Published in final edited form as:

J Sex Marital Ther. 2017 July 04; 43(5): 463–478. doi:10.1080/0092623X.2016.1208127.

Sexual Assault Severity and Depressive Symptoms as Longitudinal Predictors of the Quality of Women's Sexual Experiences

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Abstract

Depressive symptoms are one consequence of adult/adolescent sexual victimization (ASV) and are linked to sexual health. Female non-problem drinkers (N = 440) with an ASV history participated in a one-year longitudinal study. Participants completed measures of lifetime ASV severity and four quarterly assessments of depressive symptoms, ASV severity, and sexual experience quality. Multilevel models revealed that depressive symptoms interacted with ASV severity: Women with low lifetime ASV severity reported higher ratings of sexual pain as depressive symptoms increased. ASV reported during assessment months predicted sexual experience quality. Interventions to improve survivors' sexual experiences should consider incorporating treatment for depressive symptoms.

Keywords

Sexual assault; Sexual Problems; Depression

Approximately 20% of women experience rape at some point in their lives with the majority occurring prior to age 24 (Black et al., 2011). Adult/adolescent sexual victimization (ASV) – defined as unwanted sexual experiences ranging from unwanted sexual contact to attempted or completed rape since the age of 14 (Abbey, Jacques-Tiura, & LeBreton, 2011) – has implications for both long- and short-term sexual health (for review, Weaver, 2009). Sexual health is a multifaceted construct with physical (e.g., pelvic pain) and mental health (e.g., depression) components. Women with ASV histories often experience long-lasting decreases in the quality of their sexual experiences following assault (e.g., lack of sexual desire and orgasm difficulties) and report higher rates of reproductive or other sexual health problems than non-victimized women (Weaver, 2009). Sexual assault is associated with genital burning, lubrication problems, and pain during sexual intercourse, and decreased sexual pleasure in cross-sectional and qualitative research (Letourneau, Resnick, Kilpatrick,

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Saunders, & Best, 1996; Perilloux, Duntley, & Buss, 2012; Postma, Bicanic, van der Vaart, & Laan, 2013; Turchik & Hassija, 2014; Weaver, 2009).

Women exposed to gender-based violence, including ASV, have high rates of lifetime mood and anxiety disorders relative to those without such exposure (Rees et al., 2011). Women with ASV histories are twice as likely to experience a major depressive episode following assault than women without ASV histories (Hedtke et al., 2008). Past-year depression was observed in 9.1% and 13.1% of female rape victims in national and college samples respectively (Kilpatrick, Resnick, Ruggiero, Conoscenti, & McCauley, 2007). In the general population, one third of rape victims met lifetime criteria for major depression and one in four met current criteria (Kilpatrick et al., 2007). Women with forceful sexual assault experiences have higher levels of depression than women with coercive sexual experiences and non-victims (Masters et al., 2015).

Along with depressive symptoms, posttraumatic stress disorder (PTSD) or posttraumatic stress (PTS) symptoms are the most commonly observed mental health outcome of sexual assault. Posttraumatic stress symptoms are defined as symptoms consistent with the disorder, but the individual may not meet full PTSD criteria (McLaughlin et al., 2015; Stein, Walker, Hazen, & Forde, 1997). Such symptoms may be clinically significant and necessitate intervention (McLaughlin et al., 2015). Women with histories of ASV are found to have PTSD at three times the rate of women without such histories (Hedtke et al., 2008). PTSD and depression are frequently comorbid (Gros et al., 2010), although some research has found changes in PTS symptoms are associated with changes in depressive symptoms (Nickerson et al., 2013). This suggests that while PTS and depression have separate symptom constellations, PTS symptoms may include features that overlap with depressive symptoms. It is thus unclear to what extent depressive symptoms contribute unique variance to post-assault functioning.

Mental health symptoms are consistently negatively associated with sexual outcomes, including sexual enjoyment and arousal (Laurent & Simons, 2009). Depressive symptoms may contribute to post-victimization changes in sexual experiences. Individuals experiencing depression engage in few pleasurable activities, and similarly express low reward when actively engaged in activities (Hopko & Mullane, 2008). Lack of reward responsiveness may affect both the subjective experience of sexual activity and the physiological arousal accompanying sexual activity (Frohlich & Meston, 2002). Indeed, depressive symptoms are independently associated with quality of sexual experiences and sexual dysfunction (Kashdan et al., 2011; Laurent & Simons, 2009; Shindel, Eisenberg, Breyer, Sharlip, & Smith, 2011). Event-level analyses have found that depressive symptoms are related to less pleasure and connectedness during sex (Kashdan et al., 2011). It is not clear whether depression is a contributor to sexual dysfunction or an outcome because depressive symptoms may both decrease the likelihood of having sexual partners and decrease quality of sex due to stress (Shindel et al., 2011). More research has investigated PTSD and PTS symptoms as negatively associated with sexual functioning (Letourneau et al., 1996; Schnurr et al., 2009). The learning model of sexual problems posit that women who experience a sexual assault are conditioned to respond to assault-related stimuli with negative feelings, including a fear response that decreases sexual arousal and detracts from the quality of

women's sexual experiences (Letourneau et al., 1996). PTSD symptoms of hypervigilance, emotional numbing, interpersonal connection, and shames also affect sexual satisfaction, enjoyment, and functioning (for review, see Yehuda, Lehrner, & Rosenbaum, 2015).

