



Published in final edited form as:

J Interpers Violence. 2021 May ; 36(9-10): NP5060–NP5083. doi:10.1177/0886260518796522.

Associations of Emotional, Physical or Sexual Intimate Partner Violence and Depression Symptoms among South African Women in a Prospective Cohort Study

Chukwuemeka N Okafor^{1,5}, Whitney Barnett^{2,3}, Heather J Zar^{2,3}, Raymond Nhapi^{2,3}, Nastassja Koen^{4,6}, Steve Shoptaw⁵, Dan J Stein^{4,6}

¹Division of Infectious Diseases, David Geffen School of Medicine at University of California, Los Angeles, 10833 Le Conte Avenue, Los Angeles, California 90095-1688, USA

²Department of Pediatrics & Child Health, Red Cross Children's Hospital, University of Cape Town, South Africa

³MRC Unit on Child & Adolescent Health, Cape Town, South Africa.

⁴Department of Psychiatry and Mental Health, University of Cape Town, South Africa

⁵David Geffen School of Medicine, Department of Family Medicine and Department of Psychiatry, University of Cape Town.

⁶South African Medical Research Council Unit on Risk and Resilience in Mental Disorders, Cape Town, South Africa.

Abstract

Objective—Violence against women remains a significant public health problem globally.

Majority of longitudinal studies documenting the negative impact of intimate partner violence (IPV) on the mental health of women come from high-income countries. The aim of this study was to investigate the longitudinal association between emotional, physical or sexual IPV and depression symptoms among South African women in a prospective cohort study.

Methods—Participants were 981 South African women enrolled in the Drakenstein Child Health Study – a cohort study investigating the early life determinants of child health. Interview data from 4 time-points (antenatal care visit, 6 months, 12 months, and 18 months post-partum) were included. The primary independent variable was self-reported emotional, physical and sexual IPV in the past 12 months. Depressive symptoms were assessed at each time-point with the Edinburgh Postnatal Depression Scale (EPDS); a cut-off score of 13 was used to define significant depression symptoms. We used pooled-multivariable logistic regression models to determine associations between the 3 different forms of IPV and significant depression symptoms while adjusting for time-fixed and time-updated covariates.

Results—Mean age of the sample at antenatal care visit was 27 years (standard deviation=6.0). In the adjusted model including all forms of IPV and adjusting sociodemographic and clinical

characteristics, substance use and childhood trauma, emotional [adjusted odds ratio (aOR) =1.55 95% confidence interval (CI); 1.02, 2.34; $p=.039$]] and sexual (aOR= 2.02, 95% CI: 1.10, 3.72; $p<.001$) IPV were significantly associated with significant depression symptoms. The relationship between physical IPV and significant depression symptoms was not statistically significant (aOR=0.68, 95% CI: 0.44, 1.05; $p=.485$).

Conclusion—Our study confirms findings from high-income countries of the association between IPV and depressive symptoms among women in South Africa. Routine screening for IPV, including emotional IPV and intervention programs for IPV among women is needed in South Africa.

Introduction

Violence against women remains a crucial public health problem and violation of women's human rights. Global estimates from the World Health Organization (WHO) indicate that between 15% and 71% of women worldwide report some form of lifetime physical and/or sexual violence perpetrated by their intimate partner (K. M. Devries et al., 2013; Garcia-Moreno et al., 2006). Intimate Partner Violence (IPV) is considered an established risk factor for a wide range of adverse mental health problems including, posttraumatic stress disorders (Bennice, Resick, Mechanic, & Astin, 2003; Campbell, 2002), suicide attempts (K. Devries et al., 2011; Karen M. Devries et al., 2013) and depressive symptoms (Coker et al., 2002) among women.

In South Africa where the rates of IPV are among the highest in the world (K. M. Devries et al., 2013; Dunkle et al., 2004; Groves et al., 2015; R. K. Jewkes, Dunkle, Nduna, & Shai, 2010), significant gaps exist in the literature on the links between IPV and mental health. For instance, in one recent systematic review of 13 longitudinal studies on the association between IPV and incident depression, none of the studies identified or included were conducted in sub-Saharan Africa (Karen M. Devries et al., 2013). However, two studies have been published from sub-Saharan Africa since that systematic review. Tsai and colleagues (Tsai, Wolfe, et al., 2016) analyzed data from a cohort of 173 HIV-positive women in rural Uganda who were interviewed every three months for a median of 1.8 years of follow-up. In their multivariable analysis, they found significant associations between forced-sex victimization and greater depression symptom severity, lower mental health-related quality of life and increased risks of probable depression across the follow-up period. In the other study, that used longitudinal data from 1,238 pregnant women in Cape Town, South Africa, who were assessed at 4 time-points across a 3-year period found – in adjusted analysis – that greater intensity of IPV was significantly associated with depression symptom severity (Tsai, Tomlinson, Comulada, & Rotheram-Borus, 2016).

While these studies are important in beginning to address the limited studies on the longitudinal links between IPV and mental health outcomes among women in sub-Saharan Africa, a few knowledge gaps remain. We have limited knowledge about the impact of different forms of IPV on mental health outcomes. Intimate partner violence may manifest in different forms including sexual, physical and emotional abuse. Majority of studies have focused on sexual or physical IPV or on IPV as a singular domain (i.e. sexual and physical

IPV). Although emotional IPV is more common than other forms of IPV (Shamu, Abrahams, Temmerman, Musekiwa, & Zarowsky, 2011; Yoshihama, Horrocks, & Kamano, 2009), it is unclear whether its impact on depression is as strong as the effect of other forms of IPV. Another important gap in the extant studies is that they do not frequently control for key confounders of the association between IPV and depressive symptoms (Karen M. Devries et al., 2013). Research consistently shows that women with a history of childhood sexual abuse or other types of childhood traumatic experience are more likely to be victims of IPV (Barrios et al., 2015; Whitfield, Anda, Dube, & Felitti, 2003; Widom, Czaja, & Dutton, 2014) and exhibit depressive symptoms in adulthood (Barrios et al., 2015; Lindert et al., 2014; Wosu, Gelaye, & Williams, 2015). Therefore, in previous research, early life stressors may have confounded observed associations between IPV and depressive symptoms.

Our study aims to address these limitations and advance the literature on the relationship of IPV and mental health outcomes among women in sub-Saharan Africa. Here we focus our study on the vulnerable group of pregnant women residing in Cape Town, South Africa, increasing the diversity of research addressing IPV and mental health outcomes, which have predominantly come from countries in North America and Europe. Women who experience IPV during pregnancy are an important group because IPV can also affect the health of the newborn. Women who experience IPV during pregnancy as compared to women who do not have higher rates of low birth weight infants and preterm births, which are associated with more neonatal morbidity and greater mortality (Alhusen, Ray, Sharps, & Bullock, 2015; Boy & Salihu, 2004; Koen et al., 2014). Additionally, antenatal care, which a vast majority of women access provides an important opportunity to screen for IPV. We had the unique opportunity to study the relationships between IPV and depression symptoms using longitudinal data from pregnant women enrolled antenatally and followed for up to 18 months postpartum in a South African cohort study. Specifically, the aim of the current study was to address the research question of whether emotional, physical and sexual IPV are longitudinally associated with significant depression symptoms – among a sample of pregnant women in Cape Town, South Africa and whether these relationships hold after adjusting for childhood traumatic experiences. We hypothesized that emotional, physical and sexual IPV will be longitudinally associated with significant depression symptoms independent of childhood traumatic experiences.

