Long-term correlates of childhood abuse among adults with severe mental illness: Adult victimization, substance abuse, and HIV sexual risk behavior

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Abstract

The prevalence of childhood sexual and physical abuse among persons with severe mental illness (SMI) is disproportionately high. Adults with SMI also engage in high rates of HIV risk behaviors. This study examined the association between childhood abuse and adult victimization, substance abuse, and lifetime HIV sexual risk in a sample of 152 adults with SMI receiving community mental health services. Structured interviews assessed psychiatric, psychosocial, and behavioral risk factors. Seventy percent reported childhood physical and/or sexual abuse, and 32% reported both types of abuse. Participants with childhood abuse were more likely to report adult victimization and greater HIV risk. A structural equation model found that childhood abuse was directly and indirectly associated with HIV risk through drug abuse and adult vicitimization. Integrated treatment approaches that address interpersonal violence and substance abuse may be necessary for HIV risk reduction in this population.

Keywords

severe mental illness; HIV risk behavior; childhood abuse; substance abuse; revictimization

INTRODUCTION

The prevalence of childhood sexual and physical abuse among persons with severe mental illness (SMI) is disturbingly high. Among women with SMI, 43-52% report a history of childhood sexual abuse and 33-52% report a history of childhood physical abuse (e.g., Cloitre et al., 1996; Muenzenmaier et al., 1993; Mueser et al., 1998; Rosenberg et al., 2007), compared to 13-32% and 20-21%, respectively, among women in the general population (Briere and Elliot, 2003; Chartier et al., 2007; Edwards et al., 2003; Finkelhor et al., 1990). Many fewer studies have examined the prevalence of childhood abuse among men. Two studies reported that 29-36% of men with SMI reported childhood sexual abuse and 38-59% reported childhood physical abuse (Mueser et al., 1998; Rosenberg et al., 2007), compared to 4-18% and 15-31%,

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respectively, among men in the general population (Briere and Elliot, 2003; Chartier et al., 2007; Edwards et al., 2003; Finkelhor et al., 1990). Overall, women are more likely than men to report childhood sexual abuse, but there is no gender difference in the prevalence of childhood physical abuse (Briere and Elliot, 2003; Finkelhor et al., 1990; Goodman et al., 2001). Childhood sexual and physical abuse often co-occur, making it difficult to tease apart the long-term sequelae of each type of abuse (Briere and Elliot, 2003; Dévieux et al., 2007; Rosenberg et al., 2007).

Adults with severe mental illness (SMI) are disproportionately affected by HIV/AIDS. A large multi-city study reported HIV seroprevalence rates ranging from 2% to 5% in rural and metropolitan sites, respectively (Rosenberg et al., 2001), compared to 0.8% in the United States population (UNAIDS, 2006). Prior research has also documented that adults with SMI engage in high rates of sexual risk behaviors associated with HIV transmission, including multiple partners and sex trading (Meade and Sikkema, 2005a). Yet, few studies have examined the relationship between childhood abuse and HIV sexual risk behavior in this population. These studies have linked sexual and/or physical abuse, typically occurring in childhood, with sex trading (Goodman and Fallot, 1998; van Dorn et al., 2005), inconsistent condom use (Brown et al., 2000; Meade and Sikkema, 2007; van Dorn et al., 2005), more sex acts and sex partners (Malow et al., in press), higher sexual risk (Dévieux et al., 2007), and sexually transmitted infections (Brown et al., 2000). However, the complex associations between childhood abuse and HIV risk have been inadequately examined, particularly among men, and studies have not systematically examined factors that may mediate this relationship (e.g. substance abuse, adult victimization).

Theoretical models linking childhood abuse to HIV risk

Theoretical models have been proposed to explain the relationship between childhood abuse and HIV risk behavior in the general population, with the long-term sequelae of childhood abuse mediating this relationship. In perhaps the most comprehensive model, Malow and colleagues (2006) proposed that childhood sexual abuse is directly related to HIV risk behavior, with substance use, adult revictimization, and psychopathology acting as mediators. Similarly, Miller (1999) proposed a model in which the relationship between sexual abuse and HIV risk in women is mediated by drug use, sexual adjustment, and psychopathology. These authors urged that the causal and mediating pathways be empirically evaluated using modeling approaches. The primary purpose of the current study was to examine the relationship between childhood abuse and HIV risk behavior among adults with SMI using structural equation modeling (SEM). Figure I represents the hypothesized model in which childhood abuse is directly associated with lifetime HIV risk, and indirectly associated with HIV risk through substance abuse and adult victimization. Because childhood sexual and physical abuse frequently co-occur, especially in high risk samples, it can be difficult to tease apart the unique effects of each type of abuse. Therefore, as in prior studies (e.g., Kimerling et al., 2007; Sachs-Ericsson et al., 2007), we examined childhood abuse as a single variable encompassing both sexual and physical abuse. Literature related to each of these pathways is described below.