Limited research has examined how a sexual assault history and depressive symptoms interact to affect sexual experiences. With some exceptions (Kashdan et al., 2011), investigations examining these constructs have overwhelmingly relied on global questionnaires and cross-sectional methodology. Longitudinal analyses allow for more robust inferences regarding the relationship between depressive symptoms and sexual assault history on sexual experiences. The high rate of sexual assault in the population and prevalence of depressive symptoms for survivors of sexual assault necessitates a longitudinal investigation into the interplay of these constructs to inform theory and intervention.

The present year-long longitudinal investigation assesses the interaction between depressive symptoms and ASV severity in predicting the frequency and quality of sexual experiences in young women. It was hypothesized that lifetime ASV history would predict decreased quality and quantity of sexual experiences at each time point. Further, it was hypothesized that higher intra-individual depressive symptoms would interact with ASV severity to predict sexual experiences. Specifically, women with greater ASV severity and higher within-person depressive symptoms would experience lower sexual quality and frequency. Prior research indicates that PTS symptomatology affects the quality of sexual experiences (Schnurr et al., 2009) and is highly correlated with depressive symptoms (Gros et al., 2010; Hedtke et al., 2008). Because the aim of this study was to examine the unique contribution of depressive symptoms to sexual experiences, PTS symptomatology was added as a covariate. Additionally, prior evidence indicates a substantial proportion of women with an ASV history also have histories of child sexual abuse (CSA) – unwanted sexual contact prior to the age of 14. Because CSA is a risk factor for both sexual functioning concerns and depression (Fergusson, McLeod, & Horwood, 2013; Kristensen & Lau, 2011), CSA was also added as a covariate.

Method

Participants

Women aged 18–30 were recruited from a large west coast metropolitan area in the United States for a one-year longitudinal study; the larger study from which these data were drawn was described as an investigation of alcohol use and social interactions between men and women. Eligibility requirements were interest in having sex with men and having had sex with men on average at least once a month in the past 12 months. Although not included in the current analyses, women who participated in this study were also invited to participate in an alcohol administration study. To comply with ethical guidelines in the administration of alcohol in which participants must have self-administered an approximate quantity of alcohol they would receive in the lab (NIAAA, 2005), participants had to have consumed at least four drinks in a two-hour period at least once in the past 12 months. Additionally, exclusion criteria were a history of problem drinking as indicated by the Brief Michigan Alcohol Screening Test (bMAST; Connor, Grier, Feeney, & Young, 2007; Pokorny, Miller,

& Kaplan, 1972), current abstinence from alcohol consumption, or medication use that contraindicated alcohol ingestion.

Of 619 participants, 470 women (75.9%) endorsed having an ASV experience since the age of 14 and of those, 419 were included in these analyses; 51 were missing data needed for the analyses. Included participants had a mean age of 23.4 ($SD = 3.3$). The majority of participants (70.9%) were White (see Table 1). Over the half the sample (57.7%) reported an annual income of less than \$20,999 per year, and 68.7% reported part- or full-time employment. Eighty-five percent of the sample reported completing at least “some college”, and 48.9% reported being a part- or full-time student.

Procedure

Participants were recruited through printed flyers in the community, advertisements on Craigslist, and email at a local large university. Interested participants completed an online screening survey. Eligible participants received an email link to the baseline survey, at which point they were provided with electronic informed consent documents, including reassurances of confidentiality. Participants then completed measures of ASV, CSA, and baseline depressive and PTS symptoms. Weekly follow-up surveys were administered online during the third, sixth, ninth, and twelfth months following enrollment and included questions about sexual experiences, victimization, depressive symptoms, and PTS symptoms. Participants were compensated with a \$20 Amazon gift card for completion of the baseline survey and gift cards varying from \$15 to \$20 for each weekly follow-up survey. Amounts varied based on the survey week, and participants received bonus payments from \$10 to \$25 for completing all surveys in an assessment month. Participants who completed all surveys received \$350 compensation. All study procedures were approved by the university’s Human Subjects Division.

Measures

Depressive Symptoms—At baseline and at each follow-up assessment, participants completed the Patient Health Questionnaire (PHQ-8; Kroenke et al., 2009), a measure of depressive symptoms. Eight items (e.g., “How often have you experienced feeling down, depressed, or hopeless?”) were rated over the past month on scales from 0 (*Not at all*) to 3 (*nearly every day*). Items were summed to compute a total score (Cronbach’s $\alpha = .81$).

Adolescent and Adult Sexual Victimization (ASV) Severity—ASV severity was assessed with the revised Sexual Experiences Survey (Koss et al., 2007), a validated measure that uses behaviorally specific questions regarding unwanted sexual experiences since age 14, including frequency (0 = *Never* to 3 = *3 or more times*), tactic used to obtain the unwanted sexual act (i.e., coercion, intoxication, force), and outcome (i.e., sexual contact, attempted rape, completed rape). Participants completed the SES at baseline to assess lifetime sexual assault experiences. To assess for ASV occurring during the follow-up year, participants completed the SES at each quarterly assessment. Prior scoring of the SES has grouped participants into categories (e.g., unwanted sexual contact, attempted rape) or overlooked tactic as an indicator of severity of experience (Davis et al., 2014). To address these concerns, a continuous ASV severity score ranging from 0 to 63 was computed for

lifetime ASV and ASV for each quarterly assessment. This modified scoring system creates one severity score that encompasses frequency (0, 1, 2, or 3 or more times), as well as the combination of severity of outcome and tactic type (1 = sexual contact by verbal coercion; 2 = sexual contact by incapacitation; 3 = sexual contact by force; 4 = attempted or completed rape by verbal coercion; 5 = attempted or completed rape by incapacitation; 6 = attempted or completed rape by force), allowing for quantification of a greater spectrum and variance of experiences (Davis et al., 2014). The total number of experiences was then summed with the high possible score being 63 and the lowest possible score indicating no sexual assault history (Davis et al., 2014).

