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Severely Mentally Ill Women's HIV Risk: The Influence of Social Support, Substance Use, and Contextual Risk Factors

Mary E. Randolph, Ph.D.[1], **Steven D. Pinkerton, Ph.D.**[1], **Anton M. Somlai, Ed.D.**[1], **Jeffrey A. Kelly, Ph.D.**[1], **Timothy L. McAuliffe, Ph.D.**[1], **Richard H. Gibson, M.D.**[2], and **Kristin Hackl, M.S.W.**[1]

1 *Center for AIDS Intervention Research, Department of Psychiatry & Behavioural Medicine, Medical College of Wisconsin, Milwaukee, WI 53202, USA*

2 *Zablocki Veterans Affairs Medical Center, Milwaukee, WI USA*

Abstract

In structured interviews with 96 women with severe mental illness, nearly two-thirds had not used condoms during sexual intercourse in the past 3 months, more than two-thirds had sex with multiple partners, and almost one-third had been treated for a sexually transmitted infection (STI) in the past year. Women who reported fewer sexual risk context factors, such as having sex with someone the participant did not know or transactional sex, had fewer sexual partners. Larger social support networks were associated with less frequent sex after drug use. In turn, women who less often had sex after using drugs had unprotected intercourse less frequently.

Keywords

sexual risk behavior; HIV/AIDS; serious mental illness; women's health

INTRODUCTION

The vulnerability of women with severe and persistent mental illness to HIV infection far exceeds that of women in the general U.S. population (Cournos, Herman, Kaplan, & McKinnon, 1997; Rosenberg et al., 2001). HIV seroprevalence rates for persons with severe mental illness such as schizophrenia and major affective disorders range from 3% to 23% across a variety of settings and subgroups (Meade & Sikkema, 2005), and from 5.3% to 20% for women with severe mental illness in particular (Cournos & McKinnon, 1997). HIV risk among severely mentally ill women is driven by high rates of sexual risk behaviors, such as having multiple sex partners (Kalichman, Kelly, Johnson, & Bulto, 1994; Kelly et al., 1992, 1995; Otto-Salaj, Heckman, Stevenson, & Kelly, 1998) and inconsistent condom use (Kalichman, Malow, Devieux, Stein, & Piedman, 2005; Kelly et al., 1992, 1995; Otto-Salaj et al., 1998; Weinhardt, Carey, & Carey, 1998). These risk behaviors are exacerbated by high rates of alcohol and drug use (Carey et al., 2004b; Essock et al., 2003; McKinnon, Cournos, & Herman, 2001) and by contextual factors that increase HIV risk, such as "transactional sex" (having sex for money, goods, or a place to stay) and having sex with strangers (Kalichman et al., 1994; Kelly et al., 1992; Weinhardt et al., 1998). In contrast, social support may be a protective factor against sexual risk behavior for severely mentally ill women as it has been shown to be among men who have sex with men, drug users, and heterosexual college students (Catania et al.,

Address correspondence to Mary E. Randolph, Ph.D., Center for AIDS Intervention Research, Department of Psychiatry & Behavioral Medicine, Medical College of Wisconsin, Milwaukee, WI 53202, USA, e-mail: mrandolp@mcw.edu.

1991; Ekstrand & Coates, 1990; Latkin, Forman, Knowlton, & Sherman, 2003; Montoya, 1998).

Substance Use and Sexual Risk Behavior

Several previous studies have found that comorbid alcohol or drug use disorders among adults with severe mental illness are associated with greater frequency of unprotected vaginal intercourse (Carey et al., 2004b), and increase the likelihood of having a history of sexually transmitted infections (STI; Carey et al., 2004b; McKinnon, Cournos, & Herman, 2001) as well as HIV and hepatitis C infection (Essock et al., 2003). Moreover, global indicators of alcohol or substance use (e.g., any substance use or frequency of substance use) are positively correlated with HIV risk behaviors such as engaging in unprotected intercourse and having multiple sex partners (Carey, Carey, Maisto, Gordon, & Vanable, 2001; Kalichman et al., 1994; Otto-Salaj et al., 1998). However, when alcohol use is measured at the event level (e.g., before engaging in intercourse), alcohol use is not necessarily related to condom use during vaginal or anal intercourse among adults with severe mental illness (Weinhardt, Carey, Carey, Maisto, & Gordon, 2001).

