

# Safer sex intentions modify the relationship between substance use and sexual risk behavior among black South African men who have sex with men

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## ABSTRACT

Due to the global burden of HIV, a better understanding of the relationship between substance use and HIV risk behavior is a public health priority, particularly among populations with high rates of HIV infection. The current study explored the moderating effects of psychosocial factors on the relationship between substance use and sexual risk behavior. Among 480 black South African men who have sex with men recruited using respondent-driven sampling, a cross-sectional survey was conducted that included questions about their last sexual event that involved anal sex. Substance use was not associated with unprotected anal intercourse (UAI) ( $P=0.97$ ). The effect of substance use on UAI was modified by safer sex intentions ( $P=0.001$ ). Among those with higher safer sex intentions, substance use was positively associated with UAI (aOR = 5.8, 95%CI = 1.6–21.3,  $P<0.01$ ). This study found that among men who have sex with

men with high intentions to engage in safer sex, substance use was associated with increased risky sexual behavior.

**Keywords:** men who have sex with men (MSM); substance use; sexual risk behavior; South Africa

## INTRODUCTION

Because of the global burden of HIV, especially in sub-Saharan Africa, a better understanding of the relationship between drug and alcohol use and sexual risk behavior is a public health priority, particularly among populations with high rates of HIV transmission.<sup>1-4</sup> Most research supports that drug and alcohol use and sexual risk behavior are associated,<sup>2, 5</sup> including in sub-Saharan Africa.<sup>3, 4, 6, 7</sup> However, detailed reviews of the literature on this topic have noted inconsistencies, with many studies not identifying an association.<sup>8-10</sup> Inconsistencies have also been reported among black South African men who have sex with men (MSM).<sup>11, 12</sup> Specifically, an initial study found that sexual risk behavior and alcohol use are common among these men and that the two are associated,<sup>11</sup> a finding not replicated in a subsequent study.<sup>12</sup> Findings regarding drug use and sexual risk behavior were similarly inconsistent, with the same initial study measuring drug use but not reporting an association with sexual risk behavior.<sup>11</sup> In the second study, recent marijuana use was protective against HIV infection, although buying drugs or alcohol for a partner was a predictor of HIV infection.<sup>12</sup> These discrepancies have not yet been explained.

Possible explanations for these inconsistencies include the unmeasured moderating effects of other psychosocial factors.<sup>4, 10, 13-23</sup> Such factors impact the magnitude or even the direction of the effect of an exposure on an outcome. For example, in a recent study conducted among black South African MSM, we found that reasons for drinking and intentions to engage in safer sex modified the relationship between drug and alcohol use and HIV risk behavior, but that expectancies about how alcohol will affect one's behavior did not.<sup>23</sup> Specifically, drinking was

associated with sexual risk behavior among men who endorsed drinking to enhance social interaction but not among men who did not, while drug use was only positively associated with sexual risk behavior among men who intended to engage in safer sex.<sup>23</sup>

Indeed, the effects of drug and alcohol use on sexual behavior are not necessarily homogeneous; they may be contingent on other factors. For example, people's expectancies about how alcohol will affect their behavior have been shown to predict actual behavior when drinking.<sup>10, 13-18</sup> In addition, people's reasons for drinking have been found to influence the effects of alcohol.<sup>24</sup> Furthermore, reasons for drinking have been found to interact with other situational characteristics to influence levels of alcohol consumption.<sup>25</sup> Among MSM, reasons for drinking were found to be associated with how much men drink, although they were not found to have an association with sexual risk behavior.<sup>26</sup> Safer sex intentions are also important to consider as modifiers of the effect of drug and alcohol use on sexual risk behavior because people who use condoms when they are sober also tend to use them when they are using drugs or drinking, just as people who do not use condoms when they are sober tend to not use them when they are using drugs or drinking.<sup>10</sup>

One limitation to studies that have examined effect modification when looking at the relationship between drug and alcohol use and sexual risk behavior,<sup>16, 18</sup> including our own among black South African MSM,<sup>23</sup> is that they relied on general measures of drug and alcohol use and sexual risk behavior over a specific time frame but without regard to their temporal overlap. More exact temporal data, such as event-specific data, can be used to discern whether drugs or alcohol were used in close enough temporal proximity to engaging in sexual activity that it could influence this behavior.<sup>3, 4, 10</sup> Event-specific data additionally allows for simultaneous consideration of other important individual-, partnership- and event-specific characteristics.<sup>27-29</sup>

