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Differences in Sexual Risk Behaviors Between Lower and Higher Frequency Alcohol-Using African-American Adolescent Females

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Abstract

Background—To examine differences between lower and higher frequency alcohol users in sexual behaviors and psychosocial correlates of risk for HIV among young African-American females.

Methods—Data were collected from sexually active African-American females aged 15–20 years, seeking services at a STD clinic in Atlanta, GA, to assess sexual behavior, correlates of risk, and a non-disease biological marker of unprotected vaginal sex.

Results—Number of drinking occasions was significantly related to three of four psychosocial correlates and with all self-reporting sexual behavior measures. Also, heavier drinking per occasion was associated with the presence of semen in vaginal fluid.

Conclusion—Non-abuse levels of drinking were related to increased sexual risk-taking in this sample of young African-American females. Incorporating messages about the intersection of alcohol use and sexual decision making into HIV/STD prevention programs would strengthen STD prevention messaging in this vulnerable population.

Keywords

Adolescents; alcohol; HIV/STD; psychosocial correlates; sexual risk behaviors

INTRODUCTION

Young women are at greatest risk for contracting sexually transmitted diseases (STD), including HIV [1–4]. A recent report indicates that, overall, one in four girls in the U.S. has an STD [5]; with nearly half (48%) of African-American girls detected with an STD. Prior research across diverse adolescent populations, including African-American females,

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CONFLICT OF INTEREST

The authors confirm that this article content has no conflicts of interest.

suggests a link between alcohol consumption and high-risk sexual behavior, including earlier sexual debut [6, 7], multiple sexual partners [8], lower condom use [9, 10], and STDs [8, 11–14]. In addition, alcohol consumption is associated with hypothesized psychosocial determinants of sexual risk-taking among adolescents. Adolescents who drink alcohol report higher sexual sensation seeking [15, 16] have peers who support high-risk behaviors [17], and experience more depressive symptoms [18, 19]. Thus, it is important to not only examine simple main effects of alcohol use on sexual behaviors, but also examine whether alcohol use remains related to sexual risk-taking when including known determinants of sexual risk-taking in explanatory models of sexual risk.

Much of the empirical research, in general, and specifically for African-American adolescent females, has focused on the association between alcohol abuse and sexual risk-taking [8, 14]. There is markedly less research examining the impact of non-abuse levels of alcohol use on sexual behavior. This is an important and understudied area as non-abusive levels of alcohol use are more reflective of the drinking behavior of the vast majority of African-American adolescent females. Furthermore, few studies have examined the impact of non-abusive alcohol use controlling for known psychosocial determinants of sexual risk-taking.

Thus, the present study has three objectives. First, to examine differences in self-reported sexual risk behaviors between lower and higher frequency alcohol-using adolescent African-American females, as well as differences in the prevalence of a biological marker of unprotected vaginal sex; a Yc PCR assay for the presence of Y chromosome in vaginal fluid. Second, to examine differences between lower and higher frequency alcohol-using adolescent females and psychosocial determinants of high-risk sexual behavior such as fear of condom negotiation [20], sexual sensation seeking [21], peer norms about sexuality [22], and depression [23]. Third, to determine if alcohol use remains a significant predictor of sexual behavior after controlling for psychosocial determinants of high-risk sexual behavior. These data will be important in informing the design and development of HIV/STD interventions tailored to young, non-problem level alcohol-using African-American adolescent females.

MATERIALS AND METHODS

Setting

Participants were enrolled in a study evaluating a sexual risk-reduction intervention for young African-American females at an STD clinic in Atlanta, GA. Analyses reported in this article are based on data from baseline assessments prior to randomization and participation in trial conditions. Eligibility criteria include being (a) an African-American female, (b) between the ages of 15–21, (c) seeking sexual health services at the STD clinic, (d) unmarried, (e) one episode of vaginal sex without a condom in the last 90 days, and (f) providing written consent. Exclusion criteria were pregnancy or attempting to become pregnant, having a severe learning disability, or commitments that precluded participation. Recruiters screened clinic attenders from March 2002 – August 2004 and achieved an 81% participation rate (N = 439). The Institutional Review Board at Emory University approved the study protocol prior to study implementation.