Methods

Study setting

Data for this analysis comes from the Drakenstein Child Health Study (DCHS), a multidisciplinary cohort study investigating the early life determinants of childhood health within the Drakenstein subdistrict of the Western Cape Province, South Africa (Stein et al., 2015; Zar, Barnett, Myer, Stein, & Nicol, 2015). Drakenstein is a periurban area located about 60 km from Cape Town (periurban areas are settlements lying on the outskirts of urban districts). It is a low socioeconomic community, with a population of approximately 200,000 (Zar et al., 2015). The area is characterized by a high prevalence of childhood illnesses (Zar et al., 2015) and risk factors for poor health outcomes such as alcohol abuse,

tobacco smoke exposure, drug use, IPV, poverty, and HIV (Stein et al., 2015). Most of the population access health care in the public sector, including antenatal, mental health and child health care services (Western Cape Government, 2012).

Study participants

Pregnant women were recruited from two primary health care clinics – TC Newman clinic (serving a mixed ancestry population) and Mbekweni (serving a black African population) – in the Drakenstein sub-district. Enrollment of pregnant women took place between March 2012 and March 2015. Mothers were enrolled in the DCHS during their initial antenatal care visits in the second trimester of pregnancy and were eligible to participate if they were 18 years or older, were accessing antenatal care at either of the recruitment clinics, had no intention to move out of the area within the following year and signed written informed consent.

Study design

Pregnant women enrolled in the DCHS are currently followed longitudinally throughout their pregnancy until at least 5 years after birth. The current analysis utilized data collected from mothers over 4 study visits: initial antenatal care visit (referred here as baseline visit), 6 months, 12 months and 18 months. Data on a wide range of measures was collected via self-report and clinician administered measures, however, we detail only those measures relevant for the current study.

Measures

Dependent variable: Depression Symptoms—The primary dependent variable in this secondary data analysis of the DCHS was time-updated depressive symptoms assessed at each time-point, using the Edinburgh Postnatal Depression Rating Scale (EPDS)(Cox, Holden, & Sagovsky, 1987). The EPDS is a 10-item self-report measure of recent (past seven days) depressive symptoms. The EPDS has been validated for use in pregnancy (Psych & John L. Cox MA, 1990). Each item is scored on a frequency scale ranging from 0 to 3. A total score is obtained by summing the individual responses, with higher score indicative of more severe depressive symptoms. In this study, we defined a cut-off score 13 on the EPDS at each time-point to indicate significant depression symptoms as described in the original development of the scale (Cox et al., 1987) and in South Africa (Hartley et al., 2011).

Independent variable: Intimate Partner Violence—The primary independent variable was IPV exposure by sub-type (emotional, physical and sexual IPV) in the past 12 months, assessed at each time-point. The IPV questionnaire used in this study was adapted from the WHO multi-country study (R. Jewkes, 2002) and the Women's Health Study in Zimbabwe (Shamu et al., 2011) in order to assess lifetime and past-year exposure to emotional, physical and sexual IPV. Emotional abuse was assessed with the following items: being insulted or made to feel bad about oneself; being belittled or humiliated in public; being purposefully scared or intimidated; and being threatened. To assess physical abuse, women were asked about having been slapped or having something thrown at them which could hurt them; being pushed or shoved; being hit with a fist or with something else that could hurt them;

being kicked, dragged, beaten choked or burnt; and being threatened with or actually abused with a gun, knife or other weapon. Finally, sexual abuse was defined as having been physically forced to have sex when one did not want to; having sex with one's intimate partner when one did not want to out of fear of what he might do; and/or having been forced to do something sexually that was degrading or humiliating. A 4-point frequency of occurrence scale was used: (1) never, (2) once, (3) few times, (4) many times. Scoring guidelines were devised for the purposes of this study, and were based on prior work in similar South African Studies (Dunkle et al., 2004; Koen et al., 2014). Participants were assessed as having no exposure to IPV, if all responses were "never" or one response was "once" in the questionnaire.

Covariates

Sociodemographic characteristics: The study used an adapted version of the South African Stress and Health Study (SASH) (Myer, Stein, Grimsrud, Seedat, & Williams, 2008) to assess sociodemographic characteristics of participants. The questionnaire included assessment of employment status, marital status, highest level of education completed and household income. Additionally, the questionnaire assessed participant's ethnicity, as persistent socioeconomic and health disparities exist across racial groups. All sociodemographic characteristics were time-fixed assessed at enrollment.

Substance use: Substance use in this study was time-updated, assessed at each time-point with the Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) (WHO ASSIST Working Group, 2002). The ASSIST assessed reported substance use across 10 categories, but due to low frequencies of other reported substance use, the current study only included data on maternal alcohol and tobacco use. Total scores are obtained for each substance by summing individual item responses, with a higher score indicative of greater risk for substance-related health problems. We used published guidelines for the ASSIST to classify scores into three categories: low risk, moderate risk and high risk (World Health Organization, 2010).

Childhood Trauma—History of childhood trauma in this study was time-fixed, assessed only at baseline visit with the Childhood Trauma Questionnaire-Short Form (CTQ)(D. P. Bernstein et al., 1994). The CTQ is a 28-item inventory assessing three domains of childhood abuse (sexual, physical and emotional) and two domains of childhood neglect (physical and emotional), occurring at or before the age of 12 years. Each item is scored on a frequency scale from 1 ("never true") to 5 ("very often true"), such that each subscale (domain of abuse or neglect) is scored on a spectrum from 5 (no history of abuse or neglect) to 25 (very extreme history of abuse or neglect). Cut-off scores for each clinical domain as defined in the CTQ manual (D. Bernstein, 1998) were used. Cut-off scores for each clinical domain as defined in the CTQ manual (D. Bernstein, 1998) were used. Respondents scoring within the "none or minimal" range were defined as below threshold for a history of childhood trauma; those in any other category (i.e. "low to moderate", "moderate to severe" or "severe to extreme") were defined as above threshold.

Data Analysis

Frequencies and percentages were calculated to describe the sociodemographic characteristics, different forms of IPV, substance use, and childhood trauma of the analytic sample at their baseline visit. We used Chi-square tests/Fisher exact tests to compare the distributions of sociodemographic characteristics, IPV, substance use and history of childhood trauma among those with and without significant depression symptoms at their baseline visit. Pooled-logistic regression models using generalized estimating equations (GEE) were used to determine relationships between the different forms of IPV (emotional, physical and sexual) and significant depression symptoms over the follow-up visits. To preserve the temporal sequence between IPV and significant depression symptoms, we lagged the IPV variables by one time-point, so that the model estimated association between IPV at a specific time-point and significant depression symptoms at a subsequent time-point. We included data from baseline and follow-up visits and specified an exchangeable working correlation structure to account for the dependency between the repeated measurements. All sociodemographic characteristics and history of childhood trauma were treated as time-fixed variables and all others were treated as time-updated variables at each follow-up visit. When constructing multivariable models, we included all variables hypothesized a priori to be associated with maternal significant depression symptoms. We initially conducted separate models for emotional, physical and sexual IPV and including all three forms of IPV simultaneously in a final multivariable model.

Sensitivity analysis

Because prior studies have suggested that a reciprocal relationship between IPV and depression symptoms (Karen M. Devries et al., 2013; Tsai, Tomlinson, et al., 2016), we tested for potential bi-directional relationships between IPV and significant depression symptoms. We accomplished this by estimating a model using IPV as the dependent variable and lagged- significant depression symptoms as a covariate. Therefore, this model estimated the association between significant depression symptoms at one time point and IPV at a subsequent time point (Tsai, Tomlinson, et al., 2016). For this model, we used a composite variable of any IPV exposure.