Childhood sexual and physical abuse are associated with mental health problems and psychiatric disorders in adulthood (MacMillian et al., 2001; Molnar et al., 2001). Among adults with SMI, childhood abuse is associated with greater psychiatric symptoms, including depression, psychosis, dissociation, and posttraumatic stress (Craine et al., 1988; Malow et al., in press). In non-SMI samples, childhood abuse is related to HIV risk behaviors, including earlier sexual debut, multiple sex partners, unprotected intercourse, sex trading, and sexually transmitted infections (e.g., Arriola et al., 2005; Cohen et al., 2000; Parillo et al., 2001). As discussed above, emerging evidence suggests that this may also be the case among adults with

SMI. Thus, it was hypothesized that childhood abuse would be directly associated with HIV risk.

Approximately half of adults with SMI have co-occurring substance use disorders (Regier et al., 1990). Childhood physical and sexual abuse are risk factors for substance abuse in the general (Simpson and Miller, 2002) and SMI (Craine et al., 1988; Goodman et al., 1997) populations. In turn, substance abuse, particularly cocaine (Vaddiparti et al., 2006), is a strong predictor of HIV risk behavior in non-SMI populations (Chesney et al., 1998; Weinhardt and Carey, 2000). Thus, it was hypothesized that substance abuse would be directly associated with HIV risk and would mediate the relationship between childhood abuse and HIV risk.

Individuals who are abused in childhood are more likely to be sexually and physically abused again in adulthood, often repeatedly (Arriola et al., 2005; Cloitre et al., 1996; Goodman et al., 2001), and SMI is a risk factor for revictimization (Classen et al., 2005). In a recent review, childhood physical and sexual abuse each predicted sexual revictimization in adulthood, which in turn predicted greater substance abuse and HIV risk behavior, including more sex partners, sex trading, and sexually transmitted infections (Classen et al., 2005). Thus, it was hypothesized that adult victimization would be directly associated with HIV risk and would mediate the relationship between childhood abuse on HIV risk.

Study aims

The purpose of this study was to examine the association between childhood abuse and adult victimization, substance abuse, and lifetime HIV risk. First, we compared participants with sexual abuse only, physical abuse only, both sexual and physical abuse, and no abuse to determine whether childhood physical and sexual abuse yield differential outcomes. We hypothesized that participants with any childhood abuse would report higher rates of substance abuse, adult victimization, and HIV risk compared to participants with no childhood abuse. Second, we tested a model of HIV risk among adults with SMI using SEM (see Figure I). We hypothesized that childhood abuse would be both directly and indirectly associated with HIV risk through substance abuse and adult victimization. Third, we examined gender differences in the prevalence and long-term correlates of childhood abuse. We expected that women would experience higher rates of both childhood abuse and adult victimization, but that childhood abuse would be predictive of lifetime HIV risk in both genders.

METHODS

Participants and procedure

Data for this study came from a research project examining HIV risk among adults with SMI (see also Meade, 2006; Meade and Sikkema, 2005b, 2007). Participants were recruited between March 2003 and March 2004 from multiple sites serving adults with SMI in a small, Northeastern city. These included a community mental health center (25%), an intensive outpatient program (14%), a crisis/respite center (25%), and four supportive housing programs (36%). The vast majority of participants received their primary psychiatric treatment from the community mental health center and adjunctive services through affiliated agencies (e.g., intensive outpatient, vocational counseling, residential treatment). Based on data compiled by the clinical information department at the community mental health center, study participants were similar to the greater population of patients served at this center in terms of gender, age, marital status, and educational attainment, but they were less likely to be Black (27% vs. 38%, $p < .05$).

Recruitment strategies included flyers, presentations, and clinician referral. Eligibility criteria were: diagnosis of SMI (e.g., schizophrenia, major depression, or bipolar disorder, persisting

over time and causing extensive disability in social, occupational, and other important areas of functioning), 18-65 years of age, English proficiency, and no major cognitive impairments precluding an interview. A face-to-face, structured, 90-minute interview assessed psychiatric, psychosocial, behavioral, and demographic factors. All participants provided informed consent, completed the full interview, and received $20 compensation. Study procedures were approved by an institutional review board.

