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Examining Mediators of Child Sexual Abuse and Sexually Transmitted Infections

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Abstract

Background—Interpersonal violence has increasingly been identified as a risk factor for sexually transmitted infections. Understanding the pathways between violence and sexually transmitted infections is essential to designing effective interventions.

Objective—To examine dissociative symptoms, alcohol use, and intimate partner physical violence and sexual coercion as mediators of child sexual abuse and lifetime sexually transmitted infection diagnosis among a sample of women.

Method—A convenience sample of 202 women was recruited from health care settings, with 189 complete cases for analysis. A multiple mediation model tested the proposed mediators of child sexual abuse and lifetime sexually transmitted infection diagnosis. Bootstrapping, a resampling method, was used to test for mediation. Key variables included child sexual abuse, dissociative symptoms, alcohol use, and intimate partner violence.

Results—Child sexual abuse was reported by 46% of the study participants ($n = 93$). Child sexual abuse was found to have an indirect effect on lifetime sexually transmitted infection diagnosis, with the effect occurring through dissociative symptoms (95% CI = 0.0033, 0.4714) and sexual coercion (95% CI = 0.0359, 0.7694). Alcohol use and physical violence were not found to be significant mediators.

Discussion—This study suggests dissociation and intimate partner sexual coercion are important mediators of child sexual abuse and sexually transmitted infection diagnosis. Therefore, interventions that consider the roles of dissociative symptoms and interpersonal violence may be effective in preventing sexually transmitted infections among women.

Keywords

violence; women; dissociation; sexually transmitted infections

Sexually transmitted infections (STIs) and interpersonal violence are significant health problems that disproportionately affect women. Comorbidities associated with STIs in women includes pelvic inflammatory disease, chronic pelvic pain, infertility, spontaneous abortion, preterm labor and delivery, and death (Eng & Butler, 1997). Women are at greatest risk for the potential adverse outcomes of sexual activity because of biological susceptibility, asymptomatic infections, and underdiagnosis (Eng & Butler, 1997). Additionally, having a STI (specifically an ulcerative STI) is a risk factor for HIV acquisition (Eng & Butler, 1997; Fleming & Wasserheit, 1999). While there is evidence documenting the link between interpersonal violence and increased risk for STIs, less is

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University of Virginia Institutional Review Board approval was obtained for this research.

known about the mechanisms or pathways responsible for the risk among women. Understanding these pathways is important to the development of effective interventions.

Women are at high risk for multiple types of violence throughout their lifetimes. In a 2009 meta-analysis, 19.7% of women suffered some form of sexual abuse prior to age 18 years (Pereda, Guilera, Forns, & Gomez-Benito, 2009). About a third of women report abuse by an intimate partner (current or former boyfriend, girlfriend, or spouse) in their lifetimes and 3-12% in the past year (Plichta & Falik, 2001; Tjaden & Thoennes, 2000). In clinics for STI, family planning, and general primary care, higher rates of intimate partner violence have been reported (Coker, Smith, Bethea, McKeown, & King, 2000; Dimmitt Champion, Piper, Holden, Korte, & Shain, 2004).

Researchers have found an increased risk for STIs among women who experience intimate partner violence (IPV; Campbell et al., 2008; Gielen et al., 2007; Laughon et al., 2007; Wingood, DiClemente, & Raj, 2000) and child sexual abuse (CSA; Hillis, Anda, Felitti, & Marchbanks, 2001; Wilson & Widom, 2009). Support for the relationship between sexual violence in intimate relationships and an increase in both high-risk sexual behavior and STIs has also been documented (Campbell et al., 2008; Gielen et al., 2007; Maman, Campbell, Sweat, & Gielen, 2000; Stockman, Campbell, & Celentano, 2010). Multiple well-designed studies also indicate that women who report CSA are more likely to experience revictimization and a chain of risk-taking behaviors that may place them at risk for STIs (Messman-Moore & Long, 2003; Tjaden & Thoennes, 2000).

Child sexual abuse has been associated with increased rates of IPV, mental health issues such as depression and dissociation symptoms, substance abuse, multiple sexual partners, and unprotected sex (Messman-Moore & Long, 2003; Senn, Carey, Venable, Coury-Doniger, & Urban, 2006; Whiffen & MacIntosh, 2005). Additionally, women with a history of CSA are at increased risk for alcohol misuse (Messman-Moore & Long, 2003; Senn et al., 2006) and, in a systematic review, alcohol use and STI risk were found to be associated (Cook & Clark, 2005).