Therefore, the current study uses data from a specific sexual event to assess the direct association between drug and/or alcohol use and sexual risk behavior (defined as UAI) and then

to assess effect modification of this relationship by alcohol expectancies, reasons for drinking and safer sex intentions. We hypothesized that drug and/or alcohol use would be associated with increased sexual risk behavior only among men who expect alcohol to enhance sexual interactions, who drink to enhance social interaction and who intend to engage in safer sex. To investigate these issues, we used data from a study of black MSM from the metropolitan area of Tshwane (Pretoria), South Africa, a population with a heavy burden of drug and alcohol use, sexually transmitted infections (self-reported), and HIV.<sup>12, 30, 31</sup>

## **METHODS**

### **Participants**

The current project is a secondary analysis of data collected for an HIV prevalence study; details regarding the methods have been previously provided.<sup>23, 30</sup> Black South African MSM were recruited for this project between August 2011 and January 2013 using respondent-driven sampling (RDS),<sup>32, 33</sup> a strategy commonly used for populations that are difficult to include in research. RDS was chosen as the method to recruit these men because it is intended to derive valid population estimates for hidden populations, such as black South African MSM.<sup>34</sup> Eligibility criteria included: age between 18 and 44; having engaged in oral, anal, or masturbatory sex with a man in the prior 12 months; living, working, or socializing in the Tshwane (Pretoria) metropolitan area; fluency in English, Sepedi (Northern Sotho), or Tswana (Setswana); and willingness to take a rapid HIV test. Consistent with RDS methodology, seed participants were purposively selected based on geographic place of residence and their potential to propagate large and diverse recruitment chains.<sup>30</sup> Twenty seeds were selected and asked to distribute three to five recruitment coupons to eligible men from their social networks, defined as other MSM over the age of 18 who they know and would be willing to recruit into the study. The seeds were referred by the community advisory board, screened to ensure that they met all study

eligibility criteria and then interviewed about their social network size and composition. All seeds were Black and were purposively selected to ensure diversity in geographic place of residence in the Tshwane metro area and in age. All participants were linked using recruitment coupon identification numbers. Once men were enrolled in the study and completed study procedures, staff provided them with recruitment coupons for further distribution. Although not an eligibility requirement, the race/ethnicity of all seeds was Black as the focus of the study was on black South African MSM. Over three quarters of South Africans are Black. The racial/ethnic segregation demonstrated by the sample (100% were Black) reflects the racial/ethnic segregation that continues to characterize much of South Africa.

### **Procedures**

All participants completed a 90-minute interviewer-administered computer-assisted personal interview. The questionnaire was translated from English to Sepedi (Northern Sotho) and Tswana (Setswana) and then back translated following standard procedures for psychometric instruments.<sup>35</sup> All interviews were conducted in a private space, either the office of the Human Sciences Research Council in the center of Tshwane (Pretoria) or in one of the surrounding townships (e.g., in a community health center), depending on the participant's preference. Research staff involved in screening, interviewing, HIV testing, and instruction for participant recruitment were trained in a three-day session. All study participants received gift cards worth 150 South African Rand (~\$12 US Dollars) to be redeemed for purchase of products at a supermarket as primary incentive for their own participation, as well as an additional gift card worth 50 South African Rand (~\$4 US Dollars) for each successful referral to the study. All study procedures were approved by the Institutional Review Board of the New York State Psychiatric Institute in the U.S. and the Research Ethics Committee of the Human Sciences Research Council in South Africa. Participants provided separate written informed consent for the survey and HIV testing components of the study. Study staff provided referrals for

confirmatory HIV testing and counseling in the case of a positive test result, as well as mental health, or primary care services as indicated.

## **Measures**

Participants were asked about their last sexual event (LSE) that involved anal sex using a questionnaire that had been previously used among South African MSM.<sup>27, 28</sup> Information obtained included partnership characteristics such as how long ago they met their partner, where they met, their relationship to the partner, and other relational attributes: concordance in age, race, neighborhood where they live, socioeconomic status, and gender expression.

