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Seriously Mentally Ill Women's Safer Sex Behaviors and the Theory of Reasoned Action

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Abstract

Seriously mentally ill women at risk for HIV infection (n = 96) participated in structured interviews assessing sexual and substance use behavior over a 3-month period. The majority of the women (63.5%) did not use condoms. Consistent with the Theory of Reasoned Action, condom use attitudes and perceived social norms about safer sex were associated with safer sex intentions. Supplementing TRA variables with safer sex self-efficacy explained additional variance in safer sex intentions. Greater safer sex intentions were related to both greater condom use and to less frequent unprotected intercourse. In addition, less frequent sex after drug use and a less fatalistic outlook were associated with less frequent unprotected intercourse. Life circumstances specific to this population are particularly important to examine to improve the effectiveness of risk reduction interventions for seriously mentally ill women.

Keywords

sexual risk behavior; HIV/AIDS; severe mental illness

Persons with a serious mental illness such as schizophrenia or a major affective disorder are particularly vulnerable to HIV infection because of high rates of HIV risk behaviors and frequent substance use comorbidity (see review by Meade & Sikkema, 2005). This disproportionate risk of HIV infection especially affects women. HIV seroprevalence rates for women with schizophrenia and major affective disorders far exceed those of women in the general US population (Cournos, Herman, Kaplan, & McKinnon, 1997). These high rates of infection reflect high rates of underlying HIV risk behaviors, including inconsistent condom use and engaging in sex with multiple partners (Kalichman, Malow, Dévieux, Stein, & Piedman, 2005).

The Theory of Reasoned Action (TRA; Ajzen & Fishbein, 1980) has been used to model HIV-preventive behaviors in a number of studies (Albarracin, Johnson, Fishbein, & Muellerleile, 2001). This theory postulates that whether or not a specific preventive behavior (such as condom use) is enacted is a function of the individual's intention to perform that behavior, which in turn is predicted by his or her attitudes toward the behavior and by his or her perceptions of social norms regarding the behavior. The Theory of Reasoned Action often is supplemented with the construct of self-efficacy, derived from social cognitive

theory (Bandura, 1994), in studies of HIV-preventative behavior (e.g., Bogart, Cecil, & Pinkerton, 2000). Self-efficacy is very similar to the construct of perceived behavioral control, which has been added to the TRA in the Theory of Planned Behavior (Ajzen, 1985).

Individual constructs from the TRA have been used to model the HIV-preventive behaviors of individuals with serious mental illnesses in several previous studies (e.g., Otto-Salaj Heckman, Stevenson, & Kelly, 1998). However, to our knowledge, the central premises of the TRA—that attitudes and perceived social norms predict intentions, which in turn predict behaviors—have not been tested among seriously mentally ill men or women. As a "rationalistic" model, the Theory of Reasoned Action may have limited applicability to seriously mentally ill people, who face unique challenges due to their psychiatric conditions. Cognitive deficits, impaired judgment, affective instability, and poor impulse control can lead to unsafe sexual and drug use behaviors among persons with mental illness (Kelly et al., 1992). Self-efficacy for HIV risk reduction, or perceived behavioral control, may be particularly important for mentally ill women because the circumstances in which sexual activity occurs likely have a strong influence on their decisions and require high self-efficacy to overcome.

Substance use is also associated with increased HIV risk for persons with serious mental illness. Alcohol or drug use among mentally ill persons increases the likelihood of having a history of STI and is associated with unprotected vaginal intercourse (Weinhardt et al., 2001),. Emotional/cognitive factors such as fatalism/optimism and life satisfaction may be relevant as well for seriously mentally ill women, who frequently live in unstable, disadvantaged environments and circumstances. Life satisfaction and a positive outlook for the future may be a prerequisite for women in difficult personal, economic, and social circumstances to change behavior to avoid HIV risk (Somlai et al., 2000). Somlai et al. (2000) found that economically-disadvantaged women who were less optimistic about their future lives and less satisfied with their lives were more likely to have been treated for an STI in the past year, to have had unprotected sex with multiple partners in the past 3 months, or to have had injected drugs within the past 3 months than were women with a more optimistic outlook on the future and greater life satisfaction.

