Published in final edited form as:

Drug Alcohol Depend. 2014 August 1; 141: 167–170. doi:10.1016/j.drugalcdep.2014.05.021.

Regularly drinking alcohol before sex in the United States: Effects of relationship status and alcohol use disorders†

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Abstract

Background—Drinking alcohol before sex increases the likelihood of engaging in sexual risk behaviors and risk for HIV infection. Relationship status (single versus partnered) and alcohol use disorders (AUD) are associated with each other and sexual risk behaviors, yet have not been examined as predictors of drinking alcohol before sex, using national data. This study examined whether relationship status and AUD increased the likelihood of regularly drinking alcohol before sex in a nationally representative sample.

Methods—The main and additive interaction effects of relationship status and AUD on regularly drinking alcohol before sex were analyzed among sexually active drinkers (N=17,491) from Wave 2 of the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC).

Regularly drinking alcohol before sex was defined as drinking alcohol most or all of the time before sex.

†Supplementary material can be found by accessing the online version of this paper at <http://dx.doi.org> and by entering doi:...

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Contributors

Drs. Thompson, Eaton, and Hasin designed the present study. Dr. Thompson managed the literature searches and summaries of previous related work. Drs. Thompson and Hu undertook the statistical analysis. Dr. Thompson wrote the first draft of the manuscript. All authors contributed to and have approved the final manuscript.

Conflict of Interest

No conflict declared.

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Results—After adjustment for controls, relationship status (AOR=3.51; CI=2.59–4.75) and AUD (AOR=6.24; CI=5.16–7.53) increased the likelihood of regularly drinking alcohol before sex and interacted to differentially increase this risk, with the effect of being single on the likelihood of regularly drinking alcohol before sex increased among participants with AUD ($p<.001$).

Conclusions—This study reinforces the importance of relationship status and AUD to the risk for regularly drinking alcohol before sex. Public health efforts should target alcohol and HIV prevention messages to single adults, particularly those with AUD, highlighting their risk for regularly drinking alcohol before sex.

Keywords

drinking alcohol before sex; sexual risk behaviors; alcohol use disorders; relationship status; NESARC

1. INTRODUCTION

Drinking alcohol before sex is associated with unprotected sex (Kiene et al., 2009; Fisher et al., 2010) and sex with new, casual, and multiple partners (Cooper, 2006, 2002), all of which are consistently linked to transmission of HIV and other sexually transmitted diseases (e.g., Colfax et al., 2004; Hirschfield et al., 2004; Parks et al., 2012; Woolf and Maisto, 2009). Thus, drinking alcohol before sex is an important public health problem in the U.S., highlighting the need for a better understanding of its risk factors at the national level.

Several factors (e.g., sociodemographic characteristics, psychiatric disorders, alcohol sexual expectancies) increase the likelihood of abusing alcohol and engaging in sexual risk behaviors, suggesting they might also predict drinking alcohol before sex. One factor, relationship status, has been consistently linked to alcohol use and sexual risk behavior. Single adults (i.e., unmarried and not in exclusive romantic relationships) are almost twice as likely as those with partners (i.e., married or in exclusive romantic relationships) to have DSM-IV alcohol abuse or dependence (Hasin et al., 2007). Further, single individuals are more likely to have sex with new and multiple partners (O'Dowd, 2003). However, surprisingly, no community or national study has examined the influence of relationship status on drinking alcohol before sex.

Another potential risk factor for drinking alcohol before sex, alcohol use disorders (AUD), are characterized by maladaptive patterns of alcohol consumption leading to clinically significant impairment or distress (Hasin et al., 2007; Compton et al., 2007; Li et al., 2007). AUD heighten risk for HIV infection and seroconversion (e.g., Kalichman et al., 2007; Koblin et al., 2006; Zablotska et al., 2006), particularly by increasing the likelihood of high-risk sex with infected partners. Further, adults in substance abuse treatment commonly report combining sex and alcohol at their most recent sexual event, as well as numerous sexual risk behaviors (e.g., Calsyn et al., 2010a, 2010b, 2011).

Despite their associations with each other and sexual risk behaviors, relationship status and AUD have not been examined as independent or conjoint predictors of drinking alcohol before sex in the U.S. general population. Better understanding these risk factors is important to developing public health efforts to prevent HIV infection. Accordingly, we

examined whether relationship status and AUD were associated with regularly drinking alcohol before sex in the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC). Data from sexually active drinkers were analyzed to test the following hypotheses: (1) Being single (versus partnered) will be associated with regularly drinking alcohol before sex; (2) AUD (abuse or dependence) will be associated with regularly drinking alcohol before sex; and (3) Being single will have a stronger relationship to regularly drinking alcohol before sex among those with AUD than without.