Attrition

Women experiencing any IPV and those with significant depressive symptoms at baseline visit were more likely to have subsequent missed visits or to drop out from the study, thus associations between IPV and depressive symptoms may be biased. We used an inverse probability of attrition weighing approach to adjust for attrition related selection bias as described previously (Weuve et al., 2012). We first constructed models of the probability of remaining in the study (and not lost to follow-up) and calculated predicted probabilities of remaining in the study for each woman and each time-point of participation. Using the predicted probabilities from this model, we computed analytical weights that represent the inverse proportion of the probability of remaining in the study. We performed all statistical analyses using SAS version 9.4 (SAS Institute Inc., Cary, North Carolina, USA).

Results

Sample characteristics

Of 1,225 mothers enrolled in the DCHS, between March 2012 and March 2015, 981 (86%) who had two or more visits with data available on significant depression symptoms were included in this analysis and contributed 3,102 observations across 4 time-points, with 62% follow-up rate from antenatal care visit (supplemental table 2). The women who were included in the study were significantly more likely to have lower educational attainment and lower income than the women who were excluded. There were no other significant differences found between those included and those excluded (data not shown). The mean age of women at enrollment was 27 years (standard deviation=6). Most women were unemployed (73%) and 88% reported an average household income less than R5000 (approximately 500 USD) per month (Table 1). Majority of the women reported that they had been previously pregnant (65%) and about 19% were HIV-positive. At their baseline visit, 32% reported any IPV in the past year and 15%, 12% and 5% reported one, two and three forms of IPV. Twenty-five percent, 21% and 6% reported emotional, physical and sexual IPV (Table 1). At the baseline visit, 33% scored above threshold on the childhood trauma scale and prevalence of significant depression symptoms was 21% (Table 1). At baseline visit, significant depression symptoms was significantly associated with being unemployed, reporting lower educational attainment, alcohol use, reporting a history of childhood trauma and all forms of IPV.

Factors associated with significant depression symptoms in multivariable analysis

Scoring above threshold on the childhood trauma scale was significantly associated with significant depression symptoms in all multivariable models (Tables 2, 3 & 4). In addition, in the final multivariable model adjusting for all three forms of IPV, scoring above threshold on the childhood trauma scale remained significantly associated with significant depression symptoms (aOR= 2.52, 95% CI: 1.81, 3.51; $p = . <.001$; Table 5). Educational attainment also emerged as a consistent predictor of significant depression symptoms in all models, with results indicating that women with some secondary education and those who reported completing secondary/tertiary education had reduced odds of significant depression symptoms compared to those with only primary school education (Tables 2, 3, 4 & 5). In addition, in all models, women scoring in the low-moderate risk for alcohol use on the ASSIST had reduced odds of significant depression symptoms as compared to those that never used alcohol, with no significant difference for those with high-risk alcohol use compared to those who never used alcohol.

Associations between different forms of IPV and significant Depression

In a pooled-multivariable model adjusted for attrition emotional and sexual IPV were significantly associated with significant depression. Specifically, women who reported emotional IPV were 1.39 times [adjusted odds ratio (aOR) =1.39, 95% confidence interval (CI); 1.03, 1.89; $p = .002$; Table 2) more likely to experience significant depression symptoms compared to those who did not report emotional IPV. Women who reported sexual IPV had 2.07 times (95% CI: 1.19, 3.61; $p < .001$; Table 4) greater odds of experiencing significant depression symptoms compared to women who did not report sexual IPV. The relationship

between physical IPV and significant depression symptoms was not statistically significant (aOR=1.04, 95% CI: 0.74, 1.47; $p=.485$; Table 3). When all three IPV variables were included simultaneously into a multivariable logistic model, emotional IPV (aOR=1.55, 95% CI: 1.02, 2.34; $p=.039$) and sexual IPV (aOR=2.02, 95% CI: 1.10, 3.72; $p<.001$) remained statistically significantly associated with significant depression symptoms (Table 5), whereas the association with physical IPV was not statistically significant (aOR=0.68, 95% CI: 0.44, 1.05; $p=.485$).

Sensitivity analysis

In a sensitivity analysis that tested for potential bi-directional relationship, women who were depressed as compared to those not depressed were 1.43 times more likely to report experiencing any IPV at a subsequent time point (95% CI: 1.15, 1.79, $p<.001$; supplemental Table 1).

Discussion

In this study, reporting emotional or sexual IPV in the past 12 months was significantly associated with depression symptoms compared to women with no IPV exposure.

This study is among the few large population-based longitudinal studies investigating the association between different forms of IPV and significant depression symptoms among pregnant women in sub-Saharan African setting, Cape Town, South Africa. The associations between IPV and significant depression symptoms among women is well established in Countries in North America and Europe (Beydoun, Beydoun, Kaufman, Lo, & Zonderman, 2012; Lövestad, Löve, Vaez, & Krantz, 2017; Martin et al., 2006). However, longitudinal data from sub-Saharan Africa, particularly South Africa – where IPV rates are among the highest in the world – are only beginning to emerge. Our results are consistent with previous research that has found IPV to be associated with worse depressive symptoms. In one recent secondary analysis of data from a 3-year-cluster, randomized controlled trial of 1,288 pregnant women in peri-urban settings in Cape Town found that IPV intensity had a statistically significant association with depressive symptom severity (Tsai, Tomlinson, et al., 2016). The present study extends these findings by assessing different forms of IPV and documenting associations between emotional and sexual IPV and significant depression symptoms, independent of a history of childhood trauma experiences. Another longitudinal study among HIV-positive women in rural Uganda followed for over 2 years, found that experience of forced-sex victimization was associated with a subsequent increased level of depression symptom severity and increased risk of probable depression (Tsai, Wolfe, et al., 2016). Nevertheless, that study was among a cohort of HIV-positive women successfully retained in care, limiting its generalizability to other settings.

One of the important contributions of our study is the finding of an association of emotional IPV and increased odds of significant depression. The links between emotional IPV and mental health outcomes among women is less frequently studied when compared to sexual or physical IPV. Our findings are consistent with one population based study of women in Japan that found that women who experience only emotional abuse had increased symptoms of distress (Yoshihama et al., 2009). Taken together, these findings indicate that emotional

IPV might be as important an influence as sexual and physical IPV with significant depression symptoms. Emotional IPV can manifest in different forms including threats of violence, verbal abuse, humiliation, enforcement of social isolation and deprivation of financial and other basic resources by one's intimate partner (R. Jewkes, 2010). Emotional IPV may serve as a precursor to physical or sexual IPV (Renner, Habib, Stromquist, & Peek-Asa, 2014) or increases its frequency (Outlaw, 2009). Therefore, our study suggests a need for health care professionals to assess emotional violence in addition to sexual or physical partner violence in their patients experiencing depression symptoms.

In our study, sexual IPV was more robustly associated with significant depression symptoms compared to other forms of IPV. Our finding is consistent with a large body of literature demonstrating the adverse effects of sexual IPV on the mental health of women (Karen M. Devries et al., 2013). Traumatic and psychological distress linked to sexual IPV is likely a mechanism whereby IPV promotes development of depressive symptoms. The enduring stress, low self-esteem, isolation, hopelessness and physical pain due to experiences of sexual IPV can lead to mental health problems – particular depression (Dillon, Hussain, Loxton, & Rahman, 2013; Ellsberg, Jansen, Heise, Watts, & Garcia-Moreno, 2008; Rees et al., 2011).