Childhood Sexual Abuse (CSA)—CSA was assessed through the sexual abuse subscale of the Childhood Trauma Questionnaire (CTQ; Bernstein et al., 2003). Participants self-reported the degree to which sexually abusive events (e.g., “When I was growing up, someone tried to touch me in a sexual way, or tried to make me touch them”) occurred in childhood before the age of 14 (0 = *Never true* to 4 = *Very often true*). The mean score was used to represent CSA severity (5-items, Cronbach’s $\alpha = .94$).

PTS Symptoms—PTS symptoms were assessed at baseline and each follow-up assessment through the PTSD Checklist (17-items, Cronbach’s $\alpha = .94$; Blanchard, Jones-Alexander, Buckle, & Forneris, 1996). Participants answered questions inquiring about the level to which they had experienced and been bothered by PTSD symptoms (0 = *Not at all* to 4 = *Extremely*) in the past month. The scale has good construct and convergent validity and highly correlates with the Clinician Administered PTSD Scale (Blake et al., 1995). A continuous measure of PTSD symptom severity was created by summing scores across the 17 items.

Sexual Experience Ratings—For each consensual sex act reported during each assessment period, participants were asked to rate sexual pain (“How painful or physically uncomfortable was having sex with your partner on this occasion?”), sexual satisfaction (“How satisfied were you by having sex with your partner on this occasion?”), and sexual enjoyment (“How enjoyable was having sex with your partner on this occasion?”) from 0 (*Not at all*) to 4 (*Extremely*). Ratings were averaged across sex acts within each assessment period.

Data Analysis Plan

Multilevel models (MLMs) were run separately for each dependent variable (i.e., sexual enjoyment, sexual satisfaction, sexual pain) in Mplus 7.2 (Muthén & Muthén, 1998–2012) using full information maximum likelihood estimation, which estimates the variance-covariance matrix using all available data. Mplus treats MLMs as clustered hierarchical models in which the within-person random intercept and slope correspond to the Level 1 portion of the model and the between-person intercept and slope correspond to the Level 2 portion. Thus, MLMs account for the nesting of multiple observations within individuals and allow for cross-level effects.

To address our hypotheses, baseline ASV, follow-up ASV and individual-level variation in depressive symptoms predicted sexual experiences, controlling for the effects of PTS symptoms and childhood sexual abuse. Depressive symptoms were modeled as a within- (Level 1) predictor. Lifetime ASV severity was measured at baseline and modeled as a between-person (Level 2) predictor. Follow-up ASV and PTS symptoms were modeled as within- (Level 1) predictors. Level 1 predictors were person-centered, and Level 2 predictors were grand mean-centered.

Intraclass correlations (ICCs), the proportion of variance in a variable explained by the Level 2 units (Browne, Subramanian, Jones, & Goldstein, 2005; Chen, Kwok, Luo, & Wilson, 2010), were computed. ICCs indicate the similarity between observations clustered within the same person (Browne et al., 2005; Chen et al., 2010). Higher values represent stronger clustering effects; that is, that the observations are more similar to those within their cluster than to observations in other clusters.

Two conditional models were fit for each dependent variable. The first model included main effects of depressive symptoms, lifetime ASV severity, PTS symptoms, CSA, and follow-up ASV severity on each dependent variable. The second model added two cross-level interactions: within-person depression with between-person lifetime ASV severity, and within-person depression with between-person follow-up ASV severity. Relative model fit between the main-effects and interaction models for each dependent variable was compared using Bayesian Information Criterion (BIC) and Akaike Information Criterion (AIC), with smaller values indicating better fit (Kass, Raftery, & Bayes, 1995; Kline, 2005). Significant interactions were then probed at one standard deviation above and below both lifetime and follow-up ASV severity to evaluate whether slopes were significantly different from zero.

Results

Descriptive Statistics

Sample descriptive statistics are shown in Table 1. At baseline, of women reporting a sexual assault history, 74% reported a completed rape –that is, of the full sample of participants, 49.9% had experienced at least one completed rape during their lifetime. Of the full sample, 23% reported experiencing sexual assault other than a completed rape, including sexual coercion, unwanted sexual contact, and attempted rape. Of these women, 55% reported taking advantage of their intoxication was the primary tactic through which their rape occurred, 11.% reported physical force was the primary tactic, and 33.3% reported both alcohol and force tactics were utilized. Revictimization was common within this sample. Of women who experienced at least one lifetime completed rape through either coercion, intoxication, or physical force, between 22 to 44% reported experiencing rape at least three or more times through either coercion, intoxication, or physical force.

Unconditional Models

The ICCs for the three dependent variables – sexual pain, sexual satisfaction, and sexual enjoyment – were respectively .36, .46, and .47. Each of these ICCs was high enough to warrant the use of the multilevel approach.

