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Heterosexual anal sex among men and women in substance abuse treatment: Secondary analysis of two gender specific HIV-prevention trials

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Abstract

Receptive anal sex has high Human Immunodeficiency Virus (HIV) transmission risk, and heterosexual substance abusing individuals report higher anal sex rates compared to their counterparts in the general population. This secondary analysis evaluated the effectiveness of two gender specific, evidence based HIV prevention interventions (Real Men Are Safe, or REMAS, for men; Safer Sex Skill Building, or SSSB, for women) against an HIV-Education (HIV-Ed) control condition on decreasing unprotected heterosexual anal sex (HAS) among substance abuse treatment-seeking men ($n = 171$) and women ($n = 105$). Two variables, engagement in any HAS, and engagement in unprotected HAS, were assessed at baseline and 3 months post-intervention. Compared to the control group, women in the gender specific intervention did not differ on rates of any HAS at follow-up, but significantly decreased their rates of unprotected HAS. Men in both the gender specific and the control interventions reported less HAS and unprotected HAS at 3-month follow-up compared to baseline, with no treatment condition effect. The mechanism of action for SSSB compared to REMAS in decreasing unprotected HAS is unclear. More attention to HAS in HIV prevention interventions for heterosexual men and women in substance abuse treatment is warranted.

Keywords

HIV/AIDS prevention; heterosexual anal sex; gender; sexual behavior

Introduction

The Centers for Disease Control and Prevention (CDC) reports that women represent approximately 20% of new human immunodeficiency virus (HIV) infections each year, and approximately 84% of these occur through heterosexual contact (CDC, 2015). Because of the increasingly recognized importance of heterosexual transmission, HIV prevention work has expanded beyond men who have sex with men (MSM) to also target heterosexual men and women (Calsyn et al., 2009; Kalichman, Cherry, & Browne-Sperling, 1999; Pyeatt & Tirado, 2008; Tross et al., 2008; Villaruel, Jemmott, & Jemmott, 2006). It is imperative to gain an improved understanding of the risk factors associated with heterosexual transmission, one of which is heterosexual anal sex (HAS). HAS in the absence of condom use is one of the highest risk factors for HIV and sexually transmitted infections (STIs). Therefore, it is important to understand rates of both protected and unprotected anal sex because this will permit more accurate and targeted delivery of risk prevention messages. Historically, heterosexual risk prevention messages have promoted condom use, primarily with vaginal intercourse, but have often given less attention to anal sex.

Anal Sex Is Highly Risky and Not Uncommon

Anal sex, especially receptive AS, is highly predictive of HIV seroconversion and is associated with higher risk of infection than vaginal intercourse (Boily et al., 2009; Halperin, 1999; Mastro & Kitayaporn, 1998; Padian, Shiboski, & Jewell, 1990; Powis, Griffiths, Gossop, & Strang, 1995; Voeller, 1991). Based on a comprehensive review of HIV transmission in heterosexual couples, Boily et al. (2009) determined that receptive anal sex carried a 1.7% risk of HIV transmission, compared to vaginal intercourse which carried a 0.08% risk for male-to-female transmission and 0.04% female-to-male transmission.

Although often thought of as primarily occurring among MSM, research has also found that anal sex is a more common part of heterosexual activity than many realize. Using national survey data and a literature review, Halperin (1999) reported that while estimated U.S. prevalence is relatively low, the absolute number of women practicing unprotected receptive HAS is approximately seven times greater than the number of MSM engaging in receptive AS. In a more recent nationally representative probability sample in the U.S., 40% or more of women ages 20-49 years and 30% or more of women ages 50-69 years reported lifetime anal sex, and more than 20% of women 20-39 years old reported anal sex in the past year (Herbenick et al., 2010). Subgroup rates of HAS have ranged from 23% in sexually active college students (Baldwin & Baldwin, 2000), to 17-33% for urban female heterosexuals with an HIV-positive partner (Seidlin, Vogler, Lee, Lee, & Dubin, 1993). Condom use during HAS is also noted to be low. Yet another national survey found that while 30% of heterosexual women endorsed ever having had anal sex, only 16% reported using a condom at the last anal sex occasion (Leichliter, Chandra, Liddon, Fenton & Aral, 2007). Similarly, in a survey of urban low-income heterosexual women, 17% endorsed HAS in the past year, and 86% of those women reported that it was unprotected (Livak, Prachand, & Benbow, 2012). One can conclude that HAS is a common practice, that condom use remains relatively infrequent, and both must therefore be addressed and understood together in HIV prevention efforts.