Participants

For the present analysis we excluded participants who were 21 years of age upon study enrollment as they are legally able to purchase and consume alcohol which may affect their alcohol consumption patterns relative to participants under 21 years of age. Thus, this study included data from 407 participants (*mean* age 18.5 years, *SD* =1.5); half were full-time students, with most completing 11th grade or higher (63.3%). The majority (82%) reported being in a current relationship, with the mean length relationship being 16.5 months (*SD*=16.5).

Procedures

As part of the assessment protocol, participants self-collected a vaginal swab specimen. Trained monitors instructed participants to collect a vaginal swab specimen by performing a vaginal sweep for 10 to 15 seconds by modeling the collection procedure using a lifelike vaginal model (Swube applicator; Becton Dickinson Microbiology Systems, Sparks, Maryland). Subsequently, vaginal specimens were frozen and shipped to the Johns Hopkins Division of Infectious Disease Laboratory where they were evaluated using methods previously described by Melendez *et al.* [24] This novel DNA polymerase chain-reaction assay can detect the presence of the Y chromosome in vaginal fluid for up to 14 days after unprotected coitus. Although an earlier study suggested that this assay may also detect the Y-chromosome DNA from other cells [25], such as epithelial cells deposited during oral sex or digital penetration, subsequent extraction protocols have been optimized to remove any type of male and female epithelial cells. Therefore, any Y chromosome DNA detected in the vaginal fluid would come from sperm cells. In addition, all samples were processed by a female technician to reduce the possibility of contamination.

Subsequently, participants completed a 40-minute survey administered *via* audio computer-assisted self-interviewing (ACASI) technology. The survey assessed demographics, sexual history, alcohol use history, attitudes and outcome expectancies, psychosocial variables, HIV/STD knowledge and peer norms. The ACASI was completed in a group setting, with participants completing the survey on a laptop computer with headphones to assist those with limited literacy. Trained monitors ensured confidentiality and provided additional assistance to participants when needed. Given the sensitive nature of questions, a clinician was available if participants felt distressed or requested to speak with someone about the survey material. After speaking with the participant, referrals were made to other services at the clinic or to community agencies as appropriate. Participants were reimbursed \$50 for their participation.

Measures

Alcohol Use—Alcohol use was measured with three questions. Lifetime history of ever using alcohol was assessed with a single item, “In your lifetime, have you ever tried alcohol?” Response options were “Yes” and “No”. Participants responding “Yes” were asked, “In the past 60 days, how many days have you used alcohol?” Responses to this item were dichotomized based on a median split into lower and higher frequency alcohol use; lower frequency use defined as 2 or fewer days, and higher frequency use defined as 3 or more days. Finally, participants reporting a history of alcohol use were asked, “How many

alcoholic drinks do you usually have at one time?" Response options included: 1 = 1 drink, 2 = 2 drinks, 3 = 3 drinks, 4 = 4 or more drinks. Responses were dichotomized based on clinical indicators that suggest for adolescent females, consuming 3 or more drinks on a single occasion constitutes binge drinking; thus, low consumption = 1 or 2 drinks per occasion and high consumption = 3 or more drinks per occasion [26].

Sexual Behaviors—Participants indicated whether a condom was used at last vaginal sex occasion (No - Yes), how many times they engaged in vaginal sex in the past 60 days, and the number of males they had vaginal sex with in the past 60 days. Additionally, participants indicated the number of times they performed oral sex in the past 60 days, and the number of different males on which they performed oral sex during the past 60 days.

Psychosocial Correlates

Sexual Sensation Seeking for Adolescents: This scale assesses sexual sensation seeking among adolescents [27]. It is measured with nine Likert-type items ranging from 1 (strongly disagree) to 4 (strongly agree) and includes items such as "When it comes to sex, I'm willing to try anything" and "I enjoy the thrill of having sex in public places." Internal consistency for the SSSA was .72.

Depression: Depression was measured by the modified Center for Epidemiologic Studies Depression Scale (CES-D) [28, 29]. The scale has eight items including "I thought my life had been a failure" and "I felt lonely" ($\alpha = .84$). Responses ranged from 1 (less than one day) to 4 (five to seven days). Although not designed for clinical diagnosis, it has been validated as a useful screening instrument [30].