Dissociation is defined by the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV) as “a disruption in the usually integrated functions of consciousness, memory, identity, or perception of the environment” (American Psychiatric Association, 2000) and is a psychophysiological process that allows a person to alter information processing, resulting in a lack of integration of thoughts and feelings surrounding an event. Dissociative symptoms are seen as existing on a continuum, with normal dissociation consisting of daydreaming while pathological dissociation is significant amnesia or depersonalization (Bernstein Carlson & Putnam, 1993). Dissociative symptoms may develop following a traumatic event and, like symptoms of depression and anxiety, can persist and affect health significantly.

Dissociative symptoms that have been reported in women with a history of sexual or physical abuse (Messman-Moore & Long, 2003; Noll, Trickett, & Putnam, 2003; Whiffen & MacIntosh, 2005) also may prevent a woman from engaging in protective sexual health behaviors, thereby placing them at risk for STIs (Kendall-Tackett & Klest, 2009; Malow, Devieux, & Lucenko, 2006). Dissociative symptoms have been suggested as a pathway between sexual risk behaviors and CSA in women by researchers (Kendall-Tackett & Klest, 2009; Myers et al., 2006; Senn, Carey, & Venable, 2008).

Although there is research documenting the intersection of CSA and STI and HIV risk, there is less work examining the mechanisms of the association between CSA and STI risk. Pathways to explain the link have been suggested (Koenig, Doll, O’Leary, & Pequegnat, 2004; Malow et al., 2006; Miller, 1999). Miller (1999) proposed a conceptual model and

hypothesized substance use, mental illness, high-risk social networks, and social adjustment as pathways through which CSA and risky sexual behavior are linked. More recently, Malow et al. (2006) discussed a model of association between CSA and risk of STI and HIV, suggesting substance use, revictimization and psychological symptoms (posttraumatic stress disorder, depression, and dissociation) as mediators. The inclusion of revictimization in a model of STI and HIV risk is supported (Tjaden & Thoennes, 2000).

Building on conceptual and empirical work, a model is proposed in which experiences of CSA place women at higher risk for STIs, with the relationship mediated through alcohol use, revictimization (physical IPV, intimate partner sexual coercion) and dissociative symptoms (Figure 1). The associations between CSA and alcohol use, dissociation, and IPV are well-documented, but most researchers have focused on these variables as outcomes of CSA rather than mediators of CSA (Senn et al., 2006). Understanding how dissociative symptoms and revictimization are associated with STI risk will help clinicians and researchers develop effective risk reduction strategies for women at risk.

The purpose of this study was to examine dissociative symptoms, alcohol use, and revictimization (physical IPV and intimate partner sexual coercion) as mediators of child sexual abuse and STI diagnosis among a sample of women.

Method

Study Design

A descriptive cross-sectional study was designed to examine the relationships among the variables of child sexual abuse, dissociative symptoms, IPV (physical and sexual), alcohol use, and self-report lifetime STI diagnosis. University Institutional Review Board approval was obtained and all participants signed an informed consent.

Setting and Sample

Convenience sampling was used to recruit participants from two healthcare settings. Recruitment strategies included flyers, researcher presence in the healthcare sites, and provider referral. From patient rosters, healthcare providers in each setting identified eligible women (18-45 years of age, able to understand spoken and written English, with a nonemergent healthcare need) and referred them to the researcher by giving the women a flyer inviting them to participate in the “Women's Health Study.” Violence or abuse was not mentioned in the flyer or by the healthcare providers. The study was described as “studying the experiences of women and how they may or may not affect safer sex behaviors”. The upper age limit of 45 years old was set based on studies completed by other researchers (Eggleston et al., 2005). A total of 217 participants consented, 202 women returned the study instruments, and 189 women were included in this analysis. Data on the women who did not return the survey were not available. All women received resource brochures related to substance use and IPV as well as information on local mental health services during the initial interaction.

