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HIV, STD, and Sexual Risk Reduction for Individuals with a Severe Mental Illness: Review of the Intervention Literature

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Abstract

Seroprevalence studies indicate that HIV infection rates are elevated among individuals with a severe mental illness (SMI) compared to the general population. The higher prevalence of HIV among individuals with SMI has prompted the development and evaluation of tailored sexual risk reduction programs for these individuals. In this paper, we review the literature on sexual risk-reduction interventions for individuals with SMI, including interventions for both uninfected and infected individuals. We discuss components of successful interventions, identify limitations in the current literature, and highlight directions for future research. Finally, we conclude with implications for clinical practice, including a discussion of the challenges and advantages to implementing sexual risk reduction interventions for individuals with SMI.

Keywords

HIV; STD; severe mental illness; prevention

Introduction

Individuals with a severe mental illness (SMI), such as schizophrenia or bipolar disorder, are at increased risk of being infected with HIV. Due to this risk, and because of deficits in cognitive functioning, attention, information processing, and social skills resulting from their illness, sexual risk reduction interventions tailored to this population have been developed and evaluated. In this paper, we review the published literature on sexual risk reduction interventions for individuals with SMI. We begin by summarizing the prevalence of HIV and the behavioral epidemiology of sexual risk behavior among individuals with SMI; we also discuss possible reasons for elevated rates of sexual risk behavior. Next, we critically review existing sexual risk reduction interventions for individuals with SMI, and suggest directions for future intervention studies. We conclude with a discussion of the clinical implications of the findings, and an examination of the challenges and advantages to implementing sexual risk reduction programs with individuals with SMI.

HIV Prevalence Among Individuals with a Severe Mental Illness

The prevalence of HIV is higher among individuals with SMI than individuals in the general population. Reviews have found seroprevalence rates among individuals with SMI to range from 4% to 22.9%, with an average of 7.8% [1], and seroprevalence rates among adults in psychiatric settings to average 6.9% [2]. These rates are much higher than the 0.43% of the United States population estimated to be infected with HIV [3]. In one of the few studies to

directly compare HIV prevalence in individuals with and without a SMI, Stoskopf [4] used hospital discharge data and found that individuals with a mental illness were 1.44 times more likely to be HIV positive than those without a mental illness. Individuals who are dually-diagnosed with both SMI and a substance use disorder appear to be at even greater risk, with those who have a co-occurring substance use disorder 2.93 times more likely to be infected with HIV than those without a co-occurring substance use disorder [5]. A recent review of studies among dually-diagnosed individuals (i.e., individuals with SMI and a substance use disorder) found HIV prevalence rates ranged from 6% to 23% in this population [6].

The effects of being infected with HIV on mental health are less clear. Some studies have noted that the rate of mental illness is elevated among individuals who are HIV positive. For example, Atkinson, Heaton, Patterson, et al. [7] found that patients who experience HIV-related symptoms are more likely to have a major depressive episode compared to individuals who are asymptomatic or are not infected with HIV. Pence, Miller, Whetten, Eron, and Gaynes [8] found that 39% of HIV positive clinic patients had a mood or anxiety disorder, 21% had a substance use disorder, and 8% had both a mood/anxiety and a substance use disorder. However, it is difficult to know from these studies whether the onset of mental illness preceded or followed patients' diagnoses with HIV [9].

In summary, numerous studies indicate that individuals with SMI are at increased risk of being infected with HIV. Thus, it is important to develop targeted sexual risk reduction programs for these individuals.

Sexual Risk Behavior Among Individuals with Severe Mental Illness

Many individuals with SMI are intermittently sexually active, and those who are sexually active tend to engage in risky sexual practices. Reviews of the literature have found that 54% to 74% of adults with SMI were sexually active in the last year [10], with 60%, on average, sexually active in the last year [11]. Among sexually active adults with SMI, on average 43% reported having more than one sexual partner in the past year, only 17% used condoms consistently in the past year, and 46% never used a condom in the past year. Across studies, 22% of individuals with SMI reported ever trading sex, and 33% had ever been diagnosed with an STD [11]. In studies comparing individuals with and without SMI, those with SMI were more likely to have multiple partners, have unprotected sex, have an STD, and trade sex [11]. Thus, many individuals with SMI are sexually active, and many of those who are sexually active engage in sexual risk behavior.

Several explanations for the high rates of sexual risk behavior among individuals with SMI have been proposed. Some explanations invoke the symptoms of mental illness, with specific illnesses and symptoms differentially associated with sexual risk behavior [11-15].

Other explanations of sexual risk behavior among individuals with SMI suggest that the deficits associated with mental illness, such as cognitive processing difficulties, lack of planning, and poor social skills, place patients at risk. In a qualitative study of adults with SMI, Gordon, Carey, Carey, Maisto, and Weinhardt [16] found that sexual activity was often unplanned, which led to unprotected sex, and risk perceptions were often inaccurate, resulting in lack of motivation to reduce sexual risk behaviors. Thus, lack of planning and cognitive processing difficulties appear to impact sexual risk behavior among SMI. Problems with cognitive processing may also lead to a lack of knowledge about HIV transmission and prevention, which has been documented in several studies of individuals with SMI [16-18]. Difficulties with social skills associated with SMI may also lead to sexual risk behavior. Gordon et al. [16] found that adults with SMI were often unable to communicate effectively about safer sex with their partners. Difficulties in interpersonal interactions may lead to a lack of social support, which has been associated with having unprotected sex, both directly and indirectly through sex after

drug use [12,19]. Individuals with SMI have lower sexual risk-reduction self-efficacy than individuals without SMI [20]; in turn, a lack of assertiveness skills and lower sexual risk-reduction self-efficacy have been associated with HIV risk behavior among individuals with SMI [11].

Additional explanations for sexual risk behavior in this population are related to the consequences of having a SMI. Because individuals with SMI are often unable to work, they often live in poverty and are homeless, so they cannot afford to purchase condoms, have insufficient privacy to discuss safer sex with partners, and may live in areas with high rates of STDs and HIV [2,10]. Periods of hospitalization may make it difficult for individuals with SMI to sustain long-term relationships; further, patients may be unable to acquire (or use) condoms while hospitalized [2].