Conditional Models

The main effect and interaction models for each dependent variable are presented in Tables 2–4. Where the interaction between depressive symptoms and monthly ASV was not significant, comparison of the AIC and BIC determined whether the interaction could be removed from the model without significantly worsening model fit.

Sexual Pain—AIC and BIC indicated superior fit for the interaction model compared with the main-effects model (Table 2). The interaction between depressive symptoms and lifetime ASV significantly predicted sexual pain ($B = -.001, p < .05$). Simple slope analyses revealed that for women with low lifetime ASV severity (-1 SD), higher depressive symptoms at a given assessment period were associated with greater sexual pain at that assessment period ($B = .023, p < .05$; Figure 1). The interaction between depressive symptoms and follow-up ASV was not significant and was removed to create a best fitting model. Follow-up ASV significantly predicted sexual pain ($B = .019, p < 0.001$), such that each additional unit of ASV severity was associated with a .019 unit higher sexual pain.

Sexual Enjoyment—AIC and BIC indicated that the model fit with both interactions was superior to the main-effects model or single-interaction model (Table 3). The interaction between depressive symptoms and lifetime ASV did not significantly predict sexual enjoyment. The interaction between depressive symptoms and follow-up ASV significantly predicted sexual enjoyment; however, simple slope analyses were not significant. Follow-up ASV severity significantly predicted sexual enjoyment ($B = -0.020, p < 0.001$), such that each additional unit of follow-up ASV severity was associated with a .020 lower mean sexual enjoyment. CSA significantly predicted sexual enjoyment ($B = -0.116, p < .01$).

Sexual Satisfaction—AIC and BIC indicated that the model with both interactions had superior model fit to the main-effects model and single interaction models (Table 4). The interaction between depressive symptoms and lifetime ASV did not significantly predict sexual satisfaction. The interaction between depressive symptoms and follow-up ASV significantly predicted sexual satisfaction, however simple slope analyses were not significant. Follow-up ASV predicted sexual enjoyment ($B = -0.060, p < 0.001$), such that each additional unit of monthly ASV severity was associated with a .060 lower mean sexual enjoyment. Depressive symptomatology was significantly associated with less sexual satisfaction ($B = -.045, p < .05$).

Discussion

In this study, the interaction of depressive symptoms and lifetime ASV severity predicted pain experienced by women during sex over one year. For women with lower lifetime ASV severity, greater depressive symptoms were associated with greater sexual pain. Furthermore, ASV experienced during the follow-up assessment periods was associated with more sexual pain, less sexual enjoyment, and less satisfaction. This is consistent with prior findings that the acute period following a sexual assault is marked with a decrease in the quality of their sexual experiences (Weaver, 2009).

This study adds to the existing literature examining associations between sexual victimization and depressive symptomatology on women's sexual functioning. Sexual victimization is associated with increased probability of reporting sexual problems (Lemieux & Byers, 2008; Lutfey, Link Rosen, Wiegel, & McKinlay, 2009), including pelvic pain (Postma et al., 2013). PTS symptoms in women with a history of sexual victimization have been associated with negative sexual outcomes (Letourneau et al., 1996; Schnurr et al., 2009), whereas less research has focused on the impact of depressive symptoms. These results indicate that depressive symptoms are a potential contributor to sexual outcomes for women with low severity histories of sexual victimization. It is possible that the interaction of depressive symptoms with ASV exacerbates the unique negative outcomes following sexual assault. Anhedonic depressive symptoms are associated with reports of arousal and lubrication problems, vaginal pain, and difficulties with orgasm (Kalmbach, Ciesla, Janata, & Kingsberg, 2012). It is noteworthy that women with low lifetime ASV severity were more likely to experience sexual pain when they had higher depressive symptoms, whereas this association was not observed for women with high ASV severity. Sexual assault is associated with shame and disgust that affect women's sexual experiences (Vidal & Petrak, 2007; for review, see Weaver, 2009). Women with high levels of ASV may possess levels of shame and disgust that affect their sexual experiences to the extent that depressive symptoms do not provide any additional unique contribution. These results may also be the result of a ceiling effect wherein women with high ASV severity experience high levels of sexual pain overall and, therefore, the influence of depression cannot be observed. Some of these associations may be related to physical trauma to the genitals (McLean, Roberts, White, & Paul, 2011) and to women's immediate psychological responses to the assault. Future research should investigate the mediating effects of genital trauma and immediate post-assault psychological responses within the relationships among sexual assault, depressive symptoms, and quality of sexual experiences.

Depressive symptomatology was independently associated with decreased sexual satisfaction. This is consistent with a model of depression suggesting decreased pleasure in previously enjoyable activities or anhedonia. A daily diary study found that when women experience anhedonic depression, they are more likely to report less arousal, less pleasure, and less satisfaction than when not experiencing such symptoms (Kalmbach et al., 2015). Women who experience more negative affect and less positive affect during sexual activity were more likely to have sexual problems (Peixoto & Nobre, 2016). It is surprising that this pattern of results only applied to sexual satisfaction and not to sexual enjoyment. Future research should investigate divergent reports of sexual satisfaction and enjoyment.