Risk reduction interventions often target behaviors differentially depending on the audience. Anal sex receives targeted focus in interventions developed for men who have sex with men (e.g., *Many Men, Many Voices* [Wilton et al., 2009] and *d-up! defend yourself* [Jones et al., 2008]), but in general is less likely to be emphasized in heterosexual risk reduction interventions (e.g., *Safer Sex Skill Building* [Tross et al., 2008], *Real Men Are Safe* [Calsyn et al., 2009]). However, public health messages such as the CDC's report on HIV/AIDS Among Women (2015) describe a dramatic increase in heterosexual transmission of HIV, and now specifically cite receptive anal sex as one of the risk factors for women.

These findings suggest that HIV and STI risk reduction efforts should target their messages about anal sex not only to MSM but to the heterosexual population as well. Clinicians and intervention developers would benefit from broader awareness of the need to integrate information on its risk when unprotected, and strategies for enjoying anal sex while decreasing its risk. Furthermore, HIV risk is higher among those who use substances, due either to sharing injection equipment contaminated with HIV, or to engaging in high risk sex while under the influence of drugs or alcohol (CDC, 2015). Because sex and substance use are often intertwined, sex is now commonly understood as a relapse trigger for many substance abusers (Calsyn et al., 2009; Calsyn et al., 2000; Tross et al., 2008). Understanding the rates of both protected and unprotected HAS occurring in the substance abuse treatment-seeking population, therefore, would help clinicians and intervention developers be more effective in their risk reduction efforts.

As HAS is inherently different, and higher risk, for women (i.e. the receptive partner) than for men (i.e. the insertive partner), it is also important to study HAS in both groups (Boily et al., 2009; Padian, Shiboski, Glass, & Vittinghoff, 1997). The Centers for Disease Control and Prevention (CDC) reported that in 2010 the majority (84%) of new HIV infections among women were due to heterosexual contact (versus 16% due to injection drug use), and that approximately 25% of HIV+ adults and adolescents were women (CDC, 2015). Given these findings showing the shifts in the HIV/AIDS epidemic, combined with the fact that women are disproportionately at risk during receptive HAS, it is clear that the issue of HAS is highly relevant for both women and their male partners.

Gender and HAS

To address the changes in the transmission patterns of HIV/AIDS, it is important to gain an increased understanding of gender-related risk factors for heterosexual transmission, including women's biological predisposition to risk, power differentials within heterosexual relationships, pregnancy intention, and the meaning of condom use (Exner, Hoffman, Dworkin, & Ehrhardt, 2003). Unprotected HAS has consistently been shown to be the most efficient transmission route of the HIV virus (Padian et al., 1997) and intervention efforts that highlight this biologic predisposition to risk during HAS may be more effective.

Exner and colleagues (2003) argued that any effort to promote condom use must consider gender-related perspectives that are culturally and socially embedded. They noted that women who are economically or socially dependent on their male partners may be reluctant to negotiate condom use because it increases the likelihood of partner anger, relationship conflict, loss of stability or security, and abuse. Another gender-related influence on HAS is

that women or their partners seeking to avoid pregnancy may be more likely to engage in HAS as a method of birth control (Civic, 2000; Houston, Fang, Husman, & Peralta, 2007; Maynard, Carballo-Díquez, Ventuneac, Exner, & Mayer 2009; McBride & Fortenberry, 2010). Factors such as these suggest that women's experience and motivation with HAS and condom use differ from men's, and the factors influencing their decision to engage in HAS and condom use are gender-influenced. Reviews of the gender-specific HIV risk reduction literature have noted that interventions specifically oriented toward women, with curricula targeting their unique issues and circumstances, and that focus on negotiating condom use with a partner, were the most effective (El-Bassel, Gilbert, White, Wu, & Chang, 2011; Exner, Seal, & Ehrhardt, 1997; Logan, Cole, & Leukefeld, 2002; Prendergast, Urada, & Podus, 2001; Wingood & DiClemente, 1996). A key question remains, however, of whether gender-sensitive HIV risk reduction interventions can effectively impact rates of HAS.

