Published in final edited form as:

Addict Behav. 2008 December ; 33(12): 1630–1633. doi:10.1016/j.addbeh.2008.07.020.

Sensation Seeking and Alcohol Use Predict HIV Transmission Risks: Prospective Study of Sexually Transmitted Infection Clinic Patients, Cape Town, South Africa

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Abstract

Alcohol is related to HIV risk behaviors in southern Africa and these behaviors are correlated with sensation seeking personality and alcohol outcome expectancies. Here we report for the first time the associations among sensation seeking, substance use, and sexual risks in a prospective study in Africa. Sexually transmitted infection clinic patients in Cape Town South Africa (157 men and 64 women) completed (a) baseline measures of sensation seeking, sexual enhancement alcohol outcome expectancies, alcohol use in sexual contexts, and unprotected sexual behaviors and (b) 6-month follow-up measures of alcohol use in sexual contexts and unprotected sexual acts. Results confirmed that sensation seeking predicts HIV risk behavior and sensation seeking is related to alcohol outcome expectancies which in turn predict alcohol use in sexual contexts. HIV prevention counseling that addresses drinking in relation to sex is urgently needed in southern Africa.

Introduction

Alcohol use can facilitate behaviors associated with HIV transmission and research has confirmed that alcohol use contributes to the spread of HIV/AIDS in southern Africa

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(Kalichman et al., 2007; Weir et al., 2003), the region of the world which carries more than two-thirds of the global AIDS burden. The correlation between alcohol use and sexual risk behavior raises the question of whether there is a third variable that may account for the co-occurrence of both behaviors, such as risk-seeking personality dispositions. Personality characteristics such as sensation seeking may serve as unifying constructs for motivating clusters of high-risk behaviors, including substance use and sexual risk behaviors (Zuckerman, 1994). However, the associations among risk-taking personality, alcohol use and sexual risk behavior in South Africa have been assessed only in cross-sectional studies, not allowing for tests of prospective associations (Kalichman et al., 2006). The purpose of the current study is to test, for the first time in southern Africa, the prospective relationship between risk-taking personality, alcohol outcome expectancies, alcohol use in relation to sex, and sexual risk behavior.

Methods

Participants and setting

Participants were 157 men and 64 women receiving treatment services at a large sexually transmitted infections (STI) clinic in Cape Town between March 2005 and March 2006. The HIV prevalence at the is 25% among the 50% of patients who accept HIV testing.

Measures

Measures were administered in English, Xhosa (an indigenous African language) and Afrikaans (a former national language) using audio computer assisted interviewing (ACASI),

Descriptive characteristics and substance use—Participants reported demographic information and HIV risk and substance use history. Participants completed the Alcohol Use Disorder Identification Test (AUDIT, Conigrave et al., 1995); 10-items that include quantity and frequency of drinking designed to identify alcohol-related problems. Scores range from 0 to 40, and scores of 9 or above are sensitive in identifying individuals at risk for alcohol problems.

Sensation seeking—The sensation seeking construct. The South African version of the Sensation Seeking Scale consists of six items with the highest item-to-scale correlations in previous research and culturally adapted for use in South Africa. The scale is reliable with evidence for construct validity in South Africa (Kalichman et al., 2006), $\alpha = .71$.

Alcohol-sex outcome expectancies—Participants completed 7-items reflecting sex enhancing outcome expectancies from drinking alcohol culturally adapted from Goldman et al., (1999), $\alpha = .90$. The items did not overlap with the sensation seeking scale.

Drinking in sexual contexts—Participants indicated the number of times that they drank alcohol before or during sex in the previous 3-months.

HIV risk-related behaviors—Participants were instructed to think back over the past 3-months and estimate the number of male and female sex partners they had and the number

of occasions in which they practiced vaginal and anal sexual behaviors with and without condoms. To estimate sexual risks for HIV transmission, we computed the product of numbers of sexual partners in the previous three months and the number of unprotected vaginal and anal intercourse occasions during that time period. Thus, a person with one sex partner as well as a person with many sex partners in the previous three months who only engaged in condom protected sex is considered at low risk for HIV transmission. Otherwise, rates of unprotected intercourse were weighted by numbers of sex partners. A composite based on numbers of partners and rates of unprotected sex better represents HIV risks than either of the behavioral markers alone. Baseline and follow-up risk behavior composites were included in the model.

