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Types and Characteristics of Childhood Sexual Abuse: How Do They Matter in HIV Sexual Risk Behaviors Among Women in Methadone Treatment in New York City?

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Abstract

Background—Childhood sexual abuse (CSA) is often considered an important distal factor in HIV sexual risk behaviors; however, there are limited and mixed findings regarding this relationship among women experiencing substance use problems. Additionally, research with this population of women has yet to examine differences in observed CSA-HIV sexual risk behaviors relationships by CSA type and characteristics.

Objectives—This study examines relationships between CSA coding, type and characteristics and HIV sexual risk behaviors with main intimate partners among a random sample of 390 women in methadone treatment in New York City who completed individual interviews with trained female interviewers.

Results—Findings from logistic regression analyses indicate that CSA predicts substance use with sexual activity, with variations by CSA coding, type, and characteristics; however, the role of CSA is more limited than expected. Having a main partner with HIV risk mediates some relationships between CSA and drinking four or more drinks prior to sex. Intimate partner violence is the most consistent predictor of sexual risk behaviors. Other salient factors include polysubstance use, depression, social support, recent incarceration, and relationship characteristics.

Conclusions/Importance—The study contributes to understanding of relationships between CSA and HIV sexual risk behaviors and key correlates associated with HIV sexual risk behaviors among women in methadone treatment. It also highlights the complexity of measuring CSA and its association with sexual risk behaviors and the importance of comprehensive approaches to HIV prevention that address psychological, relational, situational, and substance use experiences associated with sexual risk behaviors among this population.

Keywords

childhood sexual abuse measurement; HIV sexual risk; methadone treatment

INTRODUCTION AND RATIONALE

Despite advances in prevention, HIV/AIDS remains a serious public health concern among women around the globe, with seroprevalence variation by geographic location, age, race/ethnicity, and other factors. Epidemiological data for the New York City metropolitan area indicate that the rate of HIV diagnosis was 15.0 per 100,000 women in 2011 (Centers for Disease Control and Prevention, 2013b), which reflects a decrease from the prior year (18.5 per 100,000 women in the same area; Centers for Disease Control and Prevention, 2013a). However, while there has been a decrease in the annual number of women diagnosed with HIV, the proportion of HIV diagnoses attributable to heterosexual transmission has increased. The percentage of reported HIV diagnoses for women in New York City attributed to heterosexual transmission was 45.6% (n=892) in 2001 and 78.1% (n=593) in 2011; the percentage attributed to injection drug use went from 14.8% (n=289) to 3.7% (n=28) at these same time points (New York City Department of Health and Mental Hygiene, 2008, 2012). The continued risk for women associated with heterosexual transmission demands further examination, particularly among women with substance use problems who often experience multiple HIV sexual risk factors.

Readily apparent factors include substance use with sexual activity, which negatively affects safer sex practices, involvement with intimate partners who are at high risk for HIV, and diminished relational power to request condom use by partners. Additional risk factors include this group's high rates of posttraumatic stress disorder (PTSD) and exposure to traumatic events, which are associated with increased HIV sexual risk behavior among women (Arriola, Loudon, Doldren, & Fortenberry, 2005; Cavanaugh, Hansen, & Sullivan, 2010; El-Bassel, Gilbert, Vinocur, Chang, & Wu, 2011; Engstrom, Shibusawa, El-Bassel, & Gilbert, 2011; Hebert, Rose, Rosengard, Clarke, & Stein, 2007; Kalichman, Sikkema, DiFonzo, Luke, & Austin, 2002; Moreno, 2007; Plotzker, Metzger, & Holmes, 2007). More specifically, prior estimates have shown that approximately 29% of women in methadone treatment in New York City experience PTSD, exceeding the general population of women in the U.S. by 2.5 times; approximately 90% experience lifetime exposure to intimate partner violence (IPV), exceeding the general population of women in the U.S. by 3-4 times; approximately 58% experienced childhood sexual abuse, exceeding the general population of women in the U.S. by 1.3-4 times; and approximately 22% are living with HIV, exceeding the general population of women in New York City by 27.5 times (Browne, 1993; Engstrom, El-Bassel, Go, & Gilbert, 2008; Kessler, Sonnega, Bromet, Hughes, & et al., 1995; New York City Department of Health and Mental Hygiene, 2012; Pereda, Guilera, Forns, & Gómez-Benito, 2009; Tjaden & Thoennes, 2000; Wyatt, Loeb, Solis, Carmona, & Romero, 1999). These collective experiences underscore the numerous vulnerabilities experienced by women in methadone treatment and the critical need to examine and address factors associated with HIV sexual risk behavior among this population.

As a precipitant of PTSD (Plotzker et al., 2007), intimate partner violence (Engstrom et al., 2008), sexual exchanges for drugs, money or other goods (El-Bassel, Simoni, Cooper, Gilbert, & Schilling, 2001; Vaddiparti et al., 2006), and early onset of substance use (Raghavan & Kingston, 2006), childhood sexual abuse (CSA) may be an important distal factor in HIV risk among women with substance use problems. Numerous studies document

a relationship between CSA and HIV sexual risk behaviors among women in the community, in clinics, and in schools (For meta-analysis of 46 studies, see Arriola et al., 2005). Far fewer have examined this relationship exclusively among women experiencing substance use problems. While not unanimous (Grella, Anglin, & Annon, 1996; Medrano, Desmond, Zule, & Hatch, 1999), quantitative studies conducted exclusively with women experiencing problematic substance use or heavy substance use patterns generally find statistically-significant relationships between CSA and HIV sexual risk behaviors (El-Bassel et al., 2001; Miller & Paone, 1998; Plotzker et al., 2007; Vaddiparti et al., 2006); however, prior research with this population has not examined ways in which types and characteristics of CSA may be differentially associated with HIV sexual risk behaviors and has yet to focus on a random sample of women in substance use treatment.

The absence of such research is notable given prior findings that CSA types and characteristics are differentially associated with long-term risks, including substance use and mental health problems, among women with substance use problems. For example, CSA involving force and family has been found to be associated with increased risk of PTSD among women in methadone treatment (Engstrom, El-Bassel, & Gilbert, 2012). CSA severity has been found to be associated with days of cocaine use among women who recently completed inpatient treatment for cocaine dependence (Hyman et al., 2008). These findings further support the importance of addressing this substantive gap in knowledge in this area.

In a review of 73 studies that examined relationships between CSA and sexual risk behaviors, Senn, Carey and Vanable (2008) note that the absence of a common definition of CSA is a major limitation in the body of knowledge regarding relationships between CSA and HIV sexual risk behaviors. Definitional requirements regarding age at the time of sexual activity, type of relationship and age differences between those involved in the sexual activity, type of sexual activity, the presence of force, and the coding of CSA variables (i.e., dichotomous or continuous coding) frequently differ across studies, making it difficult to compare findings in this area. This study aims to strengthen the existing body of knowledge and future efforts to achieve a common definition of CSA by examining ways in which observed relationships between CSA and HIV sexual risk behaviors among women in methadone treatment may differ depending on how CSA is defined and coded. It also aims to strengthen the existing body of knowledge by considering childhood physical abuse in the analyses, as research has shown that this experience is often associated with both CSA and HIV sexual risk behavior; however, it is frequently overlooked in CSA-HIV sexual risk behavior research (For discussion see Senn et al., 2008).

CONCEPTUAL FRAMEWORK

In order to explicate connections between CSA and HIV sexual risk behaviors, several models that conceptualize mediated relationships between CSA and HIV risk have been proposed (Malow, Dévieux, & Lucenko, 2006; Meade, Kershaw, Hansen, & Sikkema, 2009; Miller, 1999; Plotzker et al., 2007; The NIMH Multisite HIV Prevention Trial Group, 2001; Wyatt et al., 2004). For example, Miller (1999) posits that CSA contributes to problems related to substance use, mental health, and sexual risk taking, which, in turn, contribute to

increased HIV risk. Wyatt and colleagues (2004) describe the relationship between CSA and sexual risks as mediated by mental health problems and revictimization. The Miller (1999) and Wyatt et al. (2004) models are augmented by Malow and colleagues (2006) who postulate that in addition to substance use, mental health problems, and revictimization, assertiveness and self-efficacy are also important mediators between CSA and HIV sexual risk.