Individuals with SMI have frequent rates of substance use, which has been associated with more sexual risk behavior [6,11-13,15,18,21].¹ Finally, individuals with SMI report high rates of childhood sexual abuse [23]; child sexual abuse has been associated with sexual risk behavior in the general population [24], as well as with sexual risk behavior in individuals with SMI [11,12].

Overall, persons living with a SMI appear to engage in behavior that increases their risk for HIV and other STDs. This elevated risk behavior probably reflects a number of inter-related psychological and environmental influences that facilitate risky sex.

Sexual Risk Reduction Interventions for Individuals with a Severe Mental Illness

Because of the high rates of sexual risk behavior and HIV among individuals with SMI, numerous investigations of interventions designed to reduce rates of sexual risk behavior have been conducted. In the next section of this paper, we provide a comprehensive overview of existing sexual risk reduction programs for SMI individuals. We first present interventions for individuals who are HIV negative (although individuals who were infected with HIV may have participated, they were not the target of these interventions), including interventions that are comprised of: (a) purely informational or educational components; (b) informational, motivational or attitudinal, and/or skills components; and (c) multi-level interventions, that combine individual-level (i.e., informational, motivational, and/or skills components) with a social / structural component. We then present sexual risk reduction interventions for individuals who are HIV positive. We discuss possible moderators of intervention effectiveness, the cost-effectiveness of these interventions, and future directions for sexual risk reduction intervention studies with individuals with SMI.

Methods

To obtain articles for this literature review, literature searches were conducted using PubMed, PsycINFO, and Medline, using keywords “mental illness” or “mentally ill,” and “HIV,” or “sexual behavior,” and restricting results to clinical trials or randomized controlled trials published during 1980 to 2007. Additional articles were obtained through reference lists of published articles. To be included in this review, interventions had to: (a) be conducted in the US; (b) be published in a peer-reviewed journal; (c) focus on sexual risk reduction (i.e., interventions for SMI individuals who were HIV positive that focused on treatment adherence or medical care entry/retainment were not included); and (d) include individuals with SMI (i.e.,

¹Only one study has investigated substance use and sexual risk behavior using sophisticated “event level” methods [22]; this study suggests that, among individuals with SMI, the probability of using a condom was similar when alcohol had and had not been consumed before a sexual event [21]. Further investigation of this complex association is needed.

studies of individuals with substance use disorders and studies of depression following HIV diagnosis were not included). We located 27 published sexual risk reduction interventions for individuals with SMI that met our criteria.

Interventions for Individuals Who are HIV Negative

Informational Interventions—Several informational or educational HIV risk-reduction interventions were developed for individuals with SMI who are HIV negative [25-29]; a summary of these interventions is presented in Table 1. Few of these interventions have been rigorously evaluated.² In one of the few educational interventions to be evaluated, 35 adults with SMI living in group homes received three, one-hour HIV informational sessions, which included HIV videos, discussion, and a demonstration of condom use. Individuals who received the intervention did not change from pre-assessment to post-assessment on measures of HIV knowledge, fear of HIV, or comfort discussing HIV [25]. The paucity of information-only interventions reveals the widespread recognition that individuals living with a SMI require a more comprehensive intervention to overcome the challenges of HIV risk reduction.

Informational, Motivational, and Skills-Based Interventions—To address the multiple cognitive, psychosocial, and behavioral challenges associated with sexual risk reduction, interventions including informational, motivational, and/or skills components have been developed. These programs are based, implicitly or explicitly, on social-cognitive theory [30], which suggests that modeling and practice are critical for the acquisition of behavioral skills, or on the Information-Motivation-Behavioral Skills model [31], which posits that information, motivation to change a behavior, and skills for engaging in the behavior are important determinants of behavior change.

In addition to providing participants with HIV-related information, some of these programs include motivational or attitudinal components, often designed to increase patients' risk awareness and strengthen positive attitudes about condom use or sexual risk reduction [32-34]. However, the majority of these programs focus on acquisition of skills, including self-management skills, condom use skills, and assertiveness or communication skills [32-41]. Self-management is often addressed through discussion of personal triggers and through problem-solving training; condom use skills are addressed through condom use demonstration and practice; and assertiveness or communication skills are often addressed through role-play scenarios.

Relative to earlier studies that investigated information-only interventions, many of the studies investigating information, motivation, and skills programs employed stronger research methods. These studies benefited from larger sample sizes, a randomized controlled design, and follow-up after the intervention. For example, Otto-Salaj, Kelly, Stevenson, Hoffman, and Kalichman [36] randomly assigned 189 men and women in outpatient psychiatric programs to receive a group-based skills building intervention or a group-based intervention focused on general health and relationship issues. Both groups comprised seven sessions, with booster sessions at one and two months; participants were followed for one year. Results differed by gender, with men in the intervention group having greater HIV knowledge compared to men in the control group, and women in the intervention group showing greater improvement in condom attitudes, behavioral intentions, and increased condom use, compared to women in the control group. The knowledge improvement for men was evident even at the 12 month follow-up; the attitudinal and behavioral changes for women were maintained only through the 9 month follow-up [36].

²Studies that included an informational intervention as a comparison control condition are not included in this section.

In the largest randomized, controlled trial among individuals with SMI, Carey, Carey, Maisto, Gordon, Schroder, and Venable [32] recruited 408 men and women attending an outpatient psychiatric clinic, and randomly assigned them to receive: (a) a 10-session sexual risk reduction intervention, including risk awareness sensitization, pros and cons of risk reduction strategies, condom use skills, self-management, and sexual assertiveness skills; (b) a 10-session substance use risk reduction intervention; or (c) standard care control condition. Over the 6 month follow-up period, those who received the HIV prevention intervention showed improvements in HIV knowledge, sexual risk reduction motivation, and assertiveness skills, and reductions in sexual risk behavior, relative to the substance use and standard care conditions. In addition, individuals in the substance use condition had a greater increase in sexual risk reduction motivation and assertiveness skills, and a greater decrease in the number of sexual partners than did participants in the control condition [32].