2. METHODS

2.1. Sample

The NESARC is a U.S. national survey (Grant et al., 2004) whose target population included residents in households and group quarters aged 18+ years. Blacks, Hispanics, and young adults (18–24 years) were oversampled, with data adjusted for oversampling and nonresponse. Wave 1 in-person interviews were conducted with 43,093 respondents in 2001–2002 (response rate 81%). Wave 2 re-interviews were conducted in 2004–2005 with 34,653 participants (response rate 86.7%), producing a cumulative Wave 2 response rate of 70.2% (Grant et al., 2009). Field methods are described in detail elsewhere (Grant et al., 2004). Wave 2 data were analyzed because drinking alcohol before sex was measured in this wave. The sample was limited to participants who were sexually active (past year) and current drinkers (at least 1 alcoholic drink in past year) at Wave 2 (N=17,491).

2.2. Measures

The NESARC interview was the NIAAA Alcohol Use Disorder and Associated Disabilities Interview Schedule, DSM-IV Version (AUDADIS; Grant et al., 1995, 2003; Ruan et al., 2008). This fully structured instrument was designed for experienced lay interviewers. AUDADIS modules cover detailed information on drinking and associated behaviors, as well as DSM-IV diagnoses of AUD and other disorders.

2.2.1. Regularly Drinking Alcohol Before Sex—An AUDADIS item covered frequency of drinking alcohol before sex: “During the past year, how often did you drink alcohol before having sex?” Possible responses were: never, rarely, sometimes, most of the time, and always. As this study focused on drinking alcohol on a regular basis before sex (i.e., a persistent risk behavior), responses were dichotomized as: regularly drinking alcohol before sex (most of the time or always; N=615) versus others (intermittent or never).

2.2.2. Relationship Status—The AUDADIS assessed whether participants were single or partnered with the following item: “For the past year, were you married, dating, or involved in a romantic relationship?” All participants who responded affirmatively were classified as partnered, and others as single.

2.2.3. Alcohol Use Disorders—Past year AUD were measured by the AUDADIS. Reliability of AUDADIS alcohol diagnoses is very good to excellent ($\kappa=0.70\text{--}0.84$) in treated and untreated samples (Grant et al., 2003, 1995; Chatterji et al., 1997; Hasin et al., 1997). Convergent, discriminant, and construct validity of AUDADIS alcohol criteria and

diagnoses are good-to-excellent (Grant et al., 2003, 1995; Hasin et al., 1997, 1999), including concordance of diagnoses with clinician reappraisals ($k=0.60-0.76$; Canino et al., 1999; Cottler et al., 1997). Diagnoses of alcohol abuse and dependence were combined, since both are associated with sexual risk activity and relationship status.

2.2.4. Covariates—Demographics, (age, race/ethnicity, gender, education) and having any psychiatric (i.e., mood, anxiety, personality, psychotic) disorder (AUDADIS; Grant et al., 2003) were included as covariates to avoid confounding, as they are associated with AUD and sexual risk behaviors.

2.3. Data Analysis

Relationship status, AUD, and covariates were summarized descriptively (proportions, weighted 95% confidence intervals [CI]) for those who did and did not regularly drink alcohol before sex. Bivariate associations were estimated between predictors and regularly drinking alcohol before sex using odds ratios (OR), obtained from separate logistic regressions. Multivariate logistic regression was used to obtain adjusted odds ratios (AOR), representing the unique effects of being single and having AUD on regularly drinking alcohol before sex, adjusted for covariates.

To investigate whether the association between being single and regularly drinking alcohol before sex differed between those with and without AUD, the interaction effect between being single and having AUD on the risk for regularly drinking alcohol before sex was estimated using the additive (risk difference [RD]) scale (Schwartz, 2006; Rothman et al., 2008). Specifically, the interaction contrast (IC) was formed (Rothman et al., 2008), comparing RD of regularly drinking alcohol before sex for being single by AUD status. Adjusted IC for being single was computed using the marginal predicted RD (Bieler et al., 2010), obtained from logistic regression, including the cross product of being single and having AUD and control variables for adjusted estimates. A significantly positive IC ($p<.05$) would indicate that being single differentially influenced risk for regularly drinking alcohol before sex among those with versus without AUD. Analyses were conducted using SUDAAN software, which uses Taylor series linearization to account for the design effects of the NESARC and implements adjusted RD and IC through the PRED_EFF command.