Peer Norms: Peer norms about sex were measured by 8 items assessing normative beliefs (i.e., peer norms) surrounding sexual behaviors [31]. For example, participants indicated "how many of your friends think that" 1) it's okay to have vaginal or anal sex without a condom, 2) it's okay to have sex with someone you just met, 3) cheating on your partner is okay, 4) it's safe to have sex when you are high on drugs or alcohol and 5) you don't have to use a condom with someone you know well. Responses were scored on a Likert scale, with 1 being "none of my friends" and 5 being "all my friends". The scale achieved internal reliability of .68.

Fear of Condom Negotiation: This 8-item scale assesses fear of condom negotiation with a Likert scale ranging from 1 (never) to 5 (always) [31]. It includes such items as, "I have been worried that if I talked about using condoms with my boyfriend/sex partner he would accuse me of being unfaithful" and "I have been worried that if I talked about using condoms with my boyfriend or sex partner he would threaten to hit me." Cronbach's alpha was .84.

Data Analysis

Descriptive statistics summarize sociodemographic variables and alcohol use for the entire sample. In addition, analyses were performed to examine differences between lower frequency and higher frequency alcohol users on sexual risk behaviors, including a

biological measure of risky sex (YcPCR), and psychosocial factors associated with sexual risk-taking. Differences were assessed using independent samples *t* tests for continuous variables and Chi-square analyses for categorical variables. Finally, multiple linear and logistic regressions models were constructed to determine if alcohol use was a significant predictor of sexual behavior outcomes after controlling for psychosocial factors.

RESULTS

Descriptive Analyses

Prevalence of lifetime history of alcohol use (ever used alcohol) was 87% ($n = 352$). Across the participants reporting lifetime use of alcohol, the mean number of days using alcohol in the past 60 days was 5.19 days. Further, 42% of participants consumed at least 1 drink at their last drinking occasion, 29% consumed 2 drinks, 14.2% consumed 3 drinks, and 15.1% consumed 4 or more drinks. One hundred and ninety three (55% of alcohol using participants) were classified as lower frequency users based on current patterns of alcohol use (reporting drinking alcohol on 2 or less days in the past 60 days), and 159 (45% of alcohol using participants) were classified as higher frequency users (reported drinking alcohol on 3 or more days in the past 60 days). Higher frequency alcohol users were also more likely to drink 3 or more drinks per drinking occasion (37%) than lower frequency users (14%), (chi-square = 15.16, $p = .0001$).

Prior to conducting group comparisons, preliminary analyses were conducted examining bivariate associations among the study variables (i.e., age, number of drinking occasions and amount of drinking per occasion, each sexual risk behavior, positive Yc assay, and psychosocial determinants associated with sexual risk-taking). Number of drinking occasions was associated with self-reported sexual behaviors and psychosocial determinants of sexual behavior, while the amount of alcohol consumed per occasion was associated with the biological marker of sexual risk-taking (i.e., positive Yc assay).¹ Thus, we compared lower verses higher frequency alcohol users on all self-reported measures. For the biological measure, we compared the Yc assay results of those reporting low verses high alcohol consumption per drinking occasion. Additionally, age was not significantly related to either measure of alcohol use, so it was not included in further analyses.

Differences in Sexual Risk Behaviors

Higher frequency alcohol users, relative to lower frequency alcohol users, were less likely to use a condom at last sex, had more vaginal sex partners, had vaginal sex more often, performed oral sex more often, and performed oral sex on more males (Table 1). Girls consuming more alcoholic drinks per drinking occasion were more likely to test positive for Yc in vaginal fluid ($p = .03$); 41.9% of girls reporting 1–2 drinks on an occasion tested positive for Yc compared to 58.1% of those who drank 3 or more drinks. Thus, drinking alcohol was associated with all six measures of risky sexual behavior.

¹Bivariate associations among study variables are available from the corresponding author by request.

Differences in Psychosocial Correlates of Risky Sex

Higher frequency alcohol-using females reported higher sexual sensation scores, higher peer norms supportive of risky sexual behaviors, and higher depression scores. Fear of condom negotiation did not differ significantly by alcohol use (Table 2).

