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The effects of early sexual abuse on adult risky sexual behaviors among persons with severe mental illness☆

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Abstract

Objective: There were two aims: first, to examine the relationship between prior sexual abuse and three types of adult risky sexual behaviors [(1) ever traded sex for drugs or money, (2) had unprotected sex in the past 6 months, and (3) frequency of unprotected sex in the past 6 months] among persons with severe mental illness (SMI), and second, to examine the potential mediating effects of adult rape, substance use, and PTSD.
Method: Using a pooled sample of individuals with SMI ($N = 609$), logistic and negative binomial regression analyses were used to investigate the impact of prior sexual abuse on these adult risky sexual behaviors.
Results: Childhood sexual abuse was associated with having ever traded sex for money and having engaged in unprotected sex in the past 6 months. However, childhood sexual abuse was inversely associated with the number of times males had unprotected sex in the past 6 months. Results differed between males and females and the impact of potential mediators also varied by gender and type of outcome studied.
Conclusion: These findings suggest a complex link between childhood sexual abuse and adult risky sexual behaviors in persons with SMI. Clinical assessments of child abuse sequelae should include a variety of indicators and parameters of adult risky sexual behavior, as persons with SMI are at an increased risk of engaging in

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high-risk sexual behaviors and tend to have a higher exposure to childhood sexual abuse than does the general population.

Keywords: Adult risky behavior; Sexual abuse; Mental illness

Introduction

Prior research has established a link between childhood sexual abuse and adult risky sexual behaviors. Recent studies suggest that adult rape and substance use may mediate this relationship (Miller, 1999; Morrill, Kasten, Urato, & Larson, 2001; Parillo, Freeman, Collier, & Young, 2001). Empirical and theoretical support for these links have been based mostly on research conducted with community-based samples (Parillo et al., 2001), undergraduates (Meston, Heiman, & Trapnell, 1999), and females (Freeman, Parillo, Collier, & Rusek, 2001; Miller, 1999).

Theoretically, childhood sexual abuse is hypothesized to impact subsequent risky sexual behavior via three pathways: (1) psychopathology, including PTSD, depression, and dissociation; (2) drug use; and (3) adverse sexual adjustment including an obsession with sexual activities, an inability to sustain intimate relationships, and participation in destructive sexual relationships (Paolucci, Genuis, & Violato, 2001). While there is face validity to these mechanisms, they are based mainly on research with women and community-based samples. This paper advances this research by examining the relationship between childhood sexual abuse and adult risky sexual behavior among persons with severe mental illness (SMI), a population at an increased risk of childhood sexual abuse, adult risky sexual behaviors, sexually transmitted diseases, substance misuse, and victimization in adulthood.

SMI is linked both with increased rates of HIV infection (Cournos & McKinnon, 1997; Rosenberg et al., 2001a) and increased exposure to childhood sexual abuse (McKinnon, Carey, & Cournos, 1997) compared to the general population. Epidemiologic estimates of adults with SMI vary between diagnoses and sampling strategies; however, the estimated 12-month prevalence of schizophrenia is between .5 and 1.1%; bipolar disorder is between 1.0 and 1.2%; and major depression is between 5.0 and 10.3% (Kessler et al., 1994; Robins et al., 1984). For persons with SMI, the estimated rates of HIV seroprevalence are estimated to be between 3.1 and 22.9% (Carey, Weinhardt, & Carey, 1995; Cournos & McKinnon, 1997; McKinnon & Cournos, 1998; Rosenberg et al., 2001a). These rates for persons with SMI represent significant increases in the level of risk when compared to the general public, which are less than .5% (McQuillan, Khare, Karon, Schable, & Vlahov, 1997).

