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Intimate partner violence among HIV positive pregnant women in South Africa

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Abstract

The aim of the study was to determine the prevalence of intimate partner violence (IPV) and associated factors among pregnant HIV-infected women in primary health care facilities in Nkangala and Gert Sibande districts, Mpumalanga, South Africa. Participants were 673 women who were, on average, 28.39 ± 5.73 years old. Data were collected through Audio Computer Assisted Self Interview (ACASI), and analysed using the IBM Statistical Package for Social Sciences (SPSS). Overall, 56.3% reported having experienced either psychological or physical IPV, and 19.6% reported physical IPV. In logistic multivariable regression analyses, higher levels of depressive symptoms and greater perceived stigma were associated with combined physical and psychological IPV. Psychological IPV and physical IPV were also individually associated with greater perceived stigma and higher levels of depressive symptoms. The design and implementation of evidence-informed interventions that can empower and protect HIV-infected pregnant women from IPV is essential to managing their health-related quality of life.

Keywords

antenatal care; pregnant women; intimate partner violence; Conflict Tactics Scale; South Africa

Introduction

Research studies in Kenya, the United States, South Africa and Tanzania have suggested a link between HIV infection and women's experience of intimate partner violence (IPV) (Maman et al., 2002; Dunkle et al., 2004; Gielen et al., 2007; Sareen et al., 2009; Shi, Kouyoumdjian & Dushoff, 2013). Gender inequality has been cited as an underlying factor for both women's risk of IPV and HIV, and the associations between them (Jewkes et al., 2003; UNAIDS, 2012). In addition, poverty and lack of access to education increase vulnerability to HIV infection among women. The antecedents of IPV among HIV-infected

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women are in need of further study in low-resource settings like South Africa that carry a higher risk of interpersonal violence.

Studies conducted in Africa among HIV-infected women have reported IPV as a result of HIV disclosure (Hyginus et al., 2012; Shamu et al., 2014). A review of 17 studies (15 in sub-Saharan Africa and two from Southeast Asia) indicated that between 3.5% and 14.6% of women reported experiencing a violent reaction from a partner following disclosure (Medley et al., 2004). In South Africa, HIV-infected women in sero-discordant couples were the most likely to experience violence (Grinstead, Gregorich, Choi, & Coates, 2001). While IPV can lead to HIV-infection risk in women (Jewkes et al., 2010; Kouyoumdjian et al., 2013), it is also reported to be a cause of violence among women (Hyginus et al., 2012; Shamu et al., 2014), and the prevalence of IPV has been noted to be higher in HIV-infected women than among HIV-negative women (Maman et al., 2002; Fonck, Els, Kidula, Ndinya-Achola, & Temmerman, 2005; Ntanganira et al., 2008). HIV-infected women are at increased risk of all forms of violence, but predominantly physical, sexual and emotional violence (Hale & Vazquez, 2011, in Aryal, Regmi, & Mudwari, 2012).

IPV among pregnant women is even more dangerous, and has been associated with adverse maternal and infant-health effects (Devries et al., 2010). Similarly, the combination of IPV and HIV infection may result in even greater adverse consequences among pregnant women. Among HIV-infected pregnant women in Nigeria, 32.5% reported IPV in 2012, with psychological violence being the most common, and physical violence the least often form reported (27.5%, 5.9%, respectively) (Ezeanochie et al., 2011). A similar study in 2009 found 65.8% of pregnant, HIV-infected Nigerian women reported abuse, verbal abuse (51.7%), threats of violence (22.9%), and sexual deprivation (21.5%) (Ezechi et al., 2009). Studies on IPV have typically focused on pregnant women (Shamu et al., 2011; Peltzer et al., 2011; Hyginus et al., 2012) or HIV-infected women (Peltzer et al., 2013b); fewer studies have focused on the combination of IPV during pregnancy among HIV-infected women, particularly those in rural areas (e.g. Shamu, Abrahams, Temmerman, Musekiwa, & Zarowsky, 2011; Peltzer et al., 2013a). In South Africa's rural Mpumalanga province, in Nkangala district, 11.6% of HIV-infected pregnant women reported physical abuse by their partner in the previous six months in comparison to HIV-negative women (7.8%) (data reanalysed, Matseke et al., 2012). In a similar study in Mpumalanga, many HIV-infected pregnant women reported verbal aggression (67.1%), minor violence (31.6%) and severe violence (18.1%) in the past month during face-to-face interviews (data reanalysed, Peltzer et al., 2013b). These studies point to the potentially high rates of physical violence during pregnancy in this population.