These conceptual models and prior empirical findings suggest that mental health concerns, substance use, and revictimization are likely to be key factors, and potential mediators, in the CSA-HIV sexual risk relationship. As such, they should be included in analytic models that examine CSA-HIV sexual risk behavior relationships. It should be noted that although assertiveness and self-efficacy are not available in the current dataset, prior research has found that depression is negatively associated with them (For discussions see Allen & Badcock, 2003; Haaga, Dyck, & Ernst, 1991; Maciejewski, Prigerson, & Mazure, 2000). Including depression in the multiple regression models in the current study facilitates important examination of the role of depression in HIV sexual risk behaviors (Dolezal et al., 1998; Engstrom et al., 2011; Grella et al., 1996; Malow et al., 2006; Miller, 1999; Plotzker et al., 2007; Schilling, El-Bassel, Gilbert, & Glassman, 1993; Schönnesson et al., 2008; Williams & Latkin, 2005), as well as a degree of statistical control for assertiveness and self-efficacy.

There are several additional individual, relational and situational factors that are salient among women in substance use treatment and are associated with HIV sexual risk behavior. These factors include one's HIV status, partner HIV risk status, cohabitation with partner, social support, recent incarceration and homelessness (e.g., Corsi, Kwiatkowski, & Booth, 2006; El-Bassel, Gilbert, Wu, Go, & Hill, 2005; Engstrom et al., 2011; Epperson, Khan, El-Bassel, Wu, & Gilbert, 2011; Grella et al., 1996; Miller, 1999; Miller & Paone, 1998; Paxton, Myers, Hall, & Javanbakht, 2004). In recognition of prior empirical and conceptual work related to the CSA-HIV sexual risk behavior relationship (e.g., Malow et al., 2006; Meade et al., 2009; Miller, 1999; Plotzker et al., 2007; The NIMH Multisite HIV Prevention Trial Group, 2001; Wyatt et al., 2004), the current analyses draw upon a multisystemic conceptualization of the relationship between CSA and HIV sexual risk behaviors. This multisystemic conceptualization posits that individual factors, such as HIV status, mental health concerns and substance use; relational factors, such as exposure to intimate partner violence, partner's HIV risk status, and social support; and situational factors, such as recent homelessness and incarceration, are likely to be important covariates, and potential mediators, in the relationship between CSA and HIV sexual risk behaviors among women in substance use treatment.

STUDY AIMS

Informed by this study's multisystemic conceptual framework and the need to address substantive and methodological gaps in research in this area, the primary aim of the current analyses is to examine associations between CSA and HIV sexual risk behaviors and any differences in the observed relationships between CSA and HIV sexual risk behaviors based on CSA coding, types and characteristics among a random sample of women in methadone

treatment in New York City. It is anticipated that CSA involving force, family and greater severity will be associated with increased HIV sexual risk behaviors (Beitchman, Zucker, Hood, DaCosta, & et al., 1992; Engstrom et al., 2012; Hyman et al., 2008; Rodriguez, Ryan, Rowan, & Foy, 1996). As a secondary aim, we examine mediation in CSA-HIV sexual risk behavior relationships when indicated by findings from the primary analyses.

METHODS

Recruitment of random sample

This study involves secondary analysis of baseline data from the Women's Health Project (WHP), which focused on intersections between problematic substance use, intimate partner violence (IPV) and HIV among women in methadone treatment in New York City (El-Bassel et al., 2005). To recruit a random sample of women in a large methadone treatment program, the WHP used random number generation in SPSS 7.0 and selected 753 of the 1,708 women enrolled in the program between November and December 1997. A total of 559 women completed screening interviews to determine study eligibility; 416 women were eligible and agreed to participate in the study. Women enrolled in methadone treatment for at least 3 months and involved in a sexual, dating, cohabitation, childcare or economic relationship with someone described as a boyfriend, girlfriend, spouse, regular sexual partner, or father of their children in the past year were eligible to participate in the parent study. A total of 26 women who reported all female main partners were excluded from the present analyses due to distinctions in their HIV sexual risk behaviors.

Procedures

Data were collected between 1997 and 2000. Following informed consent processes, in-person interviews were conducted in English and Spanish by trained female interviewers, who administered interview questions and recorded participants' responses. The institutional review boards at Columbia University and at the methadone treatment program approved the study.

Measures

Childhood sexual abuse—The Childhood Sexual Abuse Interview (CSAI; El-Bassel, Gilbert, & Frye, 1998) focuses on sexual activities at age 15 or younger and includes 11 items based on interview schedules by Finkelhor (1979) and Sgroi (1982). The full scale of 11 items has a Cronbach's alpha of .87 with this sample (n=366). Six items inquire about touching/exposure (Did anyone ever show you their private sexual parts? Did anyone masturbate or "get off" in front of you? Did anyone ever touch your body, including your breasts or private sexual parts, or attempt to "get you off" or masturbate you sexually? Did anyone try to have you get them off, or touch their body in a sexual way? Did anyone ever rub against your body in a sexual way? Did anyone attempt to have sex with you?). Three items inquire about penetration (Did anyone have intercourse with you? Did anyone ever put their penis in your mouth or put their mouth on your private sexual parts? Did anyone ever put their penis or another object in your butt or behind?). Single items inquire about picture-taking (Did anyone ever take pictures of you while you were naked or having sex with someone?) and other sexual activity (Did you have any other sexual contact other than what

I've asked you about?). Consistent with definitions used in prior research (For discussion see Senn et al., 2008), the activity was classified as "abuse" when it involved someone 5 or more years older, force, or a relative.

In order to examine ways in which CSA coding, types and characteristics affect the observed relationships between CSA and HIV sexual risk behaviors, CSA was coded in three ways. First, we used dichotomous coding to reflect any experience of childhood sexual abuse across the 11 items of the CSAI. Second, we used continuous coding of two CSAI subscales which emerged from factor analysis with Varimax rotation: touching/exposure (range 0-6, based on 6 items described above, Cronbach's alpha with this sample=.90, n=374) and penetration (range 0-3, based on 3 items described above, Cronbach's alpha with this sample=.70, n=377). Third, we created a 5-level, mutually-exclusive categorical variable that assessed no sexual abuse, sexual abuse with someone 5 or more years older, sexual abuse involving force, sexual abuse involving a relative, and sexual abuse involving force and a relative. In the final category, 95.0% of the cases involved force and a relative simultaneously and 5.0% of the cases involved force and a relative across discrete events.

HIV sexual risk—We focused on two types of HIV sexual risk behaviors in the past six months. First, we included inconsistent condom use with up to three main partners. To begin, we dichotomized responses to questions regarding sexual activity in the past six months (In the past 6 months, how often have you had vaginal sex with this partner? In the past 6 months, how often have you had anal sex with this partner?). Categorical response options ranged from not once in the past six months to 6 or more times per week or 150 or more times in the past six months). Next, we dichotomized responses to separate questions regarding frequency of condom use with vaginal and anal sex (In the past six months, how often did you use a male condom with this partner? In the past six months, how often did you use a female condom with this partner?). Responses of "never," "less than half of the time," "about half of the time," and "more than half of the time" were coded as "inconsistent condom use" and responses of "always" were coded as "consistent condom use." We then combined these responses to identify vaginal or anal sex with inconsistent male or female condom use, as applicable, for each type of sexual activity across up to three main partners. The association between consistent condom use and reduced sexually transmitted infections (STI) among men and women seeking STI care supported this dichotomous coding of condom use (Shlay, McClung, Patnaik, & Douglas, 2004).

Second, we included substance use with sexual activity across up to three main partners (In the past six months, how often were you high on or had been using any drug when you had vaginal, anal or oral sex with this partner? In the past six months, how often were you high on or had been using heroin when you had vaginal, anal or oral sex with this partner? In the past six months, how often have you had vaginal, anal or oral sex with this partner after you had consumed four or more drinks?). Any report of vaginal, anal or oral sex while high on or using any drug, heroin, crack or cocaine, or after consuming 4 or more drinks was dichotomously coded as "drug (or heavy alcohol) use with sexual activity" for each substance.