HAS Risk Is Highly Relevant For Substance Users

Drug users, including those who abuse stimulants, opioids and alcohol, can be especially prone to sexual risk behavior because of the disinhibition and heightened sexuality associated with intoxication (Buffum, 1983; El-Bassel, Gilbert & Rajah, 2003; Rawson, Washton, Domier & Reiber, 2002; Raj, Saitz & Cheng, 2007; Volkow et al., 2007). Women are especially vulnerable to pressures to trade sex for drugs, shelter or other goods. Des Jarlais et al. (2007) found that in an urban setting, men and women in communities with high rates of drug use were particularly at risk for HIV infection regardless of whether or not they engaged in injection drug use. The researchers attributed this to the likelihood of overlapping sexual networks between injecting and non-injecting drug users and their partners. Because of the high co-occurrence of drug use and risky sexual behavior, the National Drug Abuse Treatment Clinical Trials Network evaluated two parallel randomized clinical trials on the effectiveness of gender-specific safer sex skills building groups for male and female drug users in outpatient methadone and psychosocial treatment programs (Calsyn et al., 2009; Tross et al., 2008). Using baseline data from this pair of trials, we determined that rates of AS among heterosexual male and female drug users in outpatient drug treatment were, respectively, 32.8% and 27.1%. As expected, these rates were significantly higher than in the general population (Calsyn et al., 2013), and thus are of particular public health relevance for substance treatment providers.

The intersection of substance abuse and HIV risk is often particularly concerning for women. The social and economic context in which alcohol and drugs are used can increase the risk of sexual and physical violence (El-Bassel et al., 1997). Further, sexual partners are often also substance users, increasing the likelihood for higher levels of stress related to poverty, unemployment, and limited social supports (El-Bassel et al., 2001). Drug use can also affect sexual functioning, which can impede safer sex. Heightened sexuality and impulsivity associated with stimulant use, or suppression of sexual functioning associated with opioid use, can lead to sexual coercion or partner violence (Buffum, 1983; El-Bassel, Gilbert, & Rajah, 2003; Volkow et al., 2007).

Current Study

The current study provides a unique opportunity to perform a secondary analysis examining the effect of these gender-specific HIV prevention interventions on whether men and women in substance abuse treatment engage in HAS and, if so, how many are doing so in an unprotected manner. As noted above, risk reduction interventions and substance abuse treatment often do not target HAS in discussions of heterosexual risky behavior, instead explicitly or implicitly focusing more on unprotected vaginal intercourse. Yet, HAS is known to be substantially riskier than vaginal intercourse for HIV transmission, and thus more information is needed to assess the possibility that risk reduction interventions impact whether and how often men and women engage in HAS.

Method

Participants

The study included a subsample of randomized participants from the Real Men Are Safe (REMAS; Calsyn et al., 2009) ($n = 171$) and Safer Sex Skills Building for Women (SSSB; Tross et al., 2008) ($n = 105$) studies who: 1) reported heterosexual activity in the 90 days prior to baseline assessment; 2) completed the HIV prevention intervention to which they were assigned (defined as attending 3 or more sessions out of 5 for REMAS/SSSB, or the single-session HIV Education (Treatment-As-Usual) control condition); and 3) completed the 3 month post-intervention assessment. Additional eligibility criteria from the parent studies were: 1) aged 18; 2) enrollment in a participating outpatient substance abuse treatment program (methadone maintenance or psychosocial outpatient); and 3) ability to speak and understand English. Exclusion criteria were, 1) having a primary sexual partner planning to get pregnant while the participant was enrolled in the study; 2) observable, gross mental status impairment; or 3) current episode of methadone maintenance equaled less than 30 days (Calsyn et al., 2009; Tross et al., 2008)