Variables and Measures

Sample characteristics—The demographic questions included age, education, marital status, race and ethnicity, place of residence, and insurance status. Data on race and ethnicity were collected using the National Institutes of Health reporting categories.

Childhood sexual abuse—Experiences of CSA were measured using The Severity of Childhood Sexual Abuse Scale (SCSAS; Draucker, 1997). The SCSAS is used to measure multiple characteristics of sexual abuse including frequency, level of invasiveness,

relationship to the abuser, and additional violence. For this analysis, the CSA measure was dichotomized by using the first item of the scale, measuring incidence (a response of 0 was recoded as no abuse; and responses 1-4 were recoded as an incident of CSA). Child sexual abuse was defined as “experiencing any type of sexual incident (exposure, contact, intercourse), with a person who was at least 5 years older, when I was 16 years of age or younger” (Draucker, 1997, p. 402).

Dissociation—The Dissociative Experiences Scale (DES) measured the degree of dissociative symptoms an individual experienced (Bernstein Carlson & Putnam, 1993). The scale has 28 items; participants were asked to indicate the percentage of each day (0-100%) they experienced the described dissociative item. Instrument directions specifically note that “answers show how often these experiences happen to you when you are not under the influence of alcohol and drugs.” The DES covers a variety of dissociative experiences and includes questions such as “Some people have the experience of finding new things among their belongings that they do not remember buying.” The DES, a widely used measure of dissociation and a meta-analysis of 16 studies, revealed a mean alpha reliability of 0.93 (van Ijzendoorn & Schuengel, 1996). Items of the DES are framed in a normative way that does not stigmatize the respondent for positive responses. The distribution of DES scores in the general population is skewed to the right with most individuals not experiencing a high number of dissociative symptoms. Scores can range from 0-100. Like other mental health measures, the DES measures current symptoms and does not provide information about the event/situation that may be associated with the symptoms. The alpha coefficient for this sample was 0.93.

Alcohol use—The Alcohol Use Disorders Identification Test-Consumption Items (AUDIT-C) measured alcohol use during the past year. The AUDIT-C is an alcohol screening instrument consisting of the first three questions of the Alcohol Use Disorders Identification Test. The AUDIT-C focuses on alcohol consumption only. The items ask about frequency of drinking, quantity consumed at a typical occasion, and frequency of heavy episodic drinking (six standard drinks or more on a single occasion). The AUDIT-C is scored on a scale from 0-12 (0 reflects no alcohol use). The higher the score, the more likely the participant's drinking is affecting health and safety (Fiellen, Carrington, & O'Connor, 2000). The sensitivity and specificity for risk drinking are 96.3% and 79.5%, respectively (Dawson, Grant, Stinson, & Zhou, 2005).

Intimate partner violence—Intimate partner violence was measured using the Revised Conflict Tactics Scale (CTS-2). The CTS-2 is a well-validated instrument comprised of five subscales: physical assault, injury, verbal aggression, reasoning/negotiation, and sexual coercion (Straus, Hamby, & Warren, 2003). The CTS-2 comprises 39 items rated on an 8-point frequency scale. This analysis used physical assault (12 items) and sexual coercion (7 items) in the past year as the measure for intimate partner violence physical and sexual violence, respectively. Scales were scored per the published guidelines (Straus et al., 2003). Cronbach's alpha of the physical assault scale and sexual coercion scale for this analysis were 0.93 and 0.82, respectively.

STI diagnosis—Women were asked if they had ever been told by a physician or health care professional that they had genital herpes, syphilis, genital warts or human papillomavirus (HPV), gonorrhea, or Chlamydia. A dichotomous variable was created to reflect whether the woman had ever been diagnosed with a STI during her lifetime.

Data Analysis

The statistical software program SOLAS 3.0 (Statistical Solutions, <http://www.statsolusa.com>) was used for missing data analysis, and data were determined to be missing completely at random. The DES instrument was complete for 183 cases and imputation was done only on individual cases at least 80% complete. No systematic differences were noted between those who completed the DES in its entirety and those who did not. For the CTS-2, the conservative value for an individual item was imputed so as not to overestimate IPV. Data cleaning and screening resulted in 189 complete cases for mediation analysis. Prior to analysis, the data were evaluated for normality and the DES, physical IPV, and intimate partner sexual coercion were positively skewed. Descriptive analysis was conducted with SPSS 16.0 to determine the prevalence of child sexual abuse and the relationships among child sexual abuse, dissociation, alcohol use, physical violence, sexual coercion, and STI diagnosis. Differences between groups (CSA vs. no CSA) on the background variables of age, race, education, and marital status were assessed using t-tests (continuous variables) and chi-square (categorical variables) analysis. The proposed mediators (dissociation, physical IPV, IPV sexual coercion, and alcohol use) were correlated significantly with CSA and therefore were included in the analysis.