Susser and colleagues [40,42,43] developed the Sex, Games, and Videotapes (SexG) intervention. This intervention, which initially included 15 sessions, was implemented with 59 homeless men with SMI. Much of the intervention was focused on modeling, practice, and feedback of sexual risk reduction skills, including condom use skills. Compared to participants who were randomly assigned to a 2 session HIV education (control) intervention, participants assigned to the intervention condition reported reduced rates of sexual risk behavior at the 6 month follow-up. Rates of sexual risk behavior continued to be lower for intervention participants, compared to control participants, at the 18-month follow-up; however, the difference between groups was not significant [40]. The SexG intervention was subsequently adapted by reducing the number of intervention sessions. An evaluation indicated few significant differences between intervention and control groups, although the findings were in the expected direction [42,43]. However, Linn, Neff, Theriot, Harris, Interrante, and Graham [44], using a version of the SexG intervention that was reduced to 6 sessions, found that throughout a 6 month follow-up period, homeless men with SMI who received the SexG intervention had lower sexual risk scores than individuals who received a time-matched HIV education intervention.

In general, nearly all of the interventions incorporating information, motivation, and skills components have been effective, resulting in (a) increased HIV knowledge [32-34,36,38,39, 45-47]; (b) improved motivation, including more positive condom attitudes [32,35,36,45], and stronger intentions to reduce sexual risk behavior [32,34,36]; and (c) improved skills, including greater risk-reduction self-efficacy [46], improved assertiveness skills [32,33,38], and more discussions with a partner about safer sex [32,34]. More importantly, these interventions have resulted in (d) changes in sexual behavior, including an increased frequency of condom use [33,34,36], a decreased frequency of unprotected sex [32,34], an increased percentage of condom-protected intercourse occasions [34,36,40], and a reduced number of sexual partners [32,36]. In one study, (e) a decrease in the likelihood of self-reported STD diagnosis was reported [32]. Only a few studies utilizing an information, motivational, and skills-based intervention failed to find intervention effects on any outcome [42,43,48].

Multi-level interventions—Two interventions have supplemented the individual-level intervention with a social level component. In a pilot intervention, individuals with SMI living in supportive housing programs ($n = 28$) received a 6-session skills training group focused on self-management, sexual communication skills, and condom use skills, as well as a community norm component, in which peer leaders were trained in HIV information, communication skills, and leadership skills [49]. The authors reported improvements from pre- to 4-month post-assessment in HIV knowledge, condom use self-efficacy, sexual communication self-efficacy, condom attitudes, and behavioral intentions. In addition, participants reported reductions in sexual risk behavior from pre- to post-assessment, although no formal statistical

tests were conducted due to the small sample size. There were no pre- to post-assessment changes in social norms for condom use [49].

An early study by Kelly, McAuliffe, Sikkema, et al. [50] also investigated the utility of a social-level component. These authors randomly assigned 104 adults with SMI to: (a) a 7-session, cognitive-behavioral intervention focused on risk awareness, self-management, condom use skills, and sexual assertiveness skills; (b) a 7-session cognitive-behavioral intervention plus HIV prevention advocacy training; or (c) a one session, HIV information control group. There were improvements in all three groups from pre- to 3-month post-assessment on sexual risk-reduction attitudes and skills. Interestingly, participants in both the intervention plus advocacy and the control groups had reductions in sexual risk behavior variables from pre- to post-assessment, but participants in the intervention (without advocacy) did not change on any sexual behavior variables. The intervention plus advocacy group had a greater reduction in sexual risk behavior variables than the intervention alone group; there were no differences between the intervention plus advocacy group and the control group. In addition, there was no change in peer norms for condom use among any of the groups.

Only two teams have added a social-level component to the typical individual-level sexual risk reduction intervention for individuals with SMI. These studies suggest that including a social norm component was effective in changing attitudes, skills, and sexual behavior. However, neither intervention was successful in changing social norms for condom use. Although the addition of a social norm component is promising, particularly in group home or hospital settings, where participants interact with a limited number of peers, more research is needed to identify effective ways to modify social norms; also needed are interventions that address the broader range of social-structural determinants that drive sexual risk behavior.

Interventions for Individuals Who are HIV Positive

Despite the high prevalence of HIV among individuals with SMI [1,2], few interventions focused on sexual risk reduction exist for individuals with SMI who are HIV positive. One pilot program focused on HIV education with 4 male psychiatric patients who were HIV positive; there was a 25% increase in scores on a knowledge test from pre- to post-assessment [51]. A second intervention implemented an integrated model of care with 141 adults who were HIV positive, were seriously mentally ill, and had a co-occurring substance use disorder. This intensive intervention provided individual and group counseling for one year, and attempted to address participants' basic living needs, as well as their medication adherence and sexual risk behaviors. Although there were improvements in substance use, emotional distress, and hospitalizations over the intervention year, there were no changes in sexual risk behaviors [52]. Currently, no interventions for individuals with SMI who are HIV positive have been shown to reduce sexual risk behavior.

Moderators of Intervention Effectiveness

A few studies have investigated possible moderators of intervention effectiveness, including type of mental illness, co-morbidity with substance use, and gender. Studies investigating whether the type of mental illness moderated intervention outcomes have been few, and these studies have yielded mixed results. For example, one study found that participants with schizophrenia, depression, or adjustment disorders had lower scores on HIV knowledge at post-test than participants with other diagnoses [39]. In our own work, we found that participants with major depression reduced the frequency of unprotected sex and increased safer sex discussions after an HIV intervention more than participants with other diagnoses [32]. In a third study that sampled individuals who used cocaine, Compton, Cottler, Ben-Abdallah, Cunningham-Williams, and Spitznagel [53] did not find any difference between individuals also diagnosed with major depression compared to those without a depressive disorder. Based

on these few studies that evaluated the impact of psychiatric disorder on sexual risk reduction intervention efficacy, it appears that mental illness may moderate intervention effectiveness, but further research is clearly needed. Because SMIs tend to be associated with different cognitive processing impairments, some individuals may be better able to attend to, remember, and apply the information and skills learned in the interventions. Individuals with different illnesses may also differ with respect to their ability to accurately assess risk or in social and assertiveness skills, or on a host of other factors that may moderate intervention efficacy.