Participants were also asked questions regarding event-specific characteristics of the sexual encounter, such as where it took place, whether it was in exchange for money or food, whether they used drugs or alcohol immediately prior, and whether condoms were used. All measures regarding the LSE were calculated as characteristics of the partnership, for which there is precedent,<sup>27, 28</sup> except for drug or alcohol use for which we used respondent drug or alcohol use as we are interested specifically in how the effect of this factor on sexual risk behavior was influenced by other individual constructs (i.e. reasons for consuming alcohol, expectancies about its effects, and intentions to engage in safer sex), which were collected only about the respondent.

The primary exposure was drug or alcohol use, which we defined as responding 'yes' to the item: 'Had you used alcohol or drugs just before the last time you had anal sex?' (dichotomous=yes or no). The primary outcome was unprotected anal intercourse (UAI), which we defined as having participated in anal intercourse without the use of a condom at any time during the LSE (dichotomous=yes or no).

Effect modifiers were measured using scales that were adapted for and previously validated in South Africa. The Sex-Related Alcohol Expectancy Scale<sup>36, 37</sup> was used to assess expectancies about the effects of alcohol use on sexual behavior, representing three domains:

enhancement of sexual experience, increased sexual risk taking, and disinhibition of sexual behavior ( $\alpha=0.95$ ). A sample item is: “After a few drinks of alcohol I am more sexually responsive”. Men replied on a 4-point Likert scale (“Strongly disagree” (1) - “Strongly agree” (4)). Additionally, men were asked about reasons for drinking related to enhancing social interaction.<sup>24</sup> The two items used were: “How often did you drink because a drink helps you to relax around people?” and “How often did you drink because a drink helps you to have better sex?” ( $\alpha=0.80$ ). Men replied on a 5-point scale (“Never” (1) – “Always” (5)). Men who did not drink were assigned to “Never” (1) on all of these items. Three items were used to assess intentions to engage in safer sex. Men were asked how likely it is that they will always use a condom when having insertive anal sex, when having receptive anal sex, and how likely it is they will discuss safer sex; ( $\alpha=0.89$ ). Men replied on a 4-point scale (“Very Unlikely” (1) - “Very Likely” (4)).

Potential effect modifiers (expectancies about the effects of alcohol use on sexual behavior, reasons for drinking related to enhancing social interaction, and intentions to engage in safer sex) were operationalized as continuous variables. If found to modify the effects of drug and/or alcohol use on sexual risk behavior, they were dichotomized along the mean to indicate those with high- and low-levels of the relevant construct in stratified analyses.

The survey also addressed demographic characteristics, including age, education and income. All demographic characteristics and other partnership characteristics were included for descriptive analyses and as covariates in multivariable analyses.

### **Statistical analyses**

Since RDS was the method used for the recruitment of this sample, all data were adjusted prior to analyses using an RDS II estimator.<sup>38, 39</sup> This approach gives greater weight to those participants with a small personal network size, since those men presumably would be less likely to be recruited into the study.

Tests to determine which variables were associated with UAI included t-tests for continuous and scaled variables and Chi-square tests for dichotomous variables. Multivariable analyses were run using binomial logistic regression. Multivariable analyses included all individual-, partnership- and event-specific characteristics as covariates. HIV status was not included as a covariate because we hypothesized HIV status to be a result of UAI; not a cause of it. Furthermore, HIV status was not closely related to men's awareness of their HIV status. Multicollinearity was tested among all covariates included in the multivariable analyses using variance inflation factors (VIF).<sup>40</sup> No collinearity was identified (all VIF statistic values < 1.53). Initially, a main effect between substance use and UAI was tested. Effect modification was then tested by adding multiplicative interaction terms for substance use and each hypothesized effect modifier (as a continuous variable) to the regression model individually. If effect modification by a particular construct was identified, stratified multivariable analyses with all covariates were run among groups at low- and-high levels of the relevant modifying construct (as a dichotomized variable). Statistical tests were 2-sided and  $p < .05$  was considered statistically significant. SPSS 17.0 was used for all statistical analyses.

## **RESULTS**

In total, 480 eligible participants were recruited in 18 waves between August 2011 and January 2013. Six men did not have data on the outcome variable (UAI at the LSE) and were excluded from all analyses. Among the 20 seeds, 40% were less than 24 years old, 75% had some post-secondary education, 65% had a regular income and 100% were Black. Among the entire sample, 56% were less than 24 years old, 53% had completed high school, and 35% had a regular income (see Table 1) and 100% were Black.