Contextual Sexual Risk Factors

The importance of contextual sexual risk factors has been highlighted by Weinhardt et al. (1998), who surveyed women with severe and persistent mental illness recruited from outpatient clinics and day-treatment programs at a state psychiatric hospital. Consistent condom use was rare and 15% of the women reported 2 or more sexual partners in the past 2 months. Other risk behaviors were contextual in that they occurred in situations in which sexual risk was likely. These sexual risk indicators included transactional sex, having sexual partners who were suspected to be having sex with someone else or injecting drugs, having sexual partners who participants met at a bar, clinic, or mental health program, injection drug use, sex after excessive drinking or drug use, and forced sex. Thirty-eight percent of participants reported at least one HlV-risk indicator. These women were more likely to have histories of alcohol and drug treatment and sexually transmitted infections than were women with no risk indicators.

Social Support

Research on the relationship between social networks, social support, and HIV risk in diverse populations has found that larger support networks and higher levels of support are associated with safer sexual behaviors or behavioral intentions among men who have sex with men (Catania et al., 1991; Ekstrand & Coates, 1990), college students (Basen-Engquist, 1992), and injection drug users (Latkin, Forman, Knowlton, & Sherman, 2003; Montoya, 1998), Moreover, a recent review of HIV prevention interventions to reduce sexual risk behavior among drug users found that interventions that included a social support enhancement component were among the most effective (Van Empelen et al., 2003). Social support from network members may be particularly important for people with severe mental illness (Lam & Rosenheck, 2000), though there is little research on the role of social support or social networks in severely mentally ill people's HIV risk behavior. In longitudinal research involving homeless individuals with mental illness, greater social support (as measured by the size of social networks and perceived availability of resources from social network members) was associated with increased likelihood of being tested for HIV and returning for test results (Desai & Rosenheck, 2004) and was the strongest positive predictor of quality of life (Lam & Rosenheck, 2000). However, perceived support for participants' own condom use by important social network members is not necessarily associated with greater condom use among persons with severe mental illness (Carey, Carey, & Kalichman, 1997).

To help clarify the independent influences of alcohol and substance use, contextual risk factors, and social support on the sexual risk behaviors of women with severe mental illness, we interviewed 98 sexually-active women recruited from community support programs. We assessed three indicators of sexual risk: number of sex partners, frequency of unprotected intercourse, and recent treatment for a sexually-transmitted infection. Based on previous studies, we expected that greater substance use and a larger number of contextual risk indicators would be associated with greater frequency of unprotected intercourse and a larger number of sexual partners, whereas larger social support networks would demonstrate a protective effect on these outcome variables.

METHOD

Procedure

The data reported here were collected to establish baseline risk characteristics among participants in an HIV prevention intervention study. The study was conducted in 2003 and 2004 at five community support program clinics that serve seriously mentally ill adults who live in the community but require and receive ongoing mental health services. The study clinics provide mental health outpatient and outreach services to a primarily severely mentally ill, young, unmarried, and racially diverse urban population hi Milwaukee, Wisconsin.

Women were informed about the study through flyers and posters at the clinics and by personal recruitment in clinic waiting rooms. Women were eligible to participate in the study if they were 18 years of age or older; had a history of severe mental illness (schizophrenia spectrum disorder or major chronic affective disorder); received mental health services at one of the mental health community clinics; resided in the community rather than in an institutional setting; reported unprotected vaginal or anal intercourse in the past 90 days; and had one of the following over the past 90 days: (a) sex with a new sexual partner, (b) more than one sexual partner, (c) a sexually transmitted infection (STI), (d) a sexual partner they knew also had other sexual partners, or (e) sex with an injection drug user or a person infected with HTV, About 60% of all women approached agreed to participate, and approximately 60% of those met the study's entry criteria. Lack of interest and time constraints were the most common reasons women declined to participate in the study. Participants were individually and privately interviewed by project staff and received an incentive of $10 for completing the assessment.