Factors associated with IPV among HIV-infected pregnant women have been identified as multiparous having an HIV-positive child, the experience of violence before they were diagnosed with HIV, having partners without post-secondary education (Ezeanochie et al., 2011), having an HIV-negative partner (Ezechi et al., 2009), and lower likelihood of disclosure (Makin et al., 2008). The dangers inherent in IPV during pregnancy (e.g. premature birth), especially among high-risk pregnancies in HIV-infected women, make identification of factors that may predict and prevent IPV an urgent priority. This study aimed to determine the prevalence and determinants of intimate partner violence among

pregnant HIV-infected women in primary health care facilities in rural Mpumalanga, South Africa. We hypothesised that women newly diagnosed with HIV who had not disclosed their serostatus would be more likely to report IPV and to report greater perceived HIV-related stigma. We further speculated that women reporting IPV would be less likely to have male partners involved in their pregnancy.

Method

Participants and setting

Participants were 673 HIV-positive pregnant women in South Africa recruited during the baseline phase of Protect Your Family, a clinic-randomised, controlled trial designed to test the effectiveness of a behavioural intervention aimed at increasing prevention-of-mother-to-child-transmission (PMTCT) uptake, family planning and male partner participation in the antenatal and postnatal process in 12 community health centres in Gert Sibande and Nkangala districts in Mpumalanga province, South Africa (Jones et al., 2014). Both newly diagnosed (n = 365) and previously diagnosed women (n = 308) were recruited (see Tables 1a and 1b). Newly diagnosed women had received pre- and post-HIV counselling and testing (HCT) per the South African PMTCT protocol, and referral for immediate CD4 assessment and antiretroviral therapy (ART). As such, eligible women candidates were referred to the study assessor by PMTCT/HCT staff post-HIV testing and referral for treatment. Consistent with the design of the main study, only seropositive women with partners were invited to participate in the study, although their partners were not enrolled. Additional inclusion criteria included participants from 18 years or older, and candidates who did not meet these criteria were not eligible to participate. Interested participants were offered an appointment, and enrolled after providing informed consent.

Sample characteristics

Participants were adult (18 years or older), HIV-infected women with male partners, although male partners were not enrolled. On average, the women were 17.8 weeks pregnant with a range of 6 to 30 weeks. Of the 709 HIV-infected pregnant women invited to participate in the study, eight declined, and 28 (3.8%) had unusable data due to technical difficulties or protocol deviation. As such, the final sample consisted of data from 673 participants, yielding a response rate of 94.9% [95% CI 93.2, 96.5].

Participants were, on average, 28.4 ± 5.7 years old, and most (49.6%) had completed at least 10 to 11 years of education. The majority (78.3%) of the women were unemployed and had a monthly income of less than 949 ZAR (~US$76; 67.7%). Although all participants had a partner, the majority (81.4%) of the women were not married. Nearly two-thirds (65.9%) of participants reported that their partner was HIV infected. Most (79.3%) of the women had at least one child, and 90.5% reported that their children were HIV uninfected.

The majority (72.1%) of participants reported that they had disclosed their HIV status to someone, although disclosure to their partner was much lower, 58.4%. On average, the women had been diagnosed with HIV for 23.15 ± 36.80 months and had been on ART for 13.00 ± 23.87 months. Further details on demographic characteristics and description of

demographic comparisons of women who reported not having experienced IPV as opposed to those who reported experiencing IPV are reported in Table 1a. Comparisons between women who reported experiencing psychological or physical IPV, on the other hand, are presented in Table 1b.

Procedure

Permission for the study was granted by the Human Sciences Research Council (HSRC) Ethics Review Committee, Mpumalanga Province Department of Health Research and Ethics Committee, and the University of Miami Human Subjects Research office. Participants consented to the study. All the participants completed measures in their preferred language (English, Zulu, or Sotho) using the Questionnaire Development System's (QDS) Audio Computer-Assisted Self-Interview (ACASI) software in order to enhance disclosure and accommodate all levels of literacy. To familiarise participants with the software, assessors completed the demographic component of the questionnaire with participants prior to completion of all other assessments. In addition, an on-site assessor was available at all times to answer any questions.

A physician, clinic officer, counsellor or other trained health care provider at each clinic was available to immediately evaluate participants who disclosed experiencing serious depression or thoughts of self-harm. After assessing the level of risk, if so deemed by the provider, the participant was referred for further assessment and/or hospitalisation, or, if not in immediate danger of harming herself, was referred for outpatient counselling/treatment. Community health centres had access times to licensed psychiatric nurses and social workers, as well as psychiatrists and clinical psychologists at the associated district hospital.