Child sexual abuse was associated with decreased sexual enjoyment beyond the effects of lifetime and follow-up ASV experiences and beyond PTS and depressive symptomatology. It appears these more distal experiences of CSA are particularly potent in affecting cognitive and emotional responses to sexual activity beyond more proximal experiences. Women with CSA histories report fewer positive sexual outcomes and greater sexual costs than women without such histories (Lemieux & Byers, 2008). Finkelhor and Browne's traumagenic dynamics model has been used to contextualize similar results. As a result of CSA, a child's sexuality is "shaped by the developmentally inappropriate and interpersonally dysfunctional fashion" in a process called traumatic sexualization (1985, p. 633). Additionally, CSA

survivors may internalize a sense of shame and guilt, which may result in poor self-image, negative cognitions about sex, and negative emotions (Finkelhor & Browne, 1985; Meston et al., 2006). It is possible that the degree of traumatic sexualization and stigmatization experienced through CSA was associated with negative feelings (e.g., guilt, disgust) toward sexual activity; thus participants experienced less sexual enjoyment. In a prior study involving women who reported sexual abuse histories, approximately half reported they were afraid of sex and struggled with touch, and approximately a third reported they felt guilty during sex, had problems with arousal, and were dissatisfied (Easton et al., 2011). Ongoing research to investigate long-term effects of CSA on adult sexual experiences should continue to examine such potential mechanisms.

Limitations

The causal direction of depressive symptoms and sexual experiences cannot be definitely inferred from this study. It is possible that experiencing sexual pain has a causal influence on depressive symptoms. A bidirectional relationship between mood and sexual functioning has been posited in prior research (for review, Atlantis & Sullivan, 2012). However, a recent study utilizing a lagged methodology found that anhedonic depressive symptoms' impact on sexual health were more robust than sexual functioning's influence on symptoms of mood (Kalmbach, Pillai, Kingsberg, & Ciesla, 2015). Further, while this study inquired about depressive symptoms within the last month and ASV severity since the age of 14, it is possible that depressive symptoms predated the experiences of ASA.

This sample was composed of moderate- to heavy-drinkers who experienced at least one heavy episodic drinking episode (consuming 4 or more drinks within 2 hours; NIAAA, 2005) in the last year. Alcohol can affect sexual functioning and interpersonal relationships (George & Gilmore, 2013). It is possible that women may have consumed alcohol prior to sexual activity, which may have influenced their sexual enjoyment, satisfaction, or pain. Further, this study excluded women who reported behaviors consistent with problem drinking, and these findings may not generalize to light drinkers, abstainers, or women meeting criteria for alcohol use disorder. Sexual assault is associated with problem drinking (Griffin, Wardell, & Read, 2013; Ullman, 2016). Because problem drinkers were excluded, we are cautious in the applicability of these results to all survivors of sexual assault. Future investigations should examine these constructs within a broader range of women, including problem-drinkers. Future research should investigate the event-level role of mental health symptomatology and alcohol consumption on the quality of sexual experiences.

Participants did not report whether they were currently prescribed antidepressants. Antidepressant medications may be a risk factor for sexual dysfunction in women (McCabe et al., 2016). However due to the alcohol administration component of the larger study, participants taking medications that contraindicate alcohol consumption—including antidepressants—were excluded from enrolling in the study. Additionally, each dependent variable was evaluated through a single item. Age at first ASV and CSA was not assessed, and therefore was not examined as a predictor of the quality of sexual experiences. The traumagenic dynamics model has posited that age of abuse may influence the degree of traumatic sexualization and stigmatization, and has been found to influence sexual outcomes

(Easton et al., 2011). Although online surveys may be sensitive to non-response and missing data, this study retained greater than 80% of its sample over one year, which is considered excellent retention. In addition there was relatively little missing data; between 75 to 80% of participants completed each follow-up assessment of quality of sexual experiences and between 80 to 92% of participants completed each follow-up assessment of depressive symptoms and SA.

Clinical Implications

There is extensive research documenting the ASV effects on mental and sexual health outcomes. It is noteworthy that women with lower severity of sexual victimization and depressive symptoms experienced sexual pain. Clinicians should thoroughly assess women's sexual victimization experiences with the understanding that lower severity of experience does not indicate an absence of negative consequences. Clinicians working with women related to their sexual and intimate relationships should assess depressive symptoms and consider their interaction with sexual victimization history. Furthermore, distal experiences of sexual victimization (e.g., child sexual abuse and adolescent sexual victimization) may continue to have powerful implications for adult women's sexual experiences. Thorough assessment and engagement in evidence-based treatments may offset the consequences of such experiences and benefit clients' sexual experiences and quality of life.

Conclusions

While prior investigations have identified associations between sexual assault, mental health symptoms, and sexual experiences, this study focuses on the unique and interactional role of depressive symptoms. This study's use of longitudinal methods builds upon prior research and contributes to a comprehensive understanding of the interplay between sexual assault and depressive symptoms with respect to women's sexual experiences. By improving our scientific understanding of the factors contributing to women's sexual experiences, future research may play a role in guiding sexual health interventions, particularly those focusing on women's post-sexual assault experiences.

Acknowledgments

This research was supported by grant R01AA014512 from the National Institute on Alcohol Abuse and Alcoholism (NIAAA) to Jeanette Norris. The authors thank Kevin M. King for providing statistical expertise during the preparation of this manuscript.