Covariates

Sociodemographic characteristics—Because of associations between sociodemographic characteristics and HIV risk behaviors, they are included in the multiple regression analyses in this study (Corsi et al., 2006; Dunlap, Golub, Johnson, & Wesley, 2002; Dunlap, Stürzenhofecker, Sanabria, & Johnson, 2004; Engstrom et al., 2011; Grella et al., 1996; Hoffman, Klein, Eber, & Crosby, 2000; Paxton et al., 2004). Sociodemographic variables included participants' age, race/ethnicity, highest grade completed in school, legal marital status, and annualized average monthly income. We used the log of annualized monthly income in the multiple logistic regression analyses due to the wide range of reported values for this variable (i.e., \$480.00-\$72,000.00).

Posttraumatic stress disorder—To measure PTSD, we relied on the 49-item Posttraumatic Stress Diagnostic Scale (PDS; Foa, 1995) which follows DSM-IV diagnostic criteria (American Psychiatric Association, 2000) and has reported sensitivity of 82.0% and specificity of 76.7%.

Depression—To measure depression, we dichotomized scores on the widely-used Brief Symptom Inventory depression subscale (6-item scale with published alpha coefficient of .85 yields possible range of 0-4; actual range with this sample: 0-3.83, alpha coefficient with this sample: .86, n=390; Derogatis, 1993) to reflect values that were above and below 1.865, the published median value in psychiatric outpatient norms for women.

Substance use—Based on responses to substance-specific questions regarding frequency of use in the past 6 months, any reported use of heroin, cocaine, crack, marijuana, non-prescription stimulants, non-prescription narcotics, or non-prescription tranquilizers, hypnotics, or barbiturates was coded as “drug use” in this dichotomous variable. The same coding was applied to any alcohol use in the past 6 months.

Years in methadone treatment—A single, continuously-coded question, “For how many years altogether have you been on methadone?,” assessed years in methadone treatment.

Intimate partner violence—Across up to three main partners, any positive response on the sexual coercion, physical assault, injury, and psychological aggression items of the Revised Conflict Tactics Scale was coded dichotomously to reflect presence of IPV (CTS2; Straus, Hamby, Boney-McCoy, & Sugarman, 1996).

Childhood physical abuse—To measure childhood physical abuse, we drew upon two separate questions asking participants if, before they were 18 years old, they were punched, pushed, hit, shoved, kicked, whipped, beaten, or suffered painful physical injuries, all beyond what is considered discipline, by parents, caretaker or guardian; or if they were choked, strangled, or threatened with a knife, gun, or any other weapon by parents, caretaker or guardian. Affirmative responses to either of these questions were coded as “childhood physical abuse.”

HIV, main partner HIV risk status, and cohabitation with partner—Participants' self-reported responses to a question regarding the result of their most recent HIV test were coded dichotomously. The presence of any of the following factors across up to three main partners was coded as partner risk: HIV-positive status; other sexually-transmitted disease in the past 6 months; sexual activity with other partners; sexual activity with someone who is HIV-positive or uses injection drugs; or sexual activity in exchange for money or drugs. Participants' reports of living with a partner were dichotomously coded.

Social support—We dichotomously coded the 12-item Multidimensional Scale of Perceived Social Support (Zimet, Dahlem, Zimet, & Farley, 1998) to indicate agreement or strong agreement (>2.45 , range 0-4) with having social support from family, friends, and a significant other. Cronbach's alpha of the 12-item continuous scale with this sample is .88 ($n=378$).

Incarceration and homelessness—Two single-item questions inquired about incarceration or homelessness in the last 6 months.

Data Analysis Plan

Reliability analysis was conducted with fully-observed data using IBM SPSS Statistics Version 20. Multiple imputation of missing data was conducted with the ICE (Imputation by Chained Equations) program in Stata/SE 10.1, which was used for all descriptive and logistic regression analyses (Rubin, 1987; Schafer, 2000; StataCorp, 2007). Univariate analyses were conducted in order to describe the sample and identify prevalence of CSA, HIV sexual risk behaviors, and covariates. Bivariate analyses were conducted to examine relationships between CSA and HIV sexual risk behaviors for each of the three CSA coding schemes described earlier. In order to examine relationships between CSA and HIV sexual risk behaviors while adjusting for potential confounders, multiple logistic regression analyses were conducted; a set of multiple logistic regression analyses predicting each HIV sexual risk behavior was conducted for each CSA coding scheme. While Bonferroni correction is often applied when conducting multiple analyses, its limitations and risk of inflating Type II errors prompted us to retain the conventional p-value of .05 in these analyses (For additional discussion, see Perneger, 1998). Analyses are displayed in Tables 1–4.

We conducted subsequent path analyses using Mplus Version 7.1 when the comparison of bivariate and multiple logistic regression findings suggested the possibility of mediation in the CSA-HIV sexual risk behavior relationship. When the statistical significance of the CSA-HIV sexual risk behavior relationship at the bivariate level was absent in the multiple logistic regression analyses, we conducted path analysis in which statistically-significant predictors of the dependent variable were entered as possible mediators (Baron & Kenny, 1986). In each of these situations, we examined three models: 1) the direct effect of CSA on the dependent variable; 2) the direct effects of each of the potential mediators on the dependent variable; and 3) a final model of the direct effects of CSA on the potential mediators and on the dependent variable and indirect effects of CSA on the dependent variable through the potential mediators (Kline, 2011). A weighted least squares parameter

estimate method (WLSMV) was used due to the binary nature of the variables. This method handles missing data as a function of the observed covariates and not the observed outcomes (Muthén & Muthén, 1998–2012); however, all 390 participants were included in the path models.

The following fit indices and values indicating good fit were used: chi-square statistic ($p > .05$), Comparative Fit Index (CFI; $> .90$) and Root Mean Square Error of Approximation (RMSEA; $< .06$ as good fit, $< .10$ as cutoff for mediocre fit; Hu & Bentler, 1999; Kenny, 2014). A non-significant chi-square value ($p > .05$) is generally useful in representing good fit for sample sizes 75–200; however, in larger samples (i.e., sample size of 400 or more), the chi-square value is regularly statistically significant (Kenny, 2014). Additionally, it should be noted that RMSEA estimates with small sample sizes and, in particular, small degrees of freedom often falsely indicate a poor fitting model (Kenny, Kaniskan, & McCoach, 2014). Further, some scholars have argued that there are no “golden rules” for interpreting fit indices (Marsh, Hau, & Wen, 2004).

In order to test mediation, bootstrap analyses were conducted, resampling 5,000 samples and examining the standardized confidence intervals (CI) of the indirect effects of CSA on the dependent variable through the potential mediators (Preacher & Hayes, 2008). The indirect effect is significant if zero is not included in the 95% confidence interval (Preacher & Hayes, 2008).

RESULTS

Sample Characteristics

As displayed in Table 1, the majority of the participants were Latina/Hispanic (46.9%) or African American/Black (31.3%), single, never married (46.2%), involved with one main intimate partner (77.4%), and residing with an intimate partner (61.8%). Approximately half of their main intimate partners were at risk for HIV (50.1%). Participants' mean age was 39.9 years ($SE = .34$), mean level of education was 11.0 years ($SE = .13$), and mean level of annual income was \$10,228 ($SE = 491$). In the past 6 months, 9.5% of the women were homeless and 5.9% were incarcerated.

More than half of the participants experienced CSA (55.8%) and more than a quarter of the participants experienced CSA involving force and family (27.5%). Touching/exposure was the most prevalent type of CSA, affecting 51.8% of the participants. Childhood physical abuse was reported by 37.3% of the participants and most often co-occurred with CSA (27.4%).

More than three-quarters of the participants experienced IPV in the past 6 months (77.3%). A total of 27.8% of participants met diagnostic criteria for PTSD and 14.9% experienced depression. Alcohol and drug use in the past 6 months was reported by 49.5% and 63.1% of the participants, respectively.

As shown in Table 1, the most common HIV sexual risk behavior in the past 6 months was inconsistent condom use with vaginal sex (66.3%), followed by sexual activity while high on

or using any drug (36.6%), sexual activity while high on or using heroin (22.2%), sexual activity while high on or using crack or cocaine (21.3%), sexual activity after consuming 4 or more drinks (19.4%), and inconsistent condom use with anal sex (12.1%).