3. RESULTS

Table 1 presents sample characteristics by regularly drinking alcohol before sex. Of those who did not regularly drink alcohol before sex ($N=16,876$), 5.29% were single and 14.75% had AUD. Of those who regularly drank alcohol before sex ($N=615$), 17.73% were single and 51.58% had AUD. Of those single with AUD, 26.65% regularly drank alcohol before sex, compared to 9.20% for those partnered with AUD (Supplemental Table 1¹). Of those single without AUD, 5.13% regularly drank alcohol before sex versus 1.72% for those partnered without AUD.

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After adjusting for covariates (Table 2), being single significantly increased the likelihood of regularly drinking alcohol before sex (AOR=3.51; CI=2.59–4.75), as did having AUD (AOR=6.24; CI=5.16–7.53). Tests of the differential effects of relationship status on regularly drinking alcohol before sex by AUD status (interaction; Supplemental Table 2²) showed that relationship status (being single vs. partnered) and regularly drinking alcohol before sex were more strongly associated with each other among participants with AUD than without AUD. Among those with AUD, being single increased the risk for regularly drinking alcohol before sex by 18% (RD; $p<.0001$); among those without AUD, the RD was only 3% ($p<.001$). Thus, the IC (differential effect of being single on regularly drinking alcohol before sex among participants with and without AUD) was 15% (18%–3%) [SE=4%, $p<.001$], significantly greater among participants with than without AUD.

4. DISCUSSION

Among sexually active drinkers, single individuals were over three times as likely as partnered individuals to regularly drink alcohol before sex and those with AUD were over six times as likely as those without AUD to regularly drink alcohol before sex. Further, among those with AUD, being single further significantly increased risk for regularly drinking alcohol before sex.

These findings suggest that single, sexually active drinkers and individuals with AUD should be made aware of their increased risk for regularly drinking alcohol before sex (and HIV infection) and availed of alcohol and sexual risk reduction efforts. For those with and at risk for developing AUD, early alcohol intervention and treatment may indirectly affect regularly drinking alcohol before sex. Alcohol treatment providers should assess adult patients for regularity of drinking alcohol before sex, provide them information on the associations among being single, having AUD, and regularly drinking before sex, and explore how their relationship status (single versus partnered) might influence their drinking alcohol before sex. Public health efforts should be directed to professionals who encounter alcohol misuse and sexual risk in their clinical practices (Vidanapathirana et al., 2005; Babor et al., 2007) to increase their awareness of drinking before sex as an alcohol related public health issue, to change negative (and positive) attitudes toward patients who engage in this behavior on a regular basis, and to educate providers about opportunities to discuss alcohol and HIV risk behaviors and motivate patients to change risk behaviors.

Studies suggest a complex set of multidirectional associations among alcohol sexual expectancies, alcohol use, and sexual behaviors, especially among single adults. Both acute intoxication and alcohol sexual expectancies contribute to risky sexual intentions and attitudes (Maisto et al., 2002) that increase the likelihood of engaging in sex when drinking (George et al., 2000; Bryan et al., 2007). Further, the effect of alcohol sexual expectancies on unsafe sex can be mediated through alcohol use in sexual contexts (Hendershot et al., 2007; Kalichman and Cain, 2004; Kalichman et al., 2003, 2006). Research on the role that alcohol sexual expectancies play in regularly drinking alcohol before sex, particularly among single adults and alcohol abusers, is needed. National alcohol and HIV prevention

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should target messages to single adults and alcohol abusers that highlight their increased risk for regularly drinking alcohol before sex and counter misperceptions about the sexual benefits of alcohol consumption.