Participants

Of the 98 women who completed the assessment measures, 54.1% were African-American, 36.7% were white, and 9.2% were members of other racial or ethnic groups. The women had a mean age of 43,79 (*SD* = 8.50, Range 19–63) and had an average of 2.01 children (*SD* = 1.84). The majority had completed high school (52%). Most women (69.79%) reported annual household incomes of less that $12,000 and 79.6% were unemployed. The vast majority of women were single and 43.9% of the women reported that they were neither married nor dating. Of the women who were currently in a relationship, 13.2% reported that they were married, 27.6% reported dating only 1 person, and 21.4 reported dating more than 1 person. Participants were primarily, though not exclusively heterosexual, with 14.3% of participants reporting that they were bisexual or gay. The vast majority of participants had been tested for HIV (89,6%) and most (80.2%) had been tested more than once. Of those who had received the results of their tests and knew their HIV status (*n* = 73), only 1 (1.4%) was HIV-positive. Despite the sexual behavior inclusion criteria (see below), when assessed in detail, 2 women reported no vaginal or anal intercourse with a male partner in the previous 3 months and therefore were excluded from the present study. The final sample consisted of 96 sexually-active women.

Measures

In addition to background/demographic variables, this study assessed characteristics in several domains: (1) sexual risk behavior; (2) STI treatment; (3) substance use; (4) contextual sexual risk factors; (5) social support network characteristics; and (6) HIV transmission knowledge. All scales and measures had been pilot tested and evaluated for reliability and psychometric soundness.

Sexual Behaviors—Participants were asked to recall their sexual behavior during the preceding 3 months and to report the number of male and female sexual partners during that period, as well as the number of times they had engaged in vaginal, oral, and anal intercourse with and without condoms. Participants also were asked whether they had experienced forced sex in the past 3 months.

STI Treatment—Participants were asked if they had been treated for an STI in the past year. If so, they were asked to name the STI(s) for which they had received treatment.

Substance Use—Participants described how frequently they used alcohol in the preceding 3 months, the number of tunes they had intercourse after having “too much to drink,” and how frequently they had intercourse after using drugs. They also identified the types of drugs they had used in the previous 3 months and indicated the frequency of use for each. Participants selected drugs used from a list that included heroin, cocaine, marijuana, sedative/barbiturates, tranquilizers, inhalants, crack cocaine, and amphetamines.

Sexual Risk Context Scale—Participants were presented with a listing of five risk-related situations (e.g., sex with a partner who is known or suspected to be injecting drugs) and were asked to indicate whether, and how many times, each had occurred over the previous 3 months (see Table 1). A Sexual Risk Context (SRC) score was calculated by assigning 1 point to each yes response and summing these points.

Intimate Social Support Networks—Participants identified individuals that they would “talk to for advice or about things that are very personal, private, and related to health.” The total number of individuals in participants’ social support networks constituted the size of their networks, which was treated as a proxy for social support. Participants provided information on the personal characteristics of social support network members, such as age, relationship, HIV knowledge (on a scale from 1 = “not knowledgeable at all about HIV/AIDS” to 4 = “very knowledgeable about HIV/AIDS”), and emotional/physical closeness of the relationship (on a scale from 1 = “not close at all” to 10 = “very close”).

HIV Risk Behavior Knowledge—HIV knowledge was assessed using 15 true/false items (Kelly et al., 1990). The knowledge scale included items from the following domains: risk reduction steps, correct condom use, and safer sex practices. Example items included, “All hand lotions make good lubricants for condoms” and “A person can test negative for HIV and still give it to others.” Scores on this scale indicated the number of items answered correctly, from 0 to 15.

Data Analysis

Spearman correlation and chi-square analyses were conducted to assess univariate relationships between the domains of interest. Multivariate linear and logistic regression techniques were used to test the primary hypotheses: first, that greater substance use and a larger number of contextual risk indicators (Sexual Risk Context scores) would be associated with greater frequency of unprotected intercourse as well as a larger number of sexual partners, and second, that larger social support networks would be related to lower risk as indicated by

these outcome variables. Continuous sexual behavior variables (such as frequency of sex after too much to drink, frequency of sex after using drugs, frequency of unprotected intercourse, and number of male partners) were log-transformed to reduce skewness, with the exception of Sexual Risk Context scores as the range was too small to benefit from transformation.

