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Predictors of HIV-Risk Sexual Behavior: Examining Lifetime Sexual and Physical Abuse Histories in Relation to Substance Use and Psychiatric Problem Severity Among Ex-Offenders

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Abstract

Predictors of HIV-risk sexual behavior were analyzed among a sample of ex-offenders who were completing inpatient treatment for substance dependence. Hierarchical linear regression was conducted to examine increases in participants' number of sexual partners in relation to sociodemographic characteristics, recent substance use and current psychiatric problem severity in addition to lifetime histories of sexual and physical abuse. Gender, substance use, and psychiatric problem severity predicted increases in HIV-risk sexual behaviors beyond what was predicted by abuse histories. Proportionately more women than men reported abuse histories. In addition, significantly more unprotected sexual than safer sexual practices were observed, but differences in the frequency of these practices based on lifetime abuse histories and gender were not significant. Findings suggest recent substance use and current psychiatric problem severity are risk-factors for HIV-risk sexual behavior among ex-offenders with and without lifetime abuse histories.

Keywords

HIV-risk sexual behavior; sexual abuse; physical abuse; substance use; psychiatric problem severity; ex-offenders

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The relationship between sexual and physical abuse histories, and subsequent HIV-risk sexual behavior, has been observed across many studies. For example, sexual and physical abuse histories have been related to increases in HIV-risk sexual behavior within the general population (Bensley, Van Eenwyk, & Simmons, 2000), among substance dependent persons who received methadone maintenance treatment (Kang, Deren, & Goldstein, 2002), ethnic minority adolescent young women (Champion & Collins, 2012) and adolescent young men (Jones, Runyan, Lewis, Litrownik, Black, Wiley, English, et al., 2010), persons with severe mental illness and substance use (Devieux, Malow, Lerner, Dyer, Baptista, Lucenko et al., 2007), male repeated felony drug offenders entering criminal justice settings (Belenko, Lin, O'Connor, Sung, & Lynch, 2005), and homeless/unstably housed adults living with HIV (Henny, Kidder, Stall, & Wolitski, 2007). Children with documented cases of physical and sexual abuse (and neglect) histories were found to engage HIV-risk sexual behavior 30 years later at nearly three times the rate of matched controls in one longitudinal study (Wilson & Widom, 2011).

Although the relationship between sexual/physical abuse and HIV-risk sexual behavior is consistent across populations, substance use is another factor related to such risk. Substance use might be an expression of sensation-seeking resulting from childhood abuse (Bornovalova, Gwadz, Kahler, Aklin, & Lejuez, 2008), and serve as an ineffective coping mechanism for abuse experiences (Clum, Andrinopoulos, Muessig, & Ellen, 2009) that may lead to dependence in addition to HIV-risk sexual behavior. For instance, adults with sexual abuse histories were found to be at greater risk for developing substance use disorders (Meade, Kershaw, Hansen, & Sikkema, 2009), whereas those who reported childhood physical abuse were more likely to have alcohol abuse problems (Henny et al., 2007) and be at greater risk for heavy drinking (Bensley et al., 2000).

Nonetheless, other investigations have examined substance use as a predictor of HIV-risk sexual behavior. Alcohol use among women injection drug users in detoxification treatment (Ress, Saitz, Horton, & Samet, 2001) and the use of substances while engaging in sexual activities among patients with severe co-occurring conditions (Devieux et al., 2007) were found to predict HIV-risk sexual behavior, whereas some evidence suggests sexual behavior varies among intravenous substance dependent persons in relation to their drug use, demographic characteristics, and treatment services (Mark, Nanda, Davis-Vogel, Navaline, Scotti, Wickrema, et al., 2006). In short, HIV-risk sexual behavior is influenced by factors associated with substance use, but few investigations have simultaneously examined abuse histories and recent substance use as independent predictors of HIV-risk sexual behavior.

In addition, some investigations have examined psychiatric factors in relation to HIV-risk sexual behavior among those with sexual and physical abuse histories. Kang et al. (2002) found adults who reported a history of sexual or physical abuse, compared to those who did not report such histories, had significantly higher levels of psychiatric problem severity. Emotional abuse was found to moderate the relationship between sexual abuse and HIV-risk sexual behavior among adolescents (Jones et al., 2010), suggesting that psychopathological traits might increase HIV-risk behavior among abuse survivors. Other psychiatric factors found to predict HIV-risk sexual behavior among those with abuse histories include unstable intimate relationship patterns but not the (lifetime) prevalence of affective symptoms

(Wilson & Widom, 2011), and depressive and posttraumatic stress disorder symptoms found in samples comprised of injection drug dependent women (Plotzker, Metzger, & Holmes, 2007) and men living in areas with high incidences of reported HIV-seroconversion (Holmes, Foa, & Sammel, 2005). However, the influence of psychiatric factors upon HIV-risk sexual behavior is not clear because the scope of psychiatric symptoms has been limited in terms of symptom types (Holmes et al., 2005; Plotzker et al., 2007) in addition to lifetime (but not current) prevalence rates (Wilson & Widom).

Taken together, findings across studies suggest that persons with sexual and physical abuse histories are at risk for engaging in HIV-risk sexual behaviors, and that they might have substance use and psychiatric problems that also increase such risk. There is a need to examine whether rates of recent substance use and current psychiatric problem severity predict increased HIV-risk sexual behavior beyond what might be expected from sexual and physical abuse histories. Understanding the predictive values of substance use and psychiatric problem severity (simultaneously with sexual and physical abuse histories) in relation to HIV-risk sexual behavior would have important treatment and research implications. The present study examined recent substance use and current psychiatric problem severity, together with sexual and physical abuse histories, in relation to HIV-risk sexual behavior among a sample of ex-offenders receiving inpatient treatment for substance dependence. We hypothesized that both sexual and physical abuse histories would significantly predict HIV-risk sexual behavior, and that recent substance use and current psychiatric problem severity would predict HIV-risk sexual behavior beyond these predictors.

Methods

Participants

Two hundred, seventy adults (224 men and 46 women) with a mean age of 40.4 ($SD = 9.5$) years were recruited from inpatient treatment centers in northern Illinois, in the United States. The largest proportion of participants were single (85%), and in terms of race, the majority (74.1%) of participants were Black/African-American, 21.1% were White/Anglo-American, 3.3% were Latino/a-American, and 1.5% reported other racial groupings.

Most participants reported having been unemployed (32.7%), in a controlled environment (27.7%), or employed either part-time (25.4%) or full-time (11.2%) in the past three years. Participants reported an average total monthly income of \$367.85 ($SD = 709.66$) with an average of 10.9 ($SD = 1.9$) years of education. Participants reported an average of 6.3 ($SD = 13.7$) prior convictions, an average of 9.9 ($SD = 17.4$) incarcerations, with a lifetime average rate of 77.2 ($SD = 79.2$) months incarcerated. In terms of substances of choice, the majority (41.4%) reported a history of using heroin/opiates, followed by cocaine (27.8%), alcohol (12.8%), polysubstance use (11.3%), and cannabis (6.4%). The prevalence rates of reported lifetime sexual and physical abuse were 8.1% and 11.7%, respectively.

Procedures

The present investigation was proposed to and approved by an institutional review board. The majority of participants ($n = 265$) were recruited from inpatient drug and alcohol addiction treatment facilities in Chicago, Illinois, and the surrounding suburbs over a three year period from March 2008– May 2011, whereas five participants responded to fliers that were disseminated in these areas. Inclusion criteria consisted of being 18 years or older, previously incarcerated, and released from prison/jail within the past 24 months. All participants were engaged in a process of informed consent, completed interviews prior to or on day of completing their inpatient treatment program, and received \$40 for their involvement.

Measures

Demographics—We created a brief survey to collect sociodemographic characteristics. In addition, this brief survey solicited participants' information regarding their incarceration histories and previous treatments for substance dependence.

Abuse histories and psychiatric problem severity—We administered the *Addiction Severity Index-Lite* (ASI; McLellan, Kusher, Metzger, Peters, Smith, Grissom, et al., 1992), a widely used instrument in addiction research that assesses current problem severity in the areas of alcohol and drug use; medical problems, employment, illegal activity, family/social relations, and psychiatric problems in the past 30 days. Lifetime history of physical and sexual abuse was measured using the ASI items that asked whether participants had ever been physically or sexually abused by others, with dichotomous (yes/no) responses to these items. Assessing lifetime sexual and physical abuse history has been conducted in previous investigations (Devieux et al., 2007), including those that used these ASI questions in samples consisting of substance dependence treatment patients (Morrill et al., 2001) and offenders (Belenko et al., 2005).

Psychiatric problem severity was assessed using the Psychiatric Severity Index (PSI), an ASI subscale index that is calculated by a weighted formula that includes questions regarding a range of current psychiatric symptoms and problems (McLellan et al., 1992). Scores range from .00 to 1.00., with higher scores representing greater psychiatric problem severity. The PSI is a widely used reliable and valid global estimate of the severity of psychopathology without regard to particular type (McLellan, Luborsky, Woody, O'Brien, & Druley, 1983), with good internal consistency ($> .70$; McLellan et al.), and is one of the few ASI indices to demonstrate high internal consistency across studies (Makela, 2004).

Risk Behavior Survey (RBS)—The *Risk Behavior Survey* (RBS; NIDA, 1993), a measure derived from the Risk Behavior Assessment (NIDA, 1991), was used to collect information regarding HIV-risk sexual behavior. The RBS consists of two sets of questions regarding drug and sexual behaviors in the past 30 days. Due to the sensitivity of questions, participants were given the choice to self-administer the set of sexual behavior questions of the RBS. Although there is no critical cut-off score determined for significant HIV-risk behavior, endorsement of any RBS item may indicate unacceptable risk, with higher values (e.g., number of partners, frequency of behaviors) indicating greater risk. The RBS has been

used to measure the frequency of unprotected sexual behaviors (Hien, Campbell, Killeen, Hu, Hansen, Jiang, et al., 2010) in addition to the number of sexual partners (Meade, Weiss, Fitzmaurice, Poole, Subramaniam, Patkar, et al., 2010) in the past 30 days in assessing HIV-risk sexual behavior. We examined the frequency of protected and unprotected sexual practices among our sample, and used participants' reported number of sexual partners in the past 30 days as a measure of HIV-risk sexual behavior, consistent with other studies among various populations (Holmes et al., 2005; Kang et al., 2002; Mark et al., 2006; Meade et al., 2009; Richter, Komarek, Desmond, Celentano, Morin, Sweat, et al., 2013) including offenders (Belenko et al., 2005; Knittel, Snow, Griffith, & Morenoff, 2013).

Substance use—We administered Miller's (1996) *Form-90* to collect a continuous record of alcohol and drug use over a 6 month interval. The Form-90 provides a retrospective time frame for assessment and has excellent test-retest reliability (Miller & DelBoca, 1994).

Data Analysis

A hierarchical linear regression was used to test for the influence of predictors on levels of the outcome variable (HIV-risk sexual behavior), entering predictors sequentially in three steps. Sociodemographic variables (age, gender, and race) were first entered to control for their variance in HIV-risk sexual behavior. Sexual and physical abuse histories were included in the second step, and both substance use and psychiatric problem severity index (PSI) values were included in the third step. We constructed two separate hierarchical regression models that independently examined sexual and physical abuse histories in the second step of each model to control for multicollinearity between these predictor variables that were positively and significantly correlated ($r = .66$) in order to provide a more conservative estimation of coefficients.

Statistical methods—Descriptive analyses were conducted to provide sociodemographic characteristics of the sample in addition to describing rates of sexual and physical abuse histories, substance use, psychiatric problem severity, and HIV-risk sexual behaviors. Chi-square tests were conducted to examine proportional differences among participants based on categorical sociodemographic data in relation to abuse histories. A paired sample *t*-test was conducted to examine mean differences in the frequencies of safer versus unprotected sexual practices in the past 30 days, and a two-way (history of abuse, gender) multiple analysis of variance (MANOVA) was employed to examine differences in the frequencies of these (safer, unprotected) sexual behaviors.

Missing data—A listwise deletion approach was used to evaluate data and calculate analyses, and participants with missing data (17% of all available cases) were excluded from analyses. We utilized a listwise approach instead of imputing values that would have increased the risk of artificially reducing variance given the large proportion of missing cases, as the use of true scores are ideal for multiple regression models. A missing values analysis of all the predictor and dependent variables indicated that the data were missing completely at random, Little's MCAR test; $\chi^2(13) = 14.14, p = .364$, thus our listwise deletion approach to treating missing cases was a valid technique for producing relatively unbiased estimates of regression coefficients (Allison, 2009).

Results

Preliminary Analyses

Lifetime histories of sexual ($n = 22$) and physical ($n = 31$) abuse, and history of either sexual or physical abuse ($n = 35$) was observed. Proportionately more women than men reported histories of sexual abuse [30% vs. 3%, $\chi^2(1) = 44.84, p < .001$] and physical abuse [30% vs. 7%, $\chi^2(1) = 24.56, p < .001$]. There were no significant differences in the proportion of reported sexual or physical abuse histories based on racial grouping. Most participants ($n = 249$) reported an average of .62 ($SD = 1.3$) sexual partners in the past 30 days (ranging from 0–14). In terms of substance use in the past six months, participants ($n = 267$) reported an average number of days using alcohol 20.0 ($SD = 40.7$) and drugs 44.7 ($SD = 57.4$) for a combined alcohol/drug use average of 33.33 days ($SD = 41.21$); ranging from 0–180. Psychiatric problem severity index (PSI) scores were reported by most participants ($n = 248$), with an average PSI score of .14 ($SD = .17$), ranging from .00–.89.

HIV-Risk Sexual Behaviors

Participants' frequencies of engaging in a number of sexual behaviors in the past 30 days, and the frequencies of engaging in safer sexual practices by utilizing barriers such as dental dams and condoms (i.e., "with protection") in these behaviors, are presented in Table 1. Differences between the frequencies of safer sexual practices and unprotected sexual practices were examined. To do this, we first added the frequencies across 1) safer sexual practices and, 2) all reported sexual behaviors to create respective cumulative frequencies. We then subtracted the cumulative frequency of safer sexual practices from the cumulative frequency of all reported sexual practices to derive a cumulative frequency of unprotected sexual practices; and then compared the cumulative frequency of unprotected sexual practices to the cumulative frequency of safer sexual practices using a paired-samples *t*-test (two-tailed). As a result, we observed a significantly higher cumulative frequency in unprotected sexual practices ($M = 3.26, SD = 10.03$) than safer sexual practices [$(M = 1.41, SD = 5.71), t(257) = -2.64, p = .009, (CI -3.22, -.467)$].

We also examined whether differences in the cumulative frequencies of both safer and unprotected sexual practices were related to two factors: gender, and whether participants reported a history of either sexual or physical abuse (vs. none). A two-way MANCOVA was conducted to examine differences in the frequencies of safer and unprotected sexual practices in relation to these two factors, and the results were not significant for gender, Wilks' $\Lambda = 1.00, F(2, 251) = 0.27, p = .973, \eta_p^2 = .000$, history of sexual or physical abuse, Wilks' $\Lambda = .99, F(2, 251) = 1.18, p = .310, \eta_p^2 = .009$, or the interaction term of these main factors, Wilks' $\Lambda = 1.00, F(2, 251) = 0.48, p = .620, \eta_p^2 = .004$.

Major Analyses

Results of the first hierarchical regression model are presented in Table 2. Gender (coded men = 0, women = 1) was the only sociodemographic variable in the first step that significantly predicted increased levels of HIV-risk sexual behavior by 3.4%. The inclusion of sexual abuse history in the second step contributed significantly to predicting risk, with steps 1 and 2 together accounting for 5% of the variance. The inclusion of substance use and

psychiatric problem severity index (PSI) scores in the third step significantly contributed to predicting HIV-risk sexual behavior by accounting for an additional 8.5% of the variance.

A second hierarchical regression model was employed to control for multicollinearity between sexual and physical abuse history variables that were positively and significantly correlated. Results of the second hierarchical regression model, using physical abuse in step 2, were statistically similar to the first regression model. The inclusion of physical abuse history in the second step contributed significantly to predicting levels of HIV-risk behavior, with steps 1 and 2 accounting for 5.6% of the variance. The inclusion of substance use and PSI scores in the third step significantly contributed to predicting HIV-risk sexual behavior by accounting for an additional 8.8% of the variance in this second model. We also employed a third regression model, using a combined term (consisting of no abuse history vs. either sexual or physical abuse history, coded as 0, 1, respectively) for abuse history in the second step, and the results of this model were statistically similar in that gender ($\beta = .138, t = 2.06, p = .040$), either sexual or physical abuse history ($\beta = .170, t = 2.27, p = .024$), substance use ($\beta = .252, t = 4.01, p < .000$), and PSI scores ($\beta = .163, t = 2.51, p = .013$) predicted a greater level of HIV-risk sexual behaviors.

Discussion

The significant relationships between sexual/abuse histories and HIV-risk sexual behavior suggest lifetime abuse histories pose health risks among ex-offenders, consistent with previous clinical research involving other populations with substance use issues (Devieux et al., 2007; Meade et al., 2009; Kang et al., 2002). Findings in the present study are also consistent with previous research that found marginally significant relationships between abuse and HIV-risk sexual behaviors among offenders with lifetime abuse histories entering incarcerated settings (Belenko et al., 2005), suggesting other factors such as incarceration experiences increase HIV-risk sexual behaviors (Knittel et al., 2013). Although incarceration experiences were not assessed in the present study, our use of hierarchical regression analyses enabled us to control for a number of other relevant variables, and how they incrementally predicted increases in HIV-risk sexual behavior.

Substance use predicted HIV-risk sexual behavior, consistent with previous investigations in samples with substance use issues (Mark et al., 2006; Meade, Graff, Griffin, & Weiss, 2008; Rees et al., 2001). This finding extends previous studies that either did not examine substance use as a predictor (Holmes et al., 2005) or examined only lifetime histories of substance abuse problems (Meade et al., 2009) when investigating the relationship between previous (childhood) sexual abuse and HIV-risk sexual behavior. In addition, this finding adds to previous HIV-risk sexual behavior research among offenders that did not examine recent substance use (Ames, Grenard, & Stacy, 2013; Belenko et al., 2005; Knittel et al., 2013), and it is consistent with one study involving recently released women offenders (Scott & Dennis, 2012) where abstinence was related to decreased HIV-risk sexual behavior. The additional variance in HIV-risk sexual behavior explained by substance use in the present study underscores the importance of examining recent substance use as an independent factor when examining HIV-risk sexual behavior in relation to sexual/physical abuse histories.

The significant increase in HIV-risk sexual behavior in relation to psychiatric problem severity is consistent with findings from one study (Kang et al., 2002) that found high rates of psychiatric problem severity among substance dependent persons with histories of childhood sexual and physical abuse. However, the significant predictive value of psychiatric problem severity in the present study adds to our understanding of psychiatric factors associated with HIV-risk sexual behavior among persons with abuse histories in that we used a global measure of psychopathology that assessed a broader range of psychiatric symptoms without regard to particular type or diagnostic category (McLellan et al., 1983; McLellan et al., 1992).

A number of previous investigations have measured specific psychiatric symptoms (Holmes et al., 2005; Plotzker et al., 2007), or limited the use of diagnostic categories in terms of type and lifetime prevalence (McKinnon, Cournos, & Hermann, 2001; Meade et al., 2009; Wilson & Widom, 2011) in investigations involving persons with sexual/physical abuse histories; with exception to Meade et al. (2008) who found low levels of psychiatric problem severity were found to predict HIV-risk behavior in a sample of substance dependent persons with co-occurring bipolar disorder. Although some psychiatric symptoms and diagnostic categories in relation to substance use and HIV-risk sexual behaviors have been used in examining HIV-risk pathways (Meade et al., 2008; Plotzker et al.; Wilson & Widom), findings in the present study suggest that a global measure of psychopathology such as the PSI could offer greater ecological validity in understanding the role of psychiatric conditions in relation to the sexual/physical abuse pathway to HIV-risk sexual behavior across populations. Findings in the present study suggest clinicians and researchers should consider other current psychiatric symptoms moreover PTSD, depressive, and anxiety symptoms reported in non-offender samples (Devieux et al., 2007; Henny et al., 2007; Holmes et al., 2005; Pilowsky, Wu, Burchett, Blazer, & Ling, 2011; Plotzker et al.) and offender samples (Belenko et al., 2005; Scott & Dennis, 2012) in addition to personality symptoms (Scott & Dennis) when assessing HIV-risk sexual behaviors.

Gender was found to be a significant predictor of increased HIV-risk behavior, with greater increases in HIV-risk sexual behavior found among women. In addition, proportionately more women than men reported lifetime sexual and physical abuse histories, a finding that is consistent across various samples (Bensley et al., 2000; Henny et al., 2007; Kang et al., 2002; Morrill et al., 2001; Whetton, Leserman, Lowe, Stangl, Thielman, Swartz, et al., 2006). Taken together, findings in the present study suggest women exiting criminal justice systems are at higher risk than men; especially when they have abuse histories, are using substances, and have high levels of psychiatric problem severity.

Furthermore, we observed significantly more unprotected sexual practices than safer sexual practices in our sample of ex-offenders, consistent with other investigations that found unprotected sexual practices with this population (Alemagno, Stephens, Stephens, Shaffer-King, & White, 2009; Leukefeld, Havens, Staton-Tindall, Oser, Mooney, Hall et al., 2012). We did not find any significant difference in the frequencies of sexual practices (both unprotected and safer types) in relation to gender or abuse histories, consistent with one study (Meade et al., 2010) that found no gender differences in unprotected practices among a sample of post-treatment, opioid dependent persons. Some research involving women

offenders found positive (parental) social support (Staton-Tindall, Frisman, Lin, Leukefeld, Oser, Havens, et al., 2011) and monthly recovery checkups (Scott & Dennis, 2012) related to decreased HIV-risk behavior, and it is possible that the lack of significant gender differences in terms of the frequency of sexual practices in the present study could have been attributed to protective factors that were not assessed.

Although the relationship between lifetime histories of sexual/physical abuse and HIV-risk sexual behaviors might be better understood when accounting for relevant factors such as recent substance use, psychiatric problem severity, and sociodemographic characteristics, there are some limitations in the present study. For instance, the severity, onset, and duration of sexual and physical abuse, if ascertained, would have provided richer information regarding abuse histories. Likewise, the number of participants' recent sexual partners is only one way to measure HIV-risk sexual behavior when other measures including lifetime number of partners, engaging in sex work, and whether participants' sexual partners are high risk (e.g., injection drug users, sex workers) might also indicate such risk. Examining protective factors related to reduced HIV-risk sexual behavior would have provided more insights in understanding the relationship between abuse histories and HIV-risk sexual behavior. Finally, the use of self-reported data at one time-point is another limitation of the present study, as repeated measures might have provided more information in relation to changes in HIV-risk sexual behavior over time.

The present study examined predictors of HIV-risk sexual behavior that have been examined in previous investigations involving persons with abuse histories, substance dependence, and ex-offenders. Our investigation is innovative in that it examined recent substance use and current psychiatric problem severity and found these to predict increases in HIV-risk sexual behavior beyond what was predicted by abuse histories. In addition, the present investigation involved both men and women with considerable incarceration experiences who engaged in significantly more unprotected sexual practices than safer sexual practices, adding to the growing body of literature on ex-offenders. Overall, findings in the present investigation suggest that both recent substance use and current psychiatric problem severity should be considered when assessing HIV-risk in relation to lifetime sexual and physical abuse histories.

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References

- Alemagno SA, Stephens RC, Stephens P, Shaffer-King P, White P. Brief motivational intervention to reduce HIV risk and to increase HIV testing among offenders under community supervision. *Journal of Correctional Health Care*. 2009; 15:210–221.10.1177/1078345809333398 [PubMed: 19477803]
- Allison, Paul D. Missing data. In: Millsap, RE.; Maydeu-Olivares, A., editors. *The SAGE Handbook of Quantitative Methods in Psychology*. Thousand Oaks, CA: Sage Publications Inc; 2009. p. 72-89.

- Ames SL, Grenard JL, Stacy AW. Dual process interaction model of HIV-risk behaviors among drug offenders. *AIDS and Behavior*. 2013; 17:914–925.10.1007/s10461-012-0140-2 [PubMed: 22331391]
- Belenko S, Lin J, O'Connor L, Sung HE, Lynch KG. Sexual and physical victimization as predictors of HIV risk among felony drug offenders. *AIDS and Behavior*. 2005; 9:311–323.10.1007/s10461-005-9005-2 [PubMed: 16133904]
- Bensley LS, Van Eenwyk J, Simmons KW. Self-reported childhood sexual and physical abuse and adult HIV-risk behaviors and heavy drinking. *American Journal of Preventive Medicine*. 2000; 18:151–158. [PubMed: 10698246]
- Bornoalova MA, Gwadz MA, Kahler C, Aklin WM, Lejuez CW. Sensation seeking and risk-taking propensity as mediators in the relationship between childhood abuse and HIV-related risk behavior. *Child Abuse & Neglect*. 2008; 32:99–109.10.1016/j.chiabu.2007.04.009 [PubMed: 18155295]
- Champion JD, Collins JL. Comparison of a theory-based (AIDS risk reduction model) cognitive behavioral intervention versus enhanced counseling for abused ethnic minority adolescent women on infection with sexually transmitted infection: results of a randomized controlled trial. *International Journal of Nursing Studies*. 2012; 49:138–150.10.1016/j.ijnurstu.2011.08.010 [PubMed: 21937041]
- Clum GA, Andrinopoulos K, Muessig K, Ellen JM. Child abuse in young, HIV- positive women: linkages to risk. *Qualitative Health Research*. 2009; 19:1755–1768.10.1177/1049732309353418 [PubMed: 19949224]
- Devieux JG, Malow R, Lerner BG, Dyer JG, Baptista L, Lucenko B, Kalichman SC. Triple jeopardy for HIV: substance using severely mentally ill adults. *Journal of Prevention & Intervention in the Community*. 2007; 33:5–18.10.1300/J005v33n01_02 [PubMed: 17298927]
- Henny KD, Kidder DP, Stall R, Wolitski RJ. Physical and sexual abuse among homeless and unstably housed adults living with HIV: prevalence and associated risks. *AIDS and Behavior*. 2007; 11:842–853.10.1007/s10461-007-9251-6 [PubMed: 17577656]
- Hien DA, Campbell AN, Killeen T, Hu MC, Hansen C, Jiang H, et al. The impact of trauma-focused group therapy upon HIV sexual risk behaviors in the NIDA Clinical Trials Network “Women and Trauma” multi-site study. *AIDS and Behavior*. 2010; 14:421–430.10.1007/s10461-009-9573-7 [PubMed: 19452271]
- Holmes WC, Foa EB, Sammel MD. Men’s pathways to risky sexual behavior: role of co-occurring childhood sexual abuse, posttraumatic stress disorder, and depression histories. *Journal of Urban Health: Bulletin of the New York Academy of Medicine*. 2005; 82(Supplement 1):89–99.10.1093/jurban/jti028
- Jones DJ, Runyan DK, Lewis T, Litrownik AJ, Black MM, Wiley T, English DE, et al. Trajectories of childhood sexual abuse and early adolescent HIV/AIDS risk behaviors: the role of other maltreatment, witnessed violence, and child gender. *Journal of Clinical Child & Adolescent Psychology*. 2010; 39:667–680.10.1080/15374416.2010.501286 [PubMed: 20706919]
- Kang SY, Deren S, Goldstein MF. Relationships between childhood abuse and neglect experience and HIV risk behaviors among methadone treatment drop-outs. *Child Abuse & Neglect*. 2002; 26:1275–1289. [PubMed: 12464301]
- Knittel AK, Snow RC, Griffith DM, Morenoff J. Incarceration and sexual risk: examining the relationship between men’s involvement in the criminal justice system and risky behavior. *AIDS and Behavior*. 2013 published online Feb. 8, 2013. 10.1007/s10461-013-0421-4.
- Leukefeld C, Havens J, Staton-Tindall M, Oser CB, Mooney J, Hall MT, Knudsen HK. Risky relationships: targeting HIV prevention for women offenders. *AIDS Education and Prevention*. 2012; 24:339–349.10.1080/02791072.2008.10400653 [PubMed: 22827903]
- Makela K. Studies of the reliability and validity of the Addiction Severity Index. *Addiction*. 2004; 99:398–410. [PubMed: 15049734]
- Mark HD, Nanda J, Davis-Vogel A, Navaline H, Scotti R, Wickrema R, et al. Profiles of self-reported HIV-risk behaviors among injection drug users in methadone maintenance treatment, detoxification, and needle exchange programs. *Public Health Nursing*. 2006; 23:11–19. [PubMed: 16460416]

- McKinnon K, Cournos F, Hermann R. A lifetime alcohol or other drug use disorder and specific psychiatric symptoms predict sexual risk for HIV infection among people with severe mental illness. *Aids and Behavior*. 2001; 5:233–240.
- McLellan AT, Kushner H, Metzger D, Peters R, Smith I, Grissom G, et al. The fifth edition of the Addiction Severity Index. *Journal of Substance Abuse Treatment*. 1992; 9:199–213. [PubMed: 1334156]
- McLellan AT, Luborsky L, Woody GE, O'Brien CP, Druley KA. Predicting response to alcohol and drug abuse treatments. *Archives of General Psychiatry*. 1983; 40:620–625. [PubMed: 6847331]
- Meade CS, Weiss RD, Fitzmaurice GM, Poole SA, Subramaniam GA, Patkar AA, et al. HIV risk behavior in treatment-seeking opioid-dependent youth: results from a NIDA Clinical Trials Network multi-site study. *Journal of Acquired Immune Deficiency Syndromes*. 2010; 55:65–72.10.1097/QAI.0b013e3181d916db [PubMed: 20393347]
- Meade CS, Kershaw TS, Hansen NB, Sikkema KJ. Long-term correlates of childhood abuse among adults with severe mental illness: adult victimization, substance abuse, and HIV sexual risk behavior. *AIDS and Behavior*. 2009; 13:207–216.10.1007/s10461-007-9326-4 [PubMed: 17968646]
- Meade CS, Graff FS, Griffin ML, Weiss R. HIV risk behavior among patients with co-occurring bipolar and substance use disorders: associations with mania and drug abuse. *Drug and Alcohol Dependence*. 2008; 92:296–300.10.1016/j.drugalcdep.2007.07.013 [PubMed: 17850993]
- Miller, WR. Project MATCH Monograph Series. Vol. 5. Rockville, MD: National Institute of Alcohol Abuse and Alcoholism; 1996. Manual for Form-90: A structured assessment interview for drinking and related behaviors.
- Miller WR, Del Boca FK. Measurement of drinking behavior using the Form-90 family of instruments. *Journal of Studies on Alcohol*. 1994; 12(Suppl):112–118.
- Morrill AC, Kasten L, Urato M, Larson MJ. Abuse, addiction, and depression as pathways to sexual risk in women and men with a history of substance abuse. *Journal of Substance Abuse Treatment*. 2001; 13:169–184.
- Myers HF, Wyatt GE, Loeb TB, Carmona JV, Wards U, Longshore D, et al. Severity of child sexual abuse, post-traumatic stress, and risky sexual behaviors among HIV-positive women. *AIDS and Behavior*. 2006; 10:191–199.10.1007/s10461-005-9054-6 [PubMed: 16479413]
- NIDA. Risk Behavior Survey. Rockville, MD: National Institute on Drug Abuse, Community Research Branch; 1993.
- NIDA. Risk behavior assessment. Rockville, MD: National Institute on Drug Abuse; 1991.
- Pilowsky DJ, Wu L-T, Burchett B, Blazer DG, Ling W. Depressive symptoms, substance use, and HIV-related high-risk behaviors among opioid-dependent individuals: results from the clinical trials network. *Substance Use & Misuse*. 2011; 46:1716–1725.10.3109/10826084.2011.611960 [PubMed: 21973307]
- Plotzker RE, Metzger DS, Holmes WC. Childhood sexual and physical abuse histories, PTSD, depression, and HIV risk outcomes in women injection drug users: a potential mediating pathway. *The American Journal on Addictions*. 2007; 16:431–438.10.1080/10550490701643161 [PubMed: 18058406]
- Rees V, Saitz R, Horton NJ, Samet J. Association of alcohol consumption with HIV sex- and drug-risk behaviors among drug users. *Journal of Substance Abuse Treatment*. 2001; 21:129–134. [PubMed: 11728786]
- Richter L, Komarek A, Desmond C, Celentano D, Morin S, Sweat M, et al. Reported physical and sexual abuse in childhood and adult HIV risk behavior in three African countries: findings from Project Accept (HPTN-043). *AIDS and Behavior*. 2013 online. 10.1007/s10461-013-0439-7
- Scott CK, Dennis ML. The first 90 days following release from jail: findings from the Recovery Management Checkups for Women Offenders (RMCWO) experiment. *Drug and Alcohol Dependence*. 2012; 125:110–118.10.1016/j.drugalcdep.2012.03.025 [PubMed: 22542465]
- Staton-Tindall M, Frisman L, Lin H-J, Leukefeld C, Oser C, Havens JR, et al. Relationship influence and health risk behavior among re-entering women offenders. *Women's Health Issues*. 2011; 21:230–238.10.1016/j.whi.2010.10.006 [PubMed: 21315617]

- Whetten K, Leserman J, Lowe K, Stangl D, Thielman N, Swartz M, et al. Prevalence of childhood sexual abuse and physical trauma in an HIV-positive sample from the deep south. *American Journal of Public Health*. 2006; 96:1028–1030. [PubMed: 16670226]
- Wilson HW, Widom CS. Pathways from childhood abuse and neglect to HIV-risk sexual behavior in middle adulthood. *Journal of Consulting and Clinical Psychology*. 2011; 79:236–246.10.1037/a0022915 [PubMed: 21355638]

Table 1

Frequencies of Sexual Behaviors in the Past 30 Days

	Men (n = 218)	Women (n = 42)
Receiving oral sex from women	1.34 (3.47)	.44 (1.39)
with protection	.44 (2.03)	.00 (.00)
Providing women oral sex	1.23 (4.12)	.49 (1.78)
with protection	.24 (1.56)	.21 (1.23)
Receiving oral sex from men	.00 (.07)	1.48 (4.96)
with protection	.00 (.00)	.33 (1.20)
Providing men oral sex	.00 (.00)	1.29 (4.82)
with protection	.00 (.00)	.36 (1.23)
Penetrative vaginal sex	1.95 (6.18)	1.57 (3.34)
with protection	.64 (2.56)	.62 (1.67)
Providing women penetrative anal sex	.16 (.88)	- -
with protection	.08 (.74)	- -
Providing men penetrative anal sex	.00 (.00)	- -
with protection	.00 (.00)	- -
Receiving penetrative anal sex from men	.01 (.14)	.00 (.00)
with protection	.00 (.00)	.00 (.00)

Note. Means and (standard deviations), - - the RBS does not ask women these questions.

Table 2

Hierarchical Regression Analyses for Variables Predicting HIV-Risk Sexual Behavior

Predictor	R ²	B	SE B	β
Step 1	.034 [*]			
Age		-.015	.010	-.107
Gender		.522	.256	.136 [*]
Race		.049	.085	.038
Step 2	.016 [*]			
Sexual Abuse		.728	.376	.147 [*]
Step 2 ^a	.019 [*]			
Physical Abuse		.634	.301	.150 [*]
Step 3	.085 ^{***}			
Substance Use		.008	.002	.247 ^{***}
Psychiatric Severity Index		1.335	.519	.168 ^{**}
Total R ²	.219, .237 ^a			
n	225, 224 ^a			

Note.

^aSecond model.^{*}p < .05,^{**}p < .01,^{***}p < .001.