The goals of the present study were twofold: First, to test the applicability of the Theory of Reasoned Action with respect to the safer sex attitudes, perceived norms, intentions, and behaviors of seriously mentally ill women living in a medium-sized Midwestern city; and second, to determine whether supplementing the TRA with safer sex self-efficacy and other variables relevant to the life circumstances of these women (such as alcohol and substance use, and fatalism/life satisfaction) would enhance the utility of the TRA in explaining their safer sex intentions and behaviors. We expected self-efficacy to significantly contribute to the explained variance in intentions to practice safer sex. Furthermore, we hypothesized that alcohol/substance use would predict additional variance in safer sex behaviors beyond that predicted by risk reduction intentions. We did not expect alcohol/substance use to be associated with safer sex intentions as this relationship has only been observed at the event level, i.e., when intentions are measured while participants are intoxicated (MacDonald, Zanna, & Fong, 1996). We anticipated that fatalism and life satisfaction would influence both safer sex intentions and safer sex behaviors.

Method

Participants and Procedures

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 5 community support program clinics that serve seriously mentally ill adults who live in the community but require and receive ongoing mental health services.

Clinic clients were eligible to participate in the study if they were 18 years of age or older; had a history of serious mental illness (schizophrenia spectrum disorder or chronic major affective disorder); received mental health services at one of the community support program clinics; resided in the community rather than in an institutional setting; reported unprotected vaginal or anal intercourse in the past 90 days; and reported one of the following in the past 90 days: (a) sex with a new sexual partner, (b) more than one sexual partner, (c) a sexually transmitted disease (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 HIV. About 60% (N = 163) of all women approached agreed to participate, and approximately 60% (N = 98) of these women met the study's entry criteria. Two women either had missing data on the variables of interest or reported not having had intercourse with a male partner in the past 90 days and were excluded from the analyses.

Of the remaining 96 women who participated in the study, 54.1% were African-American, 36.7% were white, and 9.2% were members of other 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: 7.1% reported that they were married, with 27.6% dating only 1 person, while 43.9% reported that they were neither married nor dating. Participants were primarily, though not exclusively heterosexual, with 14.3% of participants reporting that they were bisexual or gay (while still meeting the criteria of having had intercourse with a male partner in the past 90 days).

Measures

Participants were individually and privately interviewed by project staff. The study instrument assessed the following domains: demographics; sexual risk behaviors; substance use; condom use attitudes; and intentions, perceived social norms, and self-efficacy with regard to safer sex practices. All scales and measures were pilot tested and evaluated for reliability and psychometric soundness prior to their use in the present study.

Attitudes toward condoms—Eight items adapted from the perceived barriers to condom use scale in Kelly et al. (1997) were used to assess participants' attitudes and beliefs about condoms. Specific items asked participants about their perceptions of condom (in)effectiveness, diminished pleasure associated with condom use, and positive as well as negative connotations surrounding condom use. Level of agreement with each item was measured using a 6-point scale (1 = strongly disagree to 6 = strongly agree). The sum of

item scores was used to summarize participants' attitudes toward condoms, with higher scores indicating more positive attitudes toward condom use (Cronbach's alpha = .62).

Perceived social norms—Nine items adapted from a safer sex social norms scale in Kelly et al. (1992) were used to measure perceived normative acceptance of safer sex practices. Perceived social norms are conceptualized as an individual's beliefs about peer and partner acceptance and practices of safer sexual behaviors. Example items from the measure include, "My sex partner(s) prefer(s) that we use condoms during sex" and "Using condoms is completely accepted by my friends." Participants responded on a 4-point scale (1 = strongly disagree, 4 = strongly agree). The sum of the 9 items was used to indicate overall perceptions of positive safer sex social norms (Cronbach's alpha = .62).