Measures

Childhood abuse and adult victimization—The Trauma History Questionnaire (THQ) was used to identify physical and sexual abuse occurring in childhood (≤17 years) and adulthood (≥18 years) (Green, 1996). Physical abuse was defined as any type of physical harm caused by another person (e.g., hitting, slapping, chocking, burning, or beating). Sexual abuse was defined as any unwanted sexual touching, oral sex, or vaginal/anal intercourse that was forced or coerced, and any type of sexual contact with someone at least 5 years older before 13 years of age. Participants also reported how often each type of abuse happened and its duration. The THQ has high inter-rater reliability and test-retest reliability and has been used extensively with adults with SMI (Mueser et al., 2001). A prior analysis of the current data found that childhood sexual abuse was associated with inconsistent condom use in the past year (Meade and Sikkema, 2007).

Lifetime substance abuse—Clinicians provided DSM-IV-TR Axis I diagnoses, including lifetime alcohol and drug use disorders (APA, 2000). Participants reported whether or not they had ever had a "substance abuse problem". They also reported their lifetime use of specific substances, including cocaine and crack.

Lifetime HIV sexual risk—Items were derived from prior risk behavior assessments that the have been used successfully with adults with SMI and have high test-retest reliability (McKinnon et al., 1993; Sohler et al., 2000). Participants reported the total number of lifetime sex partners, history of lifetime sex trading for money, alcohol/drugs, or other goods, and history of sexually transmitted infection. Prior research has established that adults with SMI can reliably report lifetime HIV risk behaviors (Rosenberg et al., 2003) and that they are predictive of HIV infection (Essock et al., 2003).

Demographic information—Participants reported their age, gender, race/ethnicity, sexual orientation, marital status, employment status, and monthly income.

Data analytic strategy

The prevalence of childhood sexual and physical abuse were computed, and gender differences were examined using chi-square tests. These childhood abuse experiences were then described, including prevalence of repeated abuse, mean duration of abuse, and relationship to perpetrator (s). Participants were categorized by their childhood abuse status: sexual abuse only, physical abuse only, both sexual and physical abuse, and no abuse. Chi-square tests were used to compare these groups on the following dichotomous variables: lifetime substance abuse (drug use disorder diagnosis, alcohol use disorder diagnosis, self-reported substance abuse problem, and cocaine/crack use), adult victimization (sexual abuse, physical abuse), and lifetime HIV risk (≥20 sex partners, sex trading, sexually transmitted infection). As planned contrasts are more appropriate than omnibus tests for focused questions of multiple groups and allow greater statistical power and clarity of interpretation (Rosnow and Rosenthal, 2002), two planned contrasts were conducted: (1) sexual abuse only versus physical abuse only (to determine whether participants with either type of childhood abuse were equally likely to report negative outcomes), and (2) sexual and/or physical abuse versus no abuse (to determine whether participants with any type of childhood abuse were more likely to have negative outcomes

compared to those with no childhood abuse history). These analyses were conducted in SPSS 13.0 (SPSS, Chicago, IL).

SEM was used to assess the hypothesized model. Multiple indicator latent variables were created as follows: lifetime drug abuse (drug use disorder diagnosis, cocaine/crack use, self-reported substance abuse problem), adult victimization (sexual abuse, physical abuse), and lifetime HIV sexual risk (number of sex partners, sex trading, sexually transmitted infection). Number of partners was winsorized to minimize skew and reduce the influence of extreme scores. All of the other indicator variables were dichotomous. A polychoric correlation matrix using weighted least squares estimation and an asymptotic covariance matrix was used (Joreskog, 2004). The advantage of this analysis is that it does not make distributional assumptions and is therefore appropriate for ordinal and non-normally distributed variables.

Five things were assessed: (1) overall fit of the model, (2) amount of variability (R^2) of the latent mediators and outcome accounted for by the variables in the model, (3) significance of the individual structural paths, (4) direct and indirect effects of childhood abuse on lifetime HIV risk (test for mediation) and (5) whether the model and individual paths differed significantly between men and women. For the overall fit, the closeness of the hypothetical model to the empirical data was evaluated through goodness-of-fit indices. A chi-square value of no more than twice the degrees of freedom in the model is generally indicative of a plausible, well-fitting model (Bollen, 1989; Jaccard and Wan, 1996). However, as the chi-square value is influenced by sample size and even good fitting models may have significant chi-square values, it is recommended that multiple fit indices be used to assess model fit. The root mean square error of approximation (RMSEA) assesses absolute fit but penalizes for less parsimonious models. The RMSEA is a badness-of-fit index, with values *less* than 0.06 being desirable (Hu and Bentler, 1999). The comparative fit index (CFI) and the non-normed fit index (NNFI) compare the absolute fit with an independence model that assumes no relationships among variables, and values greater than .95 indicate good fit (Hu and Bentler, 1999). We used the chi-square, the RMSEA, the CFI, and the NNFI to evaluate the overall fit of the model. Mediation was tested by first assessing whether there was a direct and overall indirect relationship between the predictors and HIV risk, and then testing the indirect effect of each predictor on HIV risk using Sobel tests. This method has been shown to be a valid and reliable method of assessing mediation (Preacher and Hayes, 2004). Finally, multiple-group comparisons were used to determine whether the overall model or individual paths differed among men and women (Bollen, 1989; Jaccard and Wan, 1996). This was done by running two models: In one model the parameter of interest was allowed to vary across groups, and in the other model the structural path was constrained to be equal across the two groups. The difference between the two chi-square fit indices for each model yielded a chi-square test indicating whether or not the path differed significantly across the groups. A significant differential chi-square would indicate that gender moderates the path. All SEM analyses were performed using LISREL 8.5 (SSI, Lincolnwood, IL).