Measures

Sexual Behavior Inventory (SBI) / Sexual Experiences and Risk Behavior Assessment Schedule (SERBAS)—The SBI items were selected or adapted from the Sex and Drug Abuse Relationship Interview (Calsyn, Wells, Saxon, Jackson, & Heiman, 2000) and the SERBAS (Meyer-Bahlburg, Ehrhardt, Exner, & Gruen, 1991; Sohler, Colson, Meyer-Bahlburg & Susser, 2000). Items were administered using the audio computer-assisted self-interviewing (ACASI) method. ACASI has been associated with increased disclosure of high-risk behaviors compared to face-to-face interviews (Gross et al., 2000; Metzger et al., 2000). The SERBAS is a widely used sexual risk behavior assessment with good evidence of reliability and validity among both injection drug users and others at high risk for HIV (Dolezal et al., 1999; Ehrhardt et al., 2002; Sohler et al., 2000). SBI and SERBAS items in the current study used identical or very similar wording. Based on the 90 days preceding the baseline and 3 month follow-up assessment, two variables were generated for analyses: whether or not participants engaged in 1) any HAS (yes/no), and 2) unprotected HAS (yes/no).

Addiction Severity Index (ASI)—Primary substance abuse problem was determined from the ASI (McLellan et al., 1992) administered at baseline. Individuals were categorized based on whether they had used alcohol, a specific drug, or a combination of alcohol and drugs or more than one drug.

Interventions

The experimental and control conditions differed in length, amount of group discussion, inclusion of risk perception and motivational components, and opportunities for practice and skills acquisition. The experimental interventions (Real Men Are Safe, REMAS, and Safer Sex Skill Building for Women, SSSB) consisted of five 90-minute sessions including didactic material, brainstorming and discussion sessions, condom demonstrations and practice, self-assessment and risk reduction motivation exercises, communication skills and risk refusal role-plays. Although the interventions are similar, there are gender-related differences. REMAS focuses on the ways in which sex and drugs influence each other, recognizing partner needs and society's "gender roles," the importance of accepting responsibility for one's own behavior, and assertive communication skills and use of "I" statements in safer sex negotiations. Of particular relevance to the current analyses is the frank and deliberate emphasis that REMAS places on HIV transmission risk through HAS, as part of a sexual risk hierarchy module. SSSB focuses on increasing self-efficacy, decision-making skills, negotiation and refusal skills, and recognizing risk of partner abuse and preemptive safety planning, all in the context of sexual relationships with substance-using men. SSSB included, but did not focus on, discussion of risk from HAS compared to other sexual behaviors, and protection via condom use. The HIV Education control condition for both studies was a 60-minute didactic presentation of basic information about HIV/AIDS and its transmission by risky behaviors (injection and sexual practices), barriers to condom use, and exploration of healthy/safe options. The men's HIV Education condition included mention of anal sex without condoms being of highest risk for HIV/STI infection. It also included condom demonstrations without participant practice opportunity. The content of the HIV Education control condition was gender neutral, unlike that of REMAS and SSSB.

Data Analysis

Analyses were computed separately for men and women. Generalized Estimating Equations (GEE) first tested the statistical significance of average change across conditions from baseline to 3 month follow-up in the percent engaging in HAS and in any unprotected HAS. To then test the effect of intervention condition on 3 month follow-up outcomes, logistic regression analysis used intervention condition (SSSB/REMAS vs. Control) as a predictor and controlled for baseline values of the outcome. To determine similarity to the general population, the sample's 3 month follow-up 90-day HAS rates were compared to men (Reece et al., 2010) and women (Herbenick et al., 2010) from the National Survey of Sexual Health and Behavior (NSSHB) using the Test for Significance of a Proportion (Bruning & Kintz, 1987).