Measures

Socio-demographics, and HIV-related questions—Participants responded to demographic questions, including age, education, income, employment status, number of children, planned pregnancy, alcohol use, condom use at last sex, time since HIV diagnosis, and time since ART initiation.

Depression—The Edinburgh Postnatal Depression Scale 10 (EPDS-10; Cox et al., 1987) was used to assess depression. The EDPS-10 is a 10-item instrument asking participants to rate how often they have experienced different symptoms associated with depression in the past seven days. Scores range from 0 to 30, the validated cut-off score for South African populations is 12 (Lawrie, Hofmeyr, de Jager & Berk, 1998). Cronbach's alpha for the EDPS-10 scale was 0.75 in this study sample, showing adequate internal consistency, as in prior research in South Africa (Peltzer & Shikwane, 2011).

Disclosure—HIV serostatus disclosure was assessed using an adapted version of the Disclosure Scale (Visser et al., 2008), assessing disclosure among sexual partners and family members during pregnancy, as well as factors associated with disclosure. For this study, only responses regarding the participant's disclosure to anyone and her partner were used.

Intimate partner violence (IPV)—IPV was assessed using an adaptation of the Conflict Tactics Scale 18 (CTS-18; Straus et al., 1979), which assesses reasoning, psychological aggression, and mild and severe physical aggression through the use of different subscales. Respondents indicated the number of times in the past six months their partner had engaged in specific behaviours using a scale of 0 (*never*) to 6 (*more than 20 times*). Scores on the reasoning subscale range from 0 to 18, with higher scores indicating their partner more frequently used reasoning techniques during conflict resolution. The psychological aggression subscale scores range from 0 to 42, such that higher scores indicated that their partner had engaged in more frequent acts of psychological aggression. Similarly, the combined totals of mild and severe physical aggression subscales scores range from 0 to 48, such that higher scores indicated that their partner engaged in more frequent physical aggression. In this study, only the severe physical aggression totals were considered, and were dichotomised into a score of 0 if reporting no physical aggression, and 1 if reporting any form of physical aggression. Internal reliability was adequate for the reasoning and psychological aggression subscales ($\alpha = 0.70$ and $\alpha = 0.83$, respectively), and excellent for physical aggression ($\alpha = 0.91$).

Male involvement—Male involvement was assessed using a Male Involvement Index (Jones et al., 2014), comprised of 11 items related to the participant's partner's involvement in the antenatal period. Questions included 'Does your male partner attend antenatal care visits with you?', and 'Have you discussed antenatal HIV prevention for your baby with your male partner?' Participants responded to each item as 1 (*yes*) or 0 (*no*), and scores ranged from 0 to 11. Cronbach's alpha was 0.84 in this sample.

Stigma—The AIDS-Related Stigma Scale (ARSS; Kalichman et al., 2005) was used to measure internalised stigma. The ARSS is a nine-item scale, and some items include 'People who have AIDS are dirty' and 'People who have AIDS should be ashamed', which are rated dichotomously using a score of 0 '*disagree*' or 1 '*agree*'. Scores range from 0 to 9, such that higher scores suggest a higher degree of stigma. Adequate internal reliability ($\alpha = 0.75$) for this scale has been reported in previous research in South Africa (Kalichman et al., 2005). The reversed coded item ('It is safe for people who have AIDS to work with children') was removed from the total score given the scale's poor internal reliability ($\alpha = 0.58$) with its inclusion. Excluding that item, reliability was adequate ($\alpha = 0.74$).

Data analysis

Descriptive statistics were used to analyse demographic and psychosocial characteristics, and 95% confidence intervals with 1 000 bootstrap samples were used to determine the prevalence of IPV. Given the severe positive skew of the psychological and physical aggression variables, scores were dichotomised into values of 0 if the participant had a total score of 0, and 1 if her score was 1 or greater. A combined total of psychological and physical aggression scores was also computed and scores were dichotomised in a similar manner. Then, to compare the groups of women that had experienced IPV (combined physical and psychological IPV) versus those that had not, *t*-tests—or its nonparametric alternative, the Mann Whitney test—and chi-square tests were used. Similar comparisons were conducted to identify group differences between women that reported experiencing

psychological IPV and physical IPV. Lastly, three separate logistic regression models were developed using IPV (combined, physical, and psychological) as the dichotomous outcome variable, using variables significant at $p < 0.10$ as predictors. A cut-off of $p < 0.05$ level was used as the threshold for significance. IBM Statistical Package for the Social Sciences (SPSS, 2013) v22 for Windows was used to conduct the analyses.