Procedures

Participants were referred by clinic staff to participate in the evaluation of a prevention counseling project. Of the 465 patients referred, 171 were not interested in participating and 73 did not attend the assessment session, with 221 assessed at baseline. The only criterion for referral to the study was that the patient was being seen at the clinic for STI diagnostic or treatment services. Participants were provided with informed consent by the research staff and completed baseline assessments. Of the 221 participants who completed baselines, 155 returned for the 6-month follow-up, representing 70% retention. All study procedures were approved by US and South African institutional review boards.

Data analyses

We examined the associations among sensation seeking, alcohol-sex outcome expectancies, drinking in the context of sex, and HIV risk by testing the path model shown in Figure 1. The model presented here was guided by previous research conducted in the US (e.g., Kalichman & Cain, 2004) and tested in an independent cross-sectional sample of STI clinic patients in Cape Town South Africa (Kalichman et al., 2006). The model included baseline measures of sensation seeking and alcohol outcome expectancies, and baseline as well as follow-up measures of alcohol use in sexual contexts and the HIV risk composite. The model also included participant gender (coded 0 = men and 1 = women), marital status (coded 0 = married, 1 = unmarried), and the AUDIT index for quantity and frequency of alcohol use with paths drawn to all other variables. In addition, we included the counseling condition that participants received as an exogenous variable with paths drawn to follow-up behavioral measures. Standardized path coefficients are reported with their associated significance levels. In addition to evaluating the individual paths, we tested the overall fit of the model to the data. The comparative fit index (CFI, Maximum Likelihood χ^2) and the Root Mean Square Errors of Approximation (RMSEA) were both used as indicators of fit. The CFI indicates the proportion of improvement in the overall fit of the hypothesized model relative to a null model in which all covariances between variables are zero. Values of .95 or greater are desirable for the CFI and indicate an excellent fit of the model to the data. The RMSEA is helpful as an additional tool to evaluate fit because it indicates the size of the residuals, values less than .06 indicate a relatively good fit.

Results

Table 1 shows the demographic characteristics, substance use, and baseline sexual behaviors of participants who reported drinking before sex during the 3-months prior to the baseline. Correlations among variables included in the path analysis are shown in Table 2. Path analysis showed that the model in Figure 1 provided an excellent fit to the data; χ^2 (df=14) = 18.4, $p > .1$; CFI = 0.96, RMSEA = .04, 90% CI 0.00–0.08. Sensation seeking significantly predicted HIV risk behavior, as indexed by rates of unprotected intercourse weighted by numbers of sex partners at 6-months follow-up. Sensation seeking was related to drinking in sexual contexts at baseline but not at follow-up. Thus, our first hypothesis regarding sensation seeking as a predictor of subsequent sexual risk behaviors was only partially confirmed. Our hypothesis regarding alcohol outcome expectancies as a predictor of drinking in sexual contexts at follow-up was confirmed. In addition, drinking in relation to sex was related to the HIV transmission risk behavior at the follow-up assessment. Participant gender was significantly associated with alcohol expectancies, standardized estimate = $-.17$, $p < .01$, and alcohol use in sexual contexts at baseline, $-.17$, $p < .01$. Quantity and frequency of alcohol use was significantly associated with drinking in sexual contexts at baseline, $.29$, $p < .01$, and follow-up, $.45$, $p < .01$. None of the remaining paths were significant.

Discussion

The current study demonstrated that sensation seeking significantly predicts HIV risk behavior 6-months following initial assessment in a South African sample at high-risk for HIV transmission. We also found that sensation seeking was related to alcohol outcome expectancies which predicted alcohol use in sexual contexts, which were in turn related to HIV transmission risks. We conclude that sensation seeking is principally related to sexual enhancement outcome expectancies and it is these cognitions that are critical to the chain of alcohol-related events associated with HIV risk behavior. These associations suggest opportunities for risk reduction counseling in populations whose HIV risks involve alcohol. Cognitions, such as outcome expectancies, are amenable to behavioral interventions, including those that directly challenge beliefs about the effects of alcohol on sexual behavior. Counseling delivered in STI clinics, voluntary HIV testing and counseling (VCT), and substance use treatment settings can integrate basic principles of HIV prevention and brief interventions for alcohol-related HIV risk reduction. The rapidly expanding AIDS epidemic in southern Africa demands for research to immediately test effective individual and structural level HIV prevention interventions for people whose alcohol use facilitates their risks for HIV transmission.