**Table 1.** Demographic characteristics and potential modifiers of the effect of substance use on sexual risk behavior by having engaged in unprotected anal intercourse (UAI) at last sexual encounter (LSE) among black South African men who have sex with men (MSM) (n=474) in Pretoria, South Africa between August 2011 and January 2013

	Total (N=474)		UAI (N=94)		No UAI (N=380)		$\chi^2$	<i>p</i>
	%	N	%	N	%	N		
<b>Demographic characteristics</b>								
<b>Age</b>							1.38	.241
23 or younger	44%	207	17%	36	83%	171		
24 or older	56%	267	22%	58	78%	209		
<b>Educational attainment</b>							3.06	.080
≤ Grade 12	53%	250	45%	42	55%	208		
> 12 Grade or diploma	47%	224	23%	52	77%	172		
<b>Income</b>							0.57	.452
No regular income	35%	167	18%	30	82%	137		
Regular income	65%	307	21%	64	79%	243		
<b>Effect modifiers<sup>1</sup></b>	M	SD	M	SD	M	SD	<i>t</i>	<i>p</i>
Expectancies about the effects of alcohol <sup>2</sup>	2.4	0.6	2.6	0.4	2.4	0.6	-3.9	<.001
Drink alcohol to enhance social interaction <sup>3</sup>	2.4	1.2	2.7	1.3	2.3	1.2	-2.8	<.01
Intentions to engage in safe sex <sup>2</sup>	3.2	0.7	2.7	0.8	3.4	0.6	9.0	<.001

1. Higher scores indicate higher levels of the construct. 2. Range: 1-4. 3. Range: 1-5

Nearly a third (30%) of men reported that they used drugs or alcohol prior to their LSE. One fifth (20%) of the sample reported engaging in unprotected anal intercourse (UAI) during the LSE. Nearly two thirds (66%) of men said the LSE occurred with a steady partner, with an

even higher proportion (80%) occurring among men who had previously had sex with each other (see Table 2).

**Table 2.** Partnership and event characteristics of the last sexual encounter by having engaged unprotected anal intercourse (UAI) at last sexual encounter (LSE) among black South African men who have sex with men (MSM) (n=474) in Pretoria, South Africa between August 2011 and January 2013

	Total		UAI		No UAI		$\chi^2$	p
	%	N	%	N	%	N		
<b>Partnership characteristics</b>								
<b>First time with that partner</b>							6.96	.008
Yes	20%	97	10%	10	90%	87		
No	80%	377	22%	84	78%	293		
<b>Steady partner</b>							7.07	.008
Yes	66%	313	23%	73	77%	240		
No	34%	162	13%	21	87%	140		
<b>Met through friends/colleagues</b>							0.46	.498
Yes	30%	139	18%	25	82%	114		
No	71%	333	21%	69	79%	264		
<b>Live in the same neighborhood</b>							7.13	.008
Yes	63%	297	24%	70	76%	227		
No	37%	177	14%	24	87%	154		
<b>Same age</b>							15.63	<.001
Yes	22%	103	6%	6	25%	96		
No	78%	371	24%	87	77%	284		
<b>Same race</b>							2.15	.142
Yes	94%	443	21%	91	79%	352		

No	7%	31	10%	3	90%	28		
<b>Same SES</b>							0.04	.839
Yes	19%	88	19%	17	81%	72		
No	81%	385	20%	77	80%	307		
<b>Same masculinity/femininity</b>							0.00	.985
Yes	4%	20	20%	4	80%	16		
No	96%	454	20%	90	80%	364		
<hr/>								
<b>Event characteristics</b>								
<hr/>								
<b>Sex took place at home</b>							0.73	.393
Yes	93%	439	20%	89	80%	350		
No	7%	35	14%	5	86%	30		
<b>Sex was transactional</b>							0.02	.880
Yes	8%	37	19%	7	81%	30		
No	92%	436	20%	87	80%	349		
<b>Respondent substance use</b>							0.03	.859
Yes	29%	139	19%	27	81%	113		
No	71%	335	20%	67	80%	268		

There was no difference in the frequency of UAI among men who used drugs or alcohol immediately prior to having sex (19%) compared to the frequency of UAI among men who had not used drugs or alcohol immediately prior to having sex (20%,  $p=.86$ ). There was a higher frequency of UAI among steady partners ( $p<.01$ ), partners who lived in the same neighborhood ( $p<.01$ ), and age-discordant couples ( $p<.001$ ). In multivariable analyses including all participants, and all individual-, partnership- and situational characteristics, substance use prior to the LSE did not have a main effect on UAI ( $p=.97$ ). Discordance in age (aOR=4.2,

95%CI=1.8-9.8,  $p<.01$ ) and partners living in the same neighborhood (aOR=1.8, 95%CI=1.0-3.1,  $p<.05$ ) were both independently associated with UAI (Nagelkerke  $R^2=0.117$ ).