Safer sex intentions—Four items adapted from Kelly et al. (1992) were used to assess participants' intentions to use condoms or to avoid unprotected sex: "I will use a condom the next time I have sex," "I will refuse to have sex if a condom is not available," "I will talk about HIV/AIDS with a sexual partner," and "I will insist on condom use, even in the heat of the moment." Respondents used a 6-point scale to indicate level of agreement with each statement (1 = strongly disagree to 6 = strongly agree). Each participant's overall safer sex intentions score was the sum of his or her scores on the 4 individual items (Cronbach's alpha = .82).

Safer sex self-efficacy—Participants were presented with 3 situations in a scale adapted from Kelly et al. (1997) that could challenge their ability to practice safer sex and were asked to rate their confidence in being able to handle each situation using a 10-point scale (1 = cannot do at all to 10 = certain can do it). The scenarios involved confidence in initiating a conversation about safer sex, refusing unprotected sex at a time they felt emotionally vulnerable, and leaving a situation where the other person objected to safer sex. Safer sex self-efficacy scores ranged from 9 to 90, with higher scores indicating greater self-efficacy (Cronbach's alpha = .91).

Fatalism/Optimism—An 11-item scale was used to measure fatalistic views and expectations for the future. The measure was derived from the Fatalism Subscale of Heimberg's (1963) Future Time Perspective Scale. It included items such as, "The future seems very vague and uncertain to me." The participant's scale score was the sum of the 11 item endorsements (each on a 7 point scale), with higher scores indicating a greater sense of fatalism (Cronbach's alpha = .67).

Life satisfaction—Participants completed a 5-item measure adapted from the Diener et al. (1985) Satisfaction with Life Scale. Responses were made using a 5-point scale ranging from 1 = strongly disagree to 5 = strongly agree. Sample items included, "In most ways my life is close to ideal" and "I am satisfied with my life." A participant's score was the sum of the 5 items, with higher scores indicating greater satisfaction with life (Cronbach's alpha = .84).

Outcome Measures

Hierarchical multivariate linear and logistic regression techniques were used to test the main hypotheses of the Theory of Reasoned Action: First, that safer sex attitudes and norms would predict safer sex intentions, and second, that safer sex intentions would predict safer sex behaviors. Additional variables, such as safer sex self-efficacy, fatalism/optimism, and life satisfaction, that were hypothesized to affect intentions and behaviors were added to the regression models in later steps. To correct for skewness, reported frequencies of unprotected sex acts, having sex after too much to drink, and having sex after using drugs were log-transformed prior to conducting the analyses.

Results

Safer Sex Intentions

Table 1 summarizes participants' safer sex intentions, condom use attitudes, perceptions of social norms supporting safer sex, HIV knowledge, and self-efficacy to enact safer sex behaviors. As a first step in testing the Theory of Reasoned Action we conducted regression analyses to assess whether positive condom use attitudes and perceptions of social norms supporting safer sex were associated with more favorable safer sex intentions. In support of the theory, more positive condom use attitudes significantly predicted greater safer sex intentions (β = .39, $p = .001$), and positive perceived social norms regarding safer sex marginally predicted greater safer sex intentions (β = .19, $p = .057$). Overall, the TRA model variables accounted for 21% of the variance in safer sex intentions (F (2, 93) = 13.55, $p < .001$, $R^2 = .23$, adjusted $R^2 = .21$). Greater safer sex self-efficacy predicted greater safer sex intentions as well (β = .25, $p < .01$). Supplementing the TRA with safer sex self-efficacy significantly increased the proportion of variance accounted for in safer sex intentions (F (3, 92) = 12.04, $p < .001$, $R^2 = .28$, adjusted $R^2 = .26$, R^2 change = .06, $p < .01$).

The mean scores on the fatalism and life satisfaction scales are listed in Table 1. To determine whether fatalism and life satisfaction added to the predictive power of the above regression model, we entered fatalism and life satisfaction in the third step of the hierarchical regression analysis, after condom use attitudes and perceived social norms (step 1), and self-efficacy (step 2). Less fatalistic attitudes toward the future were associated with greater safer sex intentions (β = −.22, $p < .05$). The model that included fatalism and life satisfaction (β = .15, *ns*) explained a marginally greater proportion of variance, beyond that accounted for by condom use attitudes, perceived social norms, and self-efficacy (F (5, 90) = 8.69, $p < .001$, $R^2 = .33$, adjusted $R^2 = .29$, R^2 change = .04, $p = .06$).