Likewise, recent research indicates persons with SMI are at an increased risk of engaging in HIV high-risk behaviors. This finding breaks from a traditional belief that persons with SMI are less likely to engage in sexual activities because of multiple psychiatric hospitalizations, the need for continued medication maintenance, and increased social dysfunction (Cournos & McKinnon, 1997). Rates of risky sexual behavior, including multiple partners, high-risk partners, sex trading, and infrequent or no condom use also appear to be high in persons with SMI. Estimates of the frequency with which persons with SMI engage in sexual activities with multiple partners varies between 20 and 40%, which is slightly higher than estimates for the general public. Further, the rates appear to be similar for both males and females in persons with SMI (Carey, Carey, & Kalichman, 1997). Engaging in sexual activities with high-risk partners also appears to be prevalent in a large minority of persons with SMI. Specifically, 4–10% of

SMI persons report having had sex with a high-risk partner (someone who used injection drugs in the past 6–12 months). However, depending on the sampling strategy employed and the time frame utilized in the study, rates of this behavior have been as high as 31% (Carey et al., 1997). Sex trading, defined as exchanging sex for basic needs, including money, food, and shelter, ranges between 7 and 31% with females more likely than males to engage in this behavior (Butterfield et al., 2003; Carey et al., 1997). Finally, condom use appears to be sporadic with around 30% of persons with SMI reporting the use of condoms "always;" however, 25–50% of persons with SMI also report "never" using a condom during intercourse (Carey et al., 1997).

A history of childhood sexual abuse has been hypothesized as a key risk factor increasing the likelihood of adult risky sexual behaviors in persons with SMI. This proposed link has strong empirical support in non-clinical samples (Cunningham, Stiffman, Dore, & Earls, 1994; Kendall-Tackett, 2002; Paolucci et al., 2001); however, information regarding this phenomenon for persons with SMI is lacking (Goodman & Fallot, 1998; Goodman, Rosenberg, Mueser, & Drake, 1997; McKinnon et al., 1997; Rosenberg et al., 2001b). The relative dearth of studies examining antecedents and consequences of abuse and trauma in persons with SMI is surprising considering that a large proportion of this population has experienced some form of sexual trauma. Specifically, a recent study found that 26% of men and 64% of women had been sexually assaulted at some point during their lives (Mueser et al., 1998). Similarly high rates of physical abuse are also prevalent in persons with SMI (Swanson et al., 2002). Prior victimization, and more specifically, recent victimization (e.g., sexual and physical) has also been shown to impact the severity of psychiatric illness across a range of disorders (Goodman et al., 2001) and other relevant outcomes for persons with severe mental illness (Swanson et al., 2002).

In sum, persons with SMI have an increased likelihood of engaging in high-risk sexual behaviors and tend to have a higher exposure to childhood sexual abuse; however, the link between these two phenomena has not been empirically established in this population. The purpose of this paper is to examine the relationship between prior sexual abuse and three types of adult risky sexual behaviors among persons with SMI and to test the potential mediating effects of adult sexual assault, substance use, and PTSD.

Methods

Study design and sample characteristics

The data for this study were collected as part of a larger investigation of sexually transmitted disease and risk behaviors in persons with SMI in four states (Rosenberg et al., 2001a). Participants were adults with psychotic or major mood disorder who were receiving treatment through the public mental health systems of Connecticut, Maryland, New Hampshire, or North Carolina, or the Durham Veterans Affairs Medical Center (Durham VAMC) in North Carolina (all sites received approval from their respective Institutional Review Boards). Overall, approximately 87% of participants approached consented to participate in the assessments, with participation rates by site ranging from 72.3 to 93.2%. Assessments were conducted by experienced interviewers who received additional conjoint training on legal, ethical, and clinical issues regarding blood testing and pretest and post-test counseling. After informed consent was obtained, participants completed standardized interviews regarding sociodemographic characteristics, substance use, HIV risk behavior, history of STDs, health care, and other illness-related variables (Rosenberg et al., 2001a).

In New Hampshire, an inpatient sample ($n = 133$) was enrolled from consecutive admissions to the state psychiatric hospital, while outpatient subjects ($n = 145$) were selected randomly from a list of eligible clients in community support programs at two community mental health centers. The Maryland sample ($n = 135$) was randomly selected from a list of clients with schizophrenia or schizoaffective disorder receiving services from three community mental health centers in Baltimore. Participants from Connecticut ($n = 157$) were recruited from an ongoing study of community treatment for clients with SMI and substance use disorders in two urban mental health centers. North Carolina participants ($n = 192$) were subjects in an ongoing study of involuntary outpatient commitment in nine contiguous rural and urban counties. All were recruited originally during an involuntary psychiatric hospitalization. The North Carolina VA sample ($n = 184$) was enrolled from consecutive admissions to the psychiatric inpatient unit of the Durham VAMC. Thus, the sample was diverse in terms of clinical characteristics and history in addition to geographic region and metropolitan status. All persons met similar criteria for SMI in their respective states.