Men who engaged in UAI during the LSE endorsed more statements regarding drinking to enhance social interaction ( $p<.01$ ), had higher expectancies about the effects of alcohol ( $p<.001$ ), and had lower intentions to engage in safer sex ( $p<.001$ ) (see Table 1).

Interaction terms for substance use and expectancies about its effects, reasons for consuming alcohol, and intentions to engage in safer sex were added individually to the multivariable model looking at the effect of substance use prior to the LSE on UAI. The effect of substance use prior to the LSE on UAI was modified by safer sex intentions ( $p<.01$ ) but not expectancies about the effects of alcohol ( $p=.66$ ) nor reasons for consuming alcohol ( $p=.15$ ) (see Table 3).

**Table 3.** Multivariable analyses looking at the effect of substance use on UAI at LSE and potential modifiers of the effect of substance use on unprotected anal intercourse (UAI) at last sexual encounter (LSE) among black South African men who have sex with men (MSM) (n=474) in Pretoria, South Africa between August 2011 and January 2013

	aOR	95% CI	Wald	p
<b>Primary exposure</b>				
Respondent substance use	0.98	0.57-1.69	0.01	.95
<b>Effect modifiers</b>				
Expectancies about the effects of alcohol * Substance use	1.12	0.64-1.94	0.20	.66
Drink alcohol to enhance social interaction * Substance use	1.75	0.36-8.60	2.08	.15
Intentions to engage in safe sex * Substance use	5.79	1.94-17.29	11.91	<.01

1. Multivariable models included all individual (age, education, income), partnership (previous experience with the partner, relationship to the partner, how partners met, neighborhood concordance, age concordance, race concordance, SES concordance, gender concordance) and event (where sex took place, was sex transactional, respondent substance use) characteristics as covariates.

Given the observed effect modification by safer sex intentions, the sample was dichotomized at the mean (3.2) and stratified into men with lower safer sex intentions (n=268) and men with higher safer sex intentions (n=206). UAI was more frequent among men with lower safer sex intentions (28%) than among men with higher safer sex intentions (9%) ( $p<.001$ ).

Among men with lower safer sex intentions, 20% of men who used drugs or alcohol prior to the LSE reported UAI compared to 32% among men who did not. In multivariable analyses, substance use prior to the LSE was not associated with UAI among (aOR=0.5, 95%CI=0.3-1.0,  $p=.06$ ; Nagelkerke  $R^2=0.413$ ).

Among men with higher safer sex intentions, 17% of men who used drugs or alcohol prior to the LSE reported UAI compared to 6% among men who did not. In multivariable analyses, substance use prior to the LSE was positively associated with UAI (aOR=5.8, 95%CI=1.6-21.3,  $p<.01$ ; Nagelkerke  $R^2=0.133$ ).

## **DISCUSSION**

This study used event-specific data to assess if drug and/or alcohol use is associated with increased sexual risk behavior among black South African MSM and whether the relationship between drug and/or alcohol use and sexual risk behavior is modified by expectancies about the effects of alcohol, reasons for consuming alcohol, or intentions to engage in safer sex. We found that men who drank or used drugs prior to having sex were not more likely to engage in UAI and that the association between substance use and UAI was different among men with higher safer sex intentions compared to men with lower safer sex intentions. Among men with higher safer sex intentions, men who drank or used drugs prior to having sex were more likely to engage in UAI. Among the men with lower safer sex intentions, where UAI was more common, substance use was not associated with increased UAI. These

findings imply that men must have underlying intentions to engage in safer sex in order for substance use to be associated with increased sexual risk behavior.

We also found two other partnership-characteristics, age discordance and neighborhood concordance, to be associated with UAI. This is in agreement with other findings that partnership-characteristics are associated with sexual risk behavior.<sup>27, 28</sup> Neighborhood concordance might result in an assumed familiarity between sexual partners that make them less likely to engage in safer sex behavior. Age discordance might result in power imbalances where men are less likely to negotiate safer sex behaviors. These findings point to the need to consider the larger context of sexual behavior, and indicate the presence of other potential pathways that facilitate sexual risk behavior among this study population.