Sexual and Drug Use Behaviors

The 96 sexually-active women who participated in this study 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 (63.5%) of participants had not used condoms during sexual intercourse in the past 3 months. Only 1 woman reported consistent condom use. Accordingly, condom use was dichotomized as "no condom use" and "some condom use." Condom use and frequency of unprotected sex acts were moderately correlated (Spearman $r = .21$, $p < .05$).

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. Number of sexual partners was not related to condom use or to number of unprotected acts of intercourse. HIV knowledge was not associated with either sexual behavior outcome, or with safer sex intentions. Most women (62.5%) reported drinking alcohol in the past 3 months. Engaging in vaginal, anal, or oral sex after having too much to drink was reported by 42.7% of women, with a mean frequency of 3.33 occasions in the past 3 months (*SD* = 11.03). Sex after using drugs was reported by 36.5% of women, with a mean frequency of 4.78 occasions (*SD* = 13.09). Crack cocaine was used by 31.3% of the women and marijuana was used by 29.2%. Use of other drugs was much less prevalent (< 7.3%). Drinking was correlated with both marijuana use (Spearman $r = .26$, $p = .01$) and crack cocaine use ($r = .29$, $p < .01$). Frequency of sex after drinking too much was associated with frequency of sex after using drugs ($r = .35$, $p = .001$).

We assessed the relationships between the safer sex outcomes and having sex after drinking or after using drugs. Any condom use was not associated with having sex after drinking too much or sex after drug use. However, frequency of unprotected intercourse was significantly correlated with having sex after drinking too much (Spearman $r = .25$, $p < .05$) and with having sex after using drugs (Spearman $r = .32$, $p = .001$).

Relationship between Safer Sex Intentions and Behaviors

We conducted separate regression analyses to determine whether positive safer sex intentions were associated with the two sexual behavior outcomes (condom use and number of unprotected sex acts), and to assess whether alcohol and drug use in the past 3 months, and fatalism and life satisfaction would explain additional variance in these outcomes. In the first analysis, a stepwise logistic regression was performed with condom use (none versus any) as the outcome variable. No condom use was coded as “1” and at least some condom use was coded as “0.” Relationship status was entered in the first step, safer sex intentions in the second step, and frequency of sex after drinking too much or after using drugs in the third step, and fatalism and life satisfaction in the fourth step. Controlling for relationship status, women with greater safer sex intentions were more likely to have used condoms in the past 3 months (OR = .90, $p < .01$, CI = .84, .97, Nagelkerke $R^2 = .13$), in support of the Theory of Reasoned Action. Frequency of sex after drinking too much or after using drugs, fatalism, and life satisfaction were not related to condom use.

Next, a hierarchical regression analysis was conducted to assess the relationship between safer sex intentions and the total number of acts of unprotected intercourse in the past 3 months. Relationship status was entered in the first step as a control variable, safer sex intentions in the second step, frequency of sex after drinking too much and after using drugs in the third step, and fatalism and life satisfaction in the fourth step. Fatalism and life satisfaction were entered into the regression last to test whether they explained additional variance in unprotected intercourse beyond that of the more established influencing factors of intentions and sex after drinking or using drugs. Controlling for relationship status, greater safer sex intentions were associated with lower frequency of unprotected intercourse (see Table 2). Lower frequency of sex after using drugs was related to a lower frequency of unprotected intercourse, explaining an additional 13% of the variance, whereas sex after

drinking too much was no longer associated with unprotected intercourse when sex after using drugs was included in the model. Less fatalism explained a significant amount (8%) of additional variance in unprotected intercourse beyond that accounted for by relationship status, safer sex intentions, frequency of sex after using drugs or drinking too much. Women who had less fatalistic attitudes about the future had a lower frequency of unprotected intercourse. Life satisfaction was not significantly associated with frequency of unprotected sex. The overall model, which included relationship status, safer sex intentions, frequency of sex after drinking too much, frequency of sex after drug use, fatalism, and life satisfaction, accounted for 32% of the variance in frequency of unprotected intercourse.