Substance use also may moderate intervention effectiveness. In the SexG intervention, only participants who did not have a lifetime substance dependence disorder appeared to benefit from the intervention; participants with a lifetime substance dependence disorder did not differ from controls in the likelihood of engaging in sexual risk behavior [54]. Substance use may interfere both with sexual risk reduction motivations and with the ability to enact safer sex skills, particularly among individuals with SMI, who may have difficulty accurately assessing risk and enacting safer sex skills, even in the absence of substance use [11]. Indeed, Carey et al. [32] found that SMI participants who received a substance use intervention reduced their number of sexual partners and increased their positive condom attitudes, condom use intentions, and assertiveness skills relative to control group participants who received standard care, suggesting that reductions in substance use may play an important role in sexual risk reduction with individuals with SMI. Although few other studies of the effect of substance use treatment on sexual risk behavior among individuals with SMI have been conducted, studies in other populations have shown that substance use treatment reduces sexual risk behavior [55,56].

Women and men with SMI may respond differentially to safer sex interventions. Two studies investigating gender as a moderator of intervention effectiveness found that after receiving a sexual risk reduction intervention, men improved in HIV knowledge, while women improved in safer sex behaviors [32,36]. Women with SMI may be particularly at-risk for engaging in unsafe sexual behavior, because of a combination of poor communication and assertiveness skills associated with SMI, and the lack of power women typically have in heterosexual relationships (Theory of Gender and Power) [57]; thus, women with SMI may benefit more than men from sexual risk reduction interventions, particularly interventions that focus on sexual assertiveness and communication.

Cost-Effectiveness of Sexual Risk Reduction Interventions

A few researchers have investigated the cost-effectiveness of published sexual risk reduction interventions with individuals with SMI. In such studies, investigators often calculate cost per quality-adjusted life year (QALY), the latter being a metric that is purported to measure both the quality and the quantity of life lived; QALYs help to quantify the benefit of an intervention. Johnson-Masotti, Pinkerton, Kelly, and Stevenson [58] evaluated the cost-effectiveness of the three interventions (control, cognitive-behavioral, and cognitive-behavioral plus advocacy) developed by Kelly et al. [50]. They found that for men, the cost per QALY saved was \$26,305 for control participants, \$60,279 for cognitive-behavioral intervention participants, and \$41,980 for cognitive-behavioral plus advocacy participants. The cost-effectiveness of the interventions differed for women, however, costing \$3008 for control participants and \$465,994 for cognitive-behavioral plus advocacy participants per QALY saved (the cognitive-behavioral intervention for women did not lead to behavior change for women, and thus, was not evaluated). For men, all three interventions were cost-effective; for women, however, only the control intervention (HIV information) was cost-effective [58].

Pinkerton, Johnson-Masotti, Otto-Salaj, Stevenson, and Hoffman [59] evaluated the cost-effectiveness of the intervention developed by Otto-Salaj et al. [36] among women (the intervention did not lead to behavior change among men). The cost per QALY saved was

\$136,295, an ambiguous outcome with respect to cost-effectiveness. However, the cost-effectiveness of the intervention among sexually active women was \$71,367, which would likely be considered cost-effective [59].

Two cost-effectiveness studies suggest that the cost-effectiveness of sexual risk reductions interventions may differ, depending on gender, baseline level of sexual activity, and other factors, such as psychiatric illness or substance use, that may impact intervention effectiveness.

Summary of Sexual Risk Reduction Intervention Findings

Most of the sexual risk reduction interventions for individuals with SMI in the published literature have moved beyond just provision of information, and include motivational or attitudinal components, as well as behavioral skills components, such as self-management, condom use, and sexual assertiveness skills. A few interventions have included additional components in an attempt to change social norms about condom use and safer sex.

Many of the programs reviewed here were efficacious, particularly interventions that included motivational or attitudinal and skills components. Although most of the education-only interventions were not evaluated, the one that was evaluated formally found no changes from pre- to post-assessment. Interventions that included motivational and skills components, on the other hand, showed improvements in HIV-related knowledge, sexual risk reduction attitudes and motivation, and assertiveness skills, as well as reductions in sexual risk behavior. Thus, motivational and, particularly, skills components appear to be important aspects of effective sexual risk reduction programs with individuals with SMI. This is not surprising, as these components are associated with intervention efficacy among individuals without SMI as well [60].

Other aspects of many of the successful sexual risk reduction intervention programs for individuals with SMI include repetition of material and use of clear and non-technical language, to facilitate processing and retention of intervention material among participants who may have cognitive processing difficulties related to their SMI. In addition, many interventions included activities that were designed to engage participants, such as videotapes, games, and role-playing exercises, which may be important for participants with attention difficulties.

Most of the interventions comprised multiple sessions, which were relatively brief. Individuals with SMI may not be able to attend to intervention material for long periods of time. In addition, multiple sessions allow for repetition of material, with time in between presentations for participants to process the information or rehearse skills covered in the session. When the SexG intervention was shortened, the intervention effects were no longer significant [42,43]. Thus, it may be necessary to include multiple intervention sessions when working with SMI. In addition, booster sessions may be useful [61], as patients may not have retained the information they learned, and may benefit from additional skills practice and feedback, or from reinforcement and encouragement for engaging in safer sex behaviors.

Future Directions

There is generally consistent evidence that sexual risk reduction programs can be effective in reducing sexual risk behavior among individuals with SMI who are HIV negative. However, many of these studies have evaluated only changes in information, motivation, or skills; future interventions should evaluate the impact of the intervention on sexual behavior change. In addition, only one study investigated intervention impact on self-reported STD outcomes [32], and no studies investigated the impact of these interventions on biologic STD outcomes. Although using biologic STD outcomes requires a large sample size to have enough power to

detect an effect, STD outcomes would be useful to document the efficacy of these sexual risk reduction interventions.

Several methodological limitations of previous research can be addressed in future work. For example, some studies suffered from a small sample size, short follow-up periods (some included only an immediate post-intervention assessment), lack of random assignment to intervention and control groups, and low baseline rates of sexual activity or sexual risk behavior, making it difficult to detect an intervention effect. Future intervention studies should focus on recruiting a larger sample, conducting participant follow-ups for longer time periods, using a randomized design, and screening to ensure participants are engaging in sexual risk behavior.

Future research should also be conducted on the moderators of intervention effectiveness. Limited evidence suggests that psychiatric diagnosis, substance use, and gender moderate intervention effectiveness, but more research needs to be conducted before firm conclusions can be drawn. In addition, researchers should consider other possible moderators of intervention effectiveness, such as childhood sexual abuse, which has been shown to moderate intervention effectiveness in individuals without SMI [62].

