Published in final edited form as:

Womens Health Issues. 2014 ; 24(4): e425–e434. doi:10.1016/j.whi.2014.03.006.

Social support and employment status modify the effect of intimate partner violence on depression symptom severity in women: Results from the 2006 Behavioral Risk Factor Surveillance System Survey

Nathalie Dougé, B.S.¹, Erik B. Lehman, M.S.², and Jennifer S. McCall-Hosenfeld, M.D., M.Sc.^{2,3}

¹Pennsylvania State University (PSU) College of Medicine

²Department of Public Health Sciences, PSU College of Medicine

³Department of Medicine, PSU College of Medicine

Introduction

Intimate partner violence (IPV) - physical, sexual, or psychological harm caused by a current or former partner or spouse (Centers for Disease Control and Prevention [CDC]) - is a serious public health problem that affects millions of American women (Black et al., 2011). IPV is prevalent in both heterosexual and same-sex couples, whether or not they engage in sexual intimacy (Saltzman, Fanslow, McMahon, & Shelley, 1999). In the U.S., more than 1 in 3 women (35.6%) experience physical and/or sexual harm and nearly half of all women (48.4%) experience psychological aggression by an intimate partner in their lifetime (Black et. al., 2011). Moreover, nearly 5.3 million intimate partner victimizations occur among U.S. women ages 18 and older each year, resulting in about 2 million injuries and nearly 1,300 deaths annually (CDC, 2003).

Women exposed to IPV are at increased risk for medical and psychosocial comorbidity. Among the adverse health-related consequences of IPV in women, the most significant are mental health conditions, including depression, anxiety, and post-traumatic stress disorder (PTSD) (Blasco-Ros, Sanchez-Lorente, & Martinez, 2010). This often results in increased healthcare utilization among abused women (Thompson et al., 2006) and increased

© 2014 Jacobs Institute of Women's Health. Published by Elsevier Inc. All rights reserved.

Corresponding Author: Jennifer S. McCall-Hosenfeld, M.D., M.Sc., Departments of Medicine and Public Health Sciences, Pennsylvania State University College of Medicine, 500 University Drive, Mailcode: A210, Hershey, PA 17033, jmccallhosenfeld@hmc.psu.edu, Phone: 717-531-8161, Fax: 717-531-0151.

Nathalie Dougé, Pennsylvania State University College of Medicine, 500 University Drive, Mailbox 210, Hershey, PA 17033, ndouge@hmc.psu.edu

Erik B. Lehman, M.S., Department of Public Health Sciences, Pennsylvania State University College of Medicine, 600 Centerview Drive, Hershey, PA 17033, elehman@psu.edu

There were no financial conflicts of interest involving any of the authors during this study.

Publisher's Disclaimer: This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

frequency of adverse health risk behaviors, such as heavy drinking and binge drinking, recreational drug use, and HIV risk factors (Breiding, Black, & Ryan, 2008).

Due to the significant impact of IPV on women's mental health, extensive research has examined the association between IPV victimization and depressive symptoms. In a systematic review of longitudinal studies, Devries et al. (2013) noted a bidirectional relationship between IPV and depression, in which women exposed to IPV were at an increased risk of experiencing depressive symptoms, while women who reported depressive symptoms were more likely to subsequently experience IPV. Other studies have found a temporal relationship between IPV exposure and subsequent mental health problems (Coker et al., 2002). Whereas some reports show levels of depressive symptoms may decrease within a few months of leaving an abusive relationship (Campbell, Sullivan, & Davidson, 1995; Dutton & Painter, 1993), others have shown that depression in battered women can also be chronic, with symptoms continuing to exist over time despite the absence of recent re-victimization (Campbell et al., 1997; Campbell & Soeken, 1999; Campbell, Sullivan, & Davidson, 1995). Although disagreement exists on the duration and timing of depression, numerous studies have shown that women exposed to IPV report at least moderate to high levels of depression (Campbell, Sullivan and Davidson, 1995).

Prior studies have confirmed that when addressing depressive symptomatology irrespective of IPV exposure, there are associations between depression and sociodemographic characteristics, psychosocial variables, and health risk behaviors including obesity, smoking, physical inactivity, and heavy drinking (Strine et al., 2008; Timko et al., 2008; Lorant et al., 2003; Wilhelm et al., 2003; Kessler et al., 2003; Scarinci et al., 2002). Similarly, IPV exposure is independently associated with an increased risk of adverse mental health diagnoses, substance abuse, family and social problems, depression, anxiety/neuroses, and tobacco use among women (Bonomi et al., 2009). Thus, depression and IPV have numerous common covariates. However, many prior studies of the association between IPV and depression are limited in that they lack comprehensive control of potential confounders (Devries et al., 2013). Furthermore, since many existing studies are limited in that they may not entirely account for shared risk factors between IPV and depression, it is difficult to fully elaborate differences in the magnitude of their association (Devries et al., 2013).

IPV victimization is undoubtedly a significant life stressor. Examination of the association between stress and depression has shown that personal characteristics interact with stress to affect the development of depressive symptoms (Hammen, 2005). A diverse array of modifying factors affects the relationship between stressful events and depression (Gotlib and Hammen, 1992; Mrazek and Haggerty, 1994; Taylor and Aspinwall, 1996). Factors that predict attenuation of the relationship between stressful life events and depression include access to social support, various aspects of one's personality, intellectual capabilities, interpersonal skills, and various coping strategies (Kessler, 1997). Individual differences in stress reactivity may also be related to characteristics of the individual or of the environment in which the individual is embedded that modify stress effects, commonly referred to as stress-buffering factors (Kessler, 1997). Factors including social support and socioeconomic resources, such as household income, education, and employment, have all been found to play an important role in supporting resilient coping strategies when addressing extremely

stressful life events (Hobfoll, 1991; Updegraff, Taylor, Kemeny, & Wyatt, 2002). Overall, stressors and their impact on depression have been shown to vary with elements of an individual's social and demographic roles and contexts, which ultimately moderate the association between stress and depression (Hammen, 2005).

Thus, not all individuals who are exposed to stressors such as IPV develop depressive symptoms, and effect modification – interaction of IPV with aspects of the individual's psychosocial or biological environment – may in part explain why. The potential effect modifying properties of common sociodemographic, bio-psychosocial variables, health risk behaviors on the association between IPV and depressive symptoms have not been previously explored within a large population-based sample and better understanding of whether IPV interacts with health risk behaviors and/or psychosocial factors to exacerbate the occurrence or severity of depressive symptoms is needed.