Study limitations and strengths are noted. First, NESARC is based on respondent self-reports that can be affected by recall bias and social desirability. However, NESARC measures are reliable (Grant et al., 1995, 2003; Ruan et al., 2008), consisting of a carefully structured interview validated by psychiatrist evaluations (Hasin et al. 1997a, 1998; Canino et al., 1999). Second, information on drinking before sex might have been limited by dichotomizing the outcome variable. However, in a sensitivity analyses of the outcome across all its levels (in a multinomial model with an ordinal outcome), the effects of both relationship status and AUD were significantly increased among those who drank alcohol before sex ‘most of the time’ and ‘always,’ compared to ‘sometimes,’ ‘rarely,’ or ‘never,’ supporting our dichotomization of the scale at the point between ‘sometimes’ and ‘most of the time’. Further, the goal of this study was to examine the influence of relationship status and AUD on drinking alcohol before sex *on a regular basis*. This does not imply that infrequently drinking before sex is always low-risk behavior (with the wrong partner, even one occurrence could have disastrous consequences). However, frequently engaging in this behavior greatly increased the likelihood of such consequences, and is therefore of greater public health concern. Third, the study was cross-sectional and causality could not be determined. Prospective studies are needed to confirm the causal direction posited among predictors and outcome. Strengths of the study include the use of well-validated diagnostic measures, a wide variety of salient covariates, and a large representative sample, with broad geographic coverage, of sexually active alcohol drinkers.

In summary, this is the first study to examine the joint influences of relationship status and AUD, adjusting for salient covariates, on regularly drinking alcohol before sex in a large, U.S. representative adult sample. Findings demonstrate the relevance of both being single and having AUD to the risk for regularly drinking alcohol before sex. This study can serve as a benchmark for future studies on risk factors for regularly drinking alcohol before sex.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

Role of Funding Sources

This research was supported in part by grants from the National Institutes of Health, K23DA032323 (Thompson) and K05AA014223 (Hasin), and the New York State Psychiatric Institute (Hasin).

Support is acknowledged from the National Institutes of Health, K23DA032323 (Thompson) and K05AA014223 (Hasin), and the New York State Psychiatric Institute (Hasin). No authors have any relevant financial interests.

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Table 1

Characteristics of sample (sexually active drinkers) by status of regularly drinking alcohol prior to sexual activity (N=17,491).

Variable	Do Not Regularly Drink Alcohol Prior to Sexual Activity (N=16,876) %	Regularly Drink Alcohol Prior to Sexual Activity (N=615) %
Main Predictors		
Relationship Status (Single)	5.29	17.73
Alcohol Use Disorders	14.75	51.58
Control Variables		
Age		
18–29 years	20.73	18.67
30–39 years	24.23	17.51
40–49 years	25.23	25.39
50+ years	29.81	38.41
Race		
Non-Hispanic White	73.74	71.60
Non-Hispanic Black	9.44	13.51
Native American	2.05	2.96
Asian/Pacific Islander	3.38	2.77
Hispanic	11.39	9.15
Gender		
Male	54.01	69.81
Female	45.99	30.19
Education		
Less than HS	8.72	12.27
HS graduate	24.45	27.44
At least some college	66.82	60.29
Any Psychiatric Disorder	32.69	44.62

Table 2

Associations between regularly drinking alcohol prior to sexual activity and relationship status, alcohol use disorders, and control variables among sexually active drinkers (N=17,491).

Variable	Unadjusted OR (95% CI)	Adjusted ^a OR (95% CI)
Main Predictors		
Relationship Status (<i>ref = partnered</i>)	3.86 (2.94–5.07) ***	3.51 (2.59–4.75) ***
Alcohol Use Disorder (<i>ref = no disorder</i>)	6.16 (5.17–7.34) ***	6.24 (5.16–7.53) ***
Control Variables		
Age (<i>ref = 50+</i>)		
18–29 years	0.70 (0.51–0.96) *	0.36 (0.26–0.50) ***
30–39 years	0.56 (0.43–0.73) ***	0.42 (0.32–0.55) ***
40–49 years	0.78 (0.60–1.01)	0.65 (0.49–0.84) **
Race (<i>ref = Non-Hispanic White</i>)		
Non-Hispanic Black	1.47 (1.17–1.86) **	1.32 (1.03–1.70) *
Native American	1.49 (0.72–3.06)	1.19 (0.56–2.54)
Asian/Pacific Islander	0.84 (0.33–2.19)	1.11 (0.40–3.07)
Hispanic	0.83 (0.59–1.16)	0.88 (0.61–1.28)
Gender (<i>ref = Female</i>)		
Male	1.97 (1.60–2.42) ***	1.39 (1.13–1.70) **
Education (<i>ref = Some college</i>)		
Less than HS	1.56 (1.09–2.23) *	1.27 (0.88–1.85)
HS graduate	1.25 (0.98–1.58)	1.10 (0.86–1.41)
Any Psychiatric Disorder	1.66 (1.36–2.03) ***	1.40 (1.13–1.74) **

OR (95% CI) = Odds Ratio (95% confidence interval)

*
p<.05,

**
p<.01,

p<.001

^aModel controlled for all predictor and control variables.