There are limitations to the current study that should be considered when interpreting these results. The study relied on self-reported assessments of sensitive behaviors. The frequencies of behavior, even though collected using computerized interviewing procedures, should therefore be considered lower-bound estimates of actual rates. In addition, the results are based on a relatively small sample of participants, especially for women. Women are more likely to receive STI services in reproductive and primary health care clinics, reducing their presence at city STI clinics. Future research should over-sample women to assure sufficient

numbers for analysis of gender effects. Our sample is also limited by attrition that occurred between baseline and follow-up. We also only assessed one of several possible dimensions of alcohol outcome expectancies. Additional research on multiple alcohol outcome expectancies could reveal new avenues for interventions. Finally, we conducted this study in one STI clinic in Cape Town, cautioning against generalizing the results to other STI clinics throughout Cape Town and South Africa. Acknowledging these limitations, we believe that our study findings support the immediate development of HIV risk reduction interventions for high-risk drinkers in southern Africa.

Acknowledgments

National Institute of Alcohol Abuse and Alcoholism Grant R01-AA017399 supported this research.

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Figure 1.

Path model and standardized path coefficients for baseline sensation seeking and baseline alcohol outcome expectancies in relation to baseline and follow-up alcohol use in sexual contexts and HIV risk composite at follow-up. Coefficients for the control variables, quantity-frequency of alcohol use, gender, marital status and intervention condition are reported in the text.

Table 1

Baseline Demographics, Substance Use, and HIV Risks among STI Clinic Patients who Did Not and Did Drink Before Sex at baseline.

	Did not Drink Before Sex (N = 113)			Did Drink Before Sex (N = 98)		
	N	%		N	%	X ²
Gender Male	66	58		86	88	
Female	47	42		12	12	22.4**
Language						
English	56	50		51	52	
Xhosa	57	56		46	48	1.3
Employed	71	73		52	53	2.0
Married	14	12		5	5	4.4
Tested for HIV	78	69		58	59	2.2
Tested HIV positive	2	2		7	7	10.6**
AUDIT Score > 9	21	19		69	70	4.7**
AUDIT Score > 13	14	12		52	53	40.4**
Used Marijuana (Dagga)	13	12		42	43	26.7**
Used Mandrax (Methaqualone)	3	3		5	5	0.8
2+ sex partners ^a	32	28		60	61	23.1**
Previously diagnosed with an STI	63	62		81	81	4.6**
	M	SD		M	SD	t
Age	28.8	5.7		28.7	5.6	0.2
Education	11.7	2.1		11.4	2.1	1.1
Sensation seeking	1.1	0.3		1.2	0.3	1.5
Alcohol-sex outcome expectancies	2.0	0.9		2.4	0.9	3.4**
Number of sex partners ^a	1.5	1.1		3.0	6.5	4.1**
Unprotected vaginal intercourse ^a	2.9	5.3		3.9	9.1	1.2
Unprotected anal intercourse ^a	0.2	0.8		0.5	1.6	2.0*

Note:

^a Reported for the previous 3-months,
* $p < .05$,
** $p < .01$

Table 2

Correlations among variables included in the path analysis.

	Gender	Marital status	Alcohol use	Sensation seeking	Alcohol Expectancies	Alcohol use in sexual contexts (Time 1)	HIV risk composite (Time1)	Alcohol use in sexual contexts (Time 2)
Marital Status	.12							
Alcohol use	-.21**	-.08						
Sensation seeking	-.07	.05	.11					
Alcohol Expectancies	-.17**	.08	.13	.19**				
Alcohol use in sexual contexts (Time 1)	-.22**	-.06	.37**	.24**	.23**			
HIV risk composite (Time1)	-.05	-.04	.12	-.03	-.02	.30**		
Alcohol use in sexual contexts (Time 2)	-.16*	-.13	.51**	.06	.19*	.34**	.17*	
HIV risk composite (Time 2)	.09	-.02	.13	.25**	.06	.05	-.01	.27**