CSA Coding Scheme 1: Dichotomously-Coded Childhood Sexual Abuse and HIV Sexual Risk Behaviors

Dichotomously-coded CSA significantly predicted just one HIV sexual risk behavior, as displayed in Table 2. At the bivariate level, a statistically-significant relationship was found between dichotomously-coded CSA and drinking four or more drinks prior to sexual activity. Women who reported CSA were nearly twice as likely to report drinking four or more drinks prior to sex ($OR=1.84$, $CI=1.06, 3.19$, $p=.030$). This relationship became statistically insignificant in the multiple logistic regression analysis, which prompted further analysis to test for possible mediation in this relationship. Path analysis was used to examine the following possible mediators: having a partner at risk for HIV, drug use, and exposure to IPV.

The direct effect model indicated a significant, direct relationship between CSA and drinking four or more drinks prior to sexual activity ($\beta = .18$, $p=.02$); however, the model was just-identified and model fit could not be assessed ($X^2(0) = 0.00$, $p < .001$). Results of the indirect model indicated relatively poor fit with the data ($X^2(4) = 16.30$, $p = .003$; $CFI = .81$; $RMSEA = .09$), with statistically-significant relationships between CSA and having a partner with HIV risk ($\beta = .16$, $p=.001$) and between having a partner with HIV risk and drinking four or more drinks prior to sex ($\beta = .21$, $p=.003$). There were statistically-significant relationships between CSA and IPV ($\beta = .11$, $p=.02$) and between IPV and drinking four or more drinks prior to sex ($\beta = .21$, $p=.003$). While the relationship between CSA and drug use was not statistically significant ($\beta = .10$, $p=.07$), the relationship between drug use and drinking four or more drinks prior to sex was statistically significant ($\beta = .34$, $p<.001$).

Figure 1 illustrates the final model ($X^2(3) = 14.25$, $p = .003$; $CFI = .83$; $RMSEA = .10$). The fit of this final model was poor, and while not unexpected given the sample size and small degrees of freedom (Kenny et al., 2014), results should be interpreted with the fit in mind. When having a main partner with HIV risk, drug use, and IPV were added to the model, the direct relationship between CSA and drinking four more drinks prior to sex was no longer statistically significant ($\beta = .09$, $p=.20$), indicating that full mediation is present. A statistically-significant, positive relationship was found between CSA and having a main partner with HIV risk ($\beta = .15$, $p=.002$) and between having a main partner with HIV risk and drinking four or more drinks prior to sex ($\beta = .18$, $p=.01$). The indirect effect was significant ($\beta = .03$, 95% bootstrap CI of .007 to .106), indicating that having a main partner with HIV risk mediates the relationship between CSA and drinking four or more drinks prior to sexual activity. As in the indirect model, a statistically-significant, positive relationship was found between CSA and IPV ($\beta = .10$, $p=.04$) and between IPV and drinking four or more drinks prior to sex ($\beta = .28$, $p=.001$). However, in the final model, the indirect effect was not statistically significant ($\beta = .06$; 95% bootstrap CI of $-.001$ to .117), indicating that IPV is not a mediator. Finally, CSA did not significantly predict drug use; however, there

was a significant, positive relationship between drug use and drinking four or more drinks prior to sex ($\beta = .33, p < .001$). Thus, having a partner with HIV risk was the only mediator in the relationship between CSA and drinking four or more drinks prior to sex. Together, all of the variables accounted for 25% of the variance in drinking four or more drinks prior to sexual activity.

CSA Coding Scheme 2: Childhood Sexual Abuse Involving Touching/Exposure and Penetration and HIV Sexual Risk Behaviors

CSA involving touching/exposure was associated with increased risk of heroin use with sexual activity, even when adjusting for potential confounders ($OR=1.19, CI=1.01, 1.40, p=.032$), as indicated in Table 3. CSA involving touching/exposure or penetration was not associated with any other HIV sexual risk behaviors we examined.

CSA Coding Scheme 3: Childhood Sexual Abuse Involving Force, a Relative, or Someone Five Years Older and HIV Sexual Risk Behaviors

The only statistically-significant findings in the relationships between this CSA coding scheme and HIV sexual risk behaviors were as follows: CSA involving force and a relative and CSA involving someone 5 or more years older than the participant were both associated with heightened risk of drinking four or more drinks prior to sexual activity, as shown in Table 4. When adjusting for potential confounders, these relationships became statistically insignificant, which prompted further analyses to test for mediation.

Path analysis was again used to further examine whether having a main partner with HIV risk, drug use, and IPV mediates this relationship in two separate path analyses examining 1) CSA involving force and a relative and 2) CSA involving someone 5 years or older. In order to test these models, the 5-level CSA variable was dummy coded (0/1) into two separate independent variables which were used in their respective models: 1) indicating whether a participant had experienced CSA involving force by a relative (0=no; 1=yes), and 2) indicating whether the participant had experienced CSA involving someone 5 years or older (0=no; 1=yes).

The direct effect model for CSA involving force and a relative was just-identified ($X^2 (0) = 0.00, p < .001$) and indicated a significant, direct relationship with drinking four or more drinks prior to sexual activity ($\beta = .18, p = .02$). Results of the indirect model ($X^2 (4) = 17.87, p = .001; CFI = .74; RMSEA = .09$) indicated a statistically-significant relationship between CSA involving force and a relative and having a main partner with HIV risk ($\beta = .17, p = .001$) and between having a main partner with HIV risk and drinking four or more drinks prior to sex ($\beta = .14, p = .006$). There was a statistically-significant relationship between IPV and drinking four or more drinks prior to sex ($\beta = .14, p = .006$) and between drug use and drinking four or more drinks prior to sex ($\beta = .19, p < .001$). CSA involving force and a relative did not significantly predict drug use ($\beta = -.003, p = .96$).

The final model examining both the direct and indirect paths is presented in Figure 2 ($X^2 (3) = 15.17, p = .002; CFI = .81; RMSEA = .10$). Again model fit was poor, though not surprising, given the sample size and small degrees of freedom (Kenny et al., 2014); however, the fit should be taken into consideration when interpreting the findings. The direct

relationship between CSA involving force and a relative and drinking four or more drinks prior to sexual activity remained statistically significant ($\beta = .13, p=.04$). There was a statistically-significant relationship between CSA involving force and relative and having a main partner with HIV risk ($\beta = .17, p<.001$) and between having a main partner with HIV risk and drinking four or more drinks prior to sex ($\beta = .18, p=.01$). The indirect effect was significant ($\beta = .03$, 95% bootstrap CI of .011 to .129), indicating that having a main partner with HIV risk partially mediates the relationship between CSA involving force and a relative and drinking four or more drinks prior to sex. Additionally, a statistically-significant, positive direct relationship between IPV and drinking four or more drinks prior to sexual activity was found ($\beta = .05, p=.04$) and between drug use and drinking four or more drinks prior to sex ($\beta = .28, p=.001$). Thus, having a partner with HIV risk was the only mediator in the relationship between CSA involving force and a relative and drinking four or more drinks prior to sex. Together, all of the variables accounted for 26% of the variance in drinking four or more drinks prior to sex.

Next, we examined whether CSA involving someone 5 or more years older was directly related to HIV sexual risk behaviors and whether that relationship was mediated by having a main partner with HIV risk, substance use, and/or intimate partner violence. In contrast to the findings of the bivariate logistic regression analyses, findings of the direct path model found no statistically-significant direct relationship between CSA involving someone 5 or more years older and drinking four or more drinks prior to sexual activity ($\beta = .10, p=.14$). Thus, further path analysis to test for mediation was not pursued.

Post-Hoc Analyses: Childhood Physical and Sexual Abuse and HIV Sexual Risk Behaviors

The analyses yielded unexpected findings regarding reduced risk of inconsistent condom use and nonspecific drug use with sexual activity (i.e., “any drug use with sexual activity”) among women who reported childhood physical abuse, as displayed in Tables 2 and 3. To further understand these findings and the potential that childhood physical and sexual abuse may interact to influence them, we conducted post-hoc analyses to examine relationships between childhood physical abuse and sexual abuse, alone and in combination, and inconsistent condom use and drug use with sexual activity. Using a 4-level categorical variable (0=no childhood physical or sexual abuse, 1=childhood sexual abuse without physical abuse, 2=childhood physical abuse without sexual abuse, and 3=childhood physical and sexual abuse), we found no statistically-significant relationships between childhood physical and sexual abuse, alone or in combination, and inconsistent condom use during vaginal sex or anal sex, in the bivariate or multiple logistic regression analyses. As with the models predicting inconsistent condom use with anal sex displayed in Tables 2, 3 and 4, this post-hoc model also remained statistically insignificant. Additionally, there were no statistically-significant relationships in the bivariate or multiple logistic regression analyses between childhood physical and sexual abuse, alone or in combination, and nonspecific drug use with sexual activity.