Results

Prevalence of intimate partner violence

Overall, 56.3% [95% CI 52.6, 60.2] reported having experienced either psychological or physical IPV. With regard to psychological IPV, 55.1% [95% CI 51.3, 58.8%] of participants reported having experienced psychological IPV. Physical IPV, on the other hand, was reported by 19.6% [95% CI 16.6, 22.6] of the women. Further details of specific behaviours reported by the women on the CTS subscales is reported in Table 2.

Bivariate and multivariable associations with intimate partner violence

In bivariate analyses, higher levels of depressive symptoms, higher stigma and decreased male involvement were associated with combined psychological and physical IPV. Younger age, unwanted pregnancy, higher levels of depressive symptoms, more frequent use of alcohol, higher stigma, and decreased male involvement were associated with psychological IPV in bivariate analyses. Lastly, in bivariate analyses, having children, unwanted pregnancy, higher levels of depressive symptoms, more frequent use of alcohol, higher stigma, and decreased male involvement were associated with physical IPV.

In logistic multivariable regression analyses, increased depression and higher stigma were associated with combined physical and psychological IPV, after controlling for age, planned pregnancy, alcohol use and male involvement. Psychological IPV was also associated with higher endorsement of stigma and depression in the multivariable model, after controlling for age, planned pregnancy, alcohol use, and male involvement. Similarly, for the physical IPV multivariable model, higher levels of depression and stigma were associated with physical IPV after controlling for number of children, unplanned pregnancy, time since diagnosis, alcohol use, and male involvement. Further description of all three multivariable models is presented in Table 3.

Discussion

This study of HIV-infected pregnant women in a rural setting designed to identify determinants of IPV was characterised by high levels of IPV. As hypothesised, women reporting IPV were less likely to have male partners involved in the pregnancy, and to report greater perceived stigma. Both HIV-related stigma and depression were predictors of IPV, such that an increase in stigma and depression were associated with an increase in any type of IPV, as well as in all types of IPV combined. Surprisingly, neither recency of HIV diagnosis, nor HIV disclosure was associated with IPV.

The prevalence of IPV identified in this study is similar to rates found in Nigeria (Ezechi et al., 2009; Ezeanochie et al., 2011). This finding reflects previous studies suggesting that it is

typical of women in rural settings to report more IPV experiences compared to those in urban areas (Shannon et al., 2015). Rates of both psychological and physical IPV were higher than previously reported in a sample of pregnant HIV-infected women in primary health care facilities in the same region of South Africa (data reanalysed, Matseke et al., 2012), but were similar to another study in community health centres in this region (data reanalysed, Peltzer et al., 2013a). Other studies in South Africa (Phaswana-Mafuya et al., 2009; Matseke et al., 2012) using paper questionnaires have found lower IPV prevalence rates among HIV-positive pregnant women. This variability is not surprising, as reporting may vary when using face-to-face interviews; the current study utilised computerised questionnaires to provide privacy to participants enabling disclosure of sensitive information such as IPV.

Both physical and psychological IPV were associated with higher levels of depressive symptoms in this study. This finding is consistent with other studies that identified an association between IPV and adverse mental health outcomes such as depression (Hartley et al., 2011; Peltzer et al., 2013b; Stewart et al., 2014; Shannon et al., 2015). The combination of IPV, HIV infection and poor living conditions may contribute an additional burden to the lives of pregnant women, compromising their mental health status, accounting for almost half of the women in this study reporting symptoms of depression. Bearing in mind that slightly more than half of the women in this study reported having experienced psychological IPV, it is not surprising that most of these women also reported having experienced depressive symptoms. Similarly, internalised stigma reported may be related to depression. Although there is limited literature regarding the association of internalised stigma to IPV, reports indicate a strong relationship between both physical and psychological IPV and internalised stigma. Given that the study data is not longitudinal, it is not possible to ascribe a predictive relationship between internalised stigma and IPV, which may in part account for the lack of association between recency of HIV diagnosis and disclosure with IPV. It can be conjectured that women participating in this study may harbour stigmatising beliefs about their HIV infection and/or partners may have responded to their HIV diagnoses negatively, as has been noted in previous studies (e.g. Medley et al., 2004; Hyginus et al., 2012; Shamu et al., 2014). Clearly, the stigma remains associated with HIV on a community-wide scale and efforts to reduce HIV-related stigma must continue.