Although the idea of changing norms about safer sex or condom use seems promising, particularly for individuals who are hospitalized or live in group homes, and thus have a circumscribed peer group, interventions have so far been ineffective in changing social norms. Researchers may need to develop new and innovative methods to promote social norms that support safer sex. Other social and structural interventions (e.g., condom distribution, alcohol-free recreational and social opportunities) may help to supplement individual-level behavioral interventions.

Few sexual risk reduction interventions have been designed specifically for individuals with SMI who are HIV positive. These individuals face many challenges, and safer sex interventions may be viewed as a lower priority compared to their mental health, physical health, and medication needs. Some interventions have been developed for individuals with SMI who are HIV positive, that are focused on improving medication adherence (see Uldall, Palmer, Whetten, and Mellins [63] for a review of medication adherence interventions among individuals with SMI who are HIV positive) and integrating their mental and physical health care (see Soto, Bell, and Pillen [64] for a review of integrated HIV, mental health, and substance use programs for individuals who are HIV positive). However, it is important to develop safer sex interventions for these individuals, both to ensure that they protect themselves from being infected with a different strain of HIV or another STD, and to reduce the risk of inadvertent transmission of HIV to a sexual partner.

Clinical Implications

The research summarized here, and reviewed in detail elsewhere [10,11], debunks the myth that persons with a severe mental illness are sexually abstinent. To the contrary, many individuals with SMI are sexually active, and those individuals with SMI who are sexually active engage in behaviors that put them at risk for contracting an STD or HIV. Thus, individuals with SMI are in need of sexual risk reduction interventions. The research reviewed here also shows that individuals with SMI will attend sexual risk reduction programs, and they are eager to discuss sexual behavior topics. Perhaps most importantly, our review shows that individuals with SMI can benefit from sexual risk reduction interventions.

Unfortunately, resources for mental health services are inadequate and the needs of patients with a SMI are many. Sexual health and HIV prevention services are typically limited or non-existent in mental health care settings [65,66]. This gap in care needs to be addressed. Most

professionals who work with patients living with a SMI recognize that their patients are sexually active and sometimes engage in risky sexual behavior; most also recognize that discussing sexual topics with their patients does not increase rates of sexual behavior. Nonetheless, due to large case loads, limited contact time, and other barriers, these professionals may not routinely include sexual health services in their practice. Therefore, an important implication of our review is that sexual health care should become a standard component of the services provided to mentally ill patients.

We suggest that all intake evaluations include a risk behavior screening; for patients who report current or past HIV-related risk behavior, we recommend a detailed sexual behavior assessment and intervention. To prepare providers to complete such assessments, to increase their comfort with sexual health topics, and to stay abreast of new developments in infectious disease and public health, we suggest that mental health facilities provide ongoing in-service sexual health training for their staff. Coordination between mental health and reproductive health care services is encouraged, a linkage that requires some advocacy on the behalf of patients, who are often not well-understood (nor well-served) outside of psychiatric settings. Administrators need to make sure staff have adequate time to attend trainings, to conduct screenings and assessments, and to deliver sexual risk reduction interventions, because lack of time and training have been identified as barriers to delivering HIV prevention services at mental health facilities [65].

Sexual risk reduction interventions delivered in mental health facilities should include more than just information or educational materials; they should also include motivational or attitudinal components, as well as skills training (e.g., condom use training, problem-solving training, sexual assertiveness training). In addition, interventions should comprise multiple sessions, including booster sessions when feasible, use interesting and engaging activities, present information clearly, and repeat information and discussions. Such structural features increase the likelihood that risk reduction messages will be received and retained.

Challenges and Advantages to Intervening with Individuals with SMI

It can be challenging to implement sexual risk reduction interventions with individuals with SMI for several reasons. First, patients may be confused, have cognitive processing difficulties, or be unable to articulate their thoughts [67], which may interfere with their ability to attend to, understand, or process information, and may make it difficult for them to participate actively and consistently in sexual risk reduction interventions. Second, sexual risk reduction interventions for individuals with SMI are often delivered in the institutions in which the individuals live and/or receive counseling, and a lack of institutional or staff support may hinder these interventions [37]. Some staff may be uncomfortable with the topic of sexual behavior, or may be concerned that talking about sex will lead to increased sexual behavior; others may assume, incorrectly as this review shows, that patients cannot benefit from the intervention [61]. Third, intervention groups are likely to include patients with a wide range of sexual health concerns and needs, for example, individuals who are sexually abstinent, as well as individuals who are engaging in high rates of sexual risk behavior. This heterogeneity may make it difficult to address all participants' needs and concerns within a group setting; however, it is possible to make this heterogeneity an asset, as well. In this regard, Cournos, Herman, Kaplan, and McKinnon [61] point out the benefits of including individuals who are sexually abstinent in these sexual risk reduction programs: (a) these individuals may become sexually active in the future, when they can apply what they learned in the intervention; (b) abstinent individuals may talk to others about what they learned in the intervention; and (c) they can serve as a model of someone who is not at risk, to other members of the group.

Research is needed to improve sexual risk reduction interventions, but we also recognize that there are challenges to this research as well. If the intervention delivery occurs while individuals are in an inpatient setting, and they are released during the intervention follow-up period, the environment will change, making it more challenging to evaluate intervention effectiveness [37]. Additionally, if patients are in an inpatient setting or in other settings, such as a day treatment program, where they spend a lot of time with other study participants, random assignment may not be effective because of the interaction between patients assigned to different groups [37].

On the other hand, there are several advantages to working with individuals with SMI, when implementing sexual risk reduction interventions. Individuals with SMI are often unemployed, so they have the time to attend intervention sessions; moreover, our experience, corroborated by qualitative research [68], indicates that patients appreciate the opportunity to receive sexual health services, and to have research conducted on their behalf. Individuals with SMI are used to attending individual or group counseling sessions, so they may be more willing to attend intervention sessions than individuals who are unsure what to expect, as research suggests that those who are prepared for what to expect from treatment in advance are more likely to attend treatment sessions [69]. If the intervention is conducted on an inpatient unit, a day treatment program, or a supportive housing unit, intervention facilitators will not have to expend effort to track down participants, nor will transportation to the intervention be a problem. Staff can encourage and motivate individuals to attend and participate in the interventions. If the intervention is delivered by a consultant from outside of the institution, staff can use the “found time” to provide separate services to other patients, obtain additional training, complete paperwork, or other activities. For evaluation purposes, if the intervention is delivered on an inpatient unit or a group housing setting, it will be easy to locate participants for follow-up assessments.