In this study, we examined whether pre-specified covariates previously shown to be associated with IPV and depression not only affect the prevalence of depression in women with and without exposure to IPV, but may also function as effect modifiers in this association. To investigate this, we utilized data from the 2006 Behavioral Risk Factor Surveillance System (BRFSS) to examine whether factors, such as sociodemographics, psychosocial variables, and health risk behaviors interact with IPV exposure on depressive symptom severity in women. We first examined the severity of depression by the timing of IPV victimization, hypothesizing that IPV exposure is associated with depressive symptom severity, with more severe symptoms seen among women with more recent IPV exposure. Additionally, we explored the potential for sociodemographics, bio-psychosocial factors and health risk behaviors to modify the effect of IPV on the severity of depression.

Methods

Data collection & Participants

This study used cross-sectional data from female respondents of the 2006 Behavioral Risk Factor Surveillance System (BRFSS) in the 8 U.S. states and territories (Arkansas, Hawaii, Louisiana, Montana, Nevada, Virgin Islands, Virginia, and West Virginia) that incorporated both the optional Anxiety and Depression Module and Intimate Partner Violence Module of that survey year. The BRFSS is an ongoing state-based, random-digit telephone survey of non-institutionalized persons aged 18 years or older in the United States, Guam, Puerto Rico, and the Virgin Islands. The BRFSS collects information regarding the prevalence of health risk behaviors and preventive health practices that affect health status. The BRFSS methods, including the weighting procedure, are described elsewhere (CDC, 2006) and all BRFSS questionnaires, data, and reports are available at www.cdc.gov/brfss. This study was reviewed and exempted by the [name of IRB blinded by *WHI* editors for peer review] Institutional Review Board.

Measures: Independent Variable

IPV status was categorized into a 3-level variable, defined as recent, lifetime, or no IPV exposure, based on responses to the questions in the IPV module. Recent IPV exposure was

determined to be an affirmative response to the question, “In the past 12 months, have you experienced any physical violence or had unwanted sex with an intimate partner?” Lifetime IPV exposure was exclusive of recent IPV exposure. It was determined by those respondents who did not report recent IPV exposure, but responded “yes” to any of the following questions: “Has an intimate partner EVER THREATENED you with physical violence? This includes threatening to hit, slap, push, kick, or hurt you in any way,” “Has an intimate partner EVER hit, slapped, pushed, kicked, or hurt you in any way?” and “Have you EVER experienced any unwanted sex by a current or former intimate partner?” No IPV exposure, which is the reference group, was defined as a “no” response to all of the previously mentioned questions.

Measures: Outcome Variable

The primary outcome variable for this study was severity of symptoms of current depression in female respondents. The prevalence and severity of current depression in the female respondents were determined by using the Patient Health Questionnaire-8 (PHQ-8). The PHQ-8 has been validated and used in numerous clinical and population-based settings, as well as in self-administered and telephone-administered interviews (Kroenke et al., 2009), to assess eight out of the nine criteria from the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) used to diagnose depressive disorders (McClave et al., 2009). These criteria are anhedonia, depressed mood, insomnia or hypersomnia, fatigue, appetite fluctuation, feelings of worthlessness, diminished concentration, and psychomotor agitation or retardation. The ninth criterion in the DSM-IV, which assesses suicidal or self-injurious thoughts, was omitted from the questionnaire due to the inadequacy of proper intervention by telephone (CDC, 2010). This deletion has only a minor effect on scoring because thoughts of self-harm are fairly uncommon in the general population (Kroenke & Spitzer, 2002).

In order to standardize the PHQ-8 to make it similar to other BRFSS questions, the number of days in which a particular depressive symptom was experienced was limited to the past two weeks (APA, 2000). The number of days a symptom was experienced was set as follows: 0–1 day = “not at all,” 2–6 days = “several days,” 7–11 days = “more than half the days,” 12–14 days = “nearly every day,” with points (0–3) assigned to each category, respectively. A total depression score was obtained by summing individual item scores, which ranged from 0–24 points. A total score of 0–4 represents no significant depressive symptoms; 5–9, mild depressive symptoms; 10–14, moderate; 15–19, moderately severe; and 20–24, severe. These categories produced a five-level ordinal variable to describe more severe depressive symptoms. A PHQ-8 score of 10, which has 88% sensitivity and 88% specificity for major depression, regardless of diagnostic status, typically represents clinically significant depression (Kroenke et al., 2009).

Covariates: Sociodemographics, Bio-Psychosocial Variables & Risk Behaviors

Sociodemographic variables, bio-psychosocial factors and health risk behaviors selected for inclusion in our models were chosen based on consistent reports in the literature that showed the association between the selected variables and depression or depressive symptoms (Strine et al., 2008; Timko et al., 2008; Lorant et al., 2003; Wilhelm et al., 2003; Kessler et

al., 2003; Scarinci et al., 2002). Sociodemographic variables examined included age, race/ethnicity, annual household income, education level, marital status, employment status, and health care coverage. Self-reported race/ethnicity was collapsed into four categories: white (non-Hispanic), black (non-Hispanic), Hispanic, and other/multiracial (non-Hispanic). Annual household income was grouped into three categories: (1) less than or equal to \$24,999, (2) \$25,000 to \$49,999, and (3) \$50,000 or more. Marital status was classified as married (including members of an unmarried couple), separated/divorced and widowed (which were condensed into one category), or never married. Employment status was classified as employed (including self-employed), unemployed, and other (including homemaker, student, retired, and unable to work). Healthcare coverage was assessed by asking whether the respondent had any of the following: health insurance, prepaid plans, such as health maintenance organizations, or government plans such as Medicare.

Bio-psychosocial variables included self-reported good health, social support, and obesity via the current body mass index (BMI). Respondents were asked to rank their perceived health as excellent, very good, good, fair, or poor as an appropriate measure of health status (Jenkinson, Wright, & Coulter, 1994). These answer choices were condensed into a dichotomous variable, good/better health and fair/poor health, which correlated to a “yes” or “no” response, respectively, in order to be consistent with prior studies (Carbone-Lopez, Kruttschnitt, & Macmillan, 2006; Coker et al., 2002). Social support was evaluated by the question, “How often do you get the social and emotional support you need?” with a 5-tier response scale ranging from “never” to “always.” This scale was condensed into three categories: high (always/usually), moderate (sometimes), and low (rarely/never). BMI was calculated from self-reported measures of weight and height. Respondents were then categorized into the following groups: neither overweight nor obese (BMI <25), overweight (25 ≤ BMI <30), or obese (BMI ≥ 30).