Although not predictive of IPV, several factors were associated with increased IPV, including a decrease in male partners' involvement in pregnancy, unwanted pregnancy and increased alcohol use. These relationships highlight the importance of reducing IPV, as current PMTCT guidelines promote male involvement in pregnancy to enhance maternal adherence and retention in care. Similarly, greater male involvement in pregnancy increases the potential for the uptake of safer conception strategies and long-term contraception methods. Finally, the association between alcohol use and IPV accentuates the need for targeted men's programmes to reduce IPV, including men's groups and legal consequences for IPV. Additionally, provisions must be in place and implemented at the community level to inform women about how to avoid and respond to IPV when it occurs.

Implications for the design of IPV prevention interventions with women living with HIV

Gender inequality has been cited as an underlying factor in both women's risk of IPV and HIV, and the associations between them (UNAIDS, 2012) and the high IPV prevalence in this study may be partly explained by the low socio-economic status of most women in the study. The results of this study reflect the poor living conditions (78.3% unemployed and a monthly income of less than 949 ZAR; 67.7%) experienced by women in rural South Africa. It has been theorised that rural poverty is associated with IPV as it may cause women to feel stuck in harmful relationships due to limited options for gaining financial freedom (Shannon et al., 2015). Promoting gender equality, including equal access to education and employment of women is of great importance in improving their socio-economic status. The majority (81.4%) of the women in this study were not married, although they had a partner, and neither marital status nor socio-economic status was associated with IPV in the current study, in contrast with earlier research (Shannon et al., 2015). In previous studies, both low socio-economic status and single marital status were related to increased risk of IPV (Shannon et al., 2015), while marriage and high socioeconomic status have been associated with reduced risk of IPV (Abramsky et al., 2011, in Shannon et al., 2015). This study's results may reflect the relatively low income of the majority of participants, and the lack of variability of the overall sample.

Conclusion

In conclusion, the extent of IPV among HIV-infected pregnant women in rural and urban South Africa underscores the need for community-based prevention interventions. Although the factors associated with IPV can be utilised to inform appropriate intervention strategies, IPV appears to be widespread and in need of immediate action. Implementation of multidimensional interventions that can empower and protect HIV-infected pregnant women against partner violence in South Africa is essential.

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J Psychol Afr. Author manuscript; available in PMC 2017 July 08.

Table 1

a: Sample characteristics by any intimate partner violence (IPV)

Characteristic	All (*N* = 673)	No IPV (*n* = 294)	Any IPV (*n* = 379)	Z/t/χ^2, *p*
	Mean (SD) *n* (%)	Mean (SD) *n* (%)	Mean (SD) *n* (%)	
Age	28.39 (5.73)	28.83 (5.83)	28.05 (5.64)	1.79, 0.074[1]
Educational attainment				
0 – 10 years	147 (21.8%)	60 (20.4%)	87 (23.0%)	2.46, 0.292
10 – 11 years	334 (49.6%)	156 (53.1%)	178 (47.0%)	
12 years or more	192 (28.5%)	78 (26.5%)	114 (30.1%)	
Employment status				
Unemployed	527 (78.3%)	229 (77.9%)	298 (78.6%)	0.08, 0.963
Employed	116 (17.2%)	52 (17.7%)	64 (16.9%)	
Volunteering or Student	30 (4.5%)	13 (4.4%)	17 (4.5%)	
Monthly household income (South African Rand)				
< 310 (~ $25)	221 (32.8%)	130 (44.2%)	169 (44.6%)	0.78, 0.678
310 – 949 (~ $76)	225 (33.9%)	66 (22.4%)	94 (24.8%)	
950 or more	214 (33.3%)	98 (33.3%)	116 (30.6%)	
Marital status				
Not married, living separate	398 (59.1%)	168 (57.1%)	230 (60.7%)	2.19, 0.334
Not married, living together	150 (22.3%)	64 (21.8%)	86 (22.7%)	
Married	125 (18.6%)	62 (21.1%)	63 (16.6%)	
HIV serostatus of spouse/partner				
Negative	77 (29.3%)	35 (29.4%)	42 (29.2%)	0.59, 0.743
Positive	167 (63.5%)	77 (64.7%)	90 (62.5%)	
Do not know	19 (7.2%)	7 (5.9%)	12 (8.3%)	
Number of children				
None	139 (20.7%)	69 (23.5%)	70 (18.5%)	2.53, 0.112
One or more	534 (79.3%)	225 (76.5%)	309 (81.5%)	
HIV serostatus of children				

a: Sample characteristics by any intimate partner violence (IPV)