Although, the accumulation of evidence from extant studies suggest a causal association between IPV and depression symptoms, there is some evidence of more complex bidirectional relationship between IPV and depressive symptoms (Karen M. Devries et al., 2013; Tsai, Tomlinson, et al., 2016). In our sensitivity analysis, we found that depression symptoms were also associated with subsequent IPV (supplemental table 6). The study by Tsai and colleagues (2016), found a statistically significant relationship between depressive symptoms and experiencing IPV at a subsequent time-point (Tsai, Tomlinson, et al., 2016). Symptoms of depression may hinder the ability of women to leave an abusive or potentially abusive relationship (Iverson et al., 2011). Additionally, depressive symptoms may increase the odds of subsequent IPV by contributing to perceptions of inescapable threat by diminishing the cognitive recognition of imminent harm from current abusers or from other triggers linked to IPV (Breslau, Davis, Andreski, Peterson, & Schultz, 1997; Cogle, Resnick, & Kilpatrick, 2009). Additional investigation is needed to better understand the processes by which depressive symptoms may predispose to IPV.

Our study has some limitations. We relied on self-reported data for all variables used in the analysis. Particularly for the IPV, and history of childhood trauma, self-report may be prone to non-disclosure and recall bias. Underreporting of IPV and childhood trauma may occur, leading to underestimation of the association with significant depression. Second, although we aimed to preserve the temporal ordering of IPV and depression symptom relationship; we cannot infer causality regarding these associations. Because there was some overlap in the recall periods for IPV across time-points, we were unable to determine definitively that new experiences of IPV were associated with significant depressive symptoms at a subsequent time point. Related to this issue is that some of our study variables were not measured on a consistent timeframe as the outcome (e.g. alcohol and tobacco use). Third, there was a substantial overlap between the different forms of IPV, such that some of the participants in the reference group for a particular form of IPV may have experienced other

forms of IPV, potentially driving odds ratios toward the null. Fourth, significant depression symptoms in our study were measured using the EPDS, which is a screening tool originally developed for screening for the identification of postpartum depressive symptoms (Cox et al., 1987). Although, the EPDS has been shown to reliably and validly measure perinatal depression symptoms severity or screen for postpartum depression in African populations (Tsai et al., 2013), it is not a diagnostic classification of depression or of more severe forms of depression (e.g. major depressive disorders). Moreover, the recall period of the EPDS was the past 7 days, which can characterize a woman's recent depression symptoms but not how she feels 3- or 6-months ago. Fifth, coercive control and stalking, which are other forms of IPV and not included in our study may also be an important predictors of significant depressive symptoms as prior studies suggest (Cavanaugh et al., 2012; Lacey, McPherson, Samuel, Powell Sears, & Head, 2013; Mechanic, Weaver, & Resick, 2008). Finally, our study did not adjust for additional factors that may confound the associations between IPV and significant depressive symptoms including coexisting conditions (e.g. diabetes, hypertension)(Thompson & Ajayi, 2016), weight loss/gain, present or past pregnancy (Ali, Azam, Ali, Tabbusum, & Moin, 2012) complications and lack of social support (Biaggi, Conroy, Pawlby, & Pariante, 2016). In addition, most of our sociodemographic factors were measured as time-stable covariates. Changes in some sociodemographic factors during the study follow-up period such as marital status and income can also affect depression symptoms suggesting a potential for residual confounding in our study. However, our study has many strengths including our use of data from a large prospective study of women in South Africa, a country with high prevalence of IPV and depressive symptoms. In addition, our study also assessed different forms of IPV and accounted for many of the potential confounding factors of the relationship between IPV and depression symptoms particularly childhood trauma. Our study provides a significant addition to the literature, given that longitudinal studies of different forms of IPV and depressive symptoms among women from sub-Saharan Africa are scarce (Karen M. Devries et al., 2013; Tsai, Tomlinson, et al., 2016; Tsai, Wolfe, et al., 2016).

In sum, our study confirms findings from North American and European countries of the associations between experiences of IPV and significant depression symptoms among woman in Cape Town, South Africa, and highlights the adverse impact of emotional IPV on significant depression symptoms in addition to sexual IPV. These findings have important policy implications for women's health both during pregnancy and postpartum. There is a need for health care professionals caring for women during this period to screen for all subtypes of IPV, particularly among women with depression symptoms. Given that, screening alone does not reduce IPV, additional research and resources is urgently needed to develop and scale up effective healthcare-based and community-based interventions to prevent and reduce all subtypes of IPV.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

We thank the study staff and the staff at Paarl Hospital, and at Mbekweni and TC Newman clinics for their support of the study. We thank the families and children who participated in this study. Support for this study was provided by the Bill and Melinda Gates Foundation [OPP 1017641] and by the National Institute of Mental Health (NIMH) Brain Disorders in the Developing World: Research Across the Lifespan program (grant number R21 MH098662). CNP is supported by the UCLA Postdoctoral Fellowship Training Program in Global HIV Prevention Research (Currier and Gorbach, PIs); T32MH080634. SS is supported by NIMH P30 058107 – CHIPTS UCLA CFAR grant AI028697. DJS, NK, and HJZ are supported by the Medical Research Council of South Africa.