Discussion

The findings of this study suggest that although the Theory of Reasoned Action can be used to better understand the relationships among seriously mentally ill women's safer sex attitudes, perceived social norms, intentions, and behaviors, the predictive power of this model is limited and can be enhanced significantly by supplementing the TRA with safer sex self-efficacy and variables of particular relevance to this population, such as alcohol and substance use before sex and fatalism/optimism with regard to the future. In support of the TRA, women with more positive attitudes toward condoms and greater perceived social norms towards safer sex reported greater safer sex intentions (the relationship between perceived social norms and intentions was only marginally significant, $p = .057$, perhaps because the sample size, $N = 96$, was relatively small). Intentions, in turn, predicted safer sex behaviors. Specifically, women with greater safer sex intentions reported fewer acts of unprotected intercourse and were more likely to have used condoms in the previous 3 months. However, safer sex attitudes and perceived social norms explained a relatively small proportion of the variance in safer sex intentions, and intentions accounted for limited variance in safer sex behaviors (any condom use and frequency of unprotected sex). Supplementing the TRA with safer sex self-efficacy and measures of fatalism/optimism significantly increased the model's predictive power with regard to both intentions and behaviors. These findings are discussed further below.

In the present study, condom use attitudes were a stronger predictor of safer sex intentions than were perceived social norms about safer sex, replicating Jemmott and Jemmott's (1991) findings for African-American college women. Perceived social norms may be less salient for seriously mentally ill women than for the participants in Jemmott and Jemmott's (1991) study because seriously mentally ill women are less likely than college women to be in steady relationships and they often have smaller social networks than other women (Meade & Sikkema, 2005). Together, the TRA constructs of condom use attitudes and perceived social norms explained 21% of the variance in safer sex intentions. Self-efficacy predicted significant additional variance in safer sex intentions, indicating that the extent to which seriously mentally ill women feel they have the skills and ability to implement safer sex behaviors substantially influences their intentions to enact those behaviors, beyond the influences of condom use attitudes and perceived social norms about safer sex. Additionally, fatalism/optimism was associated with a marginal increase in explained variance in safer sex intentions. A positive future outlook may be necessary for seriously mentally ill persons to intend to act in the future to avoid possible negative outcomes.

Although safer sex intentions were significantly associated with both safer sex behavior outcomes, they accounted for only 13% of the variance in condom use and 14% of the variance in the number of unprotected sex acts reported by the seriously mentally ill women included in the study. In studies of other at-risk populations, the TRA often accounts for a greater proportion of the variance in safer sex behaviors (Albarracin et al., 2001). This suggests that other factors may influence seriously mentally ill women's safer sex behaviors. In the present study we examined four such factors: excessive alcohol prior to sexual activity, any drug use prior to sex, fatalism/optimism, and life satisfaction. Greater frequency of vaginal, anal, or oral sex after using drugs was associated with greater frequency of unprotected sex, as reported in previous studies (e.g., Weinhardt et al., 2001).

Greater frequency of sex after excessive alcohol use was related to greater frequency of unprotected sex in the univariate analysis, but not in the multivariate model that included sex after drug use. Neither drinking too much nor drug use before sex was associated with condom use. Similarly, Weinhardt et al. (2001) found that intercourse after alcohol consumption was not associated with condom use for women.

Independent of relationship status and safer-sex intentions, a lesser sense of fatalism (or greater optimism) was associated with lower frequency of unprotected sex. Similarly, for economically-disadvantaged women, Somlai et al. (2000) found that greater optimism/less fatalism was related to lower levels of HIV risk behavior. A sense of fatalism about the future makes it difficult to feel that current behavior should be changed to bring about future benefits. In the Somlai et al. (2000) study, as in the present one, life satisfaction was not independently associated with safer sex behaviors in multivariate analyses. Life satisfaction scores were generally low in the present study, as 52.1% of women scored in the lower third of the range of scores. This lack of variance may have contributed to the nonsignificant findings regarding this variable and also highlights one of the emotional/cognitive consequences of these women's difficult life circumstances.