We strongly encourage continued research on sexual risk reduction for individuals with SMI, including interventions for individuals who are HIV positive. Continued research into intervention moderators, and further research supplementing individual-level interventions with social and structural interventions should be pursued. While such research is being conducted, mental health professionals can implement existing interventions, for which there is empirical evidence of efficacy. Providing sexual risk reduction interventions for persons living with a severe mental illness can help to promote patients' sexual health and prevent the spread of HIV in this vulnerable population.

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Table 1

Overview of interventions for individuals with severe mental illness.

Informational Interventions for Individuals Who are HIV Negative				
Authors	Sample	Intervention	Methodology	Results
Cates & Graham (1993) [25]	35 adults with SMI living in group homes	--three 60-minute sessions --educational HIV videos and discussion; condom use demonstration	pre/post design baseline, midway assessment (after two sessions of intervention), and immediate post assessment	no changes from pre to post-assessment in HIV knowledge, fear of HIV/AIDS, or discomfort with discussion of HIV/AIDS
Davidhizar, Boonstra, Lutz, & Poston (1991) [27]	patients in long-term psychiatric care	--group sessions, some individual sessions --information tailored to the patients, video, and discussion --provision of condoms	not evaluated	not evaluated
Schindler & Ferguson (1995) [28]	patients in a forensic psychiatric hospital	--one 90-minute group session --information presentation, video of individuals living with HIV, and group activities to reinforce knowledge	no evaluation	no evaluation
Sladyk (1990) [29]	women in a psychiatric unit	--one 45-minute group session --information presentation and discussion	pre/post design baseline and immediate post-assessment	scores on HIV knowledge test improved from pre- to post-assessment (no <i>p</i> values provided)
Steiner, Lussier, Maust, DiPalma, & Allende (1994) [26]	patients in an acute partial hospitalization program at a community mental health center	--psychoeducational group; includes both men and women --presentation and discussion of information about HIV and STDs --also discussion of birth control, intimacy and relationships, and sexual myths	not evaluated	not evaluated
Informational, Motivational, and Skills-Based Interventions for Individuals Who are HIV Negative				
Berkman, Cerwonka, Sohler, & Susser (2006) [42]	92 men with SMI (56 sexually active)	intervention: SexG-Brief --six 60-minute sessions --based on cognitive-behavioral theory and social skills training control: --one 120-minute session --HIV education, including condom use instruction	RCT baseline assessment and assessments every 6 weeks for 6 months	although sexual risk score at the six month follow-up was less for intervention group than control group participants (among those who were sexually active), the difference was not significant
Berkman, Pilowsky, Zybert, Herman, Conover, Lemelle, Cournos, Hoepner, & Susser (2007) [43]	149 men with SMI, attending outpatient psychiatric clinics	intervention: enhanced SexG (E-SexG) --ten 60-minute sessions; booster sessions at 3, 6, and 9 months --focused on decision-making skills and barriers to condom use --included condom use and sexual assertiveness skills, risk awareness control: --ten 60-minute sessions; booster sessions at 3, 6, and 9 months --money management intervention	RCT baseline, 3, 6, 9, and 12 month assessments	no group differences over the follow-up period between intervention and control groups in the sexual risk index among men who were sexually active at baseline, men in the intervention group reported a greater percentage of sexual acts with casual partners where a condom was used than men in the control group, over the first 6 months of follow-up (approached significance)
Brady & Carmen (1990); Carmen & Brady (1990) [70, 71]	individuals with a chronic mental illness	--weekly, 60-minute drop-in group --some activities and discussion unstructured and determined by patient interest and level --HIV information; videos; condom use practice; provision of condoms	not evaluated	not evaluated

Informational Interventions for Individuals Who are HIV Negative				
Authors	Sample	Intervention	Methodology	Results
Carey, Carey, Maisto, Gordon, Schroder, & Vanable (2004) [32]	408 women and men attending an outpatient psychiatric clinic	HIV intervention: --ten 60-minute sessions --based on the IMB model --included HIV information, motivational components (increase risk awareness, identify pros and cons of risk reduction strategies, discuss sexual norms), and behavioral skills (condom acquisition and use, self-management, and sexual assertiveness) substance use intervention: --ten 60-minute sessions --based on social-cognitive theory --trigger identification and management, refusal skills control: --standard outpatient psychiatric care, including therapy and case management	RCT baseline, immediate post, and 3 and 6 month follow-up assessments	greater decrease in the frequency of unprotected vaginal sex, the number of casual partners, and the likelihood of self-reported STD, and greater increase in the number of discussions about safer sex, HIV knowledge, positive condom attitudes, condom use intentions, and assertiveness skills among HIV intervention participants, compared to substance use and control participants greater decrease in number of partners for HIV intervention participants, compared to control participants no differences between HIV intervention and other conditions in the pros and cons of condom use greater decrease in the number of partners and number of casual partners, and greater increase in positive condom attitudes, condom use intentions, and assertiveness skills in substance use participants compared to control participants women in the HIV intervention improved more than men in the frequency of unprotected sex; men in the HIV intervention improved more than women in knowledge individuals diagnosed with major depression in the HIV intervention reduced the frequency of unprotected sex and increased safer sex discussions more than patients diagnosed with other disorders
Collins, Geller, Miller, Toro, & Susser (2001) [35]	35 women with SMI, recruited from a state psychiatric hospital	intervention: Ourselves, Our Bodies, Our Realities --ten 50-minute sessions --talk show format (group) --based on social cognitive-theory --includes HIV education and skills training, including communication skills (through role plays) and female condom demonstration and practice control: --two 60-minute sessions --discussion of HIV and STD prevention, contraceptive options, and female-initiated methods of HIV prevention	RCT baseline, immediate post, and 6 week follow-up assessments	no group differences immediately following the intervention intervention group participants had more positive attitudes towards female condoms at 6 weeks than control group participants
Goisman, Kent, Montgomery, Cheevers, & Goldfinger (1991) [47]	50 psychiatric outpatients with a chronic mental illness	--three sessions --HIV information; condom use demonstration and practice	pre/post design baseline and immediate post assessments	improvement in HIV knowledge from pre- to post-assessment (no <i>p</i> values reported) more patients asked for condoms and information after the course