RESULTS

Participant characteristics

The sample was comprised of 70 women and 82 men with SMI. Participants ranged in age from 20 to 63 years (M = 38.61 ± 9.28) and were racially diverse (58% White, 27% Black, 11% Hispanic, 4% mixed/other). Most identified as heterosexual (85%) and had a high school education (80%). Reflecting their SMI status, the majority was single (66% never married, 28% divorced/separated, 1% widowed), was currently unemployed (82%), had a monthly income under $1000 (89%), and had a history of homelessness (80%). Primary psychiatric diagnoses were: 40% psychotic disorder (20% schizoaffective, 18% schizophrenia, 2% other) and 60% non-psychotic disorder (29% major depressive, 26% bipolar, 5% posttraumatic

stress). Two thirds had a lifetime history of substance use disorder, and 47% met criteria within the past year. Ninety percent had one or more inpatient psychiatric hospitalizations (M = 7.03 ± 8.35), and 54% were hospitalized in the past year. All were currently receiving treatment for their SMI.

Almost all participants (93%) had at least one lifetime sex partner. The mean number of sex partners was 22.82 (SD = 36.37, range = 0–300); 37% of participants had 20 or more sex partners. One third (33%) had ever engaged in sex trading, and 36% had a history of sexually transmitted infection. Two participants reported that they were HIV-positive.

Prevalence, description, and correlates of childhood abuse

The prevalence of childhood sexual and physical abuse was 47% and 58%, respectively. The majority (70%) reported at least one type of abuse, and 32% reported both types of abuse. Women were more likely than men to have been sexually abused (63% vs. 33%, $\chi^2(1) = 13.59$, $p < .001$), but there was no gender difference for physical abuse (61% vs. 50%, $\chi^2(1) = 2.00$, $p = 0.16$). Men were more likely to report no childhood abuse (40% vs. 19%, $\chi^2(1) = 8.40$, $p = .004$). Whites were more likely to report a history of physical abuse (65% vs. 42%, $\chi^2(1) = 7.65$, $p = .006$), but there was no race difference for sexual abuse (51% vs. 41%, $\chi^2(1) = 1.65$, $p = .20$). There were no group differences on age, educational attainment, sexual orientation, or marital status (all $p > .10$).

There were also gender and race differences on adult victimization. Women were more likely to report adult sexual abuse (46% vs. 9%, $\chi^2(1) = 27.36$, $p < .001$) and adult physical abuse (43% vs. 24%, $\chi^2(1) = 10.96$, $p = .001$). Whites were more likely to report adult sexual abuse (33% vs. 16%, $\chi^2(1) = 5.83$, $p = .016$) but not adult physical abuse (49% vs. 35%, $\chi^2(1) = 3.18$, $p = .08$)

Table I describes participants' childhood abuse experiences. Among participants who reported childhood sexual abuse, 61% experienced repeated abuse occurring over a mean of 5.13 years (SD = 3.92). Women were more likely than men to have been repeatedly sexually abused, abused for longer duration, and abused by a family member. Among participants who reported childhood physical abuse, 68% reported repeated abuse occurring over a mean of 7.57 years (SD = 6.29). There were no gender differences in the frequency and duration of physical abuse, but women were more likely to have been physically abused by a partner.

Table II compares participants with physical abuse only, sexual abuse only, physical and sexual abuse, and no abuse on lifetime substance abuse, adult victimization, and HIV sexual risk. There were overall group differences on all variables except substance abuse problem and cocaine use. When comparing participants with sexual abuse only versus physical abuse only, those with sexual abuse only were significantly more likely to have a lifetime drug use disorder (68% vs. 29%); otherwise there were no significant differences between these groups. In contrast, when comparing participants with any abuse versus no abuse, those with any abuse were significantly more likely to report adult physical abuse (48% vs. 30%), adult sexual abuse (33% vs. 9%), sex trading (40% vs. 24%), sexually transmitted infection (44% vs. 17%), and 20 or more sex partners (43% vs. 24%); however, there were no differences in substance abuse variables. These findings suggest that childhood sexual abuse may be a unique predictor of drug use disorder, but any childhood abuse (sexual and/or physical abuse) is a risk factor for adult victimization and lifetime HIV risk.