Regression Models of Risky Sex

To determine if alcohol use was significantly associated with risky sexual behavior, after controlling for the psychosocial correlates of sexual risk-taking, a series of multivariate regression models were constructed controlling for sensation seeking, depressive symptoms, peer norms, and fear of condom negotiation. Correlations among psychosocial correlates were low; ranging from .07 for sexual sensation seeking and depression to .22 for sensation seeking and peer norms indicating potentially little problem with multicollinearity among the explanatory variables. Findings for the linear regression models of the four continuous sexual behavior variables indicate alcohol is a significant correlate of sexual behavior in three of the four models (Table 3). However, several psychosocial correlates of sexual risk-taking remained as significant correlates of sexual behavior even after adjusting for alcohol use.

Finally, for the one dichotomous self-reported sexual behavior measure (condom use at last sex) and the biological measure (positive Yc PCR assay), logistic regression models were computed with all four psychosocial correlates and alcohol use entered as predictors. For condom use at last sexual act, girls with higher sexual sensation seeking scores were less likely to use condoms (OR = .91, 95% CI = .86–.97, $p = .004$). Amount of alcohol consumed per drinking occasion was the only predictor of a positive Yc test (OR = 1.85, 95% CI = 1.00–3.46, $p = .05$).

DISCUSSION

Compared to other racial/ethnic groups, alcohol consumption is, on average, lower among adolescent African-American females. However, our findings suggest that the vast majority (85%) of the adolescent African-American females in our sample had tried alcohol, and that although alcohol was consumed on relatively few occasions, more frequent use was associated with increased self-reported sexual risk-taking and higher sexual sensation seeking, peer norms supportive of sexual risk-taking, and depressive symptoms – all empirically established psychosocial predictors of risky sexual behavior [21–23]. Further, consuming ≥ 3 drinks per drinking occasion was associated with testing positive for a biological marker of sexual risk-taking. Gaining a better understanding of the link between alcohol use, at considerably lower, non-abuse levels, and sexual risk-taking may prove beneficial in designing HIV/STD intervention programs tailored for young African-American females who report using alcohol.

Recent studies demonstrate that even after participation in evidence-based HIV/STD interventions, alcohol continues to be an important predictor of participants' sexual risk behaviors [32]. Many interventions may be ineffective with drinkers for two reasons: 1) they do not explicitly address the intersection between alcohol use and sexual behavior, and 2)

because social cognitive models serve as the basis for many, if not most, of the HIV prevention interventions [33] yet, experimental data shows alcohol use impairs sexual decision-making primarily due to alcohol's influence on disinhibition, anxiety reduction, and cognitive impairment [34, 35]. If a adolescent female is cognitively impaired, a cognitively based intervention may not be effective. Thus, interventions for alcohol using African-American adolescent females must explicitly address the connection between drinking and impaired sexual decision making.

Given the pattern of findings between alcohol use and psychosocial correlates of risk-taking, results suggest sexual-risk reduction interventions for alcohol using African American adolescent females may benefit from addressing sexual sensation seeking, an indicator of drinking to enhance positive feelings [36]. Sexual sensation seeking was a significant predictor of four out of six measures of risky sexual behavior; even when adjusting for alcohol use. Interventions with alcohol using adolescent females may benefit from directly addressing sensation seeking tendencies of participants and how such tendencies may be exacerbated due to alcohol's effect as a disinhibiting mechanism. Another strategy may be to explore how alcohol can serve as a *trigger* that makes it more difficult to practice safer sex.

While fear of condom negotiation was not significantly different across alcohol use groups, it was associated with more vaginal sex partners. Assertive resistance is usually the most effective way to negotiate and, yet, young women are often initially reluctant to resort to assertive resistance, especially with an acquaintance [37, 38]. This reluctance, in part, may be due to a lack of awareness of how to negotiate condom use and prevent victimization [39]. One strategy may be to discuss the effects of drinking on assertive, passive, and aggressive communication as a means of highlighting how alcohol disrupts perceptions and communication in relationships. Practicing responses that are more assertive on less sensitive topics also may make women more confident in their skills.

In terms of clinical implications, physicians and clinicians who provide STD services should be encouraged to screen African-American adolescent females on alcohol consumption, especially those engaging in high-risk sexual behavior, as these individuals may need further resources specific to substance use in order to change their high risk behaviors. Further, pediatricians or family practice providers should inquire about both alcohol and sexual risk behaviors when providing care for adolescent African-American females, as even seemingly minimal levels of alcohol use may be indicative of increased sexual risk-taking in this population.