References

- Alhusen JL, Ray E, Sharps P, & Bullock L (2015). Intimate Partner Violence During Pregnancy: Maternal and Neonatal Outcomes. *Journal of Women's Health*, 24(1), 100–106. 10.1089/jwh.2014.4872
- Ali NS, Azam IS, Ali BS, Tabbusum G, & Moin SS (2012). Frequency and Associated Factors for Anxiety and Depression in Pregnant Women: A Hospital-Based Cross-Sectional Study. *The Scientific World Journal*, 2012. 10.1100/2012/653098
- Barrios YV, Gelaye B, Zhong Q, Nicolaidis C, Rondon MB, Garcia PJ, ... Williams MA (2015). Association of Childhood Physical and Sexual Abuse with Intimate Partner Violence, Poor General Health and Depressive Symptoms among Pregnant Women. *PLOS ONE*, 10(1), e0116609. 10.1371/journal.pone.0116609 [PubMed: 25635902]
- Bennice JA, Resick PA, Mechanic M, & Astin M (2003). The Relative Effects of Intimate Partner Physical and Sexual Violence on Post-Traumatic Stress Disorder Symptomatology. *Violence and Victims*, 18(1), 87–94. [PubMed: 12733621]
- Bernstein D (1998). *Childhood Trauma Questionnaire: A Retrospective Self-Report (CTQ)*. The Psychological Corporation.
- Bernstein DP, Fink L, Handelsman L, Foote J, Lovejoy M, Wenzel K, ... Ruggiero J (1994). Initial reliability and validity of a new retrospective measure of child abuse and neglect. *The American Journal of Psychiatry*, 151(8), 1132–1136. 10.1176/ajp.151.8.1132 [PubMed: 8037246]
- Beydoun HA, Beydoun MA, Kaufman JS, Lo B, & Zonderman AB (2012). Intimate partner violence against adult women and its association with major depressive disorder, depressive symptoms and postpartum depression: A systematic review and meta-analysis. *Social Science & Medicine*, 75(6), 959–975. 10.1016/j.socscimed.2012.04.025 [PubMed: 22694991]
- Biaggi A, Conroy S, Pawlby S, & Pariante CM (2016). Identifying the women at risk of antenatal anxiety and depression: A systematic review. *Journal of Affective Disorders*, 191, 62–77. 10.1016/j.jad.2015.11.014 [PubMed: 26650969]
- Boy A, & Salihu HM (2004). Intimate partner violence and birth outcomes: a systematic review. *International Journal of Fertility and Women's Medicine*, 49(4), 159–164.
- Breslau N, Davis GC, Andreski P, Peterson EL, & Schultz LR (1997). Sex differences in posttraumatic stress disorder. *Archives of General Psychiatry*, 54(11), 1044–1048. [PubMed: 9366662]
- Campbell JC (2002). Health consequences of intimate partner violence. *The Lancet*, 359(9314), 1331–1336. 10.1016/S0140-6736(02)08336-8
- Cavanaugh CE, Messing JT, Petras H, Fowler B, La Flair L, Kub J, ... Campbell JC (2012). Patterns of Violence Against Women: A Latent Class Analysis. *Psychological Trauma: Theory, Research, Practice and Policy*, 4(2), 169–176. 10.1037/a0023314
- Coker AL, Davis KE, Arias I, Desai S, Sanderson M, Brandt HM, & Smith PH (2002). Physical and mental health effects of intimate partner violence for men and women. *American Journal of Preventive Medicine*, 23(4), 260–268. 10.1016/S0749-3797(02)00514-7 [PubMed: 12406480]
- Cougle JR, Resnick H, & Kilpatrick DG (2009). A prospective examination of PTSD symptoms as risk factors for subsequent exposure to potentially traumatic events among women. *Journal of Abnormal Psychology*, 118(2), 405–411. 10.1037/a0015370 [PubMed: 19413414]
- Cox JL, Holden JM, & Sagovsky R (1987). Detection of postnatal depression. Development of the 10-item Edinburgh Postnatal Depression Scale. *The British Journal of Psychiatry: The Journal of Mental Science*, 150, 782–786. [PubMed: 3651732]

- Devries KM, Mak JYT, García-Moreno C, Petzold M, Child JC, Falder G, ... Watts CH (2013). The Global Prevalence of Intimate Partner Violence Against Women. *Science*, 340(6140), 1527–1528. 10.1126/science.1240937 [PubMed: 23788730]
- Devries K, Watts C, Yoshihama M, Kiss L, Schraiber LB, Deyessa N, ... WHO Multi-Country Study Team. (2011). Violence against women is strongly associated with suicide attempts: evidence from the WHO multi-country study on women's health and domestic violence against women. *Social Science & Medicine* (1982), 73(1), 79–86. 10.1016/j.socscimed.2011.05.006 [PubMed: 21676510]
- Devries Karen M., Mak JY, Bacchus LJ, Child JC, Falder G, Petzold M, ... Watts CH (2013). Intimate Partner Violence and Incident Depressive Symptoms and Suicide Attempts: A Systematic Review of Longitudinal Studies. *PLOS Medicine*, 10(5), e1001439. 10.1371/journal.pmed.1001439 [PubMed: 23671407]
- Dillon G, Hussain R, Loxton D, & Rahman S (2013). Mental and Physical Health and Intimate Partner Violence against Women: A Review of the Literature [Research article]. 10.1155/2013/313909
- Dunkle KL, Jewkes RK, Brown HC, Gray GE, McIntyre JA, & Harlow SD (2004). Gender-based violence, relationship power, and risk of HIV infection in women attending antenatal clinics in South Africa. *Lancet* (London, England), 363(9419), 1415–1421. 10.1016/S0140-6736(04)16098-4
- Ellsberg M, Jansen HA, Heise L, Watts CH, & Garcia-Moreno C (2008). Intimate partner violence and women's physical and mental health in the WHO multi-country study on women's health and domestic violence: an observational study. *The Lancet*, 371(9619), 1165–1172. 10.1016/S0140-6736(08)60522-X
- Garcia-Moreno C, Jansen HAFM, Ellsberg M, Heise L, Watts CH, & WHO Multi-country Study on Women's Health and Domestic Violence against Women Study Team. (2006). Prevalence of intimate partner violence: findings from the WHO multi-country study on women's health and domestic violence. *Lancet* (London, England), 368(9543), 1260–1269. 10.1016/S0140-6736(06)69523-8
- Groves AK, Moodley D, McNaughton-Reyes L, Martin SL, Foshee V, & Maman S (2015). Prevalence and rates of intimate partner violence among South African women during pregnancy and the postpartum period. *Maternal and Child Health Journal*, 19(3), 487–495. 10.1007/s10995-014-1528-6 [PubMed: 24889116]
- Hartley M, Tomlinson M, Greco E, Comulada WS, Stewart J, le Roux I, ... Rotheram-Borus MJ (2011). Depressed mood in pregnancy: Prevalence and correlates in two Cape Town peri-urban settlements. *Reproductive Health*, 8, 9. 10.1186/1742-4755-8-9 [PubMed: 21535876]
- Iverson KM, Gradus JL, Resick PA, Suvak MK, Smith KF, & Monson CM (2011). Cognitive-Behavioral Therapy for PTSD and Depression Symptoms Reduces Risk for Future Intimate Partner Violence among Interpersonal Trauma Survivors. *Journal of Consulting and Clinical Psychology*, 79(2), 193–202. 10.1037/a0022512 [PubMed: 21341889]
- Jewkes R (2002). Intimate partner violence: causes and prevention. *Lancet* (London, England), 359(9315), 1423–1429. 10.1016/S0140-6736(02)08357-5
- Jewkes R (2010). Emotional abuse: a neglected dimension of partner violence. *The Lancet*, 376(9744), 851–852. 10.1016/S0140-6736(10)61079-3
- Jewkes RK, Dunkle K, Nduna M, & Shai N (2010). Intimate partner violence, relationship power inequity, and incidence of HIV infection in young women in South Africa: a cohort study. *The Lancet*, 376(9734), 41–48. 10.1016/S0140-6736(10)60548-X
- Koen N, Wyatt GE, Williams JK, Zhang M, Myer L, Zar HJ, & Stein DJ (2014). Intimate partner violence: associations with low infant birthweight in a South African birth cohort. *Metabolic Brain Disease*, 29(2), 281–299. 10.1007/s11011-014-9525-4 [PubMed: 24729207]
- Lacey KK, McPherson MD, Samuel PS, Powell Sears K, & Head D (2013). The impact of different types of intimate partner violence on the mental and physical health of women in different ethnic groups. *Journal of Interpersonal Violence*, 28(2), 359–385. 10.1177/0886260512454743 [PubMed: 22929348]
- Lindert J, Ehrenstein OS von, Grashow R Gal G, Braehler E, & Weisskopf MG (2014). Sexual and physical abuse in childhood is associated with depression and anxiety over the life course: systematic review and meta-analysis. *International Journal of Public Health*, 59(2), 359–372. 10.1007/s00038-013-0519-5 [PubMed: 24122075]