The Institutional Review Board of the Medical College of Wisconsin approved this study.

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RESULTS

Most (79.2%) participants reported one or more sexual risk factors, as shown in Table 1. On average, women reported approximately two contextual risk factors ($M = 1.71$, $SD = 1.35$, Range = 0–5), the most common being sex with a partner known or suspected to be having sex with others, followed by transactional sex. These sexual risk factors were combined to create a Sexual Risk Context scale as described above (reliability $\alpha = .62$). Approximately one-third (32.3%) of participants reported experiencing forced sex in the past 3 months. The experience of forced sex was not significantly associated with any other variable included in analyses, nor with any of the sexual risk indicators listed in Table 1, with the exception of sex with a partner known or suspected to be injecting drugs (Spearman $r = .28$, $p < .01$).

Participants reported a mean of 19.20 ($SD = 28.32$) acts of vaginal or anal intercourse in the previous 3 months, including an average of 14.37 ($SD = 19.92$) unprotected sex acts. Nearly two-thirds (60%) of the women had not used condoms during sexual intercourse in the past 3 months—32.8% of these women reporting no condom use were in a steady relationship and 27.2% were not, $\chi^2(1, N = 95) = 1.82$, ns. Only 1 woman reported consistent condom use. Treatment for an STI in the past year was reported by 32.6% of participants. Most participants (67.7%) reported having multiple male sex partners, with a mean of 2.69 ($SD = 2.01$) partners in the previous 3 months. The number of sexual partners was not related to the total number of acts of intercourse, the number of unprotected acts, or the woman's relationship status.

Most women (62.5%) reported drinking alcohol in the past 3 months, marijuana use in the past 3 months was reported by 29.2% of the women, and crack cocaine use by 31.3%. Use of other drugs was much less common. Greater frequency of sex after excessive drinking (see Table 1) was associated with greater frequency of intoxication (Spearman $r = .71$, $p<.001$) and greater frequency of sex after using drugs was correlated with frequency of crack use (Spearman $r = .54$, $p<.001$).

Social support networks of participants comprised 1.98 ($SD = 1.38$) people, on average. Most women listed 1 (29.2%), 2 (27.1%), or 3 (20.8%) people in their networks, while 11.2% reported having no one in their social support networks. Family or boyfriend and relative/friend/second boyfriend were listed as network members most frequently at 36.0%, and 44.0% of network members, respectively. Counselors, case managers, spiritual advisors, or doctors were mentioned 29 times, making up 15.8% of network members. Smaller social support networks were marginally associated with crack cocaine use (Spearman $r = -.20$, $p = .052$).

Participants were fairly knowledgeable about HIV ($M = 11.85$, $SD = 2.64$), answering 79% of the questions correctly on average. They estimated their social support networks to be "kind of knowledgeable" about HIV, on average ($M = 1.84$, $SD = .93$). Greater personal HIV knowledge was correlated with greater network HIV knowledge (Spearman $r = .28$, $p < .01$). Larger social support networks were significantly associated with both greater network HIV knowledge (Spearman $r = .60$, $p<.001$) and greater personal HIV knowledge (Spearman $r = .22$, $p < .05$). Emotional/physical closeness to network members was rated as fairly high ($M =$

8.45, *SD* = 1.85, Range = 2–10). HIV knowledge of network members, personal HIV knowledge, and emotional/physical closeness to network members were not correlated with any other variable included in the analyses.

Univariate Analyses

Smaller social support networks were associated with higher Sexual Risk Context scores, greater frequency of sex after drug use, and more frequent unprotected intercourse (see Table 2). Higher Sexual Risk Context scores were, in turn, significantly related to greater frequency of sex after drinking too much and sex after drug use in the past 3 months, as well as to larger numbers of sexual partners, all of which were associated with one another. Relationship status (currently being in a relationship) was related to more frequent unprotected intercourse.