Risky health behaviors evaluated in this study were smoking, heavy and binge drinking, and physical inactivity. The smoking status of participants was assessed by the following questions: “Have you smoked at least 100 cigarettes in your entire life?” and if yes, “Do you now smoke cigarettes every day, some days, or not at all?” Based on their responses, women were classified as current smokers, former smokers, and non-smokers. Current smokers were defined as respondents smoking at least 100 cigarettes in their life and now smoking every day or some days. Former smokers were respondents smoking at least 100 cigarettes, but presently not smoking at all. Non-smokers were those who responded “no” to the previously stated questions regarding their smoking habits. Heavy alcohol consumption was defined as having an average of more than one drink per day, while binge drinking was defined as having five or more alcoholic beverages on one occasion. Physical inactivity was assessed by a “yes” or “no” response to the question, “During the past month, other than your regular job, did you participate in any physical activities or exercises such as running, calisthenics, golf, gardening, or walking for exercise?”

Statistical Analyses

All statistical tests utilized appropriate sample weights to account for the complex sampling design of the BRFSS. Sample weighting is the preferred method to account for complex

sampling in which some members of a group are oversampled, while others may be undersampled. Applying sample weights reduces bias and ensures that data are representative of the reference population (Yansaneh, 2003). More detailed information regarding the analysis of complex survey data can be found in Korn and Graubard (2011) and Levy and Lemeshow (2013).

Analyses were conducted via SAS Software version 9.2 (SAS Institute, Cary, NC). We used weighted chi-square analyses to assess bivariate associations between depressive symptom severity and IPV exposure, sociodemographics, bio-psychosocial factors, and behavioral risk variables. A weighted ordinal logistic regression assessed the factors independently associated with the severity of current depressive symptoms. All pre-specified potential covariates (sociodemographics, bio-psychosocial variables, health risk behaviors) were significantly associated ($p < .05$) with depressive symptom severity and were, thus, introduced into the adjusted analyses with the exception of the variable for race and ethnicity. This variable was not significant (overall $p = .756$), but was utilized in our adjusted analyses due to prior literature suggesting a strong association between race/ethnicity and depression (Riolo et al., 2005; Dunlop et al., 2003; Kessler et al., 2003; Breslau et al., 2005).

In our multivariable analyses, in addition to applying appropriate sample weights, we adjusted for each of the variables and interaction terms within the model that were shown to be significantly associated with depressive symptom severity. The variables within the model were as follows: IPV status, age, race/ethnicity, household income, education level, marital status, health care coverage, perception of health, social support, smoking, drinking, current BMI, physical, and the two significant interaction terms IPV*employment status and IPV* social support.

We then investigated individual statistical interactions between IPV and each of the sociodemographic variables, bio-psychosocial factors, and health risk behaviors on depressive symptom severity. We did not adjust for multiple comparisons, due to the increased potential for Type II error (Rothman, 1990). We found significant interactions ($p < .05$) between IPV history and two of the candidate effect modifiers, employment status and social support. These significant interaction terms were then introduced into a multivariable regression model, creating stratified results to display the effects of the interacting variables. Interactions between IPV and the remaining variables (age, race/ethnicity, income, education, marital status, health care coverage, health status, BMI, drinking, smoking and physical activity) were not found to be significant and were thus excluded from the multivariable regression.

Factors significantly associated with depression in the bivariate analyses ($p < .05$), as well as race/ethnicity, and the two interaction terms as noted above were entered into a weighted ordinal logistic regression model using simultaneous entry. This regression predicted the independent odds of each variable on worsening depressive symptoms, using the 5-category depression scale as the outcome (none to severe depression). This assessed the independent effect of each of the predictor variables, as well as the significant interaction terms, on depressive symptom severity.

Lastly, we conducted an analysis to predict individual and cumulative probabilities of women experiencing at least moderate depressive symptoms based upon the interactions of IPV status and employment and IPV status and perceived social support, respectively. The individual predicted probabilities of the 5-level tier of depression symptom severity for the combinations of groups within the interaction terms were calculated and output from the logistic regression model. The cumulative probability of having at least moderate depressive symptoms was constructed from the individual probabilities for each combination of groups within the interaction terms and then plotted against one another.

Results

Table 1 shows the results of the unadjusted bivariate analysis, employing appropriate sample weights, to assess the association of depressive symptoms with the predictor variable (IPV) and each of the pre-specified covariates (i.e., sociodemographic, bio-psychosocial, and behavioral factors). As shown in Table 1, overall, approximately 22% of the sample reported experiencing lifetime IPV, 3% reported recent IPV, and 75% reported never experiencing IPV. Sixty-nine percent of the overall sample reported no current depression, 20% reported mild depression, and 12% reported at least moderate depressive symptoms. Compared to women who reported no exposure to IPV, women who reported recent IPV exposure and women who reported lifetime exposure to IPV had 9.2 ($p < .001$) and 3.2 ($p < .001$) the odds, respectively, of exhibiting more severe depressive symptoms. Other key characteristics of women associated with more severe depressive symptoms included lower household income, lower educational attainment, being widowed, divorced, or separated from a significant other or never married, and reporting lower social support ($p < .001$).

Table 2 illustrates the results obtained from our multivariable logistic regression analysis that predicted the independent effect and odds of each variable on worsening depressive symptoms, using the 5-category depression scale as the outcome (none to severe depression), while also adjusting for all of the other variables in the model including the interaction terms. In this model, IPV status remained independently associated with depression symptom severity. Likewise, lower educational attainment, being unemployed, and lower social support were independently predictive of more severe depressive symptoms. Of note, we did not find an independent association of marital status, health care coverage, or binge drinking on the severity of depressive symptoms in this model. After testing for potential interactions between IPV and each of the pre-specified effect modifiers, we found significant interactions between IPV status and two of the candidate effect modifying variables on depressive symptom severity. IPV interacted with employment status (p for interaction $< .001$), as well as social support (p for interaction $< .001$), to produce more severe depressive symptoms. These interactions were introduced into multivariable modeling.

The results of the interaction terms, shown at the bottom of Table 2, illustrate the effect modifying properties of employment status and social support on the association between IPV and depressive symptom severity. For example, unemployed women generally had greater odds of more severe depressive symptoms compared to employed women. However, these odds were even more elevated among unemployed women exposed to recent IPV

(aOR=10.70, 95% CI=3.57, 32.04) when compared to employed women exposed to recent IPV (aOR=2.40, 95% CI= 1.44, 4.01). Likewise, the association between IPV and depressive symptom severity was modified by social support. Women with low social support generally had more severe depressive symptoms compared to women with higher social support. However, women with lower social support exposed to recent IPV had a relatively greater risk of exhibiting more severe depressive symptoms (aOR=7.79, 95% CI 3.76, 16.11) than those with higher social support exposed to recent IPV (aOR=5.24, 95% CI 2.95, 9.31).