This study is not without limitations. First, the sample consisted of young women who were seeking services at an STD clinic, and therefore may not be generalizable to non-clinic based samples or to individuals not meeting the study's eligibility criteria. Additionally, findings may not generalize to African-American females residing in other geographical areas of the U.S. Further, given our definition of lower versus higher frequency alcohol use, the findings may not be comparable to results from other studies employing different criteria to assess drinking. Also, it should be noted that our finding pertaining to alcohol consumed per drinking occasion as a predictor of positive Yc test is significant at the $p = .05$ level thus

the confidence interval begins with 1. However, although the rates of alcohol use indicate that this is a relatively low frequency event for most African-American young women, there were clear patterns of risk associated with even seemingly small increases in frequency of drinking for this population. Finally, it is important to acknowledge that data were collected in a cross-sectional design which precludes claims of causality.

CONCLUSION

Alcohol consumption was significantly associated with all six measures of sexual risk-taking behavior, both self-reported and biologically confirmed and sexual sensation seeking, peer norms supportive of sexual risk-taking, and depressive symptoms. Importantly, the findings suggest that even non-abuse levels of drinking are related to increased sexual risk-taking in adolescent African-American females, thus, incorporating messages about the intersection of alcohol use and sexual decision making into HIV/STD prevention programs could prove an effective strategy for reducing STDs in this vulnerable population.

SUMMARY

Among adolescent African-American females, non-abuse level alcohol consumption was related to increased sexual risk-taking and heavier drinking per occasion was associated with the presence of semen in vaginal fluid.

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REFERENCES

- Centers for Disease Control and Prevention. HIV/AIDS Surveillance Report, 2002 – Year End Edition. Atlanta, GA: U.S. Department of Health and Human Services; 2003. p. 856
- Gaydos CA, Howell MR, et al. Chlamydia trachomatis infections in female military recruits. *N Engl J Med*. 1998; 339(11):739–744. [PubMed: 9731090]
- Ho GY, Bierman R, Beardsley L, Chang CJ, Burk RD. Natural history of cervicovaginal papillomavirus infection in young women. *N Engl J Med*. 1998; 338(7):423–427. [PubMed: 9459645]
- Fleming DT, McQuillan GM, Johnson RE, Nahmias AJ, Aral SO, Lee FK, St. Louis ME. Herpes simplex virus type 2 in the United States, 1976 to 1994. *N Engl J Med*. 1997; 337(16):1105–1111. [PubMed: 9329932]
- Forhan, SE.; Gottlieb, SL.; Sternberg, MR., et al. Prevalence of sexually transmitted infections and bacterial vaginosis among female adolescents in the United States: Data from the National Health and Nutrition Examination Survey (NHANES) 2003–2004. Paper presented at the National STD Prevention Conference; Chicago, IL.. 2008 Mar.
- Lee HH, Chernesky MA, Schachter J, et al. Diagnosis of Chlamydia trachomatis genitourinary infection in women by ligase chain reaction assay of urine. *Lancet*. 1995; 345:213–216. [PubMed: 7823713]
- Tapert SF, Aarons GA, Sedlar GR, Brown SA. Adolescent substance use and sexual risk-taking behavior. *Journal of Adolescent Health*. 2001; 28(3):181. [PubMed: 11226840]