Model testing

We then tested the hypothetical model. All indicator loadings on the latent factors were greater than .50 ($p < .001$). Because race and gender were associated with both childhood and adult

abuse, they were added as covariates. The model had adequate fit ($\chi^2(37) = 50.22$, $p > .05$; RMSEA = 0.049; CFI = 0.92; NNFI = 0.95). Inspection of modification indices suggested that controlling for the effects of race on drug abuse and HIV risk improved model fit. Figure II depicts this final structural model with path coefficients. This model had excellent fit ($\chi^2(35) = 35.53$, $p > .05$; RMSEA < 0.01; CFI = 1.00; NNFI = 1.00).

Table III shows the direct and indirect effects of all variables in the final model. Childhood abuse was directly (z = 2.03, $p < .05$) and indirectly (z = 2.28, $p < .05$) associated with HIV risk. Childhood abuse was directly associated with adult victimization (z = 2.04, $p < .05$), and adult victimization was directly associated with HIV risk (z = 2.89, $p < .01$). Childhood abuse was not directly associated with drug abuse (z = 1.72, $p > .05$), but drug abuse was directly and strongly associated with HIV risk (z = 4.44, $p < .01$). While the overall indirect effect of childhood abuse on HIV risk was significant, Sobel tests for mediation found that the individual indirect effects of drug abuse and adult victimization on HIV risk were not significant (t = 1.64, $p = .10$ and t = 1.71, $p = .09$, respectively), though the effects were in the expected direction.

Multiple group comparisons indicated no significant difference in the models by gender ($\chi^2(8) = 6.44$, $p > .05$), indicating that the model did not differ significantly between men and women. There were also no differences between men and women for individual paths in the model (data not shown).

DISCUSSION

Consistent with our hypothesis, childhood abuse was directly and indirectly associated with increased HIV sexual risk. This finding is notable due to the disproportionately high rate of childhood abuse in adults with SMI. In this sample, 81% of women and 60% of men reported sexual and/or physical abuse in childhood, and 32% reported both types of abuse. Persons with SMI may be at high risk for HIV due to associated cognitive, emotional, and social impairments resulting from childhood abuse experiences. For example, poor judgment and impulsivity may impair accurate risk assessment and promote sexual involvement with multiple risky partners. Individuals with histories of childhood abuse may be at especially high risk for revictimization and sexual risk behavior. Mueser and colleagues (2002) proposed that trauma and SMI interact in complex ways, leading to poorer outcomes, including more severe psychiatric symptoms, higher risk of relapse, and revictimization. Indeed, a recent study found that adverse childhood events, including sexual and physical abuse, predicted HIV infection in adults with schizophrenia (Rosenberg et al., 2007).

Results suggest that participants who were abused in childhood were more likely to be abused in adulthood, and this in turn was associated with greater HIV risk. Childhood is a critical developmental period, and abuse perpetrated during this period may distort an individual's construction of relational schemas (Briere, 2002; Wenninger and Ehlers, 1998), setting the stage for future victimization and HIV risk behavior (Parillo et al., 2001; Senn et al., 2006; van Dorn et al., 2005; Wyatt et al., 2002). Although the relationship between childhood abuse and HIV risk behavior was similar for male and female participants, women were more likely to report childhood abuse and adult victimization. Results also suggest potential racial differences. In this sample, white participants were more likely to report childhood abuse but less likely to abuse drugs. Prior studies examining the effects of race on these outcomes have yielded conflicting results (Buka, 2002; Kenny and McEachern, 2000), suggesting complex relationships. Further studies with larger, well-matched samples are needed to ascertain how race may moderate the effects of childhood abuse.

Contrary to our hypothesis, childhood abuse was not predictive of drug abuse. The association between childhood abuse and substance abuse may be weaker among high risk samples,

particularly in the context of multiple risk factors (e.g., poverty, mental illness) (Brown et al., 2000; Kang et al., Morrill et al., 2001). Nevertheless, drug abuse was a strong predictor of lifetime HIV risk. Among substance abusers in general, drug abuse is more strongly related to HIV risk behavior than alcohol abuse (Morrill et al., 2001; Newman et al., 2004; Windle, 1997). Drug abusers may also be more likely to have high risk partners (e.g., injection drug users) and be part of a social network in which sexual risk behaviors are more normative (Latkin et al., 2003). The current findings suggest that individuals with SMI who have a history of childhood abuse and co-occurring drug abuse may be at particularly high risk for HIV.