Informational Interventions for Individuals Who are HIV Negative				
Authors	Sample	Intervention	Methodology	Results
Hajagos, Geiser, Parker, & Tesfa (1998) [39]	75 male inpatients with a mental illness	intervention --two 60-minute sessions --HIV information; condom use training and safer sex communication training --randomly assigned to individual or group counseling control: --one 60-minute session --watched videotape; question and answer --randomly assigned to individual or group counseling	RCT baseline, immediate post, and 2 week follow-up assessments	intervention group participants who received the intervention in individual format scored higher in HIV knowledge on the immediate post-test than patients who received the control session in group format or patients who received the intervention in group format intervention group participants who received the intervention in individual format scored higher in HIV knowledge on the 2 week follow-up than patients who received the control session in group format patients with schizophrenia, depression, or adjustment disorder had less knowledge on the posttest than patients with other primary diagnoses
Herman, Kaplan, Satriano, Cournos, & McKinnon (1994) [37]	26 individuals with an SMI in a state hospital	--cognitive behavioral intervention --ten group sessions --includes HIV information, condom use demonstration, management of high-risk situations; assertiveness and communication training	post-test only	85% answered at least 9 out of 10 knowledge questions correctly 89% reported they were more likely to use a condom during sex and 75% reported they were less likely to have sex with someone they did not know since attending the intervention requests for condoms quadrupled after the intervention
Kalichman, Sikkema, Kelly, & Bulto (1995) [34]	52 adults with a chronic mental illness	intervention: --four 90-minute sessions --same-sex, group sessions --cognitive-behavioral model --HIV information, sexual assertiveness skills, condom use skills, problem-solving skills, and self-management skills control: --waiting list	RCT baseline, immediate post, one month, and two month follow-ups (two month follow-up for intervention participants only)	intervention participants had more knowledge about HIV and condom use, and had stronger intentions to use a condom at next sex and to insist on using condoms than control group participants among 38 participants who were sexually active at baseline, from baseline to postintervention and from baseline to one-month follow-up, participants were more likely to talk to partners about safer sex; there was a decrease in the frequency of unprotected sex and an increase in the frequency and percentage of condom-protected sex events; from baseline to two-month follow-up, participants had fewer episodes of unprotected sex
Katz, Westerman, Beauchamp, & Clay (1996) [46]	27 psychiatric outpatients with a chronic mental illness	intervention: --four 120-minute group sessions --HIV information, problem-solving skills and refusal skills (including role plays) control: --no treatment	RCT baseline, immediate post, and 2 week follow-up assessments	at immediate post-test, intervention group participants had higher scores on HIV knowledge, self-efficacy, and refusal skills than control group participants (because of differential attrition, 2 week follow-up scores difficult to interpret)
Linn, Neff, Theriot,	257 sexually active,	intervention: adapted SexG --cognitive-behavioral	RCT (by shelter, not by	through the follow-up period, the mean sexual risk

Informational Interventions for Individuals Who are HIV Negative				
Authors	Sample	Intervention	Methodology	Results
Harris, Interrante, & Graham (2003) [44]	homeless men with a mental illness	--six group sessions --practice, feedback, and more practice of safer sex skills --storytelling, games, and acting control: --six group sessions --HIV education, including condom use instruction	individual) baseline and assessments every 6 weeks for 6 months	score was lower for men in the intervention group than men in the control group
NIMH Multisite HIV Prevention Trial Group (2006) [41]	99 men receiving outpatient mental health services	intervention: Project LIGHT (Living in Good Health Together) --seven 90-minute sessions --HIV knowledge, trigger identification, problem-solving skills, condom use, safer sex assertiveness skills control: --one session --informational video and brief discussion	RCT baseline, 3, 6, and 12 month assessments	participants in the intervention group decreased the number of risky sexual acts over the year of follow-up more than participants in the control group among African-American participants, those in the intervention group increased the proportion of condom-protected sex acts more than those in the control group no group differences in the number of sexual partners
Otto-Salaj, Kelly, Stevenson, Hoffman, & Kalichman (2001) [36]	189 men and women in outpatient programs for SMI	intervention: --seven sessions; one and two month booster sessions --same-gender groups --social-cognitive skill building approach --included information about HIV risk, condom use demonstration practice, trigger identification and management, sexual communication and assertiveness (modeling and role-play) control: --seven sessions; one and two month booster sessions --same-gender groups --focused on relationships, stress, nutrition, cancer heart disease, and sexual health	RCT baseline, 3, 6, 9, and 12 month assessments	men in the intervention group improved more in HIV knowledge at 3- and 12-months than men in the control group; no intervention group effects for men in condom attitudes, behavioral intentions, frequency of condom use, or percentage of condom use occasions; an increase in the number of partners for men in the control condition women in the intervention group had greater improvement in condom attitudes at 6- and 9-month follow-ups than women in the control group; greater increase in frequency of condom use and greater increase in percent of condom use occasions at 3-, 6-, and 9-month follow-ups, compared to the control group; a decline in the number of partners for women in the intervention condition; no intervention group effects for women in knowledge
Ponton, DiClemente, & McKenna (1991) [48]	76 adolescent psychiatric inpatients	--8 days over a four-week period --some group sessions; also, HIV intervention integrated into daily activities --HIV information, visit by someone who is HIV positive, role playing, art therapy, and condom practice	pre/post design baseline and immediate post design	significant decrease in misunderstandings about casual contact from pre to post-assessment no change in average knowledge score, or perceived risk of HIV infection
Susser, Valencia, Berkman, Sohler, Conover, Torres, Betne, Felix, & Miller (1998) [40]	97 homeless men with SMI (59 sexually active)	--cognitive-behavioral intervention, based on social learning theory intervention: Sex, Games, and Videotapes (SexG) --fifteen sessions --condom use skills modeled, practiced, feedback given, and practiced again	RCT baseline assessment; follow-up assessments every 6 weeks for 18 months	among sexually active participants, at 6 month follow-up, men in the intervention group had significantly lower scores on a sexual risk index, had a greater proportion of condom-protected sexual episodes, and were less likely to have engaged in