Bootstrapping, an alternative approach to Baron and Kenny's (1986) causal steps of mediation testing, was used to test a multiple mediation model with the variables of CSA dissociative symptoms, alcohol use, physical IPV, intimate partner sexual coercion, and STI diagnosis (Hayes, 2009). Bootstrapping, a nonparametric resampling procedure, was done using a SPSS macro developed by Preacher and Hayes (2009). Resampling involves the process of repeatedly sampling from the data set and generating a sampling distribution. An estimate of confidence intervals for the indirect effect in each resampled data set is calculated from the sampling distribution. The validity of mediation testing using a dichotomous dependent variable with the bootstrapping approach is supported (Hayes & Preacher, 2010; Preacher & Hayes, 2009). According to Hayes and Preacher (2010), bootstrapping is more powerful, minimizes the number of statistical tests used, quantifies the mediation effects, and does not assume that the sampling distribution for the indirect effect is normally distributed. Additionally, when considering statistical power and Type I errors in small to moderate size samples, bootstrapping for mediation testing is considered superior (Fritz & MacKinnon, 2007; Hayes & Preacher, 2010).

In the current study, 5,000 bootstrap resamples were used to generate 95% confidence intervals per recommendations (Hayes, 2009). A sample size of at least 115 was estimated to achieve 80% power (Fritz & MacKinnon, 2007).

Results

Sample

The study sample consisted of women ($n = 202$) with a mean age of 29 years ($SD = 7.96$). Thirty-five percent of the sample identified themselves as African American and greater than 84% of the women had at least a high school degree. Women in the sample reported past CSA (46%; $n = 93$), physical IPV in the past year (36.4%), intimate partner sexual coercion in the past year (40.9%) and ever having been diagnosed with an STI (39.3%). An estimated 56% of the women with a history of CSA reported lifetime STI diagnosis compared to 26% of the women with no history of CSA. Almost 22% of the sample reported *monthly use* of alcohol while 21% reported *weekly* and 5.5% reported *daily use* in the past 3 months. Ninety women (45.5%) had an AUDIT-C score greater than 3, indicating harmful drinking in the past year. Study sample characteristics are summarized in Table 1.

Bivariate Analysis

Child sexual abuse was significantly correlated with STI diagnosis ($r = 0.305, p < .001$), dissociative experiences ($r = 0.230, p = .001$), and sexual coercion ($r = .177, p = .014$). Dissociative experiences were significantly correlated with STI diagnosis ($r = 0.240, p = .001$), sexual coercion ($r = 0.382, p < .001$), and physical violence ($r = 0.340, p < .001$). T-tests and chi-square analysis did not indicate any significant differences between women with a history of CSA and women without a history of CSA on the variables of age, race and ethnicity, education, and marital status. Therefore, these variables were not included in subsequent analysis.

Mediation Analysis

A multiple mediation model (Figure 2) was tested for the analysis (Preacher & Hayes, 2009). The direct effects of CSA on the STI diagnosis (path c') and the indirect effects of CSA on STI diagnosis via the proposed mediators of dissociation, alcohol use, IPV physical violence and intimate partner sexual coercion is presented in Figure 2. As shown in Figure 2 and Table 2, a history of CSA had significant and positive direct effects (a paths) on dissociation ($\beta = 6.852, p = .01$), intimate partner sexual coercion ($\beta = 7.451, p = .01$), physical IPV ($\beta = 13.577, p = .05$), and alcohol use ($\beta = 0.980, p = .05$). Only dissociation and sexual coercion had significant direct effects (b paths) on lifetime STI diagnosis. The direction of the direct effects for dissociation and sexual coercion is consistent with the hypothesis that a positive history of CSA results in more dissociative symptoms and increased sexual coercion, thereby resulting in positive STI diagnosis. An examination of the specific indirect effects, Table 3, indicates that dissociation [$a_1b_1 = 0.199$, 95% CI (0.0033, 0.4714)] and intimate partner sexual coercion [$a_2b_2 = 0.260$, 95% CI (0.0359, 0.7694)] are significant mediators of the relationship between CSA and STI diagnosis. The total effect of CSA on lifetime STI diagnosis in an unmediated model ($\beta = 1.134, p = .0003$) is shown in Table 4.