Results

Sample Characteristics

The mean age of women and men in the sample was 38.99 ($sd = 8.89$) and 41.11 ($sd = 10.56$) years, respectively. The ethnicity of the women and men was 68.6%/54.7% White, 23.8%/31.6% Black, 12.4%/10.5% Hispanic, 8.6%/2.3% Native American, and 10.5%/1.2% other. Participants recruited from methadone maintenance (versus psychosocial) outpatient clinics was 72.4% of women and 65.5% of men. The primary ASI substance abuse problem identified for men/women, respectively, were alcohol (8.8%/3.9%), opioids (18.2%/25.7%), cocaine/amphetamines (12.9%/14.3%), sedatives (1.8%/2.9%), cannabis (3.5%/1.0%), alcohol and one or more drug (16.4%/14.3%), and more than one drug without alcohol (31.0%/32.4%).

Main Intervention Effects

Detailed results of the Real Men Are Safe (REMAS) and Safer Sex Skill Building for Women (SSSB) trials are presented elsewhere (Calsyn et al., 2009; Tross et al., 2008). For women, both the SSSB and the control condition (HIV-Ed) were associated with significantly fewer unprotected sexual occasions at 3-month follow-up. At 6 months, however, women in SSSB maintained their decrease in unprotected sexual occasions while those in HIV-Ed did not, suggesting that SSSB maintained its effect for at least 6 months post-intervention. Overall, women in SSSB had 29% fewer unprotected sexual occasions than those in HIV-Ed. The men showed similar results: those randomized to the REMAS condition had significantly fewer unprotected sexual occasions at the 3- and 6-month follow-up compared to those assigned to the HIV-Ed control condition. Men who completed at least 3 out of 5 REMAS sessions reduced their number of unprotected sexual occasions by 21% compared to HIV-Ed completers, who increased their number of unprotected sexual occasions by 2%. Overall, both interventions appeared effective at reducing unprotected sexual occasions over time.

Any HAS and Unprotected HAS

Figure 1 shows the percentage of women and men engaging in any HAS and unprotected HAS in both active and control treatment conditions.

Table 1 presents analysis results. For women, the percent of the full sample (averaged across both SSSB and HIV-Ed) engaging in any HAS and in unprotected HAS did not significantly change from baseline to 3 month follow-up (not explicitly shown in Figure 1: 24.8% to 24.8% for any HAS, 20.0% to 17.1% for unprotected HAS). In between-condition comparisons at the follow-up, the observed differences between the two intervention conditions in the percent engaging in any HAS were not statistically significantly different (15.0% versus 30.8%, shown in Figure 1). However, SSSB participants showed greater benefit in terms of unprotected HAS: they had lower rates at follow-up compared to controls (7.5% vs. 23.1%, a statistical trend, $p = .051$).

Among the men, the percent of the full sample (averaged across both REMAS and HIV-Ed) engaging in any HAS significantly decreased from baseline to 3 month follow-up (35.7% to

28.7%, $p = .049$). However, in between-condition comparisons, we found that the interventions did not differ at follow-up. Similarly, the overall percent engaging in unprotected HAS decreased between baseline and 3 month follow-up among men (25.7% to 15.8%), but intervention conditions did not differ at follow-up.

Despite the significant decline in the percent of men engaging in any HAS at follow-up, a greater percentage of REMAS completers still reported HAS in the 90 days prior to the 3 month follow-up compared to men from the age group with the highest rates of HAS in the National Survey of Sexual Health and Behavior (NSSHB; Herbenick et al., 2010) (29.6% vs. 15.9%; age group 25-29, $z = 2.91$, $p < .004$). A similar pattern emerged for female single-session HIV Education control group attenders: at the 3 month follow-up, a greater percentage of these women reported engaging in HAS compared to women in the NSSHB age group with the highest HAS rate (30.8% vs. 13.0%; age group 30-39, $z = 3.23$, $p = .002$). However, female SSSB group completers were different: at the 3 month follow-up, their rate of HAS in the past 90 days did not significantly differ from the NSSHB age group with the highest rate of HAS (15.0% vs. 13.0%; age group 30-39, $z = 0.35$).