Several limitations should be noted. First, this study was based primarily on self-report, which may be complicated by psychosis, medication side-effects, or substance abuse. However, prior research conducted among persons with SMI has established reasonable test-retest reliability and predictive validity of self-report measures of trauma exposure, substance abuse, and sexual behaviors (Goodman et al., 1999; McKinnon et al., 1993; Weiss et al., 1998). Second, due to the cross-sectional design of the study, causality could not be determined. However, childhood abuse must have predated any adult victimization and likely also predated drug abuse and HIV risk behaviors. Research using longitudinal designs is needed to adequately assess the temporal relationships between trauma symptoms, revictimization, drug abuse, and HIV risk behavior. Third, the sample size was relatively small for an SEM analysis, though within the guidelines to yield stable parameter estimates (Jaccard and Wan, 1996). However, low power may have contributed to the lack of differences between participants who experienced physical versus sexual abuse only. This supports our rationale for examining a combined variable of childhood abuse in the final model. Replication studies with larger samples are needed. Finally, use of a convenience sample raises the possibility of selection bias, though the current sample reflects the SMI population in terms of diagnoses, chronicity, and severity of functional impairments. Nevertheless, results may not generalize to adults with SMI who are not in psychiatric treatment, are less socioeconomically disadvantaged, and/or live in non-urban areas or other regions of the United States.

In sum, the results of this study suggest that childhood sexual and physical abuse may play an important role in HIV risk behavior among adults with SMI. It has been suggested that this population is at "triple jeopardy" for HIV infection due to the combination of psychiatric disabilities, substance abuse, and interpersonal trauma (Dévieux et al., 2007). Integrated treatment approaches that address interpersonal violence and substance abuse may be necessary for HIV prevention in this population. Unfortunately, among the few such interventions available, there is a lack of empirical support for efficacy in general and application to SMI populations in particular (Briere, 2003; Hansen et al., 2006; Wyatt et al., 2004). Although much more work is needed to develop effective HIV risk reduction interventions, mental health providers should be aware of the high prevalence of childhood abuse and sexual risk behaviors and should address these issues with SMI clients.