Several limitations of the present study should be noted. First, participants may have had difficulty with recall of sexual behavior and alcohol/drug use during the previous 3 months, though they reported fairly high rates of these behaviors and previous research has found that errors in recall of sexual behavior tend to be errors of omission rather than commission (McAuliffe, DiFranceisco, & Reed, 2007). Second, we did not conduct elicitation research to further clarify the relevant beliefs and norms regarding safer sex in this population (Ajzen & Fishbein, 1980). This may be reflected in the relatively low reliability for the two measures. A better understanding of the psychological determinants of seriously mentally ill women's safer sex attitudes and normative beliefs likely would strengthen the association between these constructs and safer sex intentions. Third, intentions and behaviors were assessed at the same point in time. A meta-analysis of the Theory of Reasoned Action and the Theory of Planned Behavior's associations with HIV-preventative behavior found that safer sex intentions are more strongly correlated with past safer sex behavior when measured contemporaneously than with future behavior measured prospectively (Albarracin et al., 2001).

Because only 60% of all women approached agreed to participate, self-selection bias could have influenced the findings of this study. Moreover, the entry criteria limited the study sample to "high-risk" participants who had unprotected sex in the past 90 days. Condom use was one of several dependent variables assessed in the study. The exclusion of women who had no unprotected sex in the past 90 days could have biased our findings. Specifically, the selection criteria was related to the dependent variable of condom use (no condom use versus some condom use) which can restrict the variation in the dependent variable and lead to the underestimation of potential causal effects in this analysis (King, Keohane, & Verba, 1994). Additionally, the results may not generalize to all severely mentally ill women, particularly those in an institutional rather than a community setting.

Implications for Practice

Despite these limitations, our results provide qualified support for the TRA and suggest that interventions to reduce HIV risk in seriously mentally ill women that utilize TRA variables may benefit from focusing more on attitudes toward condom use to increase safer sex intentions than on perceived social norms. Improving the skills and ability of seriously mentally ill women to implement safer sex behaviors is likely to influence their intentions to enact those behaviors as well. Our results also suggest that healthcare practioners and educators working with severely mentally ill women should more thoroughly examine the role of extenuating life circumstances specific to this population. Encouraging a positive future outlook and dealing with any drug use may be prerequisites for motivating seriously mentally ill women to avoid possible negative outcomes by increasing safer sex intentions and behaviors. Addressing the HIV risk-enhancing life circumstances of seriously mentally women and their ability to cope with these circumstances would likely improve the long-term effectiveness of sexual risk reduction interventions for these women.

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References

Ajzen, I. From intentions to actions: A theory of planned behavior. In: Kuhl, J.; Beckman, J., editors. Action-control: From cognition to behavior. Heidelberg: Springer; 1985. p. 11-39.

Ajzen, I.; Fishbein, M. Understanding attitudes and predicting social behavior. Englewood Cliffs, NJ: Prentice Hall; 1980.

Albarracin D, Johnson BT, Fishbein M, Muellerleile PA. Theories of reasoned action and planned behavior as models of condom use: A meta-analysis. Psychological Bulletin. 2001; 127:142–161. [PubMed: 11271752]

Bandura, A. Social cognitive theory and the exercise of control over HIV infection. In: DiClemente, RJ.; Peterson, JL., editors. Preventing AIDS: Theories and methods of behavioral interventions. New York: Plenum Press; 1994. p. 25-59.

Bogart LM, Cecil H, Pinkerton SD. Intentions to use the female condom among African American adults. Journal of Applied Social Psychology. 2000; 30:1923–1953.

Cournos F, Herman R, Kaplan M, McKinnon K. AIDS prevention for people with severe mental illness. Journal of Practicing Psychiatry and Behavioral Health. 1997; 3:285–292.

Diener E, Emmons RA, Larsen RJ, Griffen S. The Satisfaction with Life scale. Journal of Personality Assessment. 1985; 49:71–75. [PubMed: 16367493]

Heimberg, LK. Unpublished doctoral dissertation. Vanderbilt University; Nashville, TN: 1963. The measurement of future time perspective.