References

- Abbey A, Jacques-Tiura AJ, LeBreton JM. Risk factors for sexual aggression in young men: An expansion of the confluence model. *Aggressive Behavior*. 2001; 37:450–464.
- Atlantis E, Sullivan T. Bidirectional association between depression and sexual dysfunction: A systematic review and meta-analysis. *Journal of Sexual Medicine*. 2012; 9:1497–1507. [PubMed: 22462756]
- Bernstein DP, Stein JA, Newcomb MD, Walker E, Pogge D, Ahluvalia T, Strokes J, Handelsman L, Medrano M, Demson D, Zule W. Development and validation of a brief screening version of the childhood trauma questionnaire. *Child Abuse & Neglect*. 2003; 27:169–190. [PubMed: 12615092]
- Black, MC., Basile, KC., Breiding, MJ., Smith, SG., Walters, ML., Merrick, MT., 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.

- Blake DD, Weathers FW, Nagy LM, Kaloupek DG, Gusman FD, Charney DS, Keane TM. The development of a clinician-administered PTSD scale. *Journal of Traumatic Stress*. 1995; 8(1):75–90. [PubMed: 7712061]
- Blanchard EB, Jones-Alexander J, Buckley TC, Forneris CA. Psychometric properties of the PTSD Checklist (PCL). *Behaviour Research and Therapy*. 1996; 34:669–673. [PubMed: 8870294]
- Browne WJ, Subramanian SV, Jones K, Goldstein H. Variance partitioning in multilevel logistic models that exhibit overdispersion. *Journal of the Royal Statistical Society*. 2005; 168:599–613.
- Chen Q, Kwok O, Luo W, Wilson VL. The impact of ignoring a level of nesting structure in multilevel growth mixture models: A Monte Carlo study. *Structural Equation Modeling*. 2010; 17:570–589.
- Connor JP, Grier M, Feeney GF, Young RM. The validity of the brief Michigan alcohol screening test (bMAST) as a problem drinking severity measure. *Journal of Studies on Alcohol and Drugs*. 2007; 68:771–779. [PubMed: 17690811]
- Davis KC, Gilmore AK, Stappenbeck CA, Balsan MJ, George WH, Norris J. How to score the sexual experiences survey? A comparison of nine methods. *Psychology of Violence*. 2014; 4:445–461. [PubMed: 25512879]
- Easton SD, Coohey C, O’leary P, Zhang Y, Hua L. The effect of childhood sexual abuse on psychosexual functioning during adulthood. *Journal of Family Violence*. 2011; 26(1):41–50.
- Fergusson DM, McLeod GFH, Horwood J. Childhood sexual abuse and adult developmental outcomes: Findings from a 30-year long study in New Zealand. *Child Abuse & Neglect*. 2013; 37:664–674. [PubMed: 23623446]
- Finkelhor D, Browne A. The traumatic impact of child sexual abuse: A conceptualization. *American Journal of Orthopsychiatry*. 1985; 55:530–541. [PubMed: 4073225]
- Frohlich P, Meston C. Sexual functioning and self-reported depressive symptoms among college women. *Journal of sex research*. 2002; 39:321–325. [PubMed: 12545415]
- George, WH., Gilmore, AK. Alcohol’s effects on sexual arousal and sexual functioning. In: Miller, PM, Blume, AW, Kavanagh, DJ, Kampman, KM, Bates, ME, Larimer, MM, Petry, NM, De Witte, P., Ball, S., editors. *Principles of Addiction: Comprehensive Addictive Behaviors and Disorders*. San Diego, CA: Academic Press; 2013. p. 339–348.
- Griffin MJ, Wardell JD, Read JP. Recent sexual victimization and drinking behavior in newly matriculated college students: A latent growth analysis. *Psychology of Addictive behaviors*. 2013; 27:966. [PubMed: 23528195]
- Gros DF, Price M, Magruder KM, Frueh BC. Symptom overlap in posttraumatic stress disorder and major depression. *Psychiatry Research*. 2012; 196(2–3):267–270. [PubMed: 22386220]
- Hedtke KA, Ruggerio KJ, Fitzgerald MM, Zinzow HM, Saunders BE, Resnick HS, Kilpatrick DG. A longitudinal investigation of interpersonal violence in relation to mental health and substance use. *Journal of Consulting and Clinical Psychology*. 2008; 76:633–647. [PubMed: 18665691]
- Hopko DR, Mullane CM. Exploring the relation of depression and overt behavior with daily diaries. *Behaviour Research and Therapy*. 2008; 46:1085–1089. [PubMed: 18687422]
- Kalmbach DA, Pillai V, Kingsberg SA, Ciesla JA. The transaction between depression and anxiety symptoms and sexual functioning: A prospective study of premenopausal, healthy women. *Archives of Sexual Behavior*. 2015; 44:1635–1649. [PubMed: 25403320]
- Kashdan TB, Adams L, Savostyanova A, Ferssizidis P, McKnight PE, Nezlek JB. Effects of social anxiety and depressive symptoms on the frequency and quality of sexual activity: A daily process approach. *Behaviour Research & Therapy*. 2011; 49:352–360. [PubMed: 21463854]
- Kass RE, Raftery AE. Bayes factors. *Journal of the American Statistical Association*. 1995; 90:773–795.
- Kline, RB. *Principles and practice of structural equation modeling: Methodology in the social sciences*. New York & London: Guilford Press; 2005.
- Kilpatrick, DG., Resnick, HS., Ruggiero, KJ., Conoscenti, LM., McCauley, J. Drug-facilitated, incapacitated, and forcible rape: A national study (Final report submitted to the National Institute of Justice [NCJ 219181]). Washington, DC: U.S. Department of Justice, National Institute of Justice; 2007.