A combined total of 969 subjects provided data on victimization, sexual behavior, and the key demographic and clinical variables included in the present analysis. Of these subjects, those who had been institutionalized in the previous 6 months ($n = 203$) were excluded, as institutionalization would restrict sexual opportunities. Additionally, subjects who reported they were trying to become pregnant ($n = 86$) or who were married ($n = 71$) were excluded, for a total sample size of 609.

Following informed consent, respondents participated in a structured interview lasting about 60–90 min. Interviews were conducted between June of 1997 and December of 1998. Participants received pretest counseling for HIV/AIDS and provided blood and urine specimens (Rosenberg et al., 2001a). All participants were paid $35.00 for participating and were provided with test results, post-test counseling, and referrals for followup testing and treatment as needed.

Measures

Adult risky sexual behavior. For the present study, three HIV-risky adult sexual behaviors were examined via the AIDS Risk Inventory, a structured interview for assessing risk behaviors associated with acquiring and transmitting blood-borne infections (Chawarski & Baird, 1998; Chawarski, Pakes, & Schottenfeld, 1998). The inventory was modified for this study so that it would be easily understood by persons with severe mental illness (Rosenberg et al., 2001a). The three measures of adult risky sexual behavior were: (1) whether respondents had traded sex for drugs or money in their lifetimes, (2) whether they engaged in unprotected sex in the past 6 months, and (3) how many times they had engaged in unprotected sex in the past 6 months. References to unprotected sex for all outcome measures referred to any vaginal, anal, or oral sex.

Sexual abuse. A measure of early sexual abuse involving penetration was analyzed as a potential correlate of adult risky sexual behavior. Respondents were asked if anyone made them have sexual intercourse, anal sex, or oral sex prior to age 16. Answering in the affirmative to any of the three questions served as an indication of childhood sexual abuse.

Adult sexual assault/rape. This was assessed via the following two questions: (1) has anyone used force to make you have oral or anal since you turned 16 or (2) has anyone used force for vaginal sex since you turned 16?

Substance abuse. This was assessed with the Dartmouth Assessment of Lifestyle Instrument (DALI), specifically designed to identify substance use disorders in subjects with SMI (Rosenberg et al., 1998). This measure has high classification accuracy for current abuse of alcohol, cannabis, and cocaine among patients with severe mental illness (Rosenberg et al., 2001a, 2003).

PTSD. This was assessed using the PTSD Checklist-Civilian Version (PCL-C for DSM-IV), which was developed by the National Center for PTSD (Blanchard, Jones-Alexander, Buckley, & Forneris, 1996).

Psychiatric diagnosis. This was obtained from chart review and available clinical data for 80.7% ($n = 782$) of respondents, while diagnoses for the remaining 187 respondents (19.3%) were based on the Structured Clinical Interview for DSM-IV (SCID) (First, Spitzer, Gibbon, & Williams, 1996). Researchers at four of the sites assessed the validity of chart diagnoses by administering the SCID and found high concordance rates (Rosenberg et al., 2001a, 2003).

Demographic and social-environmental variables. Regression models controlled for several personal and social background characteristics including: gender, racial status (African-American vs. White/other), employment, and recent homelessness. In addition, subjects' degree of exposure to violence in their surrounding social environment was measured using the Community Exposure to Violence Instrument (Gaba, 1997). This instrument assessed whether the respondent experienced or witnessed any traumatic or violent events, during the past year, such as seeing someone being physically attacked, being mugged, or hearing gunfire. Prior psychometric properties of this scale demonstrate high internal consistency and reliability (Gaba, 1997). Covariates assessing recent homelessness and recent exposure to community violence (both referring to the past 6 months) were excluded from the model predicting the occurrence of *lifetime* trading sex for drugs or money.

Weighting

Data were pooled across the five study sites to obtain a sufficiently large sample to allow meaningful comparisons. As such, the samples were not randomly selected from a population of persons with SMI. The sites differed markedly from each other and from national estimates on the distributions of some variables that could be associated with risky sexual behavior. To adjust for this lack of independence, each of the five samples was weighted to match distributions on age and the prevalence of substance abuse in a nationally representative probability sample of the population of treated individuals with SMI. Specifically, population distributions were estimated using data from the NIMH National Comorbidity Study (NCS) (Kessler et al., 1994) for subjects identified with psychotic or major mood disorder who reported being hospitalized and/or using specialty mental health services within the past 6 months. Thus, prior to pooling the data, each of the five sites was individually weighted to the NCS subsample of treated SMI individuals.