- Lövestad S, Löve J, Vaez M, & Krantz G (2017). Prevalence of intimate partner violence and its association with symptoms of depression; a cross-sectional study based on a female population sample in Sweden. *BMC Public Health*, 17. 10.1186/s12889-017-4222-y
- Martin SL, Li Y, Casanueva C, Harris-Britt A, Kupper LL, & Cloutier S (2006). Intimate Partner Violence and Women's Depression Before and During Pregnancy. *Violence Against Women*, 12(3), 221–239. 10.1177/1077801205285106 [PubMed: 16456149]
- Mechanic MB, Weaver TL, & Resick PA (2008). Mental health consequences of intimate partner abuse: a multidimensional assessment of four different forms of abuse. *Violence Against Women*, 14(6), 634–654. 10.1177/1077801208319283 [PubMed: 18535306]
- Myer L, Stein DJ, Grimsrud A, Seedat S, & Williams DR (2008). Social determinants of psychological distress in a nationally-representative sample of South African adults. *Social Science & Medicine* (1982), 66(8), 1828–1840. 10.1016/j.socscimed.2008.01.025 [PubMed: 18299167]
- Outlaw M (2009). No One Type of Intimate Partner Abuse: Exploring Physical and Non-Physical Abuse Among Intimate Partners. *Journal of Family Violence*, 24(4), 263–272. 10.1007/s10896-009-9228-5
- Psych DMM, & John L Cox MA,F (Ed), Psych DM,FRC. (1990). Screening for depression during pregnancy with the edinburgh depression scale (EDDS). *Journal of Reproductive and Infant Psychology*, 8(2), 99–107. 10.1080/02646839008403615
- Rees S, Silove D, Chey T, Ivancic L, Steel Z, Creamer M, ... Forbes D (2011). Lifetime Prevalence of Gender-Based Violence in Women and the Relationship With Mental Disorders and Psychosocial Function. *JAMA*, 306(5), 513–521. 10.1001/jama.2011.1098 [PubMed: 21813429]
- Renner LM, Habib L, Stromquist AM, & Peek-Asa C (2014). The Association of Intimate Partner Violence and Depressive Symptoms in a Cohort of Rural Couples. *The Journal of Rural Health*, 30(1), 50–58. 10.1111/jrh.12026 [PubMed: 24383484]
- Shamu S, Abrahams N, Temmerman M, Musekiwa A, & Zarowsky C (2011). A Systematic Review of African Studies on Intimate Partner Violence against Pregnant Women: Prevalence and Risk Factors. *PLOS ONE*, 6(3), e17591. 10.1371/journal.pone.0017591 [PubMed: 21408120]
- Stein DJ, Koen N, Donald KA, Adnams CM, Koopowitz S, Lund C, ... Zar HJ (2015). Investigating the psychosocial determinants of child health in Africa: The Drakenstein Child Health Study. *Journal of Neuroscience Methods*, 252, 27–35. 10.1016/j.jneumeth.2015.03.016 [PubMed: 25797842]
- Thompson O, & Ajayi I (2016). Prevalence of Antenatal Depression and Associated Risk Factors among Pregnant Women Attending Antenatal Clinics in Abeokuta North Local Government Area, Nigeria. *Depression Research and Treatment*, 2016. 10.1155/2016/4518979
- Tsai AC, Scott JA, Hung KJ, Zhu JQ, Matthews LT, Psaros C, & Tomlinson M (2013). Reliability and Validity of Instruments for Assessing Perinatal Depression in African Settings: Systematic Review and Meta-Analysis. *PLOS ONE*, 8(12), e82521. 10.1371/journal.pone.0082521 [PubMed: 24340036]
- Tsai AC, Tomlinson M, Comulada WS, & Rotheram-Borus MJ (2016). Intimate Partner Violence and Depression Symptom Severity among South African Women during Pregnancy and Postpartum: Population-Based Prospective Cohort Study. *PLOS Medicine*, 13(1), e1001943. 10.1371/journal.pmed.1001943 [PubMed: 26784110]
- Tsai AC, Wolfe WR, Kumbakumba E, Kawuma A, Hunt PW, Martin JN, ... Weiser SD (2016). Prospective Study of the Mental Health Consequences of Sexual Violence Among Women Living With HIV in Rural Uganda. *Journal of Interpersonal Violence*, 31(8), 1531–1553. 10.1177/0886260514567966 [PubMed: 25586914]
- Western Cape Government. (2012). Regional Development Profile Cape Winelands District. Retrieved from https://www.westerncape.gov.za/assets/departments/treasury/dc02_cape_winelands_sep_profile_2012_01_12_12.pdf
- Weuve J, Tchetgen Tchetgen EJ, Glymour MM, Beck TL, Aggarwal NT, Wilson RS, ... Mendes de Leon CF (2012). Accounting for bias due to selective attrition: the example of smoking and cognitive decline. *Epidemiology* (Cambridge, Mass.), 23(1), 119–128. 10.1097/EDE.0b013e318230e861

- Whitfield CL, Anda RF, Dube SR, & Felitti VJ (2003). Violent Childhood Experiences and the Risk of Intimate Partner Violence in Adults: Assessment in a Large Health Maintenance Organization. *Journal of Interpersonal Violence*, 18(2), 166–185. 10.1177/0886260502238733
- WHO ASSIST Working Group. (2002). The Alcohol, Smoking and Substance Involvement Screening Test (ASSIST): development, reliability and feasibility. *Addiction* (Abingdon, England), 97(9), 1183–1194.
- Widom CS, Czaja S, & Dutton MA (2014). Child abuse and neglect and intimate partner violence victimization and perpetration: A prospective investigation. *Child Abuse & Neglect*, 38(4), 650–663. 10.1016/j.chiabu.2013.11.004 [PubMed: 24325940]
- World Health Organization. (2010). The Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) Manual for use in primary care. Retrieved June 28, 2017, from http://www.who.int/substance_abuse/publications/assist/en/
- Wosu AC, Gelaye B, & Williams MA (2015). History of childhood sexual abuse and risk of prenatal and postpartum depression or depressive symptoms: an epidemiologic review. *Archives of Women's Mental Health*, 18(5), 659–671. 10.1007/s00737-015-0533-0
- Yoshihama M, Horrocks J, & Kamano S (2009). The Role of Emotional Abuse in Intimate Partner Violence and Health Among Women in Yokohama, Japan. *American Journal of Public Health*, 99(4), 647–653. 10.2105/AJPH.2007.118976 [PubMed: 18703455]
- Zar HJ, Barnett W, Myer L, Stein DJ, & Nicol MP (2015). Investigating the early-life determinants of illness in Africa: the Drakenstein Child Health Study. *Thorax*, 70(6), 592–594. 10.1136/thoraxjnl-2014-206242 [PubMed: 25228292]

Table 1.