Discussion

Current Findings

Men showed reductions in the prevalence of any HAS and unprotected HAS, but these reductions occurred regardless of assignment to active (REMAS) or control (HIV-Ed) treatment condition. In other words, men in both intervention conditions showed HAS reductions, and the gender-specific evidence-based HIV prevention intervention did not outperform the control intervention. Despite the reductions in men's HAS, the rates remained higher than national norms at follow-up (Herbenick et al., 2010). Among women, while there was no significant overall change in HAS and unprotected HAS, there was a main effect for treatment condition: women in the SSSB treatment groups showed lower rates of unprotected HAS than controls (HIV-Ed).

Women and men showed different patterns when it came to unprotected HAS. For men, rates of unprotected HAS decreased overall in the sample and patterns observed in Figure 1 suggest the reduction may, at least partly, reflect their decreased rates of engaging in any HAS. On the other hand, SSSB women did show a decrease in unprotected HAS compared to controls despite no significant difference in overall HAS rates. For them, the results suggest the SSSB intervention did produce intentional action toward risk reduction.

Intervention Effect for Women but Not Men

Our finding that only women decreased their rate of unprotected HAS based on their intervention assignment was unexpected. That treatment assignment was associated with a reduction in risky anal sex for women, but the men's reduction occurred in both the control and active treatment conditions, was especially puzzling given that REMAS contains some specific mention of anal sex risk and SSSB does not. There are at least two possible reasons for this. The first pertains to what might be active components in the interventions. Although HIV-Ed included reference to unprotected anal sex being at the top of the sexual risk

hierarchy, and why, REMAS and SSSB included a more nuanced discussion of this topic. That is, in addition to the sexual risk hierarchy present in HIV-Ed, REMAS and SSSB also included material on how to improve condom negotiation and refusal skills, assess one's own level of current versus desired risk, understand sex as a common relapse trigger, and improve self-efficacy in communicating about sex with partners. Thus, the active ingredient in reducing anal sex risk for women may relate to the problem solving, negotiation, and communication skills present in SSSB – i.e., knowledge is not sufficient, and ability to negotiate with a male partner to use a condom is a necessary skill. This finding reflects an individual's ability to exert control over sexual encounters, control which is often gender based and more likely to favor men in heterosexual encounters (Amaro, 2005; Pulerwitz, Gortmaker, & De Jong, 2000). Skill building is essential for women who traditionally have less power in heterosexual relationships. For the men, education alone about anal sex risk may be sufficient to promote change. A second explanation might relate to type of sexual risk, in that REMAS differentiated itself from HIV-Ed more effectively for reducing unprotected vaginal sex compared to anal sex.

Risk Reduction Interventions Must Focus Explicitly on HAS

Despite the positive changes in men in both treatment conditions (i.e., decreasing their rate of any HAS and unprotected HAS), men's risk levels remained high, particularly when compared to national norms (Herbenick et al., 2010), and are concerning. Clearly, more needs to be done to decrease risk associated with unprotected HAS among men who have sex with women.

One way is to do this is to focus on further refining the HAS-related content of sexual risk reduction interventions for men and women in substance abuse treatment. HIV prevention interventions such as Real Men Are Safe (Calsyn et al., 2009) for heterosexual men in substance abuse treatment, or Nia (Pyeatt & Tirado, 2008) for heterosexual African American men in the community, often teach that anal sex is riskier than vaginal intercourse, and receptive penetrative sex is more risky compared to insertive sex, using tools such as the “Safe Sex Hierarchy” (Real Men Are Safe) and the “HIV Risk Continuum Banner of Sex Behaviors” (Nia). This more general curricula contrasts with interventions targeting MSM, which may include a more specific and thorough emphasis on anal sex (e.g., “Roles and Risks for Tops & Bottoms” and “What Are My Chances If...” exercises in Many Men, Many Voices [Wilton et al., 2009]). It is possible that similar specific content may make interventions for heterosexual men and women more effective. For example, a parallel heterosexual activity might involve brainstorming about why/when people engage in HAS, positive and negative aspects of HAS, why people do/don't use condoms for HAS and how this might differ with vaginal sex (e.g., risk of pregnancy not present with HAS), and safer ways to enjoy HAS while minimizing negative consequences. Medical complications associated with anal sex (e.g., anorectal STIs, hepatitis B, vaginal infections from anal matter when HAS precedes vaginal intercourse, HPV-related anal cancers) could also be described. Finally, the inclusion of content that speaks to men's cultural perspectives on masculinity and how they relate to their sexual relationships has been shown promising in increasing condom use and decreasing sex under the influence (Calsyn et al., 2012; 2013). Overall, our preliminary analyses suggest that anal sex risk can respond to gender-specific