In addition to the weighting, the Huber–White sandwich estimator of variance to account for the clustering of observations within sites was used (Huber, 1967; White, 1982). Weighted and clustered samples have larger variances than would occur with simple random sampling. Therefore, without adjusting for this, the precision of parameter estimates can be exaggerated and differences can appear statistically significant when they are not (Leaf, Myers, & McEvoy, 1991). Thus, all analyses used weights and a robust variance estimator to account for design effects. All analyses were conducted using Stata 8.2 (StataCorp, 2003).

Methods of analysis

The present study employed various analytic strategies in order to explore the three outcomes of interest. First, bivariate associations for the weighted data by gender and sexual abuse were assessed by Pearson χ^2 statistics converted to F statistics with noninteger degrees of freedom using second-order Rao and Scott (Rao & Scott, 1982, 1984) corrections to adjust for the weighted, clustered sampling design (StataCorp, 2003). For the binary outcomes, logistic models were estimated and for the count outcome, a negative binomial model was estimated due to overdispersion of the data. The negative binomial model is similar to the Poisson model, but is used in cases of overdispersed count data (Hardin & Hilbe, 2001). We examined both deviance statistics from a Poisson model and alpha parameters from the negative binomial model to confirm that the negative binomial model was indeed the best fitting model. In the case of the count dependent variable, the negative binomial model was a better fit than the Poisson model. The negative binomial model only includes those subjects who participated in the behavior (e.g., zeros were excluded). Each model was run first on the entire sample, and then we checked for differential effects of sexual abuse by gender. If a significant relationship was found between childhood sexual abuse and any risky sexual behavior, mediating effects among the group for whom it was significant were tested (e.g., total sample, women only, or men only). We present McFadden's R^2, the log likelihood and the Akaike Information Criterion (AIC) as measures of goodness of fit for the logistic models and the alpha parameter for the negative binomial model.

Table 1
Weighted distributions of variables included in the analysis, total, and by sex

Variables	Total (n = 609)	Females (n = 224)	Males (n = 385)	Sexually abused (n = 108)
Male	65.0			46.0**
Black	47.5	47.4	47.6	25.9**
Education				
<HS	35.7	31.4	38.0	36.4
HS	32.4	29.8	33.8	29.7
Some college	31.9	38.7	28.3	34.0
Urban	39.9	37.1	41.4	26.6**
Homeless past 6 months	15.4	9.8*	18.4	16.1
Psychotic diagnosis	70.0	63.5*	73.5	56.4**
Employed	21.4	22.8	20.6	30.7*
Community violence	59.8	48.6**	65.9	67.0
Any child sexual abuse	17.7	28.4**	13.2	
Adult rape	17.0	36.8**	6.7	36.8**
Substance use	29.9	20.3**	35.0	40.1*
PTSD	36.1	33.9	37.3	54.0**
Any unprotected sex, past 6 months	33.8	38.3	31.4	43.4
Ever traded sex for drugs or money	19.7	25.8*	16.5	32.0**
Number times unproteced sex, past 6 months	8.2 (1.9)	7.7 (2.3)	8.4 (2.7)	8.3 (4.0)

* Statistical significance: $p < .05$.
** Statistical significance: $p < .01$.

Results

Table 1 displays descriptive statistics for all variables included in the analyses, as well as bivariate statistics on gender and childhood sexual abuse. Approximately, 18% of the total sample reported childhood sexual abuse involving penetration prior to age 16 and 17% reported sexual assault or rape during adulthood. One-third of the sample reported having unprotected sex at some point during the previous 6 months. Subjects had unprotected sex an average of 8.2 times in the previous 6 months. Almost 20% traded sex for drugs or money at some point in their lifetime. Females were significantly more likely to report childhood sexual abuse and adult sexual assault, and to have ever traded sex for money or drugs than were males. Also, females were less likely to be homeless in the previous 6 months, to have a diagnosed psychotic disorder, to have a substance use disorder, and to have experienced community violence than were males. Those who reported childhood sexual abuse were more likely to be female, White, reside in rural settings, and were less likely to have a psychotic diagnosis, compared to the full sample. Sexually abused respondents were also more likely to report adult sexual assault, PTSD, substance abuse, and ever having traded sex for drugs or money in their lifetime, again, compared to the total sample.