- Koss MP, Abbey A, Campbell R, Cook S, Norris J, Testa M, White J. Revising the SES: A collaborative process to improve assessment of sexual aggression and victimization. *Psychology of Women Quarterly*. 2007; 31:357–370.
- Kristensen E, Lau M. Sexual function in women with a history of intrafamilial childhood sexual abuse. *Sexual and Relationship Therapy*. 2011; 26:229–241.
- 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]
- Laurent SM, Simons AD. Sexual dysfunction in depression and anxiety: conceptualizing sexual dysfunction as part of an internalizing dimension. *Clinical Psychology Review*. 2009; 29:753–785.
- Letourneau EJ, Resnick HS, Kilpatrick DG, Saunders BE, Best CL. Comorbidity of sexual problems and posttraumatic stress disorder in female crime victims. *Behavioral Therapies*. 1996; 27:321–326.
- Lemieux SR, Byers ES. The sexual well-being of women who have experienced child sexual abuse. *Psychology of Women Quarterly*. 2008; 32(2):126–144.
- Lutfey KE, Link CL, Rosen RC, Wiegel M, McKinlay JB. Prevalence and correlates of sexual activity and function in women: Results from the Boston Area Community Health (BACH) Survey. *Archives of Sexual Behavior*. 2009; 38:514–527. [PubMed: 18188686]
- Masters NT, Stappenbeck CA, Kaysen D, Kajumulo KF, Davis KC, George WH, Norris J, Heiman JR. A person-centered approach to examining heterogeneity and subgroups among survivors of sexual assault. *Journal of Abnormal Psychology*. 2015; 124:685–696. [PubMed: 26052619]
- McCabe MP, Sharlip ID, Lewis R, Atalla E, Balon R, Fisher AD, Segraves RT. Risk factors for sexual dysfunction among women and men: A consensus statement from the fourth international consultation on sexual medicine 2015. *The Journal of Sexual Medicine*. 2016; 13(2):153–167. [PubMed: 26953830]
- McLaughlin KA, Koenen KC, Friedman MJ, Ruscio AM, Karam EG, Shahly V, Kessler RC. Subthreshold posttraumatic stress disorder in the world health organization world mental health surveys. *Biological Psychiatry*. 2015; 15:375–384.
- McLean I, Roberts SA, White C, Paul S. Female genital injuries resulting from consensual and non-consensual vaginal intercourse. *Forensic Science International*. 2011; 204:27–33. [PubMed: 20570068]
- Meston CM, Rellini AH, Heiman JR. Women's history of sexual abuse, their sexuality, and sexual self-schemas. *Journal of Consulting and Clinical Psychology*. 2006; 74(2):229–236. [PubMed: 16649867]
- Muthén, LK., Muthén, BO. *Mplus user's guide*, Seventh Edition. Los Angeles, CA: Muthén & Muthén; 1998–2012.
- National Institute on Alcohol Abuse and Alcoholism. Council guidelines on administering alcohol in human subjects. Bethesda, MD: National Institutes of Health; 2005.
- Nickerson A, Steenkamp M, Aerka IM, Salters-Pedneault D, Carper TL, Barnes JB, Litz BT. Prospective investigation of mental health following sexual assault. *Depression and Anxiety*. 2013; 30:444–450. [PubMed: 23165889]
- Peixoto MM, Nobre P. Positive and negative affect during sexual activity: Differences between homosexual and heterosexual men and women, with and without sexual problems. *Journal of Sex & Marital Therapy*. 2016; 42(1):4–17. [PubMed: 25514698]
- Perilloux C, Duntley JD, Buss DM. The costs of rape. *Archives Sexual Behavior*. 41:1099–1106.
- Pokorny AD, Miller BA, Kaplan HB. The brief MAST: A shortened version of the Michigan alcohol screening test. *American Journal of Psychiatry*. 1972; 129(3):342–345. [PubMed: 5053717]
- Postma R, Bicanic I, van der Vaart H, Laan E. Pelvic floor muscle problems mediate sexual problems in young adult rape victims. *Journal of Sexual Medicine*. 2013; 10:1978–1987. [PubMed: 23679151]
- Schnurr PP, Lunney CA, Forshay E, Thurston VL, Chow BK, Resick PA, Foa EB. Sexual function outcomes in women treated for posttraumatic stress disorder. *Journal of Women's Health*. 2009; 18:1549–1557.

- Shindel AW, Eisenberg ML, Breyer BN, Sharlip ID, Smith JF. Sexual function and depressive symptoms among female North American medical students. *Journal of Sexual Medicine*. 2011; 8:391–399. [PubMed: 21054793]
- Stein MB, Walker JR, Hazen AL, Forde DR. Full and partial posttraumatic stress disorder: Findings from a community survey. *American Journal of Psychiatry*. 1997; 154:1114–1119. [PubMed: 9247398]
- Turchik JA, Hassija CM. Female sexual victimization among college students: Assault severity, health risk behaviors, and sexual functioning. *Journal of Interpersonal Violence*. 2014; 29:2439–2457. [PubMed: 24505086]
- Ullman SE. Sexual revictimization, PTSD, and problem drinking in sexual assault survivors. *Addictive Behaviors*. 2016; 53:7–10. [PubMed: 26414205]
- Vidal ME, Petrak J. Shame and adult sexual assault: A study with a group of female survivors recruited from an East London population. *Sexual and Relationship Therapy*. 2007; 22:159–171.
- Weaver TL. Impact of rape on female sexuality: Review of selected literature. *Clinical Obstetrics & Gynecology*. 2009; 52:702–711. [PubMed: 20393422]
- Yehuda R, Lehrner A, Rosenbaum TY. PTSD and sexual dysfunction in men and women. *Journal of Sexual Medicine*. 2015; 12:1107–1119. [PubMed: 25847589]