In order to illustrate the clinical significance of the interactions between IPV status and employment and IPV status and perceived social support on the severity of depressive symptoms, we created predicted cumulative probabilities of different levels of depressive symptoms stratified by employment and social support, for each of the three IPV categories. Figure 1 and Figure 2 illustrate the cumulative probabilities of women experiencing at least moderate depressive symptoms based upon the interactions of IPV status and employment and IPV status and perceived social support, respectively. As shown in Figure 1, overall, unemployed women had more severe depressive symptoms compared to employed women. Moreover, categorizing women by type of IPV exposure within the respective employment status strata demonstrated that the association between IPV and severity of depressive symptoms actually differ based on employment status. Of note, there was little difference in the risk of exhibiting at least moderate depressive symptoms among employed women exposed to lifetime IPV victimization (53%) versus recent IPV victimization (52%). Among employed women, however, although the overall risk for at least moderate depression was lower, this risk among women exposed to recent IPV (30%) was almost double the risk compared to women exposed to lifetime IPV (16%). This figure suggests that – among employed women -- recent IPV exposure is associated with a more marked effect on depressive symptoms than lifetime IPV exposure, but this same effect is not seen among unemployed women. The interaction effect demonstrated by this figure shows that the association between levels of IPV exposure and depressive symptom severity functions differently depending on employment stratum.

As shown in Figure 2, overall, women with higher levels of social support experienced more severe depressive symptoms compared to women with lower levels of social support. However, the association between IPV and depressive symptoms differed by social support stratum. Among women with high social support, women exposed to recent IPV had a 30% risk of moderate depression compared to a risk of almost half that (13%) among women exposed to lifetime IPV. This effect differs from the risk for having at least moderate depressive symptoms among women with low social support. In the lowest social support stratum, there was very little difference between the risk of at least moderate depressive symptoms among women exposed to recent (71%) and lifetime (69%) IPV. These predicted probabilities again illustrate effect modification – i.e., that the effect of IPV exposure on depressive symptoms varies across strata of social support. Among the highest social support stratum, women exposed to recent IPV had substantially increased risk compared to women exposed to lifetime IPV, but among women in the lowest social support stratum, any IPV exposure (recent or lifetime) was associated with high levels of risk for at least moderate depression.

Discussion

This study examined the association between IPV status, sociodemographic and psychosocial factors, and health risk behaviors on depression severity in women. The frequency of lifetime and recent IPV in this study are similar to the frequencies reported in other nationally representative surveys (Black et al., 2011). In addition, this study identified two factors that interact with IPV in the association between IPV and depressive symptom severity – employment status and social support.

Prior research (Vos et al., 2006; Ansara and Hindin, 2011; Sato-Dilorenzo and Sharps, 2007) has confirmed the strong association between IPV and depression, but has not fully examined the association between IPV and the severity of depressive symptoms. Previous studies (Coker et al., 2002; Pico-Alfonso et al., 2006; Bonomi et al., 2009) have stratified IPV by type (i.e. physical, sexual, and psychological) and revealed a higher incidence and severity of depressive symptoms in women exposed to physical/psychological IPV and psychological IPV when compared to women not exposed to any forms of IPV. Results from this study indicated that women who experienced recent IPV were almost three times more likely to exhibit increasing severity in depressive symptoms, while women who reported IPV exposure in their lifetime were about twice as likely to report more severe depressive symptoms, compared to women who reported never being exposed to IPV. These findings reinforce the impact of the overall timing of IPV exposure on depression. IPV has been previously noted to affect depression as long as 14 years after IPV occurs (Lindhorst & Oxford, 2008). Our study extends this knowledge by showing that, overall, recent IPV is associated with even more severe depressive symptoms than having a more remote history of IPV. We extend this knowledge to show that recent IPV is particularly relevant among women who may be considered protected against the adverse effects of IPV exposure - employed women or women with high levels of social support. Women who were employed or in the highest social support stratum had the largest relative impact of recent – compared to lifetime – IPV exposure.

Our study shows how social support interacts with IPV on depressive symptomatology, which was suggested by prior research (Tan, Basta, Sullivan, & Davidson, 1995). Our study also extends prior research to show how such interaction affects the severity of depressive symptoms. Furthermore, studies have demonstrated the association of depression with low social support among women exposed to IPV (Hegarty et al., 2013; Mburia-Mwalili et al., 2010). Our study extends the literature by strongly suggesting social support interacts with IPV exposure, and that even women with high social support are vulnerable to the effects of recent IPV. Conversely, women with the lowest levels of social support are vulnerable to more severe depressive symptoms if they are exposed to IPV victimization at any time in their life. This is important because regardless of when victims of IPV seek help, others often do not know how to respond (Latta, 2009), or the attempted assistance is perceived as unhelpful (Fanslow & Robinson, 2010). Hence, low social support in the presence of either lifetime or recent IPV is associated with high severity of depressive symptoms.

Likewise, our finding that employment status interacts with IPV on depressive symptom severity is particularly relevant in light of the fact that approximately 21% of full-time

working adults have reported experiencing IPV in their lifetime, with 64% of them indicating it negatively impacted their ability to work (Corporate Alliance to End Partner Violence, 2005). Therefore, employee assistance programs (EAPs), which provide screening and assessment, counseling, case management, and referral services to individual IPV victims, have become an asset for such employees seeking help and resources to combat their experiences with IPV. In fact, women who used the EAP for IPV assistance were overall satisfied with EAP services and representatives (Pollack et al, 2010). Although these programs may benefit all women with IPV exposure, they may be of particular relevance for women exposed to recent IPV. Our data further show that overall, unemployed women have the highest level of depressive symptoms, suggesting that unemployment limits resources available to women subjected to IPV, which could potentially propagate the sense of helplessness, depression and low self-esteem (Walker, 2000) commonly associated with IPV victims. Future research should investigate this further.

Strengths and Limitations

Our study has noteworthy strengths, including the use of a large, representative sample of women, a widely used survey instrument in the BRFSS, and subsequent statistical power to answer the novel research question addressed by this study. However, there are important limitations to consider. Our data were obtained from results of a self-reported questionnaire and thus, we cannot exclude response bias. Also, the BRFSS excludes people without home telephones and those who only use cell phones. Therefore, this study may underrepresent women affected by IPV who do not have access to land lines since those without telephones are more likely to be socioeconomically disadvantaged and at an increased risk for IPV (Fogarty et al., 2008). This study was conducted on cross-sectional data, and thus causality cannot be determined. Although we may suspect that any lifetime or recent IPV exposure, unemployment, and low social support increase overall depressive symptom severity, it is also possible that a reciprocal association exists – i.e., more severe depressive symptoms predispose women to experience IPV, be unemployed, or have lower levels of social support. Lastly, we did not address multiple comparisons in our statistical models. Although this methodology decreases the probability for Type I error (i.e., rejecting the null hypothesis too readily), it does increase the probability that Type II error will occur (i.e., failure to reject a false null hypothesis) (Rothman 1990).