Characteristic	All (*N* = 673)	No IPV (*n* = 294)	Any IPV (*n* = 379)	Z/t/χ^2, *p*
	Mean (SD) *n* (%)	Mean (SD) *n* (%)	Mean (SD) *n* (%)	
Negative	477 (89.3%)	204 (90.7%)	273 (88.3%)	1.23, 0.540
Positive	28 (5.2%)	9 (4.0%)	19 (6.1%)	
Do not know	29 (5.4%)	12 (5.3%)	17 (5.5%)	
Disclosure of serostatus (to anyone)				
No	188 (27.9%)	90 (30.6%)	98 (25.9%)	1.86, 0.173
Yes	485 (72.1%)	204 (69.4%)	281 (74.1%)	
Disclosure of serostatus (to partner)				
No	280 (41.6%)	122 (41.5%)	158 (41.7%)	0.003, 0.960
Yes	393 (58.4%)	172 (58.5%)	221 (58.3%)	
Diagnosed during this pregnancy				
No	308 (45.8%)	130 (44.2%)	178 (47.0%)	0.50, 0.478
Yes	365 (54.2%)	164 (55.8%)	201 (53.0%)	
Pregnancy				
Wanted	317 (47.1%)	151 (51.4%)	166 (43.8%)	3.80, 0.051
Unwanted	356 (52.9%)	143 (48.6%)	213 (56.2%)	
Months since diagnosis	23.15 (36.80)	21.44 (33.42)	24.48 (39.21)	0.99, 0.322[1]
Months since ART initiation	13.00 (23.87)	12.96 (23.81)	13.04 (23.95)	0.43, 0.671[1]
Condom at last sex				
No	325 (48.3%)	133 (45.2%)	192 (50.7%)	1.95, 0.163
Yes	348 (51.7%)	161 (54.8%)	187 (49.3%)	
Depression	12.03 (5.97)	10.79 (5.73)	12.99 (5.98)	**4.81, < 0.001**
Alcohol use (≥ 3 drinks/day) past month				
No	581 (86.3%)	262 (89.1%)	319 (84.2%)	3.43, 0.064
Yes	92 (13.7%)	32 (10.9%)	60 (15.8%)	
Male involvement index	7.10 (3.07)	7.39 (3.18)	6.86 (2.98)	**2.84, 0.005**[1]
Internalised stigma	0.77 (1.36)	0.47 (1.09)	1.01 (1.49)	**6.70, < 0.001**[1]

b: Sample characteristics by psychological and physical intimate partner violence (IPV; *N* = 673)

Characteristic	No IPV (*n* = 302)	Psychological IPV (*n* = 371)	Z/t/χ^2, *p*	No IPV (*n* = 541)	Physical IPV (*n* = 132)	Z/t/χ^2, *p*
	Mean (SD) *n* (%)	Mean (SD) *n* (%)		Mean (SD) *n* (%)	Mean (SD) *n* (%)	
Age	28.88 (5.84)	27.99 (5.62)	2.02, 0.044[1]	28.54 (5.77)	27.77 (5.54)	1.38, 0.168
Educational attainment						
0 – 10 years	63 (20.9%)	84 (22.6%)	2.56, 0.278	112 (20.7%)	35 (26.5%)	2.40, 0.301
10 – 11 years	160 (53.0%)	174 (46.9%)		270 (49.9%)	64 (48.5%)	
12 years or more	79 (53.0%)	113 (30.5%)		159 (29.4%)	33 (25.0%)	
Employment status						
Unemployed	236 (78.1%)	291 (78.4%)	0.062, 0.970	424 (78.4%)	103 (78.0%)	0.30, 0.863
Employed	53 (17.5%)	63 (17.0%)		94 (17.4%)	22 (16.7%)	
Volunteering or student	13 (4.3%)	17 (4.6%)		23 (4.3%)	7 (5.3%)	
Monthly household income (South African Rand)	132 (43.7%)	167 (45.0%)	0.73, 0.695	242 (44.7%)	57 (43.2%)	1.26, 0.533
< 310 (~ $25)	69 (22.8%)	91 (24.5%)		132 (24.4%)	28 (21.2%)	
310 – 949 (~ $76)	101 (33.4%)	113 (30.5%)		167 (30.9%)	47 (35.6%)	
950 or more						
Marital status						
Not married, living separate	173 (57.3%)	225 (60.6%)	2.48, 0.289	322 (59.5%)	76 (57.6%)	4.04, 0.133
Not married, living together	65 (21.5%)	85 (22.9%)		113 (20.9%)	37 (28.0%)	
Married	64 (21.2%)	61 (16.4%)		106 (19.6%)	19 (14.4%)	
HIV serostatus of spouse/partner						
Negative	35 (28.5%)	42 (30.0%)	1.01, 0.604	64 (30.3%)	13 (25.0%)	2.075, 0.354
Positive	81 (65.9%)	86 (61.4%)		134 (63.5%)	33 (63.5%)	
Do not know	7 (5.7%)	12 (8.6%)		13 (6.2%)	6 (11.5%)	
Number of children						
None	70 (23.2%)	69 (18.6%)	2.13, 0.144	120 (22.2%)	19 (14.4%)	**3.93, 0.048**
One or more	232 (76.8%)	302 (81.4%)		421 (77.8%)	113 (85.6%)	
HIV serostatus of children						
Negative	210 (90.5%)	267 (88.4%)	0.80, 0.671	380 (90.3%)	97 (85.8%)	2.37, 0.305
Positive	10 (4.3%)	18 (6.0%)		19 (4.5%)	9 (8.0%)	
Do not know	12 (5.2%)	17 (5.6%)		22 (5.2%)	7 (6.2%)	