Discussion

The findings from this analysis add to the knowledge of the prevalence of CSA and adult victimization (sexual and physical) of women. Child sexual abuse was reported by 46% of the women, a rate higher than that found in many previous studies and unexpected in a convenience sample of women seeking healthcare. Hillis et al. (2001) found a high prevalence of adverse childhood experiences (not limited to sexual abuse) among adult females in a managed care organization but studies reporting higher rates of CSA have traditionally been with samples of women recruited from STI and HIV clinics (Myers et al., 2006; Senn et al., 2006). A possible explanation for the higher rates of CSA in this sample may involve the study design. The researcher used a self-administered anonymous approach to ascertain information related to abuse, enabling women to feel more comfortable revealing sensitive information about childhood sexual experiences. Additionally, unlike studies which report a refusal rate of 9% on child abuse questions, (Hillis et al., 2001; Laughon et al., 2007) the current study had no missing data for the CSA items. A third possible explanation for the higher rates was the broad definition of CSA used. The lack of consensus among researchers regarding the definition of CSA is an identified issue and a critique within the field (Senn et al., 2008).

Past year IPV was found to be over 35%, similar to the rates of IPV reported in clinic settings (Coker et al., 2000; Dimmitt Champion et al., 2004; Laughon et al., 2007). This rate is higher than that reported in national population-based studies (Tjaden & Thoennes, 2000) and may be due to the anonymous nature of the data collection. The higher rates of both

CSA and IPV reported in this sample reinforce the need for abuse assessment (and resource referral) across the lifespan in healthcare interactions.

Unlike the mediation analysis conducted by Senn, Carey, Vanable, Coury-Doniger, and Urban (2006), who found IPV mediating the relationship between CSA and sexual risk behavior, the current analysis of physical and sexual IPV examined separately found only sexual coercion to be a significant mediator of CSA and STI diagnosis. The finding that sexual coercion is associated strongly with a STI diagnosis is supported (Maman et al., 2000; Stockman et al., 2010; Wingood et al., 2000). Wingood et al. (2000) found experiencing both sexual and physical violence as compared to physical violence alone to be associated with increased risk of STIs, and more recently Stockman et al. (2010) reported that a coerced first sexual intercourse experience and coerced sex after sexual debut were associated independently with multiple sex partners and substance abuse. This analysis supports sexual coercion as an important mechanism in the relationship between CSA and STI risk and further suggests that sexual coercion in an intimate partner relationship has a greater role in STI risk as compared to physical IPV. Assessing for sexual coercion within relationships has important implications for healthcare providers.

The lack of effect for physical IPV in this analysis may also be a result of collinearity, common in mediation analysis. Bivariate analysis found sexual coercion and physical IPV to be highly correlated (0.733). High correlation among mediators generally lessens specific indirect effects and can lead the researcher to conclude that a proposed variable does not act as a mediator when it does or to conclude it does when it does not (Preacher & Hayes, 2009). Therefore, physical IPV may have a role in the pathway between CSA and STI diagnosis but collinearity limits the analysis. Additionally, this study examined STI diagnosis (an outcome of unprotected sexual behavior) and not risky sexual behaviors. Future multiple mediator models that include mediators that represent unique constructs as well as measures of risky sexual behavior will permit more complete understanding of these relationships.

Secondly, alcohol use was not found to mediate the relationship between CSA and STI diagnosis for this sample of women. Although other researchers have found strong relationships among CSA, alcohol use, and risky sexual behaviors (Cook & Clark, 2005), alcohol use was not found in this study to have a significant indirect effect on lifetime STI diagnosis. Researchers who have examined alcohol as a mediator used several measures for capturing alcohol use (Senn et al., 2006). In this study, the AUDIT-C, a shortened version of the AUDIT, was used to measure past year alcohol use only; in future studies other substances should be included as additional measures of substance use.