Informational Interventions for Individuals Who are HIV Negative				
Authors	Sample	Intervention	Methodology	Results
		--storytelling, games, and acting control --two sessions --HIV and STD information; basic instruction in condom use		high-risk sexual behavior (having multiple partners and unprotected vaginal or anal sex) than men in the control group although men in the intervention group had lower scores on the sexual risk index at 18 months than men in the control group, differences were not significant
Thurstone, Riggs, Klein, & Mikulich-Gilbertson (2007) [45]	50 adolescents with major depressive disorder, conduct disorder, and a substance use disorder	--one individual session on HIV (in 16 week cognitive-behavioral substance use intervention) --included HIV-related information; triggers for not using a condom, condom pros and cons	pre/post design baseline assessment (right before HIV session) and immediate post assessment (at end of 16 week substance use intervention)	significant increase in HIV information and increased positive beliefs about condom use from pre- to post-assessment
Weinhardt, Carey, & Carey (1997) [38]	17 men and women with SMI	--based on the Information, Motivation, Behavioral Skills model --same-gender groups --six 60-minute sessions --HIV information; risk of behaviors; condom use demonstration; identification of high-risk situations; role-playing of safer sex communication	pre/post design baseline, immediate post, and one month follow-up assessments	HIV knowledge increased from pre- to post-assessment and from pre-assessment one-month follow-up at one month follow-up, participants improved in stating a reason for refusal of unsafe sex and stating intentions appropriately; no change in refusal of unsafe behavior or suggesting an alternative behavior no changes in condom attitudes, perceived risk, self-efficacy, or sexual risk behavior score
Weinhardt, Carey, Carey, & Verdecias (1998) [33]	20 female psychiatric outpatients	intervention: --ten, 75-minute sessions --HIV information, risk awareness, and sexual assertiveness training control: --waiting list	RCT baseline, immediate post, 2, and 4 month follow-up assessments	intervention group improved more in sexual assertiveness from baseline to immediate post, 2 month, and 4 month follow-ups than the control group intervention group improved more in HIV knowledge from baseline to immediate post and 2 month follow-up than control group intervention group used condoms more frequently at 2 month follow-up than control group participants no group differences in perceived risk, behavioral intentions, or frequency of unprotected sex
Multi-Level Interventions for Individuals Who are HIV Negative				
Kelly, McAuliffe, Sikkema, Murphy, Somlai, Mulry, Miller, Stevenson, Fernandez (1997) [50]	104 women and men with SMI	intervention: --seven, 90-minute group sessions --same sex groups --cognitive-behavioral intervention --focused on increasing risk awareness, trigger identification and self-management, condom use practice, and sexual assertiveness training intervention + advocacy: --seven, 90-minute group sessions --same sex groups	RCT baseline and 3 month follow-up assessments	intervention plus advocacy group had a greater reduction in the number of partners, a greater reduction in the frequency of unprotected sex, compared to participants in the intervention group from pre to post, those in the intervention plus advocacy group reduced the number of sexual partners, the number of casual partners, and the number of unprotected sex acts, and were less likely

Informational Interventions for Individuals Who are HIV Negative				
Authors	Sample	Intervention	Methodology	Results
		--cognitive-behavioral intervention -- focused on increasing risk awareness, trigger identification and self-management, condom use practice, sexual assertiveness training, and HIV prevention advocacy training control: --one, 60-minute session --same sex groups --HIV information and question answering		to have multiple partners, to have new or casual partners, and to have unprotected sex; those in the control group reduced the number of sexual partners and were less likely to have multiple partners and to have unprotected sex; those in the intervention group did not change on any of the sexual behavior variables from pre to post, all 3 groups improved risk reduction self-efficacy, had more positive sexual partner condom use norms and condom use outcome expectancies, and had lower perceived barriers to condom use; intervention and intervention plus advocacy groups increased HIV knowledge; no change in peer norms for condom use for any group
Sikkema, Meade, Doughty-Berry, Zimmerman, Kloos, & Snow (2007) [49]	28 residents of supportive housing programs with SMI	--based on social cognitive theory --six 90-minute skills training sessions; a 4 month community norm intervention; and a two-hour HIV prevention training session for staff --same sex groups --skills training sessions included HIV education, goal setting, trigger identification and self-management, sexual communication skills, condom use skills, and relapse prevention --community norm intervention included identifying peer leaders and meeting with peer leaders to discuss HIV information, communication skills, and leadership skills	pre/post assessment baseline, immediate post, and 4 month follow-up assessment	from baseline to immediate post assessment, condom use self-efficacy and sexual communication self-efficacy increased; condom attitudes improved from baseline to 4 month follow-up, HIV knowledge, condom use self-efficacy, and sexual communication self-efficacy increased; condom attitudes and behavioral intentions improved no changes in social norms for condom use at immediate post or 4 month follow-up assessments reductions in sexual risk behavior (<i>p</i> values not reported)
Interventions for Individuals Who are HIV Positive				
Lauer-Listhaus & Watterson (1988) [51]	4 male psychiatric patients who were HIV positive	--six group sessions, plus individual meeting with therapist --psychoeducation and group discussion --topics included, physical and psychological symptoms of HIV, treatments, precautions to prevent infection of others, death and future uncertainty	pre/post design	25% increase in the number of correct responses from pre- to post-assessment (<i>p</i> values not reported)
Whetten, Reif, Osterman, Pence, Swartz, Whetten, Conover, Bouis, Thielman, & Eron (2006) [52]	141 adults who have a mental illness, have a substance use disorder, and are HIV positive	--based on the Transtheoretical Model --integrated model of care, which included individual and group counseling; treatment was for one year --addressed all client needs (e.g., basic	pre/post design baseline, 3, 6, 9, and 12 month assessments	reduction in the percentage of participants using drugs in the past month and in the percentage of participants using any alcohol at 6 and 12 month assessments reduction in emotional distress and in depression and

Informational Interventions for Individuals Who are HIV Negative				
Authors	Sample	Intervention	Methodology	Results
		living needs, spiritual needs), including medication adherence and sexual risk behaviors		anxiety at 6 and 12 month assessments reduction in the number of emergency room visits at 9 month assessment; reduction in the number of inpatient hospital days at 3, 6, and 12 month assessments no change in medication adherence or the percentage of participants reporting any sexual risk behavior

Note: SMI = severe mental illness; STD = sexually transmitted disease; RCT = randomized controlled trial; IMB = information, motivation, behavioral skills

¹ Number of participants not provided.