Acknowledgments

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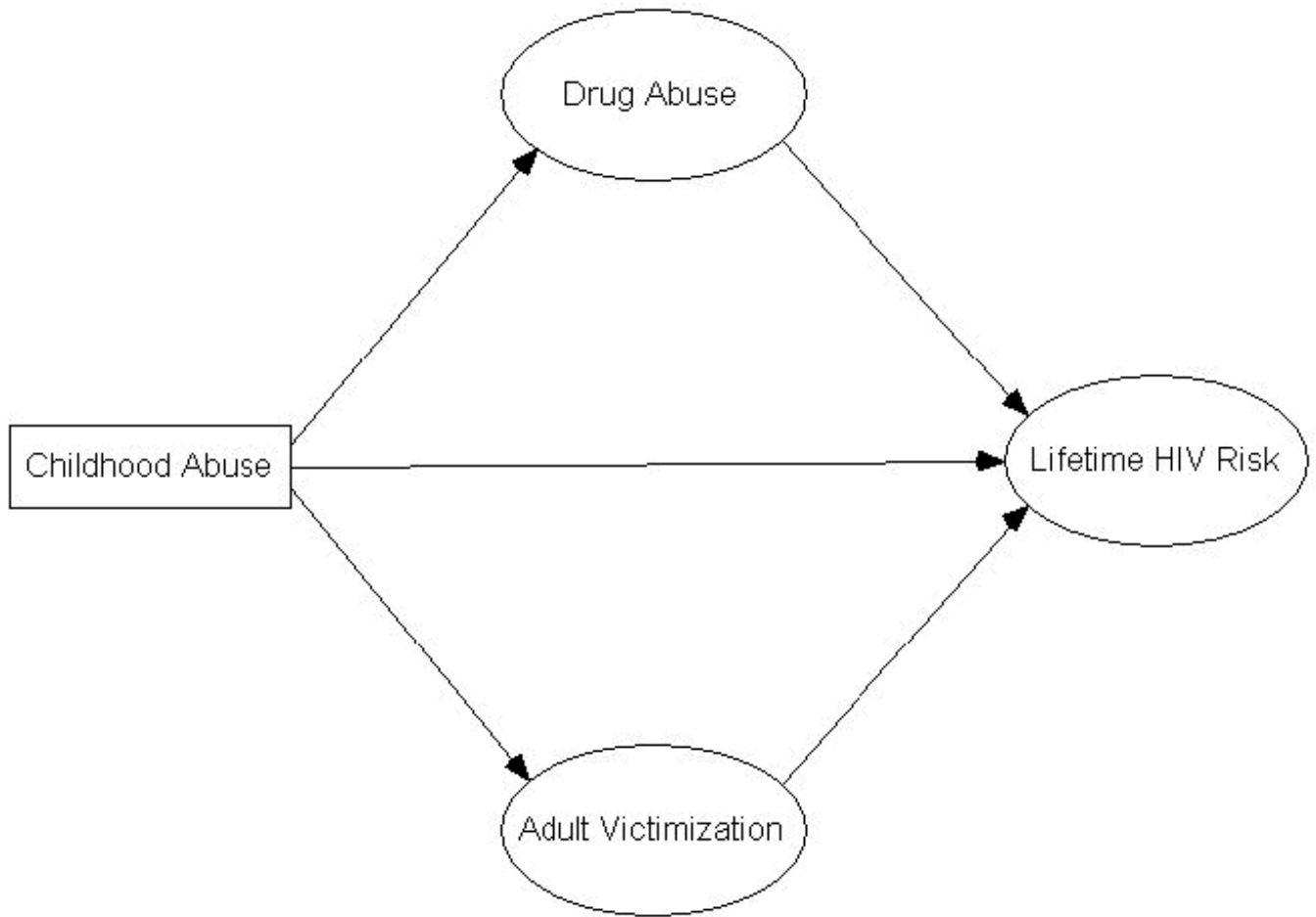
Figure I.
Hypothesized relationships between childhood abuse, drug abuse, adult victimization, and lifetime HIV risk
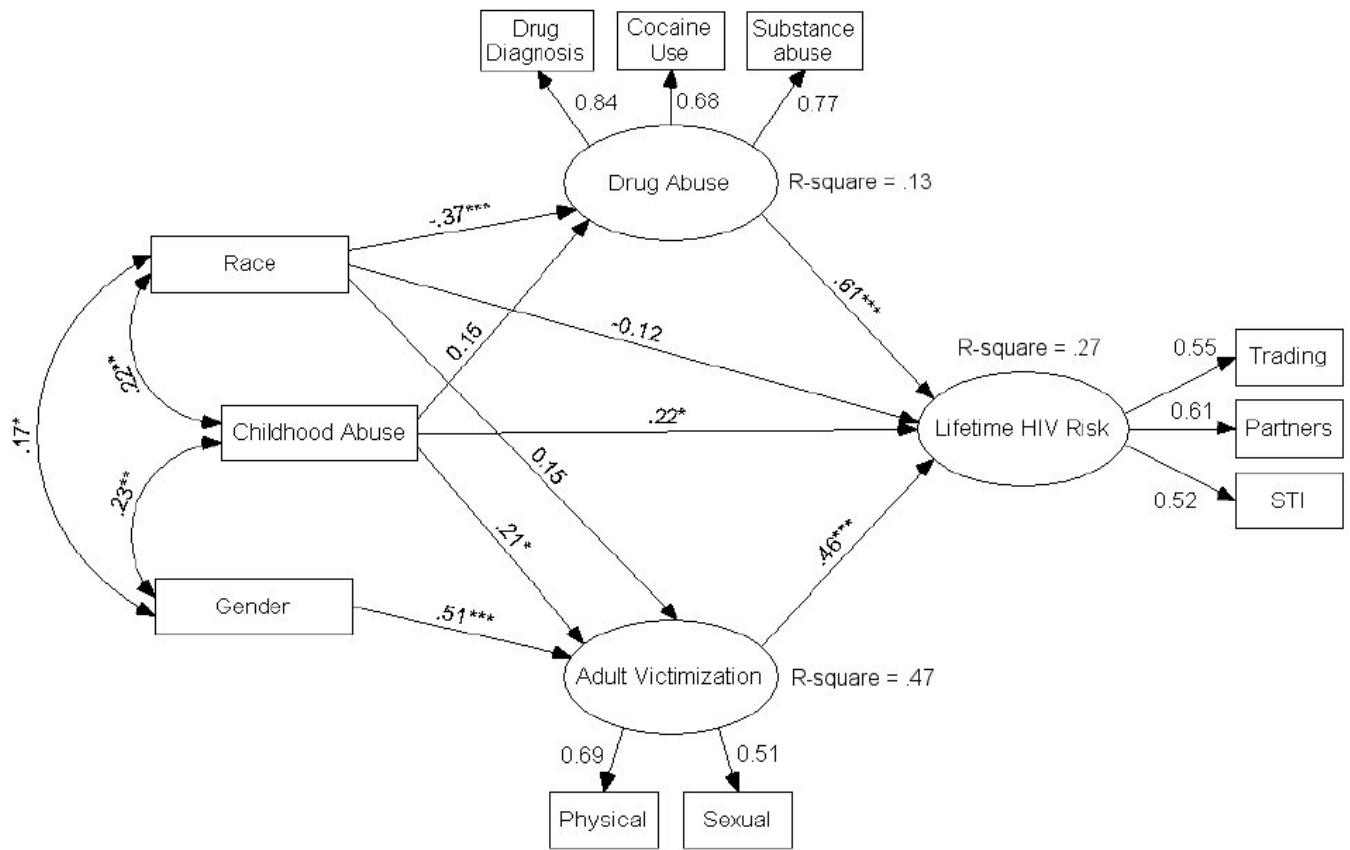
Figure II.
Structural equation model depicting paths and standardized estimates among childhood abuse, drug abuse, adult victimization, and HIV risk behavior (measurement error terms not shown).
$\chi^2(35) = 35.53$, $p = .44$; RMSEA = 0.00 (0.00 - .06); CFI = 1.00; NNFI = 1.00
*$p < .05$, **$p < .01$, ***$p < .001$