Jemmott LS, Jemmott JB III. Applying the theory of reasoned action to AIDS risk behavior: Condom use among Black women. Nursing Research. 1991; 40:228–234. [PubMed: 1857648]

Kalichman SC, Malow R, Dévieux J, Stein JA, Piedman F. HIV risk reduction for substance using seriously mentally ill adults: Test of the information-motivation-behavior skills (IMB) model. Community Mental Health Journal. 2005; 41:277–289. [PubMed: 16131007]

Kelly JA, McAuliffe TL, Sikkema KJ, Murphy DA, Somlai AM, Mulry GW, Miller JG, Stevenson LY, Fernandez MI. Reduction in risk behavior among adults with severe mental illness who learned to advocate for HIV prevention. Psychiatric Services. 1997; 48:1283–1288. [PubMed: 9323747]

Kelly JA, Murphy DA, Bahr GR, Brasfield TL, Davis DR, Hauth AC, Morgan MG, Stevenson LY, Eilers MK. AIDS/HIV risk behavior among the chronic mentally ill. American Journal of Psychiatry. 1992; 149:886–889. [PubMed: 1609866]

King, G.; Keohane, RO.; Verba, S. Designing Social Inquiry: Scientific Inference in Qualitiative Research. Princeton, NJ: Princeton U Press; 1994.

MacDonald TK, Zanna MP, Fong GT. Why common sense goes out the window: Effects of alcohol on intentions to use condoms. Personality and Social Psychology Bulletin. 1996; 22:763–775.

McAuliffe TL, DiFranceisco W, Reed BR. Effects of question format and collection mode on the accuracy of retrospective surveys of health risk behavior: A comparison with daily sexual activity diaries. Health Psychology. 2007; 26:60–67. [PubMed: 17209698]

Meade CS, Sikkema KJ. HIV risk behavior among adults with severe mental illness: A systematic review. Clinical Psychology Review. 2005; 25:433–457. [PubMed: 15914265]

Otto-Salaj LL, Heckman TG, Stevenson LY, Kelly JA. Patterns, predictors and gender differences in HIV risk among severely mentally ill men and women. Community Mental Health Journal. 1998; 34:175–190. [PubMed: 9620162]

Somlai AM, Kelly JA, Heckman TG, Hackl K, Runge L, Wright C. Life optimism, substance use, and AIDS-specific attitudes associated with HIV risk behavior among disadvantaged innercity women. Journal of Women's Health & Gender-Based Medicine. 2000; 9:1101–1111.

Weinhardt LS, Carey MP, Carey KB, Maisto SA, Gordon CM. The relation of alcohol use to HIV-risk sexual behavior among adults with a severe and persistent mental illness. Journal of Consulting and Clinical Psychology. 2001; 69:77–84. [PubMed: 11302280]

Table 1

Safer Sex Measures

	Mean (SD)	Range
Attitudes toward condoms	32.80 (7.88)	10–48
Perceived safer sex norms	21.35 (5.88)	4–36
Intentions to practice safer sex	16.08 (6.40)	4–24
Safer sex self-efficacy	64.52 (23.25)	9–90
HIV knowledge	11.85 (2.64)	3–15
Fatalism	45.71 (11.25)	22–66
Life satisfaction	12.41 (5.78)	5–25

Table 2

Regression analysis predicting frequency of unprotected intercourse

Model		Beta	*F*	*Adj. R^2*	*ΔR^2*
1	Relationship status	.29**			
			8.44**	.07	.08**
2	Relationship status	.20*			
	Intentions	−.28**			
			8.44***	.14	.07**
3	Relationship status	.22*			
	Intentions	−.20*			
	Sex after drinking	.10			
	Sex after drug use	.33***			
			8.95***	.25	.13***
4	Relationship status	.14*			
	Intentions	−.22***			
	Sex after drinking	.08			
	Sex after drug use	.28**			
	Fatalism	.31**			
	Life satisfaction	−.16			
			8.27***	.32	.08**

* p ≤.05

** p ≤..01

*** p ≤..001