Dissociation as a mediator of CSA and sexual risk has been suggested by other researchers (Kendall-Tackett & Klest, 2009; Koenig et al., 2004; Malow et al., 2006; Senn et al., 2006) and is supported in this analysis. Findings revealed that CSA had a significant indirect effect on STI diagnosis, with the effect occurring through dissociation and intimate partner sexual coercion. Psychological mechanisms such as dissociation may be barriers to practicing safe sex. If women with a history of sexual abuse dissociate during times of sexual intimacy, traditional educational and counseling messages may not be effective. Identifying significant mediators between CSA and STIs among women has important implications for clinical practice and research. Dissociative symptoms, independent of their cause, need to be addressed clinically, particularly when affecting health outcomes. Therefore, even though the analysis did not distinguish between CSA-related dissociative symptoms and IPV-related dissociation symptoms, the findings suggest a possible role for identifying dissociation in STI prevention efforts.

Limitations

The cross-sectional design did not allow temporal relationships to be established among the variables of dissociative symptoms, alcohol use, physical IPV, sexual coercion, and STI diagnosis, and therefore a causal relationship cannot be confirmed between CSA and STI diagnosis. Significant indirect effects support mediation but do not prove causality. In this situation, it can be argued that experiences of CSA most likely occurred prior to dissociative symptoms or experiences of IPV simply based on time. In addition, the sample consists of a large number of uninsured women reporting higher rates of CSA and IPV and therefore may not be representative of all women seeking healthcare. Convenience sampling limits the generalizability of the findings and replicating the study is an area for future research. The results support dissociative symptoms and sexual coercion as important factors in STI risk in this sample of women, but further work examining a larger, more representative sample of women is important for a better understanding.

Additional limitations include the possibility of response bias related to the use of self-reported STIs diagnosis and CSA recall. However, biological measurement of STI diagnosis would have identified only current infection and not lifetime prevalence. Examination of the accuracy of self-report data, particularly sexual behavior, has found that self-administered questionnaires generally were not biased in either direction (underreporting or overreporting) (Schroder, Carey, & Vanable, 2003), further validating the importance of the current findings. Finally, despite the fact that socioeconomic data was not collected and therefore not included in the analysis, both education and insurance status were measured and served as proxy measures of socioeconomic status. Prior to mediation testing, the bivariate analysis revealed no significant differences between women who reported a history of CSA and those who did not report on the variables of insurance and education. Future research should include a measure of income in addition to insurance and education.

Summary

Despite these limitations this study is an important contribution to the existing literature on IPV because pathways and mediators between CSA and STI risk in women were examined. Violence and mental health researchers have suggested dissociation as a mediator of CSA and adult risk behaviors (Kendall-Tackett & Klest, 2009; Myers et al., 2006; Senn, Carey, & Vanable, 2008). However, there are limited studies testing the role of dissociative symptoms and sexual risk in women. This research provides support that dissociative symptoms mediate the relationship between CSA and lifetime risk of STIs in this group of women. Additionally this study supports sexual coercion as an independent mechanism in STI risk. STIs can have substantial adverse consequences for the health of women and understanding the mechanisms of risk is important for both research and clinical practice.

Strengths of this analysis include a multiple mediation model examining several potential mediators and inclusion of several types of lifetime interpersonal violence experiences. Examining the role of dissociative symptoms in sexual risk among women is an important underexplored area of inquiry. In summary, dissociation and intimate partner sexual violence were found to be mediators in the relationship between CSA and lifetime STI diagnosis. The findings add to the body of literature that recognizes CSA as a risk factor for lifetime health consequences. Interpersonal violence and STIs are public health issues and are associated with significant morbidity especially among women. Identifying significant mediation factors between violence and the outcomes of sexual risk is essential to developing successful interventions. Finally, these findings support the need for clinical assessment of all forms of interpersonal violence and suggest further investigation of the relationship between dissociative symptoms and sexual risk behaviors.

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Figure 1.
Conceptual Model
* measured and included in the mediation analysis

Figure 2.
Multiple mediation model.
** Correlation is significant at the 0.01 level.
* Correlation is significant at the 0.05 level.