Figure 1.
Interaction of Depressive Symptoms and Lifetime ASV on Sexual Pain

Table 1

Sample (N = 419) Descriptive Statistics and Sexual Victimization Incidence

Variable	N	Percentage
Race/Ethnicity		
Caucasian/White	297	70.9%
African-American/Black	13	3.1%
Asian/South Asian	29	6.9%
Multiracial/Other	73	17.4%
Hispanic/Latina	34	8.1%
CSA	115	27.5%
1 Lifetime Rape	209	49.9%
Both CSA and ASA	97	23%
Monthly ASA	164	41.8%
Variable	Mean (SD)	Range
Age	23.4 (3.3)	18–30
Baseline Lifetime ASV Severity	25.65 (18.74)	1–63
Monthly ASV Severity	8.02 (10.52)	0–36
Baseline Depressive Symptoms	6.08 (5.25)	0–24
Baseline PTS Symptoms	11.88 (12.95)	0–68
Total Male Vaginal Sex Partners	14.42 (17.07)	1–101

CSA = Childhood Sexual Abuse; ASV = Adult/Adolescent Sexual Victimization

Table 2

Fit Statistic and Variance of Slope and Intercept for Conditional Models of Number of Sexual Pain

Variable	Model 1: Main Effects		Model 2: Depressive Symptoms and ASV Interaction	
	Coefficient	SE	Coefficient	SE
Level 1				
Depressive Sx	13.522 **	.502	13.55 ***	.503
PTSD	.266	.018	.267 ***	.01
Monthly ASA	44.984 ***	1.97	53.853 ***	2.89
Sexual Pain Residual Variance	.523 ***	.039	.468 ***	.04
Level 2				
Depressive Sx	-.023	.018	-.026	.019
PTSD	.210	.13	.207	.13
ASV Lifetime	.005 *	.002	.002	.002
Monthly ASA	-.001	.001	.019 ***	.004
CSA	.048	.040	.069	.041
Dep Sx × ASV	--		-.001 *	.00
Low ASV Life	--		.023 *	.012
Mean ASV Life	--		.007	.008
High ASV Life	--		-.009	.010
BIC	41076.18		27665.65	
AIC	40962.51		27548.84	

*
 $p < 0.05$;**
 $p < 0.01$;***
 $p < 0.001$

Table 3

Fit Statistics and Variance of Slope and Intercept for Conditional Models of Sexual Enjoyment

Variable	Model 1: Main Effects		Model 2: Depressive Symptoms and ASV Interaction	
	Coefficient	SE	Coefficient	SE
Level 1				
Depressive Sx	13.552 ***	.502	13.552 ***	.502
PTSD	.266 ***	.010	.266 ***	.010
Monthly ASA	44.98 ***	1.97	53.62 ***	2.85
Enjoyment Residual Variance	.37 ***	.012	.334 ***	.020
Level 2				
Depressive Sx	-.022	.018	-.031	.02
ASV Lifetime	-.002	.002	-.001	.002
Monthly ASA	-.001	.001	-.020 ***	.004
CSA	-.085 *	.040	-.116 **	.040
Dep Sx × ASV Life	--		-.001	.001
Low ASV Life	--		-.009	.007
Mean ASV Life	--		-.001	.007
High ASV Life	--		.013	.009
Dep Sx × ASV Monthly	--		.003 ***	.001
Low ASV Monthly	--		-.005	.008
Mean ASV Monthly	--		.004	.008
High ASV Monthly	--		.02	.010
BIC	40775.76		27441.27	
AIC	40662.09		27318.90	

*
 $p < 0.05$;**
 $p < 0.01$;***
 $p < 0.001$

Table 4

Fit Statistics and Variance of Slope and Intercept for Conditional Models of Sexual Satisfaction

Variable	Model 1: Main Effects		Model 2: Depressive Symptoms and ASV Interaction	
	Coefficient	SE	Coefficient	SE
Level 1				
Depressive Sx	13.55***	.502	13.52***	.50
PTSD	.266***	.010	.27***	.010
Monthly ASA	44.98***	1.97	48.12***	2.23
Sex Satisfaction	.42***	.023	.41***	.026
Residual Variance				
Level 2				
Depressive Sx	-.033	.020	-.045*	.021
ASV Lifetime	-.003	.002	.001	.002
Monthly ASA	-.001	.001	-.060***	.010
CSA	-.071	.045	-.078	.045
Dep Sx × ASV	--		.00	.000
Dep Sx × ASV Monthly	--		.005**	.002
Low ASV Life	--		.001	.007
Mean ASV Life	--		.00	.010
High ASV Life	--		-.001	.015
Low ASV Monthly	--		-.006	.014
Mean ASV Monthly	--		-.008	.013
High ASV Monthly	--		-.011	.011
BIC	27552.00		27145.61	
AIC	27474.12		27023.24	

*
 $p < 0.05$;**
 $p < 0.01$;***
 $p < 0.001$