DISCUSSION

This study is the first to our knowledge that examines ways in which CSA coding, type and characteristics may affect observed relationships between CSA and HIV sexual risk behaviors among women in substance use treatment. Although it finds statistically-significant, often mediated, relationships between CSA and HIV sexual risk behaviors with main intimate partners, the findings regarding associations between CSA and HIV sexual risk behaviors are more limited than anticipated, particularly given the scope of analyses conducted. There are multiple ways to understand these unexpected findings.

First, prior research with women in methadone treatment also found no association between CSA and condom use or number of male sex partners; however, it found that other factors, including race, alcohol use, residing with a partner, suicidality, and HIV status predicted sexual risk behaviors (Grella et al., 1996). Similarly, our findings point to the significance of residing with a partner, alcohol use, HIV-negative status, IPV exposure, and lack of social support as key predictors of inconsistent condom use during vaginal sex with main intimate partners. Other individual, relational, and situational factors, including depression, alcohol and drug use, having a partner with HIV risk, and recent incarceration, also differentially predicted having sex with main partners while under the influence of drugs or alcohol. Together with prior research with women in methadone treatment and women recruited from the community who used drugs (Grella et al., 1996; Medrano et al., 1999), our findings indicate that the role of CSA in most of the HIV sexual risk behaviors examined in this study may be less salient than current psychological, substance use, relational, and situational factors.

Second, it is possible that methodological issues influenced the findings. This study focused only on sexual risk behaviors with main partners and considered these risks across three main partners. It may be that associations between CSA and sexual risk behaviors differ between main and secondary partners and that this differential association was not captured in our analyses (Sangi-Haghpeykar, Poindexter, Young, Levesque, & Horth, 2003). Additionally, this study relied on dichotomously-coded sexual risk variables. It is possible that continuously-coded sexual risk variables may yield different findings regarding relationships between CSA and sexual risk behaviors with main partners. Finally, this study collapsed all drug use into a single category which may have obscured the specific roles of different drugs in CSA-sexual risk behavior relationships (Miller, 1999).

In contrast to expectations based on prior research (Beitchman et al., 1992; Rodriguez et al., 1996), this study found that touching/exposure, and not penetration or other CSA measures, predicted increased risk of heroin use with sexual activity. This unexpected finding suggests that unobserved contextual aspects of these experiences, which may include age, relationship, frequency, duration and circumstances of the touching/exposure, have important bearing on the long-term sequelae of CSA. Similar to findings by Wyatt and Peters (1986a) that different definitions of CSA result in variations in prevalence estimates, this study indicates that definitional differences also affect findings regarding observed associations between CSA and sexual risk behaviors. Further, this study suggests that

childhood sexual and physical abuse may interact in ways that are important to further understand in relation to HIV sexual risk behaviors among this population.

The most consistent finding regarding the CSA-HIV sexual risk behavior relationship was the statistical significance of the association between CSA and increased likelihood of drinking four or more drinks prior to sex with main partners. This finding held with dichotomously-coded CSA and with CSA involving force and a relative in both logistic regression and path analyses. When dichotomously coded, the CSA-heavy alcohol use prior to sex relationship was mediated by having a partner with HIV risk. Having a partner with HIV risk also partially mediated the relationship between CSA involving force and a relative and heavy alcohol use prior to sexual activity. Drug use and IPV were not mediators, but they were associated with drinking four or more drinks prior to sexual activity; and the total combination of variables explained a considerable portion of the variance in consuming 4 or more drinks prior to sex.

There are several ways to understand the links between CSA, involvement with partners at risk for HIV, and drinking four or more drinks prior to sex. Involvement with an intimate partner at high risk for HIV may reflect engagement in a high-risk social network and hindered ability to identify and address risks, sexual or otherwise, among women with histories of CSA (Miller, 1999). It may also reflect continuation of a high-risk sexual trajectory that was initiated through early sexual abuse (Browning & Laumann, 1997). Additionally, women may use alcohol prior to sex as a form of avoidant coping with their partner's risks, particularly when the threat of violence is present (Lazarus & Folkman, 1984; Schiff, El-Bassel, Engstrom, & Gilbert, 2002). While these possibilities can facilitate understanding of the mediated relationship between CSA and heavy alcohol use prior to sex, there remains a need for additional research to further understand the relatively consistent associations between CSA and heavy alcohol use prior to sex and the relatively limited associations between CSA and drug use with sex among women in methadone treatment.

In this study, IPV was the most consistent predictor of HIV sexual risk behavior. This finding is consistent with prior cross-sectional and longitudinal research among women in methadone treatment (El-Bassel et al., 2005; Engstrom et al., 2011). In the context of violence, women may fear retaliation for requests to use condoms (Wingood & DiClemente, 1997). Additionally, they may use drugs and alcohol with sexual activity to manage psychological and physical trauma associated with victimization (Briere, 1992; Kilpatrick, Acierno, Resnick, Saunders, & Best, 1997). The findings underscore the critical importance of ongoing efforts to design and test interventions to address co-occurring substance use and IPV as part of HIV prevention (For additional discussion, see Amaro et al., 2007; Gilbert et al., 2006; Morrissey et al., 2005).

This study makes novel contributions to understanding relationships between CSA and sexual risk behaviors with main partners among women in methadone treatment; however, it is not without its limitations, as discussed earlier and further addressed here. While the multiple questions regarding types of sexual activities were a strength of the CSA measure (Wyatt & Peters, 1986b), it relied on retrospective recall. Although events that occurred at sufficient age are likely to be recalled (Brewin, Andrews, & Gotlib, 1993), the personal

nature of such disclosure may have resulted in underestimated CSA prevalence in this study. Further, emerging trends in reported HIV diagnoses among women in New York City indicate an overall decrease in the annual number of HIV diagnoses reported, with a ten-fold decrease in the number of women whose diagnoses were attributed to injection drug use between 2001 and 2011 (New York City Department of Health and Mental Hygiene, 2008, 2012). This study's data, which were gathered between 1997 and 2000, may reflect higher HIV risks when compared to current data. Interpretation of study questions may have also affected the study's findings. In particular, the CPA items may have resulted in underestimates of CPA prevalence as one of the items involved participants' making a determination regarding experiences that exceeded discipline. Finally, the cross-sectional data suggest caution when making causal inferences regarding the correlates of sexual risk behaviors and mediators in the CSA-HIV relationships (Kazdin & Nock, 2003).

CONCLUSION

This study finds that CSA type and characteristics are differentially associated with consuming four or more drinks prior to sexual activity and using heroin with sexual activity. Additionally, the study finds that having a main partner with HIV risk mediates relationships between both any CSA and CSA involving force and a relative and drinking four or more drinks prior to sex. Although women with histories of CSA are at heightened risk of having sex under the influence of alcohol, and depending on the CSA characteristics, having sex under the influence of heroin, the associations between CSA and sexual risk behaviors are more limited than expected, especially in light of the numerous analyses conducted in this study. The findings suggest that IPV, polysubstance use, depression, social support, recent incarceration, and relational contexts are salient factors in HIV sexual risk behaviors. As such, they highlight the critical importance of further research to develop and test multifaceted, comprehensive approaches to HIV prevention among women in methadone treatment.

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Biographies

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Dr. Louisa Gilbert is a licensed social worker with 25 years of experience developing, implementing and testing multi-level interventions to address HIV/AIDS, substance abuse, trauma, partner violence and other co-occurring issues among vulnerable communities in the U.S. and Central Asia. She has served as the Co-Director of the Social Intervention Group since 1999 and the Co-Director of the Global Health Research Center of Central Asia since 2007. Her specific area of research interest has concentrated on advancing a continuum of evidence-based interventions to prevent intimate partner violence among drug-involved women and women in the criminal justice system. More recently, her funded research has also focused on identifying and addressing structural and organizational barriers in harm reduction programs to implementing evidence-based interventions to prevent overdose among drug users in Central Asia.