J Psychol Afr. Author manuscript; available in PMC 2017 July 08.

b: Sample characteristics by psychological and physical intimate partner violence (IPV; *N* = 673)

Characteristic	No IPV (*n* = 302)	Psychological IPV (*n* = 371)	Z/t/χ^2, *p*	No IPV (*n* = 541)	Physical IPV (*n* = 132)	Z/t/χ^2, *p*
	Mean (SD) *n* (%)	Mean (SD) *n* (%)		Mean (SD) *n* (%)	Mean (SD) *n* (%)	
Disclosure of serostatus (to anyone)						
No	92 (30.5%)	96 (25.9%)	1.74, 0.187	148 (27.4%)	40 (30.3%)	0.46, 0.499
Yes	210 (69.5%)	275 (74.1%)		393 (72.6%)	92 (69.7%)	
Disclosure of serostatus (to partner)						
No	125 (41.4%)	155 (41.8%)	0.01, 0.919	217 (40.1%)	63 (47.7%)	2.53, 0.111
Yes	177 (58.6%)	216 (58.2%)		324 (59.9%)	69 (52.3%)	
Diagnosed during this pregnancy						
No	134 (44.4%)	174 (46.9%)	0.43, 0.512	407 (75.2%)	99 (75.0%)	0.003, 0.956
Yes	168 (55.6%)	197 (53.1%)		134 (24.8%)	33 (25.0%)	
Pregnancy						
Wanted	156 (51.7%)	161 (43.4%)	**4.56, 0.033**	266 (49.2%)	51 (38.6%)	4.72, 0.030
Unwanted	146 (48.3%)	210 (56.6%)		275 (50.8%)	81 (61.4%)	
Months since diagnosis	21.66 (33.78)	24.36 (39.09)	1.01, 0.312 [1]	21.10 (33.53)	31.55 (47.15)	1.68, 0.094
Months since ART initiation	13.17 (24.44)	12.87 (23.44)	0.59, 0.555 [1]	12.43 (22.71)	15.34 (28.13)	0.47, 0.641
Condom at last sex						
No	137 (45.4%)	188 (50.7%)	1.88, 0.170	257 (47.5%)	68 (51.5%)	0.68, 0.408
Yes	165 (54.6%)	183 (49.3%)		284 (52.5%)	64 (48.5%)	
Depression	10.74 (5.75)	13.08 (5.95)	5.16, < 0.001	11.50 (5.97)	14.20 (5.45)	4.73, < 0.001
Alcohol use (≥ 3 drinks/day) past month	270 (89.4%)	311 (83.8%)	**4.39, 0.036**	477 (88.2%)	104 (78.8%)	**7.92, 0.005**
No	32 (10.6%)	60 (16.2%)		64 (11.8%)	28 (21.8%)	
Yes						
Male involvement index	7.39 (3.19)	6.85 (2.96)	2.90, 0.004 [1]	7.29 (2.03)	6.28 (3.12)	3.44, 0.001 [1]
Internalised stigma	0.49 (1.17)	1.01 (1.46)	**6.84, < 0.001** [1]	0.65 (1.18)	1.30 (1.86)	**4.61, < 0.001** [1]

Note: ART = Antiretroviral Therapy.

[1] Mann-Whitney test was used for comparison of groups.

Table 2

Conflict tactics scale (CTS) by subscales (past month; $N = 673$)

	Item	0	1–5 times	6–20 times	> 20 times
		N (%)	*N* (%)	*N* (%)	*N* (%)
CTS Reasoning	Discussed the issue calmly	220 (32.7%)	317 (47.1%)	42 (6.2%)	94 (14.0%)
	Got information to back up	327 (48.6%)	255 (37.9%)	33 (4.9%)	58 (8.6%)
	Brought in or tried to bring	445 (66.1%)	178 (26.4%)	21 (3.1%)	29 (4.3%)
	Total Score Mean (SD)	4.04 (4.35)			
CTS Verbal aggression	Insulted or swore at you	531 (78.9%)	114 (16.9%)	18 (2.7%)	10 (1.5%)
	Sulked and/or refused to talk about it	496 (73.7%)	145 (21.5%)	14 (2.1%)	18 (2.7%)
	Stomped out to the room or house (or yard)	487 (72.4%)	163 (24.2%)	9 (1.3%)	14 (2.1%)
	Cried	472 (70.1%)	178 (26.4%)	14 (2.1%)	9 (1.3%)
	Did or said something to spite you	505 (75.0%)	151 (22.4%)	10 (1.5%)	7 (1.0%)
	Threatened	570 (84.7%)	91 (13.5%)	8 (1.2%)	4 (0.6%)
	Threw, smashed, or kicked something	604 (89.7%)	55 (8.2%)	12 (1.8%)	1 (0.3%)
	Total Mean (SD)	3.20 (5.31)			
CTS Physical aggression (mild)	Threw something at you	620 (92.1%)	45 (6.7%)	5 (0.7%)	3 (0.4%)
	Pushed	589 (87.5%)	79 (11.7%)	3 (0.4%)	2 (0.3%)
	Slapped	584 (86.8%)	81 (12.0%)	5 (0.7%)	3 (0.4%)
	Total Mean (SD)	0.62 (1.87)			
CTS Physical aggression (severe)	Kicked	624 (92.7%)	46 (6.8%)	2 (0.3%)	1 (0.1%)
	Hit	627 (93.2%)	42 (6.2%)	3 (0.4%)	1 (0.1%)
	Beat	611 (90.8%)	54 (8.0%)	4 (0.6%)	4 (0.6%)
	Threatened	648 (96.3%)	22 (3.3%)	3 (0.4%)	0 (0.0%)
	Used a knife	657 (97.6%)	15 (2.2%)	0 (0.0%)	1 (0.1%)
	Total Mean (SD)	0.50 (1.97)			

Note: CTS = Conflict Tactics Scale.

Table 3

Multivariable logistic regression models for any intimate partner violence (IPV), psychological IPV, and physical IPV ($N = 673$)

Characteristic	Any violence[a] OR (95% CI)	p^a	Psychological[b] OR (95% CI)	p^b	Physical[c] OR (95% CI)	p^c
Age	0.983 (0.956 – 1.010)	0.212	0.979 (0.952 – 1.006	0.129		NS
Number of children (ref = no)		NS		NS	1.269 (0.856 – 1.881)	0.236
Pregnancy unplanned (ref = planned)	1.242 (0.903 – 1.708)	0.182	1.276 (0.929 – 1.754)	0.133	1.301 (0.947 – 1.789)	0.105
Months since diagnosis		NS		NS	1.002 (0.998 – 1.007)	0.346
Depression	1.055 (1.026 – 1.085)	< 0.001	1.060 (1.031 – 1.090)	< 0.001	1.059 (1.030 – 1.088)	< 0.001
Alcohol use (≥ 3 drinks/day) past month (ref = no)	1.262 (0.780 – 2.039)	0.343	1.337 (0.828 – 2.161)	0.235	1.365 (0.844 – 2.207)	0.205
Male involvement index	0.972 (0.922 – 1.026)	0.302	0.974 (0.923 – 1.027)	0.328	0.967 (0.917 – 1.020)	0.221
Internalised stigma	1.392 (1.193 – 1.624)	< 0.001	1.352 (1.166 – 1.568)	< 0.001	1.358 (1.170 – 1.576)	< 0.001

Note: NS = Not Significant in bivariate analyses for this model.

[a] Hosmer and Lemeshow $\chi^2 = 12.35$, $p = 0.136$; Nagelkerke $R^2 = 0.104$

[b] Hosmer and Lemeshow $\chi^2 = 10.29$, $p = 0.245$; Nagelkerke $R^2 = 0.108$

[c] Hosmer and Lemeshow $\chi^2 = 6.39$, $p = 0.604$; Nagelkerke $R^2 = 0.109$