Table 2
Logistic Model: any unprotected sex in past 6 months

	Any unprotected sex in past 6 months							
	Total ($n = 586$)		Females ($n = 214$)		Males ($n = 372$)		Females ($n = 214$)	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Independent variables								
Male	.79	.34–1.85						
Black	1.25	.82–1.91	1.32	.59–2.96	1.32	.63–2.77	1.74	.75–4.05
Education								
HS	.88	.56–1.30	.77	.36–1.62	.98	.73–1.30	.61	.35–1.06
Some college	.96	.41–2.28	.55	.14–2.16	1.10	.58–2.07	.51	.14–1.79
Urban	.50	.26–.99*	.64	.23–1.81	.46	.20–1.06†	.77	.29–2.07
Homeless	1.14	.42–3.07	.81	.24–2.79	1.12	.42–2.96	.90	.28–2.86
Psychotic diagnosis	.44	.30–.64***	.64	.46–.89**	.30	.16–.57***	.59	.45–.76***
Employed	1.14	.72–1.81	2.80	1.53–5.11**	.68	.34–1.34	3.49	1.53–7.94**
Community violence	1.34	.94–1.93†	.73	.44–1.20	2.23	1.06–4.69*	.52	.22–1.22
Child sexual abuse	1.20	.75–1.92	1.65	1.08–2.54*	1.08	.56–2.07	1.46	.85–2.50
Adult rape							1.17	.85–1.61
Substance use							1.56	.57–4.24
PTSD							2.74	1.07–7.03*
Model Fit Statistics								
McFadden's R^2	.065		.066		.108		.106	
Log likelihood	−351.369		−133.159		−207.326		−127.504	
AIC	1.24		1.338		1.168		1.313	

† Statistical significance: $p < .10$.
* Statistical significance: $p < .05$.
** Statistical significance: $p < .01$.
*** Statistical significance: $p < .001$.

Unprotected sex in the previous 6 months

The first logistic model (Table 2) showed that in the total sample, subjects living in urban settings (OR = .50, $p < .05$) and those with psychotic diagnoses (OR = .44, $p < .001$) were less likely to report having any unprotected sex in the previous 6 months. Stratifying by gender shows that employed females were more likely than unemployed females (OR = 2.80, $p < .001$), and females who reported childhood sexual abuse (OR = 1.65, $p < .05$) were more likely than those who did not report such abuse to have had unprotected sex in the previous 6 months. Adult sexual assault/rape and substance abuse did not mediate the relationship between childhood sexual abuse and unprotected sex among females; however, PTSD (OR = 2.74, $p < .05$) did appear to mediate the relationship (child sex abuse OR = 1.46, $p = .17$). For males, the impact of childhood sexual abuse was not significantly associated with engaging in unprotected sex in the past 6 months.

Table 3
Logistic Model: any sex for drugs or money in lifetime

	Any sex for drugs or money in lifetime							
	Total ($n = 598$)		Females ($n = 220$)		Males ($n = 378$)		Males ($n = 379$)	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Independent variables								
Male	.60	.32–1.15						
Black	1.24	.72–2.14	.82	.21–3.25	1.89	1.06–3.37*	1.67	1.00–2.80*
Education								
HS	.66	.39–1.12	1.15	.34–3.86	.43	.29–0.63***	.38	.24–.63***
Some college	.85	.59–1.22	0.61	.18–2.12	1.14	.76–1.70	1.07	.72–1.59
Urban	1.52	1.14–2.04**	3.55	1.35–9.30**	1.04	.83–1.30	1.29	.79–2.11
Homeless								
Psychotic diagnosis	1.48	.96–2.26†	.90	.34–2.37	2.21	1.20–4.05**	2.69	1.45–5.00**
Employed	.97	.75–1.26	1.41	.37–5.43	.81	.27–2.43	1.28	.39–4.18
Community violence								
Child sexual abuse	2.38	1.67–3.39***	1.80	.85–3.82	3.15	1.50–6.62**	2.20	1.29–3.75**
Adult rape							3.43	.68–17.20
Substance use							1.01	.77–1.31
PTSD							2.70	1.67–4.39***
Model Fit Statistics								
McFadden's R^2	.051		.060		.077		.128	
Log likelihood	−282.235		−116.883		−158.138		−149.278	
AIC	.977		1.144		.884		.853	

† Statistical significance: $p < .10$.
* Statistical significance: $p < .05$.
** Statistical significance: $p < .01$.
*** Statistical significance: $p < .001$.