sexual risk reduction interventions, but that there is still room for improvement and this might be achieved via augmentation of HAS-related curricula.

Men's rates at the post-intervention 3-month follow-up for any HAS (27.8% for HIV-Ed, 29.6% for REMAS), and unprotected HAS (16.7% HIV-Ed, 14.8% REMAS), while reduced from baseline, were still significantly higher than national norms (Herbenick et al., 2010). This finding underscores that men are in a position to decrease sexual risk for the couple during HAS by using a condom. Taking responsibility for one's health, as well as one's partner's health, is a common focus of interventions targeting men. The importance of taking this stance for anal as well as vaginal intercourse is clearly indicated. Interventions targeting women often focus on developing direct and indirect negotiation skills and strategies for convincing male partners to use a condom or engage in less risky sexual behaviors. Such interventions may need to focus on how negotiations may be similar or different when the focus is on anal rather than vaginal intercourse.

The women in HIV-Ed reported higher rates of any HAS (30.8%) and unprotected HAS (23.1%) at the 3-month follow-up compared to women in SSSB. This finding, when compared to the reductions in risk seen in the SSSB group, implies that women were less able or comfortable with condom use with partners. This may be because, as Exner et al. (2003) noted, women can face cultural and economic barriers to power equality in relationships with men that may lower the likelihood that they can affect change in their partners' condom use rates or decisions to engage in HAI. These findings also suggest that the problem solving content in HIV prevention interventions for women, such as SSSB, is effective.

Limitations

The current study represents an initial and novel examination of this topic. A relatively small sample size precluded a more in depth examination of other important variables such as relationship status and primary drug of abuse, both of which may influence HAS and condom use. Because this was a secondary analysis, our data also did not include participants' reasons for engaging in HAS. Therefore, we can only speculate about improvements to HAS-related content in prevention interventions with this population. Focus groups with those who engage in HAS might uncover additional barriers to reducing risk that inform future intervention refinement. Another factor to consider is that this study included only those men and women who completed the interventions (attended at least 3 of the 5 REMAS/SSSB sessions or the 1 HIV-Ed session). Therefore, there may be other, non-specific characteristics of the sample associated with results (e.g., motivation, specific interest in reducing risky behavior, better substance abuse treatment outcomes) that merit exploration.

This study is limited by the use of self-reported sexual behavior data gathered via the ACASI method. We acknowledge having no objective measure against which to check data accuracy, and that participants' memory, possible misinterpretation of questions, or other factors may have affected their reports of HAS. However, previous studies conducted among drug users have reported high reliability and validity of self-reported sexual risk behaviors (Dolezal et al., 1999; Ehrhardt et al., 2002; Needle et al., 1995; Sohler et al., 2000).

Conclusion

In summary, this study suggests that even within gender-specific multi-session HIV risk reduction interventions, we must find additional ways to address sexual risk associated with HAS, especially for men. REMAS devotes more session time on HAS risk than does SSSB, but SSSB's content nevertheless appears effective at reducing risk for women at follow-up. For men, it is unclear whether more or different education, more or different condom negotiation/communication, or something else—perhaps the problem solving skills training in SSSB—might lead to greater risk reduction. A larger and fully powered trial of interventions that include HAS as one of their primary foci is needed to clarify these exploratory findings.

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Figure 1. Prevalence of anal sex and unprotected anal sex for women and men, by condition and timepoint

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