Katherine Winham received her doctoral degree from the Kent School of Social Work at the University of Louisville, where she was awarded the John M. Houchens Prize for Outstanding Dissertation. She is a practicing social worker and licensed marriage and family therapist and holds master's degrees in both fields. With the goal of developing interventions, her research focuses on investigating relationships between victimization experiences and physical and mental health outcomes and high risk behaviors (substance use, HIV risk behaviors) among vulnerable and underserved populations, especially women involved with the criminal justice system.

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Figure 1.

Final fitted path model with estimated regression coefficients for the direct path between CSA and four or more drinks prior to sex and as mediated by main partner with risk, drug use and intimate partner violence (standardized estimates are in parentheses).

Figure 2.

Final fitted path model with estimated regression coefficients for the direct path between CSA involving force and a relative and four or more drinks prior to sex and as mediated by main partner with risk, drug use and intimate partner violence (standardized estimates are in parentheses).

Table 1

Participant characteristics and reported sexual risk behaviors (N=390)

	M	(SE)
Age in years	39.9	.34
Average annual income (US\$)	10,228	491
Number of years of education completed	11.0	.13
Number of years in methadone treatment	9.2	.36
CSA: Touching/exposure (0-6 range)	2.01	.12
CSA: Penetration (0-3 range)	.39	.04
	<i>n</i>	%
Race/ethnicity		
African American/Black	122	31.3
Latina/Hispanic	183	46.9
White	67	17.2
Other	18	4.6
Legal marital status		
Single, never married	180	46.2
Divorced or separated	87	22.3
Widowed	41	10.5
Married	82	21.0
More than 1 main intimate partner	88	22.6
Cohabitation with at least 1 partner	241	61.8
Financial independence from partner	123	31.6
At least 1 main intimate partner with HIV risk	195	50.1
HIV-positive status	83	21.3
Social support	232	59.6
Childhood sexual abuse history-Any	218	55.8
CSA with someone 5+ years older	37	9.6
CSA involving force	34	8.6
CSA involving a relative	39	10.1
CSA involving a relative and force	107	27.5
Touching/exposure	202	51.8
Penetration	92	23.5
Childhood trauma history		
Childhood sexual abuse, no physical abuse	111	28.4
Childhood physical abuse, no sexual abuse	39	9.9
Childhood physical and sexual abuse	107	27.4
Intimate partner violence in past 6 months	301	77.3
Mental health		
PTSD diagnosis	108	27.8
Depression	58	14.9

	M	(SE)
Substance use-Past 6 months		
Alcohol use	193	49.5
Other drug use	246	63.1
Homeless-Past 6 months	37	9.5
Incarcerated-Past 6 months	23	5.9
Sexual risk behaviors-Past 6 months		
Inconsistent condom use-vaginal sex	259	66.3
Inconsistent condom use-anal sex	47	12.1
Sexual activity while high on or using any drug	143	36.6
Sexual activity while high on or using heroin	87	22.2
Sexual activity while high on or using crack or cocaine	83	21.3
Sexual activity after consuming 4 or more drinks	76	19.4

Unadjusted and Adjusted Odds Ratios of Relationships between Childhood Sexual Abuse (CSA) and HIV Sexual Risk Behaviors (N=390)

	Inconsistent Condom Use—Vaginal Sex OR (95% CI)	Inconsistent Condom Use—Anal Sex OR (95% CI)	Any Drug Use with Sexual Activity OR (95% CI)	Heroin Use with Sexual Activity OR (95% CI)	Crack or Cocaine Use with Sexual Activity OR (95% CI)	Four or More Drinks Prior to Sexual Activity OR (95% CI)
Unadjusted Model						
CSA (0-1 coding)	1.14 (.73, 1.77)	1.10 (.58, 2.08)	1.27 (.82, 1.98)	1.29 (.78, 2.12)	1.52 (.90, 2.55)	1.84 (1.06, 3.19) *
Adjusted Model						
Age	.96 (.91, 1.00) ^a	.95 (.89, 1.02) ^b	.97 (.93, 1.01) ^c	.99 (.94, 1.04) ^d	1.02 (.96, 1.07) ^e	1.03 ^f
Race/ethnicity						
White/Other (Reference)	—	—	—	—	—	—
Black/African American	1.06 (.51, 2.21)	.67 (.24, .186)	1.17 (.60, 2.30)	.80 (.37, 1.72)	1.90 (.84, 4.31)	.78 (.33, 1.83)
Latina/Hispanic	.86 (.44, 1.71)	.97 (.39, 2.42)	1.08 (.57, 2.04)	1.21 (.61, 2.42)	1.33 (.59, 2.95)	1.82 (.83, 3.98)
Log of annual income	1.00 (.70, 1.44)	.75 (.47, 1.19)	.94 (.68, 1.30)	1.18 (.82, 1.70)	.85 (.58, 1.26)	.72 (.49, 1.06)
Education	.98 (.88, 1.09)	.99 (.83, 1.18)	1.04 (.94, 1.15)	1.00 (.89, 1.12)	1.12 (.98, 1.28)	1.13 (.98, 1.30)
Legal marital status						
Single, never married (Reference)	—	—	—	—	—	—
Divorced or separated	1.23 (.61, 2.48)	1.50 (.61, 3.70)	1.12 (.60, 2.08)	.78 (.38, 1.58)	.70 (.33, 1.49)	.55 (.25, 1.21)
Widowed	1.04 (.41, 2.62)	1.19 (.30, 4.71)	1.11 (.48, 2.55)	.96 (.37, 2.50)	1.28 (.50, 3.28)	.46 (.14, 1.47)
Married	1.04 (.52, 2.06)	1.29 (.55, 3.08)	.81 (.43, 1.52)	.81 (.40, 1.63)	.65 (.30, 1.41)	.97 (.45, 2.07)
Years in methadone treatment	.98 (.94, 1.02)	.99 (.94, 1.06)	1.01 (.97, 1.04)	.96 (.91, 1.00)	1.01 (.97, 1.06)	.96 (.91, 1.00)
At least 1 main partner with HIV risk	.88 (.50, 1.54)	1.60 (.75, 3.44)	1.55 (.94, 2.56)	1.37 (.76, 2.46)	2.65 (1.40, 5.03) **	2.30 (1.23, 4.30) **
Cohabitation with a main partner	2.21 (1.23, 4.0) **	1.53 (.69, 3.42)	1.43 (.85, 2.40)	1.54 (.86, 2.78)	.93 (.51, 1.70)	.68 (.37, 1.26)
Depression	1.44 (.65, 3.21)	1.47 (.56, 3.68)	2.59 (1.32, 5.11) **	2.33 (1.16, 4.68) *	1.87 (.88, 3.96)	1.62 (.74, 3.53)
Posttraumatic stress disorder	1.02 (.51, 2.01)	.80 (.35, 1.81)	1.36 (.77, 2.39)	1.15 (.64, 2.09)	1.21 (.64, 2.28)	1.13 (.58, 2.19)
Drug use	.61 (.34, 1.09)	1.19 (.57, 2.49)	—	—	—	3.59 (1.76, 7.35) ***
Alcohol use	2.30 (1.35, 3.92) **	2.02 (.996, 4.11) *	—	1.00 (.59, 1.71)	2.09 (1.17, 3.73) **	—
HIV-positive status	.21 (.09, .48) ***	1.40 (.61, 3.22)	.71 (.38, 1.33)	.80 (.39, 1.63)	.75 (.34, 1.63)	1.34 (.62, 2.88)
IPV in the past 6 months	5.03 (2.71, 9.35) ***	1.93 (.72, 5.15)	3.25 (1.68, 6.31) ***	2.30 (1.07, 4.96) *	3.39 (1.42, 8.11) **	4.09 (1.56, 10.67) **
Social support	.52 (.29, .94) *	.96 (.45, 2.04)	.90 (.54, 1.51)	.74 (.41, 1.31)	.61 (.33, 1.12)	1.58 (.82, 3.03)

	Inconsistent Condom Use—Vaginal Sex OR (95% CI)	Inconsistent Condom Use—Anal Sex OR (95% CI)	Any Drug Use with Sexual Activity OR (95% CI)	Heroin Use with Sexual Activity OR (95% CI)	Crack or Cocaine Use with Sexual Activity OR (95% CI)	Four or More Drinks Prior to Sexual Activity OR (95% CI)
Homeless in past 6 months	.97 (.39, 2.41)	1.78 (.60, 5.23)	1.81 (.80, 4.09)	1.25 (.54, 2.90)	.94 (.38, 2.34)	1.25 (.51, 3.02)
Incarcerated in past 6 months	1.92 (.55, 6.67)	.25 (.03, 2.16)	6.91 (2.11, 22.60)**	2.51 (.83, 7.59)	6.49 (2.08, 20.20)***	1.05 (.34, 3.22)
Childhood physical abuse	.52 (.29, .93)*	.46 (.21, 1.00)*	.60 (.35, 1.02)	.86 (.48, 1.52)	.81 (.43, 1.53)	1.30 (.71, 2.40)
Childhood sexual abuse (0-1 coding)	1.34 (.76, 2.36)	1.02 (.49, 2.10)	1.15 (.69, 1.93)	1.21 (.69, 2.13)	1.05 (.55, 1.98)	1.40 (.74, 2.63)

* p .05

** p .01.

*** p .001.

^a F (22, 1000.0)=2.89, p = .000.