Ever trade sex for drugs or money

In the second logistic model (Table 3), those who lived in urban settings were more likely to report ever having traded sex for drugs or money (OR 1.52, $p < .01$), as were those who reported childhood sexual abuse (OR = 2.38, $p < .001$). Stratifying by gender showed that females who lived in urban settings were more likely than their nonurban counterparts to report having traded sex for drugs or money (OR = 3.55, $p < .01$), as were Black males (OR = 1.89, $p < .05$), males with a psychotic diagnosis (OR = 2.21, $p < .01$), and males who reported a history of childhood sexual abuse (OR = 3.15, $p < .01$). Males with a high school education were less likely than males with less than a high school education to report ever having traded sex for drugs or money (OR = .38, $p < .001$). For the male sample, PTSD was positively associated with ever having traded sex for drugs or money (OR 2.70, $p < .001$) and reduced the odds ratio of child sexual abuse from 3.15 to 2.20, although child sexual abuse remained significant. For females, the impact of childhood sexual abuse was not significantly associated with ever trading sex for drugs or money.

Table 4
Negative Binomial Model: number of times unprotected sex past 6 months

	Number of times unprotected sex past 6 months IRR (Robust *SE*)							
	Total ($n = 198$)		Females ($n = 76$)		Males ($n = 122$)		Males ($n = 122$)	
	OR	95% CI	OR	95% CI	OR	95% CI	IR	95% CI
Independent variables								
Male	.90	.67–1.21						
Black	.59	.39–.88*	1.21	.72–2.02	.48	.19–1.20	.76	.27–2.14
Education								
HS	1.47	.76–2.86	1.11	.41–3.01	1.33	.46–3.78	1.21	.55–2.64
Some college	1.11	.60–2.05	0.58	.31–1.08†	1.38	.71–2.68	1.41	.82–2.42
Urban	.51	.32–.80**	0.41	.37–.47***	.44	.29–.67***	.36	.20–.64***
Homeless past 6 months	1.41	.61–3.26	0.19	.04–.91*	1.54	.89–2.66	1.39	.86–2.25
Psychotic diagnosis	.80	.58–1.11	0.73	.53–1.02†	1.26	.72–2.20	1.90	1.24–2.93**
Employed	1.37	.70–2.68	2.87	2.03–4.06***	1.26	.51–3.16	1.46	.56–3.83
Community violence	1.69	1.01–2.81*	1.18	.55–2.53	1.53	.74–3.17	.99	.39–2.52
Any child sexual abuse	.62	.37–1.04†	1.00	.70–1.41	.23	.16–.31***	.20	.13–.29***
Adult rape							.26	.16–.44***
Substance use							2.86	1.15–7.12*
PTSD							1.27	.57–2.82
Model Fit Statistics								
/ln alpha	.54	.30–.79	.34	−.06–.75	.52	.22–.82	.43	.22–.64
alpha	1.72	1.34–2.21	1.41	1.24–1.90	1.68	1.24–2.27	1.54	1.24–1.90

† Statistical significance: $p < .10$.
* Statistical significance: $p < .05$.
** Statistical significance: $p < .01$.
*** Statistical significance: $p < .001$.

Number of times had unprotected sex in the past 6 months

The negative binomial model (Table 4) showed that Black subjects (OR = .59, $p < .05$) and those living in an urban setting (OR = .51, $p < .01$) had unprotected sex fewer times compared to others, and those exposed to community violence reported a greater frequency of unprotected sex (OR = 1.69, $p < .05$). Stratifying by gender revealed that females who reported being homeless at some point during the 6 months prior to the interview had unprotected sex fewer times than females who did not report being homeless during the same 6 months (OR = .19, $p < .05$); the same was true for those living in urban areas (OR = .41, $p < .001$). Women who were employed were at higher risk of increased frequency of unprotected sex (OR = 2.87, $p < .001$) as compared to those who were unemployed.