Another consideration in the interpretation of our data is possible misclassification effect. The 2006 BRFSS assessed 12-month exposure to sexual and physical violence only, but additionally assessed sexual, physical and threatened violence among women with lifetime exposure. We elected to use a more comprehensive definition of IPV concordant with accepted definitions of IPV (Saltzman, Fanslow, McMahon, & Shelley, 1999), and thus included threatened violence only in the lifetime exposed group. Thus, women who were exposed to threatened violence in the past year - but not physical or sexual violence – would have been incorrectly classified as exposed to “lifetime” rather than “recent” IPV. Misclassification bias should therefore be considered when interpreting our results.

Implications for Practice and/or Policy

Our study has important implications. It places an emphasis on potential avenues to address services for women who have survived an abusive relationship and are trying to cope with additional stressors associated with suffering from depressive symptoms. Interventions designed to improve mental health in women exposed to IPV must account for social support and employment status of the women in addition to IPV history. Our data suggest that interventions that reduce social isolation and improve access to services are likely to be particularly effective in combating depressive symptoms among women exposed to both recent and lifetime IPV. Formal workplace support programs, such as EAPs, or management training programs, specifically tailored to screen and provide support to victims of IPV have proven to be beneficial (Swanberg, Logan, & Macke, 2005). Although these programs have the potential to benefit women with any lifetime IPV exposure, employed women who have experienced recent IPV may experience the strongest benefit. Therefore, policies advocating implementation of such programs in the workplace should be advocated.

Acknowledgments

Funding/Support: Dr. McCall-Hosenfeld's contribution on the project was funded by the NIH Office of Research on Women's Health's Building Interdisciplinary Research Careers in Women's Health (BIRCWH) Career Development Award, 5 K12 HD05582.

All authors had full access to all the data in the study and take responsibility for the integrity of the data and accuracy of the data analysis.

References

- American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 4. Washington, DC: 2000. text rev
- Ansara DL, Hindin MJ. Psychosocial consequences of intimate partner violence for women and men in Canada. *Journal of Interpersonal Violence*. 2011; 26:1628–1645. [PubMed: 20501897]
- Black, MC.; Basile, KC.; Breiding, MJ.; Smith, SG.; Walters, ML.; Merrick, MT.; Chen, J.; Stevens, MR. The National Intimate Partner and Sexual Violence Survey (NISVS): 2010 Summary Report. Atlanta, GA: National Center for Injury Prevention and Control, Centers for Disease Control and Prevention; 2011.
- Blasco-Ros C, Sanchez-Lorente S, Martinez M. Recovery from depressive symptoms, state anxiety and post-traumatic stress disorder in women exposed to physical and psychological, but not to psychological intimate partner violence alone: A longitudinal study. *BMC Psychiatry*. 2010; 10:98. [PubMed: 21108834]
- Bonomi AE, Anderson ML, Reid RJ, Rivara FP, Carrell D, Thompson RS. Medical and psychosocial diagnoses in women with a history of intimate partner violence. *Archives of Internal Medicine*. 2009; 169:1692–1697. [PubMed: 19822826]
- Breiding MJ, Black MC, Ryan GW. Chronic disease and health risk behaviors associated with intimate partner violence-18 U.S. states/territories, 2005. *Annals of Epidemiology*. 2008; 18:538–544. [PubMed: 18495490]
- Breslau J, Kendler KS, Su M, Gaxiola-Aguilar S, Kessler RC. Lifetime risk and persistence of psychiatric disorder across ethnic groups in the United States. *Psychological Medicine*. 2005; 35:317–327. [PubMed: 15841868]
- Campbell JC, Kub J, Belknap RA, Templin T. Predictors of depression in battered women. *Violence Against Women*. 1997; 3:271–293.
- Campbell JC, Soeken KL. Women's responses to battering over time: An analysis of change. *Journal of Interpersonal Violence*. 1999; 14:21–40.

- Campbell R, Sullivan CM, Davidson WS. Women who use domestic violence shelters: Changes in depression over time. *Psychology of Women Quarterly*. 1995; 19:237–255.
- Carbone-Lopez K, Kruttschnitt C, Macmillan R. Patterns of intimate partner violence and their associations with physical health, psychological distress, and substance use. *Public Health Reports* (Washington, DC: 1974). 2006; 121:382–392.
- Centers for Disease Control and Prevention. Intimate Partner Violence: Definitions. Retrieved June 12, 2011, from: <http://www.cdc.gov/violenceprevention/intimatepartnerviolence/definitions.html>
- Centers for Disease Control and Prevention (CDC). Costs of Intimate Partner Violence Against Women in the United States. Atlanta, GA: US Department of Health and Human Services; 2003. Retrieved June 12, 2011, from: http://www.cdc.gov/ncipc/pub-res/ipv_cost/ipv.htm
- Centers for Disease Control and Prevention. Behavioral Risk Factor Surveillance System Operational and User's Guide. 2006. Retrieved June 12, 2011, from: <ftp://ftp.cdc.gov/pub/Data/Brfss/userguide.pdf>
- Centers for Disease Control and Prevention. Current depression among adults – United States, 2006 and 2008. *Morbidity and Mortality Weekly Report*. 2010; 59:1229–1235. [PubMed: 20881934]
- Coker AL, Davis KE, Arias I, Desai S, Sanderson M, Brandt HM, Smith PH. Physical and mental health effects of intimate partner violence for men and women. *American Journal of Preventive Medicine*. 2002; 23:260–268. [PubMed: 12406480]
- Corporate Alliance to End Partner Violence. Workplace Statistics. 2005. Retrieved March 3, 2013, from: http://www.caepv.org/getinfo/facts_stats.php?factsec=3
- Devries KM, Mak JY, Bacchus LJ, Child JC, Falder G, Petzold M, Astbury J, Watts CH. Intimate Partner Violence and Incident Depressive Symptoms and Suicide Attempts: A Systematic Review of Longitudinal Studies. *PLOS Medicine*. 2013; 10(5):e1001439. [PubMed: 23671407]
- Dunlop DD, Song J, Lyons JS, Manheim LM, Chang RW. Racial/ethnic differences in rates of depression among preretirement adults. *American Journal of Public Health*. 2003; 93:1945–1952. [PubMed: 14600071]
- Dutton DG, Painter SL. Emotional attachments in abusive relationships: A test of traumatic bonding theory. *Violence and Victims*. 1993; 8:105–120. [PubMed: 8193053]
- Fanslow JL, Robinson EM. Help-seeking behaviors and reasons for help seeking reported by a representative sample of women victims of intimate partner violence in New Zealand. *Journal of Interpersonal Violence*. 2010; 25:929–951. [PubMed: 19597160]
- Fogarty CT, Fredman L, Heeren TC, Liebschutz J. Synergistic effects of child abuse and intimate partner violence on depressive symptoms in women. *Preventive Medicine*. 2008; 46:463–469. [PubMed: 18207563]
- Gotlib, IH.; Hammen, CL. Psychological aspects of depression: Toward a cognitive-interpersonal integration. New York: Wiley; 1992.
- Hammen C. Stress and depression. *Annual Review of Clinical Psychology*. 2005; 1:293–319.
- Hegarty KL, O'Doherty LJ, Chondros P, Valpied J, Taft AJ, Astbury J, Gunn JM. Effect of type and severity of intimate partner violence on women's health and service use: findings from a primary care trial of women afraid of their partners. *Journal of Interpersonal Violence*. 2013; 28:273–294. [PubMed: 22929341]
- Hobfoll SE. Traumatic stress: A theory based on rapid loss of resources. *Anxiety Research*. 1991; 4:187–197.
- Jenkinson C, Wright L, Coulter A. Criterion validity and reliability of the SF-36 in a population sample. *Quality of Life Research*. 1994; 3:7–12. [PubMed: 8142947]
- Kessler RC, Berglund P, Demler O, Jin R, Koretz D, Merikangas KR, Wang PS. The epidemiology of major depressive disorder: results from the National Comorbidity Survey Replication (NCS-R). *Journal of the American Medical Association*. 2003; 289:3095–3105. [PubMed: 12813115]
- Kessler RC. The effects of stressful life events on depression. *Annual Review of Psychology*. 1997; 48:191–214.
- Korn, EL.; Graubard, BI. Analysis of health surveys. Vol. 323. John Wiley & Sons; 2011.
- Kroenke K, Spitzer RL. The PHQ-9: a new depression diagnostic and severity measure. *Psychiatric Annals*. 2002; 32:1–7.