Baseline Characteristics of the Sample by Significant Depression

| | | | Significant Depression Symptoms | | | | |
|-------------------------------------|----------|------|---------------------------------|------|----------|------|---------|
| | Overall | | Yes | | No | | |
| Characteristics | N | % | n | % | n | % | p-value |
| Total | 980 | 100 | 208 | 24.0 | 660 | 76.0 | |
| Age, mean (SD) | 27 (6.0) | | 26 (6.0) | | 27 (6.0) | | 0.09 |
| Site | | | | | | | |
| Mbekweni | 535 | 54.5 | 101 | 48.6 | 363 | 55.0 | 0.10 |
| Newman | 446 | 45.5 | 107 | 51.4 | 297 | 45.0 | |
| Race | | | | | | | |
| Black | 534 | 54.5 | 102 | 49.0 | 360 | 54.6 | 0.16 |
| Mixed race | 446 | 45.5 | 106 | 51.0 | 299 | 45.4 | |
| Marital Status | | | | | | | |
| Single | 588 | 60.0 | 127 | 61.1 | 392 | 59.5 | 0.69 |
| Employment | | | | | | | |
| Not working | 725 | 73.9 | 168 | 80.8 | 477 | 72.3 | 0.01 |
| Income | | | | | | | |
| <ZAR1000/m | 379 | 38.6 | 88 | 42.3 | 255 | 38.6 | 0.64 |
| ZAR1000–5000/m | 483 | 49.2 | 96 | 46.2 | 324 | 49.1 | |
| >ZAR5000/m | 119 | 12.1 | 24 | 11.5 | 81 | 12.3 | |
| Educational attainment | | | | | | | |
| Primary | 74 | 7.5 | 26 | 12.5 | 43 | 6.5 | 0.01 |
| Some secondary | 535 | 54.5 | 114 | 54.8 | 362 | 54.8 | |
| Completed secondary/any tertiary | 372 | 37.9 | 68 | 32.7 | 255 | 38.6 | |
| Multigravida | 640 | 65.2 | 137 | 65.9 | 432 | 65.5 | 0.91 |
| HIV Positive | 183 | 18.7 | 35 | 16.8 | 122 | 18.5 | |
| Childhood trauma (CTQ) | | | | | | | |
| Above threshold | 331 | 34.4 | 109 | 52.4 | 186 | 28.2 | <0.01 |
| Alcohol involvement (ASSIST) | | | | | | | |
| Never | 644 | 65.6 | 117 | 56.3 | 414 | 62.7 | <0.01 |
| Low-moderate risk | 242 | 24.7 | 55 | 26.4 | 187 | 28.3 | |
| High risk | 95 | 9.7 | 36 | 17.3 | 59 | 8.9 | |
| Tobacco involvement (ASSIST) | | | | | | | |
| Never | 670 | 68.3 | 129 | 62.0 | 431 | 65.3 | 0.16 |
| Low-moderate risk | 63 | 6.4 | 11 | 5.3 | 52 | 7.9 | |
| High risk | 248 | 25.3 | 68 | 32.7 | 177 | 26.8 | |
| Emotional IPV[†] | 252 | 25.7 | 84 | 40.4 | 155 | 23.5 | <0.01 |
| Physical IPV[†] | 211 | 21.5 | 79 | 38.0 | 115 | 17.4 | <0.01 |

| | | | Significant Depression Symptoms | | | | |
|-------------------------|---------|-----|---------------------------------|------|----|-----|---------|
| | Overall | | Yes | | No | | |
| Characteristics | N | % | n | % | n | % | p-value |
| Sexual IPV [†] | 65 | 6.6 | 35 | 16.8 | 26 | 3.9 | <0.01 |

Note- EPDS=Edinburg Postnatal Depression Scale; Above Threshold defined as 13 on EPDS; SD=Standard Deviation, ZAR= South African Rand; IPV=Intimate Partner Violence; CTQ=Childhood Trauma Questionnaire; ASSIST= Alcohol, Smoking and Substance Involvement Screening Test

[†] Past year

* p<.05

** p<.01

*** p<.001

Table 2.

Multivariable Models of the Association Between Emotional IPV and Significant Depression Symptoms

| | Odds ratio (95% CI) | |
|--|----------------------------|------------------------|
| | Not adjusted for attrition | Adjusted for attrition |
| Age | 0.99 (0.96, 1.02) | 1.01 (0.97, 1.05) |
| Race (vs. Black) | | |
| Mixed race | 1.20 (0.50, 2.86) | 2.10 (0.60, 7.35) |
| Marital status (vs. Married/cohabiting) | | |
| Single | 1.02 (0.77, 1.34) | 1.51 (1.01, 2.26) |
| Site (vs. Mbekweni) | | |
| Newman | 1.39 (0.60, 3.21) | 1.05 (0.29, 3.81) |
| Gravidity (vs. Multigravida) | | |
| Primigravida | 0.97 (0.72, 1.32) | 1.11 (0.71, 1.74) |
| Work (vs. not working) | | |
| Working | 0.81 (0.59, 1.12) | 0.86 (0.57, 1.31) |
| Education (vs. primary) | | |
| Some secondary | 0.63 (0.44, 0.92) *** | 0.53 (0.33, 0.80) *** |
| Completed secondary/any tertiary | 0.54 (0.36, 0.81) *** | 0.46 (0.28, 0.76) *** |
| Income (vs. <ZAR1000/m) | | |
| ZAR1000–5000/m | 0.93 (0.72, 1.20) | 1.08 (0.77, 1.52) |
| >ZAR5000/m | 1.07 (0.69, 1.66) | 0.98 (0.57, 1.68) |
| Alcohol (vs. never) | | |
| Low-moderate risk | 0.78 (0.59, 1.03) | 0.69 (0.48, 0.99) * |
| High risk | 1.24 (0.92, 1.65) | 1.17 (0.82, 1.69) |
| Tobacco (vs. never) | | |
| Low-moderate risk | 0.68 (0.42, 1.12) | 0.55 (0.28, 1.01) |
| High risk | 0.97 (0.72, 1.30) | 1.00 (0.66, 1.50) |
| HIV status (vs. negative) | | |
| Positive | 1.08 (0.79, 1.51) | 1.14 (0.73, 1.76) |
| Childhood abuse (vs. below threshold) | | |
| Above threshold | 2.42 (1.91, 3.08) *** | 2.52 (1.80, 3.51) *** |
| Emotional IPV (vs. none) [†] | 1.32 (1.05, 1.66) ** | 1.39 (1.03, 1.89) ** |

Note- EPDS=Edinburg Postnatal Depression Scale; CI=confidence interval; Above Threshold defined as ≥ 13 on EPDS; SD=Standard Deviation, ZAR= South African Rand; IPV=Intimate Partner Violence; CTQ=Childhood Trauma Questionnaire; ASSIST= Alcohol, Smoking and Substance Involvement Screening Test

[†] Past year

* p<.05

** p<.01

p.<.001

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

Table 3.

Multivariable Models of the Association Between Physical IPV and Significant Depression Symptoms

| | Odds ratio (95% CI) | |
|--|----------------------------|------------------------|
| | Not adjusted for attrition | Adjusted for attrition |
| Age | 0.99 (0.96, 1.02) | 1.00 (0.97, 1.04) |
| Race (vs. Black) | | |
| Mixed race | 1.22 (0.54, 3.00) | 1.76 (0.59, 5.26) |
| Marital status (vs. Married/cohabiting) | | |
| Single | 1.00 (0.75, 1.33) | 1.41 (0.97, 2.05) |
| Site (vs. Mbekweni) | | |
| Newman | 1.41 (0.62, 3.20) | 1.20 (0.39, 3.66) |
| Gravidity (vs. Multigravida) | | |
| Primigravida | 0.97 (0.71, 1.33) | 1.05 (0.69, 1.60) |
| Work (vs. not working) | | |
| Working | 0.82 (0.61, 1.15) | 0.87 (0.58, 1.32) |
| Education (vs. primary) | | |
| Some secondary | 0.64 (0.44, 0.93) * | 0.51 (0.32, 0.82) * |
| Completed secondary/any tertiary | 0.54 (0.35, 0.84) * | 0.45 (0.27, 0.75) * |
| Income (vs. <ZAR1000/m) | | |
| ZAR1000–5000/m | 0.93 (0.72, 1.20) | 1.07 (0.76, 1.51) |
| >ZAR5000/m | 1.06 (0.68, 1.66) | 0.98 (0.57, 1.69) |
| Alcohol (vs. never) | | |
| Low-moderate risk | 0.79 (0.60, 1.04) | 0.65 (0.45, 0.94) * |
| High risk | 1.25 (0.94, 1.08) | 1.20 (0.83, 1.73) |
| Tobacco (vs. never) | | |
| Low-moderate risk | 0.68 (0.41, 1.11) | 0.55 (0.29, 1.01) |
| High risk | 0.97 (0.72, 1.31) | 1.02 (0.67, 1.54) |
| HIV status (Vs. negative) | | |
| Positive | 1.07 (0.78, 1.48) | 1.13 (0.72, 1.76) |
| Childhood abuse (vs. below threshold) | | |
| Above threshold | 2.45 (1.93, 3.11) *** | 2.57 (1.84, 3.58) *** |
| Physical IPV (vs. none) † | 1.15 (0.90, 1.47) | 1.04 (0.74, 1.47) |