Males who reported a history of childhood sexual abuse (OR = .23, $p < .001$) had unprotected sex fewer times in the previous 6 months than males who did not report such abuse. The finding for urban living among males was the same as that for females. In the mediating model, adult sexual assault was associated with fewer incidents of unprotected sex in the past 6 months (OR = .26, $p < .001$) among males, while substance use (OR = 2.86, $p < .05$) was associated with an increased frequency of unprotected sex. Neither variable mediated the impact of child sexual abuse on the number of times engaged in unprotected sex in the past 6 months among males. Finally, for females, the impact of childhood sexual abuse was not significantly associated with the frequency of unprotected sex in the past 6 months.

Discussion

The current study examined the relationship between childhood sexual abuse and adult high-risk sexual behaviors in persons with SMI. Previous research with community-based samples has indicated that childhood sexual abuse is associated with increased engagement in risky sexual behaviors during adulthood (Cunningham et al., 1994) and that both substance abuse and adult rape/sexual assault may be mechanisms through which childhood sexual abuse translates into adult risky sexual behavior (Parillo et al., 2001). The current findings indicate a relationship between childhood sexual abuse and adult risky sexual behaviors among persons with SMI, although the relationship is complex and appears to vary by gender and type of high-risk sexual behavior studied. Further, the mediating effect of PTSD, adult rape, and substance abuse also vary by gender and type of outcome studied.

For two of the behaviors examined in the current study (logistic models of engagement in any unprotected sex in the past 6 months and lifetime sex trading), child sexual abuse was associated with adult risky sexual behavior in the expected direction. That is, a history of child sexual abuse was related to higher rates of unprotected sex in the past 6 months for females and to higher rates of lifetime sex trading for males. Both of these relationships were partially mediated by PTSD. Further, the relationship between childhood sexual abuse and lifetime trading sex for drugs or money for the full sample was partially mediated by PTSD, adult rape, and substance use (results not shown but available upon request). Support for the mediating role of these factors is consistent with findings that sequelae of child sexual abuse in community and nonclinical samples frequently includes revictimization, increased use of substances, and higher levels of psychiatric symptomatology (Roberts, O'Conner, Dunn, Golding, & Team, 2004).

However, as shown in Table 4, childhood sexual abuse was *negatively* related to the number of times that males had unprotected sex in past 6 months. This finding diverges from what might be expected, and what has been found in community-based samples (although the majority of this work has been

conducted with predominantly female samples), where childhood sexual abuse traditionally has been associated with increased, rather than decreased, risk (Cunningham et al., 1994). When examining the number of times engaging in unprotected sex during the past 6 months for males, there was a significant main effect for substance abuse; however, it did not have a mediating effect.

There may be a couple of reasons that our results deviate from what was expected regarding the analysis of the count outcome (number of times unprotected sex in past 6 months). First, prior research studying these or similar variables has used a standard linear regression to assess this relationship (Parillo et al., 2001). However, it is highly unlikely that the number of times engaging in unprotected sex, or other high-risk sexual behaviors, in any time period is in fact normally distributed; therefore, analysis with linear models, as has been used in prior research is suspect at best. Second, the analysis of the count variable was based on a relatively small number of events, and therefore, should be re-examined with a larger sample. Next, it is possible that the respondents, when asked about the frequency of sex-related outcomes in the past 6 months, demonstrated unreliability in their responses. However, this conclusion seems tenuous at best, as other responses from these data that can be confirmed with collateral information appear reliable. Also, as was mentioned previously, the significant and negative relationship between childhood sexual abuse and the number of times one engaged in unprotected sex in the past 6 months was only present for males (nonsignificant finding for females). Prior research on the effects of childhood sexual abuse for males has been lacking, not only in psychiatric samples, but also in community-based samples. Finally, prior relationships between child sexual abuse and subsequent risky sexual behaviors and their potential mediating effects have largely been established in samples other than persons with SMI. Consequently, this paper presents novel findings for a population that is at increased risk of HIV and other STDs.