- Kroenke K, Strine TW, Spitzer RL, Williams JB, Berry JT, Mokdad AH. The PHQ-8 as a measure of current depression in the general population. *Journal of Affective Disorders*. 2009; 114:163–173. [PubMed: 18752852]
- Latta RE. Struggling to define my role. *Dissertation Abstracts International: Section B: Sciences and Engineering*. 2009; 69:5783.
- Levy, PS.; Lemeshow, S. *Sampling of populations: methods and applications*. John Wiley & Sons; 2013.
- Lorant V, Deliege D, Eaton W, Robert A, Philippot P, Ansseau M. Socioeconomic inequalities in depression: A meta-analysis. *American Journal of Epidemiology*. 2003; 157:98–112. [PubMed: 12522017]
- McClave AK, Dube SR, Strine TW, Kroenke K, Caraballo RS, Mokdad AH. Associations between smoking cessation and anxiety and depression among US adults. *Addictive Behaviors*. 2009; 34:491–497. [PubMed: 19217720]
- Mburia-Mwalili A, Clements-Nolle K, Lee W, Shadley M, Wei Y. Intimate partner violence and depression in a population-based sample of women: Can social support help? *Journal of Interpersonal Violence*. 2010; 25:2258–2278. [PubMed: 20051589]
- Mrazek, P.; Haggerty, R. *Reducing the Risks for Mental Disorders: Frontiers for Preventive Intervention Research*. Washington D.C: National Academy Press; 1994.
- Pico-Alfonso MA, Garcia-Linares MI, Celda-Navarro N, Blasco-Ros C, Echeburua E, Martinez M. The impact of physical, psychological, and sexual intimate male partner violence on women's mental health: depressive symptoms, posttraumatic stress disorder, state anxiety, and suicide. *Journal of Women's Health*. 2006; 13:599–611.
- Pollack KM, McKay T, Cumminskey C, Clinton-Sherrod AM, Lindquist C, Lasater BM, Grisso JA. Employee assistance program services for intimate partner violence & client satisfaction with these services. *Journal of Occupational & Environmental Medicine*. 2010; 52:819–826. [PubMed: 20657305]
- Riolo SA, Nguyen TA, Greden JF, King CA. Prevalence of depression by race/ethnicity: findings from the National Health and Nutrition Examination Survey III. *American Journal of Public Health*. 2005; 95:998–1000. [PubMed: 15914823]
- Rothman KJ. No Adjustments Are Needed For Multiple Comparisons. *Epidemiology*. 1990; 1:43–46. [PubMed: 2081237]
- Saltzman, LE.; Fanslow, JL.; McMahon, PM.; Shelley, GA. *Intimate partner violence surveillance: Uniform definitions and recommended data elements, Version 1.0*. Atlanta, GA: National Center for Injury Prevention and Control Centers for Disease Control and Prevention; 1999.
- Sato-Dilorenzo A, Sharps PW. Dangerous intimate partner relationships and women's mental health and health behaviors. *Issues in Mental Health Nursing*. 2007; 28:837–848. [PubMed: 17729169]
- Scarinci IC, Beech BM, Naumann W, Kovach KW, Pugh L, Fapohunda B. Depression, socioeconomic status, age, and marital status in black women: a national study. *Ethnicity and Disease*. 2002; 12:421–428. [PubMed: 12148715]
- Strine TW, Mokdad AH, Balluz LS, Gonzalez O, Crider R, Berry JT, Kroenke K. Depression and anxiety in the United States: Findings from the 2006 behavioral risk factor surveillance system. *Psychiatric Services (Washington, DC)*. 2008; 59:1383–1390.
- Swanberg JE, Logan T, Macke C. Intimate partner violence, employment, and the workplace: consequences and future directions. *Trauma Violence Abuse*. 2005; 6:286–312. [PubMed: 16217118]
- Tan C, Basta J, Sullivan CM, Davidson WS. The role of social support in the lives of women exiting domestic violence shelters: An experimental study. *Journal of Interpersonal Violence*. 1995; 10(4):437–451.
- Taylor, SE.; Aspinwall, LG. Mediating and moderating processes in psychosocial stress: Appraisal, coping, resistance, and vulnerability. In: Kaplan, HB., editor. *Psychosocial stress: Perspectives on structure, theory, life-course, and methods*. San Diego, CA: Academic Press; 1996. p. 71-110.
- Timko C, Sutkowski A, Pavao J, Kimerling R. Women's childhood and adult adverse experiences, mental health, and binge drinking: the California Women's Health Survey. *Substance Abuse Treatment, Prevention, and Policy*. 2008; 3:15.