Note- EPDS=Edinburg Postnatal Depression Scale; CI=confidence interval; Above Threshold defined as ≥ 13 on EPDS; SD=Standard Deviation, ZAR= South African Rand; IPV=Intimate Partner Violence; CTQ=Childhood Trauma Questionnaire; ASSIST= Alcohol, Smoking and Substance Involvement Screening Test

† Past year

* p<.05

** p<.01

p.<.001

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

Table 4.

Multivariable Models of the Association Between Sexual IPV and Significant Depression Symptoms

| | Odds ratio (95% CI) | |
|--|----------------------------|------------------------|
| | Not adjusted for attrition | Adjusted for attrition |
| Age | 0.98 (0.96, 1.01) | 1.00 (0.97, 1.03) |
| Race (vs. Black) | | |
| Mixed | 1.25 (0.56, 2.80) | 1.81 (0.64, 5.36) |
| Marital status (vs. Married/cohabiting) | | |
| Single | 0.99 (0.76, 1.32) | 1.39 (0.95, 2.02) |
| Site (vs. Mbekweni) | | |
| Newman | 1.32 (0.58, 2.98) | 1.09 (0.37, 3.14) |
| Gravidity (vs. Multigravida) | | |
| Primigravida | 0.83 (0.60, 1.14) | 1.05 (0.69, 1.60) |
| Work (vs. not working) | | |
| Working | 0.85 (0.62, 1.16) | 0.86 (0.57, 1.30) |
| Education (vs. primary) | | |
| Some secondary | 0.63 (0.44, 0.91) * | 0.53 (0.34, 0.82) * |
| Completed secondary/any tertiary | 0.54 (0.37, 0.81) * | 0.42 (0.28, 0.77) * |
| Income (vs. <ZAR1000/m) | | |
| ZAR1000–5000/m | 0.93 (0.72, 1.21) | 1.07 (0.75, 1.51) |
| >ZAR5000/m | 1.04 (0.68, 1.60) | 0.93 (0.55, 1.58) |
| Alcohol (vs. never) | | |
| Low-moderate risk | 0.77 (0.58, 1.03) | 0.66 (0.46, 0.96) * |
| High risk | 1.27 (0.95, 1.70) | 1.21 (0.84, 1.75) |
| Tobacco (vs. never) | | |
| Low-moderate risk | 0.70 (0.42, 1.15) | 0.57 (0.30, 1.07) |
| High risk | 0.97 (0.72, 1.27) | 1.01 (0.67, 1.57) |
| HIV status (Vs. negative) | | |
| Positive | 1.07 (0.77, 1.48) | 1.12 (0.72, 1.75) |
| Childhood abuse (vs. below threshold) | | |
| Above threshold | 2.40 (1.89, 3.05) *** | 2.52 (1.81, 3.51) *** |
| Sexual IPV (vs. none) [†] | 1.83 (1.27, 2.64) *** | 2.07 (1.19, 3.61) *** |

Note- EPDS=Edinburg Postnatal Depression Scale; CI=confidence interval; Above Threshold defined as ≥ 13 on EPDS; SD=Standard Deviation, ZAR= South African Rand; IPV=Intimate Partner Violence; CTQ=Childhood Trauma Questionnaire; ASSIST= Alcohol, Smoking and Substance Involvement Screening Test

[†] Past year

* p<.05

** p<.01

p.<.001

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

Table 5.

Multivariable Models of the Independent Associations Between Different Forms of IPV and Significant Depression Symptoms

| | Odds ratio (95% CI) | |
|--|----------------------------|------------------------|
| | Not adjusted for attrition | Adjusted for attrition |
| Age | | |
| Race (vs. Black) | 0.99 (0.96, 1.01) | 1.00 (0.97, 1.03) |
| Mixed | 1.26 (0.55, 2.85) | 1.93 (0.71, 5.23) |
| Marital status (vs. Married/cohabiting) | | |
| Single | 1.01 (0.77, 1.33) | 1.36 (0.94, 1.97) |
| Site (vs. Mbekweni) | | |
| Newman | 1.30 (0.57, 2.98) | 1.00 (0.36, 2.76) |
| Gravidity (Ref= Multigravida) | | |
| Primigravida | 0.98 (0.72, 1.34) | 1.04 (0.69, 1.57) |
| Work (vs. not working) | | |
| Working | 0.83 (0.62, 1.16) | 0.87 (0.58, 1.32) |
| Education (vs. primary) | | |
| Some secondary | 0.65 (0.45, 0.94) * | 0.52 (0.33, 0.80) *** |
| Completed secondary/any tertiary | 0.54 (0.36, 0.81) *** | 0.46 (0.29, 0.78) *** |
| Income (vs. <ZAR1000/m) | | |
| ZAR1000–5000/m | 0.93 (0.72, 1.21) | 1.07 (0.76, 1.51) |
| >ZAR5000/m | 1.04 (0.68, 1.62) | 0.93 (0.55, 1.58) |
| Alcohol (vs. never) | | |
| Low-moderate risk | 0.77 (0.58, 1.02) | 0.66 (0.46, 0.96) * |
| High risk | 1.25 (0.94, 1.67) | 1.20 (0.83, 1.73) |
| Tobacco (vs. never) | | |
| Low-moderate risk | 0.70 (0.42, 1.16) | 0.58 (0.31, 1.08) |
| High risk | 0.96 (0.72, 1.29) | 0.99 (0.64, 1.50) |
| HIV status (Vs. negative) | | |
| Positive | 1.07 (0.78, 1.48) | 1.13 (0.73, 1.76) |
| Childhood abuse (vs. below threshold) | | |
| Above threshold | 2.38 (1.88, 3.03) *** | 2.52 (1.81, 3.51) *** |
| Emotional IPV (vs. none) † | 1.29 (1.02, 1.73) * | 1.55 (1.02, 2.34) * |
| Physical IPV (vs. none) † | 0.87 (0.63, 1.20) | 0.68 (0.44, 1.05) |
| Sexual IPV (vs. none) † | 1.72 (1.15, 2.57) *** | 2.02 (1.10, 3.72) *** |

Note- EPDS=Edinburg Postnatal Depression Scale; CI=confidence interval; Above Threshold defined as ≥ 13 on EPDS; SD=Standard Deviation, ZAR= South African Rand; IPV=Intimate Partner Violence; CTQ=Childhood Trauma Questionnaire; ASSIST= Alcohol, Smoking and Substance Involvement Screening Test

† Past year

*
p<.05

**
p<.01

p<.001

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript