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Child Sexual Abuse and HIV-Related Substance Use and Sexual Risk Across the Life Course Among Males and Females

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Abstract

Child sexual abuse is associated with substance use and sexual risk behaviors during adolescence and adulthood, but no known studies have documented associations across the life course in a nationally representative U.S. sample. We used the National Longitudinal Study of Adolescent to Adult Health to measure associations between child sexual abuse and substance use and sexual risk behaviors during adolescence, young adulthood, and adulthood among males and females ($n = 11,820$). Approximately 10% of females and 7% of males reported child sexual abuse. Associations with substance use were strongest during adolescence and lessened over time. Increased odds of sexual risk among those with a history of child sexual abuse remained consistent through the life course. Significant gender differences existed for some associations (e.g., adulthood multiple partners: males adjusted odds ratio (AOR) = 1.73, 95%CI:1.18, 2.53; females AOR = 1.11, 95%CI:0.79, 1.56). Trauma-informed prevention interventions should address child sexual abuse among both males and females to prevent substance use and sexual risk behavior throughout the life course.

Keywords

child sex abuse; drug use; gender differences; sex risk

Human immunodeficiency virus (HIV) incidence peaks in young adulthood and persists through the 30s in the United States. In 2010, approximately 38,000 new HIV infections

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were reported among men and almost 10,000 new infections among women, with the majority of diagnoses occurring in individuals aged 25–34 years (Centers for Disease Control and Prevention, 2011). Injection and non-injection drug use as well as co-occurring sexual risk behaviors are established HIV risk factors (Des Jarlais et al., 1999; Jemmott, Jemmott, & Fong, 1992; Strathdee et al., 2001). As HIV incidence has stayed relatively stable in recent years, there remains an urgent need to identify and address factors driving substance use and sexual risk that emerge early in the life course to prevent continued HIV-related risk behaviors and hence HIV infection in the young adulthood and adulthood time periods among men and women in the United States.

Unfortunately, child sexual abuse (CSA) is prevalent in the United States, with estimated rates of at least 20% among women and 5–10% among men (Barth, Bermetz, Heim, Trelle, & Tonia, 2013). Despite varying definitions of CSA in extant literature, it is clear that forced sexual contact during childhood is associated with subsequent HIV-related substance use and sexual risk behaviors (Draucker & Mazurczyk, 2013; Senn, Carey, & Vanable, 2008). Those with a history of CSA have increased odds of injection drug use, a direct determinant of HIV infection, and use of non-injected drugs such as crack/cocaine and methamphetamine (Draucker & Mazurczyk, 2013; Dube et al., 2003). Increased use of non-injection drugs, in part, contributes to sexual risk behaviors such as having multiple partners and involvement in the sex trade, which are also elevated in those with a history of CSA (Littleton, Breittkopf, & Berenson, 2007; Negriff, Blankson, & Trickett, 2015; Senn et al., 2008; Senn, Carey, Vanable, Coury-Doniger, & Urban, 2006). CSA is associated with earlier age of risk-taking, such as drug initiation and sexual debut, among adolescents (Dube et al., 2003; Kilpatrick et al., 2000). The effects of CSA also appear to persist into adulthood (Beitchman et al., 1992; Caffaro, 2016; Kendler et al., 2000; Lopez-Patton et al., 2016). CSA has been relatively well studied compared to other forms of childhood trauma, yet significant gaps in our knowledge on the effects of CSA on HIV-related substance use and sexual risk remain. A key limitation is that few studies control for potential confounding factors such as co-occurrence of other forms of childhood trauma (Senn et al., 2008). Physical and emotional abuse are linked to both CSA and HIV-related risk behaviors (Dube et al., 2003; Huang et al., 2011), but few studies have been able to isolate the independent effect of CSA on HIV risk due to limited power and lack of measurement of other forms of abuse.

The majority of research on CSA and HIV risk has focused on associations with sexual risk behaviors in female-only samples (Senn et al., 2008), finding that women with a history of CSA have elevated numbers of sex partners, sex trade involvement, and sexually transmitted infection (STI). Though less consistently documented, evidence suggests CSA is also associated with substance use among women (Draucker & Mazurczyk, 2013). Unfortunately, few studies have examined CSA and HIV-related risk in men, particularly among heterosexuals. The scant evidence suggests men with a history of CSA report a greater number of sexual partners, unprotected sex acts, and sex trading (Senn et al., 2006, 2008). The degree to which the association between CSA and HIV-related risk behavior varies by gender has not been well described. Research on gender differences is limited by a lack of studies including men and few that empirically test effect modification by gender (Senn et al., 2008). The findings from studies that do explore gender differences are inconsistent, with some demonstrating increased sexual risk among men with a history of CSA compared

to women, while others have found no gender differences (Dube et al., 2005; Rotheram-Borus, Mahler, Koopman, & Langabeer, 1996; Senn et al., 2006). This inconsistency is also seen when examining gender differences in the effect of CSA and substance use (Huang et al., 2011). It is important to examine gender differences in associations between CSA and both drug use and sexual risk to know who to prioritize for trauma-informed HIV prevention and to better understand the potential need for gender-specific approaches to prevention programming.

The present analysis aims to contribute to the body of literature by examining associations between CSA and HIV-related substance use and sexual risk behaviors across the life course using the National Longitudinal Study of Adolescent to Adult Health and to examine whether these associations vary by gender.

Methods

Sample

The National Longitudinal Study of Adolescent to Adult Health (Add Health) is a longitudinal cohort study designed to explore health from adolescence to adulthood (Carolina Population Center). The study design has been described in detail elsewhere (Resnick et al., 1997; Sieving et al., 2001). Briefly, the nationally representative sample contains individuals who were in 7th–12th grade in the United States during 1994–1995. Wave I of the in-home survey (1994–1995) collected data from more than 20,000 adolescents and their parents regarding their social and demographic characteristics, households, risk behaviors, friendships, and health status. Cohort members were interviewed again during young adulthood in 2001–2002 (wave III; ages 18–26; $n = 15,197$) and adulthood in 2007–2008 (wave IV; ages 24–32; $n = 15,701$). The current analysis includes participants with sample weights at waves I, III, and IV who provided data regarding CSA ($n = 11,820$).

Measures

Child sexual abuse—In the waves III and IV surveys, participants were asked, “How often did a parent or other adult caregiver touch you in a sexual way, force you to touch him or her in a sexual way, or force you to have sexual relations?” Responses ranged from “this has never happened” to “more than 10 times.” Those reporting at least one instance of sexual abuse before the age of 18 during either interview were defined as having experienced CSA.

Substance use—Participants reported substance use behaviors at each data collection wave. Adolescent marijuana use was any reported use, while young adulthood and adulthood marijuana was use in the past 12 months. Cocaine use was defined as any prior use reported during adolescence and adulthood and in the past 12 month use during young adulthood. Crystal methamphetamine use was not measured during adolescence and was defined as past-12-month use reported during young adulthood and any prior use during adulthood. Prescription pain killer misuse (PPKM) was not measured during adolescence, and lifetime misuse was assessed during young adulthood and adulthood.

Sexual risk behaviors—Participants reporting ≥ 2 sexual partnerships in their lifetime during adolescence, and in the past 12 months during young adulthood and adulthood, were considered to have multiple sexual partnerships. Sex trade involvement was defined as having ever given someone sex in exchange for drugs or money during adolescence, having ever given or bought sex during young adulthood, and having bought or sold sex during the past 12 months in adulthood. STI was measured as self-reported lifetime diagnosis with chlamydia, gonorrhea, and/or trichomoniasis during adolescence and past 12 month diagnosis during adulthood. During young adulthood, participants whose urine tested positive for chlamydia, gonorrhea, and/or trichomoniasis were considered to have biologically confirmed STI.

Covariates—We considered the following covariates based on their a priori hypothesized relationship with the exposure and outcome: race, categorized as Hispanic, non-Hispanic white, non-Hispanic black, non-Hispanic other (including groups such as Asian and Native American); age; educational attainment at adulthood, categorized as less than high school completion, high school completion, and greater than high school education; and functional poverty, defined as not having enough money to pay housing or utility bills in the past 12 months, which was reported by the parent during adolescence and by the participant during young adulthood. To isolate the effect of CSA, we also controlled for emotional and physical abuse before the age of 18 by a parent or adult caregiver.

Data analysis

All analyses were conducted using survey procedures using SAS software (version 9.4) to account for the complex survey design and to yield nationally representative estimates. We used bivariate analyses to calculate the weighted prevalence of sociodemographic characteristics and childhood traumatic experiences by gender. Using logistic regression, we calculated unadjusted and adjusted odds ratios and 95% confidence intervals for associations between CSA and each HIV-related substance use and sexual risk outcome during adolescence, young adulthood, and adulthood in the total sample and by gender. We conducted multivariable logistic regression analyses that estimated the main effects of CSA on HIV-related risk behaviors in adolescence, young adulthood, and adulthood while controlling for age, race, poverty (during adolescence only for adolescence outcome analyses, during both adolescence and young adulthood for young adulthood and adulthood outcome analyses), educational attainment (adulthood analyses only), and childhood physical and emotional abuse. Adjusted models in the total sample also included gender. In separate models, we obtained gender-specific estimates by including a product-interaction term between CSA and gender.

Results

Sample characteristics among those with a history of CSA

The analytic sample (n = 11,820) was evenly distributed by gender (Male: n = 5,328, 50.0%; Female: n = 6,492, 49.9%); Table 1). The distribution of race did not differ by gender, and the majority of participants were White. Compared to women, men were significantly older and reported lower educational attainment. Functional poverty during adolescence did not

differ by gender. However, those reporting they were unable to pay housing or utility bills during young adulthood were more likely to be female (p-value < 0.0001). Compared to men, a higher proportion of women reported a history of childhood sexual (9.8 versus 6.7; p-value < 0.0001) and emotional abuse (19.3 versus 13.3; p-value < 0.0001), but there was no difference in the prevalence of physical abuse.

Associations between CSA and HIV-related outcomes during adolescence

Men and women who experienced CSA had increased odds of marijuana use compared to those who did not experience CSA (Table 2). The association was significantly higher among men in both unadjusted and adjusted models (Male adjusted odds ratio (AOR): 2.03, 95% CI: 1.47, 2.80), though the association among women attenuated after adjustment (Female AOR: 1.18, 95% CI: 0.83, 1.67). The odds of adolescent cocaine use and multiple sexual partnerships were also significantly higher among those with a history of CSA, and associations did not differ by gender. Sex trade involvement appeared elevated in those with a history of CSA (AOR: 1.93, 95% CI: 0.91, 4.07), but the association was not significant. Though not associated among women, CSA was strongly associated with self-reported STI in the unadjusted model among men (OR: 3.36, 95% CI: 1.31, 8.58) but lost significance after adjustment (AOR: 2.14, 95% CI: 0.65, 7.04).

Associations between CSA and HIV-related outcomes during young adulthood

Marijuana was no longer significantly associated with CSA during young adulthood (Table 3). In the total sample, both before and after adjustment, those with a history of CSA had increased odds of cocaine (AOR: 1.87, 95% CI: 1.22, 2.87) and crystal methamphetamine use (AOR: 2.34, 95% CI: 1.42, 2.86), and associations did not differ by gender. While unadjusted associations with PPKM were similar in men and women, only the relationship among men remained after adjustment (AOR: 1.65, 95% CI: 1.12, 2.43). Men with a history of CSA also had increased odds of multiple sexual partnerships (AOR: 1.62, 95% CI: 1.18, 2.23). Among women, the association with multiple sexual partnerships lost significance after adjustment (AOR: 1.25, 95% CI: 0.94, 1.66). CSA was strongly associated with sex trade involvement in the total sample in unadjusted and adjusted models (AOR: 2.38, 95% CI: 1.56, 3.63). Odds of biologically confirmed STI were elevated among men before adjustment (OR: 1.78, 95% CI: 1.03, 3.08), but the association was no longer significant after adjustment (AOR: 1.27, 95% CI: 0.61, 2.64). CSA was not associated with young adulthood STI among women.

Associations between CSA and HIV-related outcomes during adulthood

During adulthood, HIV-related risk behaviors continued to be elevated among those with a history of CSA (Table 4). CSA was significantly associated with marijuana and cocaine use among women prior to adjustment (marijuana OR: 1.51, 95% CI: 1.16, 1.98; cocaine OR: 1.69, 95% CI: 1.28, 2.24), but after adjustment, neither substance was significantly associated in either gender. The odds of PPKM were higher among women with a history of CSA (AOR: 1.48, 95% CI: 1.05, 2.09) but was not associated with CSA among men. Among men, multiple sexual partnerships (AOR: 1.73, 95% CI: 1.18, 2.53) and sex trade involvement (AOR: 2.56, 95% CI: 1.19, 5.51) were associated with CSA but were not associated among women. In unadjusted models, men with a history of CSA had almost

three times the odds of self-reported STI (OR: 2.89, 95% CI: 1.41, 5.92), but the association was no longer significant after adjustment (AOR: 1.90, 95% CI: 0.75, 4.82). CSA was not associated with STI among women.

Discussion

In this nationally representative U.S. sample, approximately 10% of women and 7% of men reported a history of CSA. From adolescence through adulthood, those who were sexually abused before the age of 18 had significantly elevated odds of HIV-related substance use and sexual risk behaviors. In contrast to decreasing strength in associations with substance use over time, we found the effect of CSA on sexual risk remained relatively consistent across adolescence, young adulthood, and adulthood. Specifically, those with a history of CSA had an approximately 40–60% increase in the odds of multiple sexual partnerships and about twice the odds of sex trade involvement during each period. HIV intervention programming should incorporate trauma-informed approaches for those with a history of CSA in order to reduce substance use and sexual risk behaviors that drive HIV risk throughout the life course.

Though it has been suggested that men do not view experiencing CSA as negatively as women (Rind, Tromovitch, & Bauserman, 1998), our findings support the scant extant research illustrating the deleterious effects of CSA among men (Bensley, Van Eenwyk, & Simmons, 2000; Hillis, Anda, Felitti, Nordenberg, & Marchbanks, 2000; O’Keefe et al., 2014; Raj, Silverman, & Amaro, 2000). In fact, our study is one of the few to empirically test modification by gender and suggests that effects of CSA on HIV-related risk may be stronger and longer-lasting in men compared to women. A study of a New Zealand birth cohort reported similar findings and documented decreasing sexual risk over time among sexually abused women while risk of multiple partnerships and incident herpes simplex virus-2 increased for male CSA victims (Van Roode, Dickson, Herbison, & Paul, 2009). CSA is hypothesized to cause feelings of stigmatization (Finkelhor, 2008; Finkelhor & Browne, 1985), which can contribute to psychological distress and low self-esteem and, in turn, sexual risk behavior (Senn et al., 2008). Since CSA has historically been viewed as an issue primarily affecting women, male CSA victims may feel even further stigmatized and also less comfortable disclosing and seeking treatment.

Only one other study has examined effects of child abuse on substance use across time and found that those who experienced abuse or neglect had elevated odds of substance abuse or dependence and illicit drug use when followed-up at age 29 and again at age 40 (Widom, Marmorstein, & White, 2006; Widom, Weiler, & Cottler, 1999). We found that the effect of CSA on substance use was strongest during adolescence and appeared to wane over time. For example, marijuana use was significantly elevated among those with a history of CSA during adolescence, but associations were no longer significant during young adulthood and adulthood. The relationship between CSA and substance use may be masked during the developmental periods included in Add Health, given substance use typically peaks around 18–25 years of age in the general population (Wagner & Anthony, 2002), and therefore elevated substance use among those with a history of CSA may reemerge as the rest of the Add Health participants age out of substance use. Conversely, sexual risk behavior remained

elevated among those with a history of CSA across each period. Numerous studies have documented higher levels of sexual risk among CSA victims in adolescent and adult samples (Senn et al., 2008), but only the aforementioned study in the New Zealand birth cohort has taken a life-course approach to explore effects across time (Van Roode et al., 2009). Insecure attachment (Fraley & Shaver, 2000) and traumatic sexualization (Finkelhor & Browne, 1985) may drive the sexual partnerships and behaviors of those with a history of CSA (Senn & Carey, 2010). These dynamics may be introduced as adolescents enter sexual relationships and become ingrained, hence leading to consistently elevated levels of sexual risk behaviors throughout the life course.

Treatment methods for survivors of CSA, such as cognitive processing therapy, are effective in reducing symptoms of posttraumatic stress and depression (Chard, 2005). Given these mental disorders are drivers of substance use and sexual risk behaviors (Hutton, Lyketsos, Zenilman, Thompson, & Erbeling, 2004; Khan et al., 2009; Mazzaferro et al., 2006; Regier et al., 1990), interventions aimed at prevention of these behaviors should assess history of CSA among both men and women and incorporate CSA-informed treatment methods in their programming. Our findings that CSA is associated with substance use and sexual risk across developmental periods highlights the potential for primary and secondary prevention of these HIV-related risk behaviors if screening and treatment is targeted appropriately.

Our study benefits from a large nationally representative sample that allows for examination of gender modification and control of potential confounders in relation to numerous HIV-related risk outcomes across the life course, yet it is subject to typical limitations of CSA research. There is currently no uniform definition of CSA in the field, and Add Health's measure may not be directly comparable to that of other studies. Moreover, the measure used in this analysis does not assess perpetration of CSA by other family members, such as siblings; this form of CSA is also prevalent and has negative effects on health (Caffaro, 2016). CSA was assessed retrospectively, which is a common and valid method despite its potential limitations (Hardt & Rutter, 2004), but some studies suggest the estimated effect of abuse on outcomes may differ depending on prospective versus retrospective assessment (Widom et al., 1999). Social desirability and selection bias are also possible given the sensitive topics examined and the use of a school-based sample. The time periods for substance use history measured at each wave are not uniform and make comparison over time difficult for some substances, such as cocaine. Adolescent sexual risk outcomes, such as multiple partnerships, may be confounded by the CSA experience itself. Finally, Men who have sex with men (MSM) in this sample reported increased prevalence of both CSA and some HIV-related risk behaviors. However, since our analyses focused on gender differences, we did not include MSM status, and it is possible the elevated associations among men are driven by increased risk in MSM. Future research should examine whether associations between CSA and HIV-related risk differ for subgroups of men, including MSM.

In conclusion, our findings suggest CSA has implications for HIV-related substance use and sexual risk behaviors throughout the life course for both men and women. Despite the robust body of work on the link between CSA and HIV risk, future research in representative samples is warranted to continue to examine the effects of CSA across time, particularly

among men. It important to determine the long-term trajectories of risk behaviors throughout the life course for those with a history of CSA in order to best time interventions and prevent further HIV risk. We also must continue to explore the pathways through which CSA contributes to substance use and sexual risk and whether those factors are distinct by gender to design appropriate trauma-informed interventions that address the potentially unique needs of men and women with a history of CSA.

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Table 1

Sociodemographic Characteristics, History of Child Sexual Abuse, and Substance Use Among U.S. Males (N = 5,328) and Females (N = 6,492).

Characteristic	Males (n=5,328) No. (weighted %)	Females (n=6,492) No. (weighted %)	P-value (χ^2 test)
Socio-demographics			
Race			
White	2909 (65.6)	3498 (66.8)	0.1976
Black	998 (15.2)	1475 (16.0)	
Hispanic	865 (12.2)	948 (11.2)	
Other	554 (7.0)	566 (6.0)	
Age at Wave I (Mean, SE)	16.0 (0.12)	15.9 (0.12)	0.0023
Age at Wave IV (Mean, SE)	28.9 (0.12)	28.7 (0.12)	<0.0001
Education			
Less than High School	464 (9.7)	375 (6.8)	<0.0001
High School Graduate	978 (20.2)	846 (13.6)	
Greater than High School	3886 (70.1)	5271 (79.6)	
Unable to Pay Housing/Utility Bills at Wave I			0.5669
No	3796 (83.8)	4475 (82.7)	
Yes	745 (16.2)	1000 (17.3)	
Unable to Pay Housing/Utility Bills at Wave III			<0.0001
No	4649 (88.2)	5437 (83.8)	
Yes	637 (11.8)	1003 (16.2)	
Childhood Abuse			
Sexually Abused by Parent/Adult Caregiver			
No	3989 (93.3)	5847 (90.2)	<0.0001
Yes	339 (6.7)	645 (9.8)	
Physically Abused by Parent/Adult Caregiver			
No	4471 (87.7)	5598 (88.3)	0.5168
Yes	689 (12.3)	746 (11.7)	
Emotionally Abused by Parent/Adult Caregiver			
No	4594 (86.7)	5218 (80.7)	<0.0001
Yes	683 (13.3)	1227 (19.3)	

Table 2

Associations Between Child Sexual Abuse and Adolescent HIV-related Substance Use and Sexual Risk Behaviors Among U.S. Males (N = 5,328) and Females (N = 6,492).

Outcomes	Total Sample (n=11,820)				Males (n=5,328)				Females (n=6,492)			
	% ^a	OR (95% CI)	AOR ^b (95% CI)	% ^a	OR (95% CI)	AOR ^c (95% CI)	%	OR (95% CI)	AOR ^c (95% CI)	%	OR (95% CI)	P-value ^d crude (adjusted)
Marijuana Use												
No CSA	26.9	1.00	1.00	28.3	1.00	1.00	25.2	1.00	1.00	1.00	1.00	0.1300
CSA	38.2	1.69 (1.39, 2.05)	1.49 (1.16, 1.91)	44.5	2.03 (1.50, 2.75)	2.03 (1.47, 2.80)	33.8	1.52 (1.19, 1.93)	1.18 (0.83, 1.67)			(0.0186)
Cocaine Use												
No CSA	2.9	1.00	1.00	3.2	1.00	1.00	2.4	1.00	1.00	1.00	1.00	0.7368
CSA	7.8	2.82 (1.92, 4.14)	3.31 (2.17, 5.07)	9.9	3.11 (1.89, 5.11)	3.90 (2.27, 6.70)	6.4	1.28 (1.66, 4.65)	2.76 (1.52, 5.02)			(0.3837)
Multiple Sex Partners												
No CSA	18.7	1.00	1.00	21.4	1.00	1.00	16.0	1.00	1.00	1.00	1.00	0.5134
CSA	27.4	1.64 (1.33, 2.01)	1.63 (1.28, 2.06)	30.1	1.58 (1.15, 2.18)	1.50 (1.04, 2.15)	25.6	1.81 (1.39, 2.34)	1.74 (1.26, 2.41)			(0.4830)
Sex Trade Involvement												
No CSA	1.1	1.00	1.00	1.5	1.00	1.00	0.6	1.00	1.00	1.00	1.00	0.9090
CSA	1.7	1.63 (0.83, 3.20)	1.93 (0.91, 4.07)	2.8	1.84 (0.78, 4.37)	1.84 (0.68, 4.98)	1.0	1.71 (0.61, 4.77)	2.09 (0.74, 5.95)			(0.8558)
STI												
No CSA	1.6	1.00	1.00	0.8	1.00	1.00	2.3	1.00	1.00	1.00	1.00	0.1245
CSA	3.2	2.04 (1.22, 3.40)	1.32 (0.67, 2.62)	2.8	3.36 (1.31, 8.58)	2.14 (0.65, 7.04)	3.4	1.48 (0.83, 2.62)	1.02 (0.47, 2.19)			(0.3244)

^aPercent with the outcome.

^bAdjusted for age, race, gender, child emotional abuse and physical abuse, and poverty during adolescence.

^cAdjusted for age, race, child emotional abuse and physical abuse, and poverty during adolescence.

^dP-value for gender difference.

Table 3

Associations Between Child Sexual Abuse and Young Adulthood HIV-related Substance Use and Sexual Risk Behaviors Among U.S. Males (N = 5,328) and Females (N = 6,492).

Outcomes	Total Sample (n=11,820)				Males (n=5,328)				Females (n=6,492)			
	% ^a	OR (95% CI)	AOR ^b (95% CI)	% ^a	OR (95% CI)	AOR ^c (95% CI)	%	OR (95% CI)	AOR ^c (95% CI)	%	OR (95% CI)	P-value ^d crude (adjusted)
Marijuana Use												
No CSA	33.4	1.00	1.00	38.3	1.00	1.00	28.1	1.00	1.00	28.1	1.00	0.9616
CSA	36.1	1.13 (0.92, 1.38)	1.15 (0.91, 1.57)	42.4	1.18 (0.86, 1.63)	1.36 (0.92, 2.01)	31.8	1.19 (0.92, 1.54)	1.01 (0.77, 1.34)	31.8	1.01 (0.77, 1.34)	(0.2127)
Cocaine Use												
No CSA	6.6	1.00	1.00	8.5	1.00	1.00	4.6	1.00	1.00	4.6	1.00	0.9035
CSA	10.7	1.69 (1.19, 2.40)	1.87 (1.22, 2.87)	14.7	1.85 (1.13, 3.04)	1.98 (1.08, 3.61)	7.9	1.78 (1.14, 2.78)	1.77 (1.04, 3.02)	7.9	1.77 (1.04, 3.02)	(0.7765)
Crystal Meth Use												
No CSA	2.5	1.00	1.00	3.3	1.00	1.00	1.6	1.00	1.00	1.6	1.00	0.8446
CSA	5.9	2.50 (1.67, 3.75)	2.34 (1.42, 3.86)	8.2	2.62 (1.44, 4.75)	2.61 (1.25, 5.45)	4.4	2.85 (1.57, 5.17)	2.06 (1.04, 4.08)	4.4	2.06 (1.04, 4.08)	(0.6544)
PPKM												
No CSA	19.8	1.00	1.00	21.4	1.00	1.00	18.2	1.00	1.00	18.2	1.00	0.5624
CSA	25.0	1.35 (1.09, 1.68)	1.28 (0.99, 1.66)	28.7	1.48 (1.06, 2.08)	1.65 (1.12, 2.43)	22.5	1.31 (1.00, 1.71)	1.06 (0.77, 1.46)	22.5	1.06 (0.77, 1.46)	(0.0812)
Multiple Sex Partners												
No CSA	27.5	1.00	1.00	32.0	1.00	1.00	22.8	1.00	1.00	22.8	1.00	0.1618
CSA	36.0	1.48 (1.26, 1.75)	1.41 (1.13, 1.76)	45.7	1.79 (1.39, 2.29)	1.62 (1.18, 2.23)	29.5	1.41 (1.14, 1.76)	1.25 (0.94, 1.66)	29.5	1.25 (0.94, 1.66)	(0.1971)
Sex Trade Involvement												
No CSA	3.9	1.00	1.00	5.7	1.00	1.00	2.0	1.00	1.00	2.0	1.00	0.8163
CSA	10.1	2.81 (2.00, 3.94)	2.38 (1.56, 3.63)	15.7	3.09 (1.90, 5.05)	2.16 (1.19, 3.91)	6.4	3.39 (2.00, 5.75)	2.81 (1.49, 5.31)	6.4	2.81 (1.49, 5.31)	(0.5688)
STI												
No CSA	6.4	1.00	1.00	5.6	1.00	1.00	7.2	1.00	1.00	7.2	1.00	0.1933
CSA	8.7	1.38 (1.00, 1.92)	1.14 (0.75, 1.73)	9.6	1.78 (1.03, 3.08)	1.27 (0.61, 2.64)	8.1	1.12 (0.74, 1.70)	1.05 (0.63, 1.75)	8.1	1.05 (0.63, 1.75)	(0.6958)

^aPercent with the outcome.

^bAdjusted for age, race, gender, child emotional abuse and physical abuse, and poverty during adolescence.

^cAdjusted for age, race, child emotional abuse and physical abuse, and poverty during adolescence.

^dP-value for gender difference.

Table 4

Associations Between Child Sexual Abuse and Adulthood HIV-related Substance Use and Sexual Risk Behaviors Among U.S. Males (N = 5,328) and Females (N = 6,492).

Outcomes	Total Sample (n=11,820)			Males (n=5,328)			Females (n=6,492)			P-value ^d crude (adjusted)
	% ^a	OR (95% CI)	AOR ^b (95% CI)	% ^a	OR (95% CI)	AOR ^c (95% CI)	%	OR (95% CI)	AOR ^c (95% CI)	
Marijuana Use										0.3157
No CSA	22.9	1.00	1.00	28.7	1.00	1.00	16.8	1.00	1.00	(0.5983)
CSA	27.2	1.26 (1.02, 1.55)	1.22 (0.96, 1.56)	32.7	1.21 (0.86, 1.69)	1.31 (0.89, 1.93)	23.4	1.51 (1.16, 1.98)	1.14 (0.84, 1.55)	
Cocaine Use										0.1372
No CSA	20.1	1.00	1.00	25.3	1.00	1.00	14.7	1.00	1.00	(0.7799)
CSA	25.4	1.36 (1.06, 1.73)	1.38 (1.02, 1.86)	29.6	1.24 (0.87, 1.77)	1.43 (0.91, 2.24)	22.6	1.69 (1.28, 2.24)	1.33 (0.96, 1.86)	
Crystal Meth Use										0.1240
No CSA	8.9	1.00	1.00	10.9	1.00	1.00	6.9	1.00	1.00	(0.8116)
CSA	13.9	1.64 (1.24, 2.16)	1.37 (0.98, 1.91)	14.8	1.41 (0.93, 2.15)	1.43 (0.83, 2.46)	13.3	2.07 (1.49, 2.87)	1.32 (0.91, 1.92)	
PPKM										0.0031
No CSA	14.9	1.00	1.00	18.3	1.00	1.00	11.5	1.00	1.00	(0.1655)
CSA	18.1	1.26 (0.96, 1.66)	1.25 (0.93, 1.68)	15.9	0.85 (0.53, 1.34)	0.97 (0.59, 1.61)	19.6	1.89 (1.38, 2.58)	1.48 (1.05, 2.09)	
Multiple Sex Partners										0.1367
No CSA	24.3	1.00	1.00	29.0	1.00	1.00	19.4	1.00	1.00	(0.0991)
CSA	31.4	1.43 (1.17, 1.75)	1.37 (1.07, 1.75)	42.4	1.80 (1.33, 2.45)	1.73 (1.18, 2.53)	24.1	1.31 (0.99, 1.74)	1.11 (0.79, 1.56)	
Sex Trade Involvement										0.5671
No CSA	1.6	1.00	1.00	2.6	1.00	1.00	0.6	1.00	1.00	(0.2421)
CSA	3.6	2.26 (1.31, 3.92)	2.12 (1.07, 4.23)	7.2	2.88 (1.53, 5.43)	2.56 (1.19, 5.51)	1.2	1.93 (0.59, 6.38)	1.00 (0.25, 3.97)	
STI										0.0636
No CSA	3.3	1.00	1.00	2.1	1.00	1.00	4.6	1.00	1.00	(0.3606)
CSA	5.9	1.85 (1.25, 2.74)	1.43 (0.86, 2.36)	5.7	2.89 (1.41, 5.92)	1.90 (0.75, 4.82)	6.0	1.35 (0.88, 2.06)	1.21 (0.75, 1.93)	

^aPercent with the outcome.

^bAdjusted for age, race, gender, child emotional abuse and physical abuse, and poverty during adolescence.

^cAdjusted for age, race, child emotional abuse and physical abuse, and poverty during adolescence.

^dP-value for gender difference.