The findings presented here indicate that although childhood sexual abuse is associated with *whether or not* a person with SMI has either engaged in unprotected sex in the past 6 months (females) or has traded sex for money in their lives (full sample and males), it shows a statistically significant inverse relationship with how many times males had unprotected sex in the past 6 months. The current data add to the extant research (Goodman & Fallot, 1998; Goodman et al., 1997; Rosenberg et al., 2001b) by presenting a complex picture of the relationship between childhood sexual abuse and adult risky sexual behavior in persons with SMI. Specifically, these findings imply that, for persons with SMI, childhood sexual abuse serves as a threshold for engaging in risky sexual behavior as an adult. However, more research is warranted regarding what factors influence the frequency with which persons with SMI engage in risky sexual behaviors; this research should also continue to explore differences between males and females in the risk for engaging in risky sexual behaviors as these data do show apparent gender differences, not only in outcomes but also in the putative predictors and impacts of the mediating variables.

People with SMI are more likely to engage in substance abusing behaviors compared to the rest of the population (Goodman et al., 2001), oftentimes in efforts to "self-medicate" rather than take psychotropic medications (Swartz et al., 1998). Further, epidemiologic studies show higher levels of PTSD among people with SMI (Butterfield et al., 2003; Carey et al., 1997). In combination, one could infer that persons with SMI may be at risk of having an especially high incentive to trade sex for drugs, and even more so for those who exhibit symptoms of PTSD. Indeed, PTSD, had a significant mediating effect on trading sex for drugs (for males and the total sample) suggesting the possibility of the following pattern: a person with SMI being at increased likelihood of trading sex for drugs in order to get drugs to alleviate PTSD symptoms but in the process placing themselves at risk to be sexually assaulted or raped as an

adult, which, in turn, likely exacerbates PTSD symptoms and contributes to the further need for drugs, thus perpetuating a dangerous cycle. One potential gateway for initiation of this pattern appears to be childhood sexual abuse.

It is important to note that the overall effect of mental disorder on the relationship between childhood sexual abuse and subsequent adult risky sexual behavior per se cannot be examined using these data, since all the respondents had a serious mental illness and no comparison group was included without mental illness. The sample, thus, had a restricted range of variability in clinically relevant risk factors—such as symptoms and functional impairment—which might, in a general community sample, have shown a significant association with likelihood of increased risky sexual behaviors. The selection of a SMI sample may also have attenuated the effects of demographic variables (e.g., lower SES) known to increase risky sexual behavior in the general population. Moreover, the pooled samples used in these analyses were not randomly selected from a common population, and only apply to individuals in treatment for a major mental disorder. In addition, the survey relied on retrospective self-report data to obtain sensitive personal information about events that may have occurred long in the past. Undoubtedly, there is some error in these measures, notwithstanding that the validity and reliability of the component instruments has been reasonably demonstrated in previous studies of comparable populations (Goodman et al., 1999). A final limitation is that there was no examination of variations in treatment receipt, type, or intensity. It is thus impossible to say, from our data, whether mental health interventions or contact with service providers might lower adult risky behaviors in these subjects.

The findings presented here are useful, however, in elucidating the interrelationship between child sexual abuse and adult risky sexual behaviors in persons with SMI. Further, these findings indicate that this relationship must be considered in light of the kind of adult risky sexual behavior examined, with a particular emphasis on making a distinction between the *occurrence versus* the *quantity* of adult risky sexual behavior. In clinical settings, persons with SMI who also endorse a history of childhood sexual abuse should still raise concern regarding the potential for the client to engage in adult risky behavior, even if the extent of that behavior appears to be unrelated to childhood sexual abuse history. By the same token, effective interventions for such individuals must be comprehensive, addressing multiple problems including underlying psychopathology, addiction, trauma sequelae, and need for community support. In the end, future research is needed to clarify further how clinicians can adequately assess risk for sexual behaviors that increase the likelihood of risky sexual behaviors among patients with SMI. Ultimately, the results suggest that once more is understood about the factors underlying adult risky sex in both males and females with SMI, clinicians can better detect risk and target interventions to reduce the chances that their patients engage in potentially harmful behaviors that adversely affect mental health outcomes, and most importantly, the quality of their lives.

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Résumé

French-language abstract not available at time of publication.

Resumen

Spanish-language abstract not available at time of publication.