The current findings enhance our previous findings because we used data that allowed us to discern whether having used drugs and/or alcohol immediately prior to having sex in order to be able to influence sexual behavior.<sup>23</sup> Using event-specific data also allowed us to control other individual-, partnership- and event-specific characteristics. Considered in addition to the previous findings,<sup>23</sup> the current findings may help to explain inconsistencies in studies looking at drug and alcohol use and sexual risk behavior,<sup>7-9</sup> including among black South African MSM.<sup>11,</sup>

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Our findings both support and contradict what has previously been reported regarding drug and alcohol use and sexual risk behavior. The high levels of drug and alcohol use and sexual risk behavior that were reported in our study are in accordance with previous research among black South African MSM,<sup>11, 12</sup> and are especially concerning given the high prevalence of HIV infection and limited awareness of current HIV status.<sup>23, 30</sup> Alcohol use and drug use are also prevalent among the adult (15+ years), general population in South Africa (10% reported heavy episodic drinking, including 18% of males; 4% reported any drug use in the past 3-months, including 8% of males).<sup>41</sup> Our finding that drinking or using drugs prior to having sex did not have an association with sexual risk behavior among the entire sample is in line with some

other studies,<sup>8-10</sup> including studies conducted in sub-Saharan Africa,<sup>7-9</sup> but is in contrast to the large body of evidence suggesting that drug and alcohol use is associated with increased sexual risk behavior.<sup>3-5</sup>

The current study has certain limitations. First, we assessed alcohol and drug use in association with engaging in sex using a single item and thus were not able to distinguish between the two. Given the prevalence of alcohol use compared to drug use (86% of men drank alcohol while only 16% used drugs; no men exclusively used drugs),<sup>42</sup> we assume that alcohol use represents most substance use in this context but future studies should make this distinction. Also, unlike the item used to assess drug and/or alcohol use, the effect modifiers were not assessed specific to the sexual encounter, lessening the alignment with the primary exposure and outcome variables. Furthermore, two of the effect modifiers were specific to alcohol use but not drug use. Also, the study did not collect information on being on treatment for HIV. Given how few men knew their current HIV status (only 34.7% of the sample had gotten tested for HIV in the past 6 months. Among HIV positive MSM, nearly half (48.3%) thought that it was very unlikely or unlikely that they were HIV-infected), the limited availability of ART during the study period (2011-2013), and guidelines for starting ART during the study period (CD4 count <350 cells/ $\mu$ L), we suspect that few men were on treatment for HIV. We also observed large confidence intervals around the effect estimates once the sample was stratified. Also, the study was conducted among black South African MSM and generalizability outside of that setting is unknown. Lastly, the data collected are self-reported and could have been subject to social desirability or recall bias.

The current study contributes to a further understanding of drug and alcohol use and its relationship to sexual risk behavior by demonstrating the modifying effects of safer sex intentions. Understanding more about the context in which drug and alcohol use lead to sexual risk behavior is important for identifying effective strategies for reducing HIV transmission. For example, among black South African MSM with lower intentions to engage in safer sex (among

whom sexual risk behavior was more frequent than among those with higher intentions), using drugs or alcohol prior to having sex does not appear to influence safer sex behavior. If the underlying intention to perform a particular behavior is not there, it is logical that drug or alcohol use could not affect that behavior. In contrast, among black South African MSM who intend to engage in safer sex, using drugs or alcohol appears to reduce the possibility that they will engage in safer sex. This could be because alcohol and drugs are known to impair decision-making, have disinhibiting effects, encourage impulsivity, and minimize fear of negative consequences, particularly those that are more distal.<sup>15, 43, 44</sup> Our findings suggest that efforts to reduce sexual risk behavior among black South African MSM should consider focusing on both increasing safer sex intentions and negating the impact of drug and alcohol use on sexual risk behavior, otherwise they may yield little benefit. Specifically, given the high HIV prevalence in this population, many men may have developed a sense of fatalism regarding HIV infection and intervention efforts could target strengthening their underlying intentions to engage in safer sex behavior. Among men who express safer sex intentions, intervention efforts could target strategies to reduce drug or alcohol use before engaging in sexual encounters or effectively negotiating safer sex even when drinking or using drugs.

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