^b F (22, 1000.0)=.97, p =.503.

^c F (20, 1000.0)=2.37, p = .0006.

^d F (21, 1000.0)=1.51, p = .067.

^e F (21, 1000.0)=2.39, p = .0004.

^f F (21, 1000.0)=2.15, p = .0019.

Table 3

Unadjusted and Adjusted Odds Ratios for Relationships between Types of Childhood Sexual Abuse (CSA) and HIV Sexual Risk Behaviors (N=390)

	Inconsistent Condom Use—Vaginal Sex OR (95% CI)	Inconsistent Condom Use—Anal Sex OR (95% CI)	Any Drug Use with Sexual Activity OR (95% CI)	Heroin Use with Sexual Activity OR (95% CI)	Crack or Cocaine Use with Sexual Activity OR (95% CI)	Four or More Drinks Prior to Sexual Activity OR (95% CI)
Unadjusted Model						
Childhood sexual abuse						
Touching/Exposure	.99 (.87, 1.11)	1.01 (.85, 1.20)	1.09 (.96, 1.23)	1.18 (1.02, 1.36)*	1.13 (.97, 1.31)	1.13 (.99, 1.29)
Penetration	1.03 (.70, 1.52)	1.24 (.78, 1.99)	.90 (.62, 1.30)	.79 (.50, 1.24)	.91 (.60, 1.39)	.95 (.64, 1.39)
Adjusted Model						
Age	.96 (.92, 1.02) ^a	.95 (.89, 1.02) ^b	.97 (.92, 1.01) ^c	.99 (.94, 1.04) ^d	1.02 (.96, 1.07) ^e	1.04 (.98, 1.09) ^f
Race/ethnicity						
White/Other (Reference)	—	—	—	—	—	—
Black/African American	1.01 (.46, 2.23)	.72 (.26, 2.00)	1.11 (.57, 2.19)	.74 (.33, 1.65)	1.81 (.79, 4.16)	.73 (.31, 1.71)
Latina/Hispanic	.88 (.42, 1.85)	1.00 (.40, 2.52)	1.01 (.54, 1.89)	1.14 (.56, 2.34)	1.27 (.57, 2.84)	1.71 (.77, 3.78)
Log of annual income	.93 (.64, 1.34)	.72 (.43, 1.22)	.93 (.67, 1.29)	1.20 (.83, 1.75)	.85 (.57, 1.26)	.74 (.51, 1.10)
Education	.99 (.89, 1.10)	.99 (.85, 1.16)	1.04 (.94, 1.14)	.98 (.88, 1.10)	1.10 (.96, 1.26)	1.12 (.97, 1.28)
Legal marital status						
Single, never married (Reference)	—	—	—	—	—	—
Divorced or separated	1.19 (.60, 2.36)	1.57 (.62, 3.96)	1.17 (.63, 2.19)	.81 (.40, 1.65)	.71 (.34, 1.51)	.53 (.25, 1.16)
Widowed	1.00 (.39, 2.54)	1.23 (.30, 5.01)	1.15 (.49, 2.68)	1.12 (.43, 2.95)	1.31 (.51, 3.38)	.49 (.13, 1.90)
Married	1.02 (.50, 2.05)	1.33 (.55, 3.22)	.82 (.44, 1.53)	.85 (.42, 1.72)	.66 (.30, 1.43)	.97 (.45, 2.08)
Years in methadone treatment	.99 (.95, 1.03)	.99 (.93, 1.05)	1.00 (.97, 1.05)	.95 (.91, .999)*	1.01 (.96, 1.06)	.96 (.91, 1.00)
At least 1 main partner with HIV risk	.89 (.51, 1.54)	1.40 (.66, 2.96)	1.53 (.93, 2.52)	1.31 (.74, 2.30)	2.34 (1.25, 4.38)**	2.25 (1.20, 4.19)**
Cohabitation with a main partner	2.44 (1.31, 4.56)**	1.65 (.69, 3.94)	1.47 (.86, 2.52)	1.51 (.83, 2.75)	.92 (.49, 1.73)	.68 (.37, 1.26)
Depression	1.47 (.66, 3.25)	1.43 (.56, 3.64)	2.56 (1.30, 5.03)**	2.41 (1.18, 4.91)*	1.89 (.89, 3.99)	1.67 (.77, 3.64)
Posttraumatic stress disorder	1.13 (.56, 2.25)	.80 (.35, 1.83)	1.33 (.74, 2.38)	1.08 (.57, 2.04)	1.08 (.57, 2.06)	1.01 (.52, 1.98)
Drug use	.62 (.34, 1.11)	1.12 (.54, 2.33)	—	—	—	3.96 (1.91, 8.22)***
Alcohol use	2.28 (1.27, 4.08)**	2.08 (1.02, 4.23)*	—	.93 (.53, 1.62)	2.02 (1.09, 3.73)*	—

	Inconsistent Condom Use—Vaginal Sex OR (95% CI)	Inconsistent Condom Use—Anal Sex OR (95% CI)	Any Drug Use with Sexual Activity OR (95% CI)	Heroin Use with Sexual Activity OR (95% CI)	Crack or Cocaine Use with Sexual Activity OR (95% CI)	Four or More Drinks Prior to Sexual Activity OR (95% CI)
HIV-positive status	.22 (.10, .47) ***	1.46 (.54, 3.96)	.69 (.37, 1.28)	.78 (.39, 1.53)	.80 (.38, 1.66)	1.11 (.51, 2.40)
IPV in the past 6 months	5.06 (2.72, 9.40) ***	1.77 (.66, 4.75)	3.12 (1.60, 6.09) ***	2.25 (1.02, 4.94) *	3.37 (1.42, 8.05) **	3.43 (1.37, 8.59) **
Social support	.53 (.29, .96) *	.82 (.38, 1.79)	.85 (.51, 1.42)	.73 (.40, 1.31)	.59 (.31, 1.09)	1.60 (.81, 3.13)
Homeless in past 6 months	1.03 (.40, 2.62)	1.77 (.62, 5.07)	1.87 (.82, 4.23)	1.37 (.58, 3.20)	.99 (.40, 2.44)	1.39 (.57, 3.39)
Incarcerated in past 6 months	1.65 (.51, 5.33)	.27 (.03, 2.42)	8.01 (2.58, 24.80) ***	2.79 (.98, 7.92) *	7.90 (2.64, 23.55) ***	1.14 (.35, 3.73)
Childhood physical abuse	.55 (.30, .996) *	.43 (.19, .998) *	.58 (.34, .996) *	.79 (.44, 1.42)	.76 (.40, 1.46)	1.19 (.64, 2.19)
CSA: Touching/Exposure	.95 (.81, 1.12)	1.00 (.83, 1.22)	1.06 (.92, 1.22)	1.19 (1.01, 1.40) *	1.07 (.88, 1.29)	1.09 (.92, 1.28)
CSA: Penetration	1.24 (.73, 2.11)	1.31 (.80, 2.12)	.92 (.61, 1.39)	.74 (.46, 1.19)	.95 (.58, 1.56)	.92 (.60, 1.40)

*
 p .05**
 p .01.***
 p .001.^a $F(23, 1000.0)=2.68, p=.0000.$ ^b $F(23, 1000.0)=.95, p=.5234.$ ^c $F(21, 1000.0)=2.30, p=.0008.$ ^d $F(22, 1000.0)=1.63, p=.0339.$ ^e $F(22, 1000.0)=2.27, p=.0007$ ^f $F(22, 1000.0)=1.91, p=.0069.$