Table I

Description of childhood abuse experiences among adults with SMI

	Women	Men	Statistic	p-value
Sexual abuse	n = 44	n = 27		
Repeated abuse	73%	44%	$\chi^2(1)=5.34$	.021
Duration of abuse (yrs)	M = 6.02 ± 4.22	M = 3.28 ± 2.41	t(34)=2.50	.017
Perpetrator				
Family member	73%	37%	$\chi^2(1)=8.27$	.004
Other adult	22%	33%	$\chi^2(1)=1.10$	.295
Partner	7%	0%	$\chi^2(1)=1.51$	.220
Stranger	16%	19%	$\chi^2(1)=0.06$	.809
Peer	8%	26%	$\chi^2(1)=3.76$	.053
Multiple	24%	15%	$\chi^2(1)=0.87$	.350
Physical abuse	n = 43	n = 41		
Repeated abuse	79%	59%	$\chi^2(1)=3.72$	.054
Duration of abuse (yrs)	M = 6.41 ± 5.26	M = 8.93 ± 7.19	t(50)=1.46	.152
Perpetrator				
Family member	73%	63%	$\chi^2(1)=0.72$	.395
Other adult	0%	5%	$\chi^2(1)=1.65$	.198
Partner	15%	0%	$\chi^2(1)=6.66$	.010
Stranger	3%	15%	$\chi^2(1)=2.87$	.090
Peer	12%	24%	$\chi^2(1)=1.79$	.180
Multiple	26%	30%	$\chi^2(1)=0.72$	.788

Table II

Effect of childhood abuse on lifetime substance abuse, adult victimization, and HIV sexual risk

	Physical abuse only n = 35	Sexual abuse only n = 22	Physical and sexual abuse n = 49	No abuse n = 46	Overall differences	Planned contrasts	
						Physical only vs. sexual only	Any abuse vs. no abuse
Substance abuse							
Drug use disorder	29%	68%	57%	46%	$\chi^2 = 10.59^*$	$\chi^2 = 8.61^{**}$	$\chi^2 = 0.24$
Alcohol use disorder	40%	27%	39%	44%	$\chi^2 = 1.68$	$\chi^2 = 0.96$	$\chi^2 = 0.60$
Substance use problem	71%	82%	74%	70%	$\chi^2 = 1.19$	$\chi^2 = 0.79$	$\chi^2 = 0.40$
Cocaine use	54%	73%	59%	52%	$\chi^2 = 2.82$	$\chi^2 = 1.94$	$\chi^2 = 0.89$
Adult victimization							
Physical	46%	27%	59%	30%	$\chi^2 = 10.54^*$	$\chi^2 = 1.94$	$\chi^2 = 4.10^*$
Sexual	29%	18%	43%	9%	$\chi^2 = 15.34^{**}$	$\chi^2 = 0.79$	$\chi^2 = 9.95^{**}$
Lifetime HIV risk							
Sex trading	26%	46%	47%	17%	$\chi^2 = 11.78^{**}$	$\chi^2 = 2.37$	$\chi^2 = 7.18^{**}$
≥20 sex partners	37%	46%	47%	24%	$\chi^2 = 6.08^*$	$\chi^2 = 0.39$	$\chi^2 = 5.20^*$
Sexually transmitted infections	40%	50%	45%	17%	$\chi^2 = 10.69^*$	$\chi^2 = 0.55$	$\chi^2 = 10.09^{**}$

*
p < .05,

**
p < .01

Table III

Direct and indirect effects of childhood abuse on drug abuse, adult victimization, and HIV sexual risk

	Childhood Abuse		Drug abuse	Adult victimization	Female gender		White race	
	Direct	**Indirect**	**Direct**	**Direct**	**Direct**	**Indirect**	**Direct**	**Indirect**
Drug abuse	.15	--	--	--	--	--	-.37***	--
Adult victimization	.21*	--	--	--	.51***	--	.15	--
Lifetime HIV risk	.22*	.19*	.61***	.46***	--	.24*	.12	.15

*
p < .05,

**
p < .01,

***
p < .001