Multivariate Analyses

We conducted multivariate regression analyses to assess relationships between social support network size, Sexual Risk Context scores, and sex after drinking too much and after drug use in the past 90 days with the outcome variables of number of sexual partners and frequency of unprotected intercourse. In the first regression analysis, Sexual Risk Context was the only variable to significantly predict number of partners ($\beta = .52$, $p < .001$). Specifically, higher Sexual Risk Context scores were associated with larger numbers of sexual partners ($F(4, 91) = 11.44$, $p < .001$, $R^2 = .34$, adjusted $R^2 = .31$).

In the second regression analysis, conducted to explain total frequency of unprotected intercourse in the past 3 months, the predictors included relationship status as a control variable, frequency of sex after excessive alcohol use, frequency of sex after drug use, Sexual Risk Context scores, social network size, and number of male sexual partners. Controlling for relationship status ($\beta = .25$, $p<.01$), only frequency of sex after drug use was significantly associated with frequency of unprotected intercourse independently of the other variables ($\beta = .35$, $p = .001$, $F(5, 89) = 6.88$, $p<. 001$, $R^2 = .28$, adjusted $R^2 = .24$).

Follow-up analysis to test for mediation by frequency of sex after drug use (Baron & Kenny, 1986) showed that the association of social network size with frequency of unprotected intercourse was completely mediated by frequency of sex after drug use. The relationship of social network size with frequency of unprotected intercourse, controlling for relationship status, ($\beta = -.23$, $p < .05$), was reduced to non-significance ($\beta = -.13$, *ns*) when frequency of sex after drug use was included in the regression model ($\beta = .36$, $p<.001$, $F(3, 91) = 10.12$, $p<.001$). A Sobel test (Preacher & Leonardelli, 2001) of the indirect (mediation) effect confirmed this conclusion (Aroian Sobel = − 2.17, $p < .05$).

DISCUSSION

The severely mentally ill women who participated in this study engaged in high levels of sexual risk behaviors. Nearly two-thirds of participants had not used condoms during sexual intercourse in the past 3 months, more than two-thirds had sex with multiple partners, and almost one-third had been treated for an STI in the past year. Having sex with someone the participant suspected was having sex with others was common, as were transactional sex and sex with a partner the participant did not know. Participants reported more sexual risk context factors than the severely mentally ill women in Kalichman et al. (1994) and Weinhardt et al. (1998), with the exception that the rate of engagement in transactional sex was similar to that of the sample in Kalichman et al. (1994). Rates of alcohol, crack cocaine, and marijuana use also were high. Alcohol and marijuana use rates were similar to those in Kalichman et al. (1994), though the rate of cocaine use (crack cocaine use) was much higher in the present study.

About one-third of women participants had experienced forced sex in the past 3 months. This rate is higher than the rates in studies of female psychiatric outpatients: 13% of the women in Weinhardt et al.'s (1998) study had been forced into sex in the previous 2 months and 25% reported forced sex in the past year in Otto-Salaj et al.'s (1998) study, In contrast, 61% percent of the severely mentally ill women in Kalichman et al.'s (1994) community sample had been forced into sex in the past year. These findings indicate that sexual coercion is a significant problem for women with severe mental illness (Weinhardt, Bickham, & Carey, 1999).

The univariate analyses in the present study identified an interconnected matrix of sexual risk/protective factors for this sample of women with severe mental illness. The size of the women's social support networks, contextual risk factors, having sex after drinking too much, and having sex after using drugs were each significantly correlated with one another (with the exception of network size and sex after excessive alcohol use). However, whereas alcohol and drug use were each associated with both sexual risk behavior outcomes (frequency of unprotected intercourse and number of sex partners), social support network size was associated only with frequency of unprotected intercourse, and the number of sexual risk context factors was related only to the number of sex partners.