Table 4

Unadjusted and Adjusted Odds Ratios for Relationships between Childhood Sexual Abuse (CSA) Characteristics and HIV Sexual Risk Behaviors (N=390)

	Inconsistent Condom Use—Vaginal Sex OR (95% CI)	Inconsistent Condom Use—Anal Sex OR (95% CI)	Any Drug Use with Sexual Activity OR (95% CI)	Heroin Use with Sexual Activity OR (95% CI)	Crack or Cocaine Use with Sexual Activity OR (95% CI)	Four or More Drinks Prior to Sexual Activity OR (95% CI)
Unadjusted Model						
No CSA (Reference)	—	—	—	—	—	—
CSA involving someone 5+ years older	2.41 (.89, 6.54)	.67 (.19, 2.40)	1.37 (.64, 2.95)	.99 (.40, 2.44)	1.52 (.63, 3.65)	2.62 (1.12, 6.10)*
CSA involving force	1.36 (.58, 3.21)	1.28 (.38, 4.32)	.58 (.24, 1.45)	.45 (.13, 1.61)	.71 (.23, 2.18)	.38 (.09, 1.72)
CSA involving a relative	1.00 (.47, 2.12)	1.39 (.51, 3.75)	1.63 (.79, 3.37)	1.99 (.89, 4.41)	2.06 (.91, 4.64)	1.53 (.63, 3.74)
CSA involving force and a relative	.92 (.55, 1.54)	1.10 (.52, 2.33)	1.39 (.84, 2.31)	1.48 (.83, 2.65)	1.62 (.87, 3.0)	2.29 (1.23, 4.28)**
Adjusted Model						
Age	.95 (.91, 1.00) ^a	.95 (.89, 1.02) ^b	.97 (.93, 1.01) ^c	.99 (.94, 1.04) ^d	1.02 (.97, 1.07) ^e	1.03 (.98, 1.09) ^f
Race/ethnicity						
White/Other (Reference)	—	—	—	—	—	—
Black/African American	1.03 (.49, 2.16)	.69 (.24, 1.93)	1.25 (.63, 2.48)	.87 (.40, 1.91)	1.99 (.87, 4.57)	.83 (.35, 1.99)
Latina/Hispanic	.90 (.45, 1.80)	.97 (.38, 2.45)	1.09 (.56, 2.10)	1.22 (.60, 2.50)	1.34 (.58, 3.05)	1.85 (.83, 4.14)
Log of annual income	.98 (.68, 1.41)	.75 (.47, 1.19)	.96 (.69, 1.34)	1.23 (.85, 1.79)	.88 (.59, 1.30)	.75 (.51, 1.12)
Education	.99 (.89, 1.11)	.99 (.83, 1.17)	1.03 (.93, 1.14)	.98 (.87, 1.10)	1.10 (.96, 1.27)	1.11 (.96, 1.28)
Legal marital status						
Single, never married (Reference)	—	—	—	—	—	—
Divorced or separated	1.27 (.62, 2.58)	1.47 (.59, 3.65)	1.20 (.64, 2.25)	.80 (.38, 1.65)	.71 (.33, 1.52)	.62 (.28, 1.37)
Widowed	.96 (.37, 2.46)	1.18 (.30, 4.69)	1.11 (.48, 2.58)	.98 (.37, 2.60)	1.25 (.48, 3.28)	.47 (.15, 1.52)
Married	1.07 (.53, 2.15)	1.27 (.53, 3.03)	.76 (.40, 1.43)	.73 (.36, 1.48)	.59 (.27, 1.31)	.91 (.42, 1.96)
Years in methadone treatment	.99 (.95, 1.03)	.99 (.94, 1.05)	1.00 (.96, 1.04)	.95 (.91, .999) [*]	1.01 (.96, 1.05)	.95 (.91, 1.00)
At least 1 main partner with HIV risk	.87 (.49, 1.53)	1.65 (.75, 3.62)	1.66 (1.00, 2.77) [*]	1.53 (.84, 2.77)	2.91 (1.54, 5.51) ^{***}	2.46 (1.29, 4.69) ^{**}
Cohabitation with a main partner	2.24 (1.21, 4.15) ^{**}	1.52 (.68, 3.37)	1.50 (.89, 2.55)	1.66 (.91, 3.02)	.97 (.53, 1.77)	.70 (.38, 1.32)
Depression	1.40 (.63, 3.12)	1.47 (.58, 3.73)	2.65 (1.33, 5.25) ^{**}	2.37 (1.15, 4.85) [*]	1.85 (.86, 3.97)	1.58 (.72, 3.50)
Posttraumatic stress disorder	1.06 (.53, 2.15)	.79 (.35, 1.80)	1.37 (.77, 2.44)	1.16 (.62, 2.15)	1.23 (.64, 2.35)	1.15 (.58, 2.28)

	Inconsistent Condom Use—Vaginal Sex OR (95% CI)	Inconsistent Condom Use—Anal Sex OR (95% CI)	Any Drug Use with Sexual Activity OR (95% CI)	Heroin Use with Sexual Activity OR (95% CI)	Crack or Cocaine Use with Sexual Activity OR (95% CI)	Four or More Drinks Prior to Sexual Activity OR (95% CI)
Drug use	.60 (.33, 1.08)	1.23 (.59, 2.59)	—	—	—	3.38 (1.64, 6.95) ***
Alcohol use	2.35 (1.37, 4.05) **	2.05 (1.01, 4.17) *	—	1.00 (.58, 1.71)	2.05 (1.14, 3.69) *	—
HIV-positive status	.21 (.09, .49) ***	1.41 (.60, 3.33)	.68 (.36, 1.28)	.77 (.37, 1.57)	.73 (.33, 1.62)	1.27 (.58, 2.81)
IPV in the past 6 months	4.88 (2.61, 9.12) ***	1.95 (.73, 5.20)	3.19 (1.63, 6.22) ***	2.25 (1.04, 4.87) *	3.30 (1.38, 7.91) **	4.10 (1.55, 10.82) **
Social support	.48 (.27, .88) *	1.00 (.46, 2.17)	.98 (.58, 1.65)	.83 (.46, 1.50)	.66 (.35, 1.23)	1.67 (.85, 3.27)
Homeless in past 6 months	.92 (.37, 2.30)	1.77 (.61, 5.14)	1.98 (.86, 4.59)	1.32 (.56, 3.13)	.97 (.39, 2.44)	1.25 (.50, 3.10)
Incarcerated in past 6 months	2.01 (.58, 7.00)	.22 (.02, 2.02)	6.45 (1.95, 21.31) **	2.23 (.73, 6.85)	6.09 (1.97, 18.87) **	.96 (.31, 3.00)
Childhood physical abuse	.58 (.31, 1.08)	.47 (.21, 1.04)	.58 (.34, 1.01)	.85 (.46, 1.55)	.82 (.42, 1.61)	1.27 (.67, 2.40)
Childhood sexual abuse	—	—	—	—	—	—
No CSA (Reference)	—	—	—	—	—	—
CSA involving someone 5+ years older	2.73 (.94, 7.97)	.59 (.15, 2.32)	1.24 (.53, 2.90)	1.03 (.39, 2.72)	.92 (.33, 2.55)	2.01 (.78, 5.19)
CSA involving force	1.82 (.61, 5.44)	1.13 (.30, 4.25)	.49 (.18, 1.33)	.39 (.10, 1.49)	.55 (.16, 1.92)	.34 (.07, 1.65)
CSA involving a relative	1.06 (.42, 2.67)	1.55 (.52, 4.65)	1.78 (.78, 4.03)	2.31 (.95, 5.65)	1.74 (.67, 4.53)	1.41 (.50, 3.93)
CSA involving force and a relative	1.00 (.47, 2.12)	.98 (.39, 2.45)	1.25 (.66, 2.37)	1.32 (.65, 2.67)	1.07 (.45, 2.55)	1.59 (.74, 3.44)

* p .05** p .01.*** p .001.^a F (25, 1000.0)=2.60, p =.0000.^b F (25, 1000.0)=.91, p =.5985.^c F (23, 1000.0)=2.21, p =.0009.^d F (24, 1000.0)=1.50, p =.0577.^e F (24, 1000.0)=2.13, p =.0013.^f F (24, 1000.0)=2.04, p =.0022.