- Thompson RS, Bonomi AE, Anderson M, Reid RJ, Dimer JA, Carrell D, Rivara FP. Intimate partner violence: Prevalence, types, and chronicity in adult women. *American Journal of Preventive Medicine*. 2006; 30:447–457. [PubMed: 16704937]
- Updegraff, JA.; Taylor, SE.; Kemeny, ME.; Wyatt, GE. The positive and negative effects of HIV-infection in women with low socioeconomic resources. 2002.
- Vos T, Astbury J, Piers LS, Magnus A, Heenan M, Stanley L, Webster K. Measuring the impact of intimate partner violence on the health of women in Victoria, Australia. *Bulletin of the World Health Organization*. 2006; 84:739–744. [PubMed: 17128344]
- Wilhelm K, Mitchell P, Slade T, Brownhill S, Andrews G. Prevalence and correlates of DSM-IV major depression in an Australian national survey. *Journal of Affective Disorders*. 2003; 75:155–162. [PubMed: 12798255]
- Walker, LE. The battered woman syndrome. 3. New York, NY: Springer; 2000.
- Yansanah, IS. Construction and use of sample weights. Expert Group Meeting to review the draft Handbook on Designing of Household Sample Surveys; United Nations Secretariat Statistics Division; 2003. Available at: http://unstats.un.org/unsd/demographic/meetings/egm/Sampling_1203/docs/no_5.pdf

Biographies

Nathalie Dougé, B.S. is currently a M.D. candidate at the Pennsylvania State College of Medicine, Hershey, PA. She plans on pursuing a career in Internal Medicine.

Erik B. Lehman, M.S., is a biostatistician at the Pennsylvania State University College of Medicine

Jennifer S. McCall-Hosenfeld, MD, MSc, is Assistant Professor of Medicine and Public Health Sciences at the Pennsylvania State College of Medicine, Hershey, PA. Her research focuses on primary/preventive care of women, especially rural women and survivors of intimate partner violence.

Figure 1.
Cumulative probability of at least moderate depressive symptoms by IPV exposure, stratified by employment status

Figure 2.
Cumulative probability of at least moderate depressive symptoms by IPV exposure, stratified by perceived social support

Table 1

Unadjusted prevalence estimates* of increasing depression severity among U.S. adult women, 2006 BRFSS**

	Total weighted frequency (%)	None n=3,742,094 (68.6%)	Mild n=1,077,048 (19.8%)	Moderate n=398,202 (7.3%)	Moderately Severe n=150,063 (2.8%)	Severe n=85,779 (1.6%)	Odds Ratio	95% Confidence Interval	p-value
IPV Status									
Lifetime***	1,289,376 (22.1)	51.3	25.1	13.2	6.1	4.3	3.2	(2.8, 3.6)	<0.001
Recent	163,190 (2.8)	23.3	29.7	33.4	7.7	6.0	9.2	(6.2, 13.5)	<0.001
None	4,387,536 (75.1)	75.2	17.9	4.7	1.6	0.6		Reference	
Socio-demographics									
Age									
25-34	1,198,752 (20.5)	67.2	21.8	6.7	2.8	1.5	0.8	(0.6, 1.0)	0.061
35-44	1,345,318 (23.0)	69.2	19.4	6.7	3.1	1.7	0.7	(0.6, 0.9)	0.013
45-54	1,379,946 (23.6)	71.2	17.2	6.1	3.5	2	0.7	(0.5, 0.9)	0.002
55-64	1,033,768 (17.7)	72.4	17.9	6.2	2.7	0.9	0.6	(0.5, 0.8)	<0.001
18-24	882,319 (15.1)	61.3	23.6	12.2	1.1	1.8		Reference	
Race/Ethnicity									
Black, non-Hispanic	743,313 (12.8)	65.4	22.9	8.1	2.1	1.6	1.2	(1.0, 1.4)	0.073
Hispanic	365,538 (6.3)	66.3	21.7	6.6	2.4	3.0	1.2	(0.9, 1.6)	0.354
Other, non-Hispanic	543,167 (9.4)	67.8	18.8	8.4	3.3	1.6	1.1	(0.9, 1.4)	0.391
White, non-Hispanic	4,144,186 (71.5)	69.5	19.2	7.1	2.8	1.5		Reference	
Annual Household Income									
less than \$25,000	1,173,536 (23.1)	49.4	24.3	15.6	6.6	4.2	4.2	(3.6, 4.9)	<0.001
\$25,000 to \$49,999	1,369,764 (26.9)	67.1	21.7	8.0	2.3	1.0	1.8	(1.5, 2.1)	<0.001
\$50,000 or more	2,546,205 (50.0)	78.4	16.1	3.7	1.3	0.5		Reference	
Education Level									
Did not graduate high school	451,427 (7.7)	47.2	27.4	13.4	7.1	4.8	4.8	(3.9, 6.0)	<0.001
Graduated high school	1,760,090 (30.2)	61.1	22.5	10.8	3.5	2.0	2.7	(2.3, 3.1)	<0.001
Attended College/Technical School	1,587,676 (27.2)	67.3	21.3	7.1	2.8	1.5	2.0	(1.7, 2.3)	<0.001

		Depression Scale					Odds Ratio	95% Confidence Interval
	Total weighted frequency (%)	None n=3,742,094 (68.6%)	Mild n=1,077,048 (19.8%)	Moderate n=398,202 (7.3%)	Moderately Severe n=150,063 (2.8%)	Severe n=85,779 (1.6%)		
Graduated from College/Technical School	2,034,737 (34.9)	80.2	14.7	3.3	1.2	0.6		Dougherty et al.
Marital Status								
Widowed/Divorced/Separated	941,815 (16.2)	57.5	21.6	11.7	5.6	3.6	2.1	(1.8, 2.5)
Never Married	1,026,783 (17.6)	62.6	23.1	10.8	1.8	1.8	1.6	(1.3, 1.9)
Married/Partnered	3,862,752 (66.2)	72.8	18.4	5.4	2.3	1.0		Reference
Employment Status								
Unemployed	299,129 (5.1)	48.7	23.1	16.7	5.5	6.0	3.2	(2.3, 4.6)
Other	1,832,256 (31.5)	63.1	20.3	9.5	4.4	2.7	1.7	(1.5, 1.9)
Employed	3,687,213 (63.4)	72.8	19.2	5.5	1.7	0.7		Reference
Health Care Coverage								
Yes	4,790,636 (82.3)	71.6	18.5	6.4	2.2	1.3	0.5	(0.4, 0.5)
No	1,031,992 (17.7)	54.2	26.0	11.7	5.4	2.7		Reference
Bio-psychosocial variables								
Perceived Good Health								
Yes	4,988,363 (85.5)	73.7	18.3	5.7	1.5	0.7	0.2	(0.2, 0.2)
No	844,032 (14.5)	35.8	28.9	17.7	10.7	6.9		Reference
Social Support								
Low	381,787 (6.6)	32.9	26.4	19.8	10.8	10.1	8.0	(6.4, 9.9)
Moderate	768,171 (13.3)	41.5	29.6	16.2	8.3	4.5	4.7	(4.0, 5.6)
High	4,640,458 (80.1)	75.5	17.8	5.0	1.3	0.4		Reference
Current Body Mass Index								
Overweight	1,592,360 (28.8)	67.7	19.9	8.0	3.0	1.4	1.3	(1.2, 1.6)
Obese	1,442,943 (26.1)	60.4	23.4	9.2	3.8	3.2	1.9	(1.6, 2.2)
Neither obese nor overweight	2,490,892 (45.1)	73.5	17.6	6.1	2.1	0.7		Reference
Health Behaviors								
Heavy/Binge Drinker								
Yes	692,002 (12.0)	64.5	22.4	8.6	2.9	1.6	1.2	(1.0, 1.5)