Table 1
Women's Health Study Sample Characteristics

	Total n = 202	Positive CSA history n = 93; 46%	No CSA history n = 109; 54%	p
Age (mean), years, SD	29.97, 7.96	30.87, 7.16	29.22, 8.5	.197 ^a
Race/ethnicity, %				.762 [§]
Black/African American	35.2	37.4	33.3	
White	61.2	60.4	61.9	
Native/Asian Pacific	2.0	1.1	2.9	
Don't know	0.5	0.0	1.0	
Refused	1.0	1.1	1.0	
Education, %				.396 [§]
< High school	15.9	18.3	13.9	
≥ High school	84.1	81.7	86.1	
Type of insurance, %				.802 [§]
None	34.5	38.0	31.4	
Public	15.7	15.2	16.2	
Private	48.7	45.7	51.4	
Military	1.0	1.1	1.0	
Marital status, %				.191 [§]
Never married	41.2	33.3	48.1	
Married	28.1	33.3	23.6	
Living with someone	22.1	23.7	20.7	
Divorced	8.5	9.7	7.6	
Place of residence, %				.122 [§]
Rural	52.3	61.3	44.3	
Urban	47.7	38.7	55.7	

Notes.

^a = t-test statistic,

[§] = chi square statistic,

^e = standard deviation,

* statistically significant

Table 2

Correlation Coefficients for Study Variables

Variable	Child sexual abuse	Physical IPV	Dissociation	Alcohol Use	Sexual Coercion IPV	STI Diagnosis
Child sexual abuse	1.000	0.175*	0.230**	0.153*	0.177*	0.305**
Physical IPV		1.000	0.340**	0.079	0.733**	0.123
Dissociation			1.000	0.070	0.382**	0.240**
Alcohol use				1.000	0.036	0.093
Intimate partner sexual coercion					1.000	0.228**
STI diagnosis						1.000

Notes.

* Correlation is significant at the .05 level (2-tailed).

** Correlation is significant at the .01 level (2-tailed).

IPV = intimate partner violence, STI = sexually transmitted infection

Table 3
Indirect Effects of CSA on STI Diagnosis Through Proposed Mediators (ab paths)*

Mediator	Data	Boot	Bias	SE	95% Confidence Intervals
Total	0.3934	0.4236	0.0302	0.1922	0.0885, 0.8836
Dissociation	0.1999	0.2107	0.0107	0.1187	0.0033, 0.4714
Alcohol Use	0.0512	0.0548	0.0037	0.0722	-0.0543, 0.2434
Physical IPV	-0.1177	-0.1256	-0.0079	0.1225	-0.4255, 0.0622
Intimate Partner Sexual Coercion	0.2600	0.2837	0.0237	0.1833	0.0359, 0.7694

Notes.

* 5,000 resamples;

IPV = intimate partner violence, STI = sexually transmitted infection

Table 4
Total Effect and Direct Effects of CSA and STI Diagnosis Mediation Model

Pathways	Coefficient	SE	<i>p</i> (two-tailed)
Total Effect (unmediated model)			
(CSA → STI diagnosis) ^c	1.134	0.312	≤.001
Direct effect of CSA on STI diagnosis (c' path) ^{c'} (mediated model)			
(CSA → STI diagnosis)	0.857	0.335	.011
Direct effects (a paths)			
(CSA → dissociation)	6.852	0.014	≤.001
(CSA → physical IPV)	13.577	5.323	.012
(CSA → sexual coercion intimate partner)	7.451	2.817	.009
(CSA → alcohol use)	0.980	0.384	.012
Direct effects of mediators on STI diagnosis (b paths)			
(dissociation → STI diagnosis)	0.029	0.014	.035
(physical IPV → STI diagnosis)	-0.009	0.007	.211
(sexual coercion → STI diagnosis)	0.035	0.014	.014
(alcohol use → STI diagnosis)	0.052	0.063	.404

Notes.

^c = the total effect of CSA (independent variable) on lifetime STI diagnosis (outcome) in an unmediated model.

^{c'} = the direct effect of the independent variable (CSA) on STI diagnosis; c' in Figure 1.

CSA = child sexual abuse, IPV = intimate partner violence, STI = sexually transmitted infection