Overall, social support played a protective role in these severely mentally ill women's lives. Women who had larger social support networks reported fewer sexual risk context factors, less use of drugs prior to sex, and fewer instances of unprotected intercourse, though the latter relationship was mediated by drug use before sex, As the majority of participants reported having only one or two people in their social support networks (and more than 10% had no one), there is a clear need to provide assistance to severely mentally ill women to help them strengthen their social support networks. The association of social support network size and frequency of unprotected sex became non-significant when drug use before sex was included in the regression model and further analysis supported the conclusion that social support network size had an indirect relationship with frequency of unprotected sex. The results of the mediational analysis highlight the central role of drug use in shaping these women's sexual risk: Women with larger social support networks engaged less frequently in sex after drug use, and women who less often had sex after using drugs correspondingly had unprotected intercourse less frequently.

Women with higher Sexual Risk Context scores drank alcohol to excess and used drugs prior to sex more frequently than other women. In turn, excessive use of alcohol or drugs prior to sex were each associated with having greater numbers of sex partners in the univariate analyses, as was the number of sexual risk context factors. Sexual Risk Context scores remained significantly associated with the number of sexual partners in the multivariate analyses after controlling for the influence of excessive alcohol use and drug use. These findings underscore the importance of taking into account the context in which risk behaviors occur in the lives of severely mentally ill women.

Conclusions from this study are limited by the inherent limitations of self-report data, particularly with severely mentally ill individuals. However, if there were errors in the retrospective reports of sexual behavior, recent evidence suggests that they would likely be in the direction of underestimation (McAuliffe, DiFranceisco, & Reed, 2006). Because only 60% of all women approached agreed to participate, self-selection bias could have influenced the findings of this study. Women were eligible for the study if they reported unprotected intercourse in the past 3 months and at least one other sexual risk factor, such as sex with a new sexual partner. Thus results may not be generalizable beyond sexually active severely mentally ill women at risk for HIV living in a community setting. Nevertheless, these findings have implications for how HIV prevention programs for severely mentally ill women are developed and administered. To further benefit these programs, future research could

investigate social network variables that influence HIV risk, such as relationships among network members and severely mentally ill women's perceptions of support provided to them.

Previous HIV risk reduction interventions for adults with severe mental illness mainly have focused on increasing HIV-related knowledge, motivation to reduce personal risk, behavioral and cognitive skills for specific risk reduction acts, and attitudes and social norms around safer sex behaviors (Carey et al., 2004a; Kelly et al., 1997). Greater attention is needed to the specific risk situations and barriers to change that these individuals are likely to face (Kelly, 1997). The results of the present study and other studies indicate that elevated rates of substance use and sexual risk context factors not prevalent in the general population are particularly relevant issues for women with severe mental illness. Moreover, our findings suggest that women with severe mental illness do not receive sufficient social support, which is a potential protective factor against HIV risk. In short, sexual risk reduction programs for severely mentally ill women would greatly benefit from the inclusion of elements that help these women increase their social support networks, reduce alcohol and substance use, and recognize dangers associated with particularly risky situations.

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TABLE 1

Sexual Risk Context Factors and Intercourse after Alcohol and Drug Use

	%	Mean frequency in past 3 months (SD)	Frequency range
Sex with non-monogamous partner	69.8%	10.09 (25.42)	0–180
Transactional sex	39.6%	3.54 (11.36)	0–100
Sex with someone did not know	33.3%	1.21 (2.86)	0–20
Met partner at bar	15.6%	.41 (1.52)	0–10
Sex with person injecting drugs	12.5%	.54 (2.69)	0–24
Sex after too much drink	42.7%	3.33 (11.03)	0–90
Sex after using drugs	36.5%	4.78 (13.09)	0–100

TABLE 2

Spearman Correlations between Variables Included in Regression Analyses

	Sexual partners	Unprotected Sex	STI sex treatment	Sex after alcohol	Sex after drug use	Network size	Sexual risk context	Relationship status
Sexual partners	—	.17	.06	.21*	.37***	−.13	.57***	−.16
Unprotected sex		—	−.5	.22*	.32**	−.27**	.04	.30**
STI treatment			—	−.18	.02	−.10	.15	−.04
Sex after alcohol				—	.35***	−.04	.30**	−.02
Sex after drug use					—	−.28**	.38***	−.00
Network size						—	.31**	−.06
Sexual risk context							—	−.17
Relationship status								—

* $p \leq .05$;

** $p \leq .01$;

*** $p \leq .001$.