8. Cook RL, Comer DM, Wiesenfeld HC, et al. Alcohol and drug use and related disorders: An underrecognized health issue among adolescents and young adults attending sexually transmitted disease clinics. *Sexually Transmitted Diseases*. 2006; 33(9):565. [PubMed: 16572042]
9. Cooper ML. Alcohol use and risky sexual behavior among college students and youth: Evaluating the evidence. *Journal of Studies on Alcohol*, supp. 2002; 14:101–117.
10. Hingson RW, Strunin L, Berlin BM, Heeren T. Beliefs about AIDS, use of alcohol and drugs, and unprotected sex among Massachusetts adolescents. *American Journal of Public Health*. 1990; 80:295–299. [PubMed: 2305908]
11. Greenwood GL, White EW, Page-Shafer K, et al. Correlates of heavy substance use among young gay and bisexual men: the San Francisco young men's health study. *Drug Alcohol Depend*. 2001; 61:105–112. [PubMed: 11137274]
12. Morrison T, DiClemente RJ, Wingood G, Collins C. Frequency of alcohol use and its association with STD/HIV-related risk practices, attitudes and knowledge among African-American community-recruited sample. *Int J STD AIDS*. 1998; 9:608–612. [PubMed: 9819113]
13. Thompson JC, Kao TC, Thomas R. The relationship between alcohol use and risk taking sexual behaviors in a large behavioral study. *Prev Med*. 2005; 41:247–252. [PubMed: 15917018]
14. Cook RL, Pollock NK, Rao AK, Clark DB. Increased prevalence of herpes simplex virus type 2 among adolescent women with alcohol use disorders. *Journal of Adolescent Health*. 2002; 30(3): 169–174. [PubMed: 11869923]
15. Donohew L, Zimmerman R, Cupp P, Novak S, Colon S, Abell R. Sensation seeking, impulsive decision-making, and Risky Sex: Implications for Risk-Taking and Design of Interventions. *Personality and Individual Differences*. 2000; 28:1079–1091.
16. Hittner JB, Swickert R. Sensation seeking and alcohol use: A meta-analytic review. *Addict Behav*. 2006; 31:1383–1401. [PubMed: 16343793]
17. Bachanas PJ, Morris MK, Lewis-Gess, et al. Predictors of risky sexual behavior in African American adolescent girls: Implications for prevention interventions. *Journal of Pediatric Psychology*. 2002; 27:519–530. [PubMed: 12177252]
18. Kuntsche E, Knibbe R, Gmel G, Engels R. 'I drink spirits to get drunk and block out my problems..' beverage preference, drinking motives, alcohol use in adolescence. *Alcohol and Alcoholism*. 2006; 41(5):566–573. [PubMed: 16799163]
19. Windle M, Windle RC. Coping strategies, drinking motives, and stressful life events among adolescents: Associations with emotional and behavioral problems, and academic functioning. *Journal of Abnormal Psychology*. 1996; 105:551–560. [PubMed: 8952188]
20. Crosby RA, DiClemente RJ, Wingood GM, et al. Condom use and correlates of African American adolescent females' infrequent communication with sex partners about preventing sexually transmitted diseases and pregnancy. *Health Educ Behav*. 2002; 29:219–231. [PubMed: 11942716]
21. Hittner JB, Swickert R. Sensation seeking and alcohol use: A meta-analytic review. *Addict Behav*. 2006; 31:1383–1401. [PubMed: 16343793]
22. DiClemente RJ, Lodico M, Grinstead OA, et al. African-American adolescents residing in high-risk urban environments do use condoms: Correlates and predictors of condom use among adolescents in public housing developments. *Pediatrics*. 1996; 98:269–278. [PubMed: 8692629]
23. Mazzaferro KE, Murray PJ, Ness RB, Bass DC, Tyus N, Cook RL. Depression, stress, and social support as predictors of high-risk sexual behaviors and STIs in young women. *J Adolesc Health*. 2006; 39:601–603. [PubMed: 16982400]
24. Melendez JH, Giles JA, Yuenger JD, et al. Detection and quantification of Y chromosomal sequences by real-time PCR using the LightCycler(R) system. *Sex Transm Dis*. 2007; 34(8):617–619. [PubMed: 17334265]
25. Ghanem KG, Melendez JH, McNeil-Solis C, et al. Condom use and vaginal Y chromosome detection: the specificity of a potential biomarker. *Sex Transm Dis*. 2007; 34(8):620–623. [PubMed: 17308500]
26. Donovan JE. Estimated blood alcohol concentrations for child and adolescent drinking and their implications for screening instruments. *Pediatrics*. 2009; 123(6):e975–e981. [PubMed: 19482748]
27. DiClemente RJ, Milhausen RR, Spitalnick J, et al. Validation of the sexual sensation seeking scale for adolescents. (under review).