		Depression Scale				Odds Ratio	95% Confidence Interval
	Total weighted frequency (%)	None n=3,742,094 (68.6%)	Mild n=1,077,048 (19.8%)	Moderate n=398,202 (7.3%)	Moderately Severe n=150,063 (2.8%)	Severe n=85,779 (1.6%)	
No	5,069,769 (88.0)	69.3	19.4	7.1	2.7	1.6	Douglas et al.
Smoking Status							
Current smoker	1,315,751 (22.6)	50.4	25.7	14.2	5.8	4	(2.7, 3.6)
Former smoker	1,074,851 (18.5)	70.9	17.9	6.7	3.0	1.4	(1.1, 1.5)
Never smoked	3,432,487 (58.9)	74.7	18.2	4.9	1.5	0.7	Reference
Physical Activity							
Yes	4,370,453 (74.9)	73.1	18.2	5.9	1.9	0.9	(0.4, 0.5)
No	1,462,357 (25.1)	54.6	24.5	11.6	5.4	3.8	Reference

* Unadjusted prevalence estimates were obtained from statistical analysis conducted without controlling for each of the variables within the model.

** All analyses employed appropriate sample weighted.

*** Lifetime IPV is mutually exclusive of recent IPV. Lifetime IPV excludes an affirmative response to experiencing any physical violence or unwanted sex with an intimate partner in the past 12 months, which defines recent IPV.

Table 2

Adjusted prevalence estimates* of increasing depression severity among U.S. Adult Women, 2006 BRFSS**

	Adjusted Odds Ratio	95% Confidence Interval	p-value
IPV Status			<0.001
Lifetime***	1.76	(1.42, 2.18)	<0.001
Recent	2.60	(1.34, 5.00)	0.005
None	Reference		
Socio-demographics			
Age			<0.001
25–34	0.84	(0.62, 1.13)	0.244
35–44	0.82	(0.61, 1.11)	0.192
45–54	0.67	(0.49, 0.91)	0.012
55–64	0.56	(0.40, 0.76)	<0.001
18–24	Reference		
Race/Ethnicity			<0.001
Black, non-Hispanic	0.73	(0.58, 0.90)	0.005
Hispanic	0.52	(0.35, 0.76)	<0.001
Other, non-Hispanic	0.71	(0.57, 0.90)	0.004
White, non-Hispanic	Reference		
Annual Household Income			0.006
less than \$25,000	1.42	(1.15, 1.77)	0.001
\$25,000 to \$49,999	1.18	(0.99, 1.40)	0.062
\$50,000 or more	Reference		
Education Level			0.001
Did not graduate high school	1.66	(1.23, 2.23)	<0.001
Graduated high school	1.33	(1.09, 1.62)	0.005
Attended College/Technical School	1.39	(1.15, 1.68)	<0.001
Graduated from College/Technical School	Reference		
Marital Status			0.540
Widowed/Divorced/Separated	1.08	(0.91, 1.28)	0.342
Never Married	1.11	(0.87, 1.42)	0.412
Married/Partnered	Reference		
Employment Status			0.083
Unemployed	1.17	(0.84, 1.63)	0.353
Other	1.23	(1.02, 1.49)	0.029
Employed	Reference		
Health Care Coverage			0.090
Yes	0.86	(0.71, 1.02)	0.090
No	Reference		

	Adjusted Odds Ratio	95% Confidence Interval	p-value
Bio-psychosocial variables			
Perceived Good Health			<0.001
Yes	0.29	(0.24, 0.35)	<0.001
No	Reference		
Social Support			<0.001
Low	3.54	(2.53, 4.95)	<0.001
Moderate	3.44	(2.64, 4.48)	<0.001
High	Reference		
Current Body Mass Index			<0.001
Overweight	1.27	(1.07, 1.51)	0.006
Obese	1.66	(1.39, 1.97)	<0.001
Neither obese nor overweight	Reference		
Health Behaviors			
Heavy/Binge Drinker			0.089
Yes	1.20	(0.97, 1.49)	0.089
No	Reference		
Smoking Status			<0.001
Current smoker	1.69	(1.43, 2.01)	<0.001
Former smoker	1.13	(0.93, 1.36)	0.209
Never smoked	Reference		
Physical Activity			<0.001
Yes	0.62	(0.53, 0.73)	<0.001
No	Reference		
Interactions			
IPV Exposure by Employment Status			0.001
Unemployed: Lifetime vs. None	7.45	(4.19, 13.24)	<0.001
Unemployed: Recent vs. None	10.70	(3.57, 32.04)	<0.001
Other: Lifetime vs. None	2.69	(1.99, 3.62)	<0.001
Other: Recent vs. None	4.43	(2.42, 8.09)	<0.001
Employed: Lifetime vs. None	2.41	(1.89, 3.06)	<0.001
Employed: Recent vs. None	2.40	(1.44, 4.01)	<0.001
IPV Exposure by Social Support			0.013
Low: Lifetime vs. None	6.18	(3.75, 10.19)	<0.001
Low: Recent vs. None	7.79	(3.76, 16.11)	<0.001
Moderate: Lifetime vs. None	2.93	(2.04, 4.20)	<0.001
Moderate: Recent vs. None	2.78	(1.22, 6.34)	0.015
High: Lifetime vs. None	2.66	(2.07, 3.41)	<0.001
High: Recent vs. None	5.24	(2.95, 9.31)	<0.001

* Adjusted prevalence estimates were obtained by multivariable analysis controlling for each of the variables as well as the interaction terms within the model that were shown to be significantly associated with depressive symptom severity.

** All analyses employed appropriate sample weights.

*** Lifetime IPV is mutually exclusive of recent IPV. Lifetime IPV excludes an affirmative response to experiencing any physical violence or unwanted sex with an intimate partner in the past 12 months, which defines recent IPV