28. Melchior LA, Huba GJ, Brown VB, Reback CJ. A short depression index for women. *Educational Psychology Measurement*. 1993; 53:1117–1125.
29. Santor DA, Coyne JC. Shortening the CES-D to improve its ability to detect cases of depression. *Psychol Assess*. 1997; 9:233–243.
30. Radloff LS. The use of the Center for Epidemiologic Studies Depression Scale in adolescents and young-adults. *J Youth Adolesc*. 1991; 20:149–166. [PubMed: 24265004]
31. Wingood G, DiClemente R. Partner influences and gender - related factors associated with non-condom use among young adult African American women. *Am J Community Psychol*. 1998; 26:29–51. [PubMed: 9574497]
32. The National Institute of Mental Health (NIMH) Multisite HIV Prevention Trial Group. Predictors of Sexual Behavior Patterns Over One Year Among Persons at High Risk for HIV. *Arch Sex Behav*. 2002; 31:165–176. [PubMed: 11974642]
33. Edgar, T.; Noar, SM.; Murphy, B. Communication Skills Training in HIV Prevention Interventions. In: Edgar, T.; Noar, SM.; Freimuth, VS., editors. *Communication perspectives on AIDS in the 21st Century*. New York: Erlbaum; 2008. p. 29-65.
34. Lannutti, P.; Monahan, JL. Social cognition under the influence: Drinking while communicating. In: Roskos-Ewoldsen, D.; Monahan, JL., editors. *Communication and social cognition: Theories and methods*. New Jersey: Erlbaum; 2007. p. 217-241.
35. Norris J, Masters NT, Zawacki T. Cognitive mediation of women's sexual decision-making: The influence of alcohol contextual factors, and background variables. *Annu Rev Sex Res*. 2004; 15:258–296. [PubMed: 16913281]
36. Cooper ML, Frone MR, Russell M, Mudar P. Drinking to regulate positive and negative emotions: A motivational model of alcohol use. *J Pers Soc Psychol*. 1995; 69:990–1005. [PubMed: 7473043]
37. Ullman SE, Knight RA. The efficacy of women's resistance strategies in rape situations. *Psychol Women Q*. 1993; 17:23–38.
38. Zawacki T, Norris J, George WH, et al. Explicating alcohol's role in acquaintance sexual assault: Complementary perspectives and convergent findings. *Alcohol Clin Exp Res*. 2005; 29:263–269. [PubMed: 15714049]
39. Gidycz CA, Cobel CN, Latham L, Layman MJ. Sexual assault experience in adulthood and prior victimization experience: A prospective analysis. *Psychol Women Q*. 1993; 17:151–168.

Table 1

Risky sexual behavior: comparing lower versus higher frequency alcohol users.

Outcome Measure	Lower Frequency	Higher Frequency
Percent reporting condom used at last sex	61%	38%
	Mean	Mean
Number of vaginal sex partners (past 60 days)	1.46 (1.06)	1.87 ^{**} (1.64)
Number of times having vaginal sex (past 60 days)	12.30 (14.15)	19.50 ^{***} (21.96)
Number of guys performed oral sex on (past 60 days)	.88 (.90)	1.50 [*] (2.50)
Number of times performed oral sex (past 60 days)	3.87 (4.43)	6.92 ^{**} (9.17)

Note: Standard deviations are in parentheses.

P<.05;

^{**}
P<.01;

^{***}
P<.001.

Table 2

Psychosocial correlates of risky sex: comparing lower frequency versus higher frequency alcohol users.

Outcome Measure	Lower Frequency	Higher Frequency
Fear of condom negotiation	10.37 (4.33)	10.65 (4.61)
Sexual sensation seeking	17.66 (3.85)	18.80 ** (3.85)
Peer norms	19.78 (4.96)	22.01 *** (4.66)
Depressive symptoms	16.49 (6.62)	18.42 * (7.55)

Note: Means with standard deviations in parentheses.

*
p<.05;

**
p<.01;

p<.001.

Table 3

Linear regression models predicting risky sexual behaviors.

Predictors	β at Final Step			
	Number of Partners Vaginal Sex	Number of Times Vaginal Sex	Number of Partners Gave Oral Sex	Number of Times Gave Oral Sex ^a
Alcohol use	.10 [^]	.18 ^{**}	.14 [*]	.16 [*]
Fear of condom negotiation	.06	.15 ^{**}	.09	.07
Sexual sensation seeking	.18 ^{***}	.07	.15 [*]	.21 ^{**}
Peer Norms	.03	.01	.06	.10
Depressive Symptoms	.12 [*]	.03	-.08	.01

Note.

^a All dependent measures were assessed for the past 60 days (e.g., number of partners you had vaginal sex with in the past 60 days).

[^] P<.10;

^{*} P<.05;

^{**} P<.01;

^{***} P<.001.