



Binge drinking and the risk of suicidal thoughts, plans, and attempts



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HIGHLIGHTS

- We evaluated binge drinking and the odds of suicidality (thoughts, plans, attempts).
- We examined this association by sex and past year major depressive episodes (MDEs).
- Past month binge drinking was associated with suicidality among females without MDE.
- Among males without MDE, binge drinking was only associated with suicidal thoughts.
- Past month binge drinking was not associated with suicidality among adults with MDE.

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ABSTRACT

Background: Major depression is one of the strongest known risk factors for suicide. However, of the estimated 8.5 million adults with serious thoughts of suicide in the past year, only half had a major depressive episode (MDE). Identifying risk factors for suicide in the absence of depression may provide additional targets for prevention and intervention. This study uses nationally representative data to evaluate the association of binge drinking with suicidal thoughts, plans, and attempts in adults with and without MDE.

Methods: Combined 2008–2012 National Survey on Drug Use and Health data were analyzed. Sex-stratified prevalence estimates of past year suicide indicators were generated by past month binge drinking and past year MDE status. Logistic regression was used to evaluate the association of binge drinking with suicide indicators by sex with and without MDE.

Results: Unadjusted prevalence estimates for suicide indicators in males and females were higher among binge drinkers than among nonbinge drinkers, regardless of MDE status. Regression analyses indicated that binge drinking was associated with suicidal thoughts (adjusted odds ratio [aOR] = 1.51, 95% confidence interval [CI] = 1.28–1.79), plans (aOR = 1.75, CI = 1.23–2.48), and attempts (aOR = 2.57, CI = 1.74–3.79) in females without MDE and with suicidal thoughts in males without MDE (aOR = 1.25, CI = 1.04–1.49). Among males and females with MDE, binge drinking was not associated with any of the suicide indicators ($p > .05$).

Conclusions: Binge drinking in females without MDE may be an indicator for identifying at risk individuals for targeting suicide prevention activities.

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1. Introduction

Approximately 105 people commit suicide every day, and suicide is the 10th leading cause of death in the United States (Centers for Disease Control and Prevention, 2012, 2013). Depression is one of the strongest known risk factors for suicide (Goldney, Wilson, Grande, Fisher, & McFarlane, 2000; Kessler, Borges, & Walters, 1999), but less than 50% of attributable risk for suicide is due to major depression (Goldney et al., 2000). Of the estimated 8.5 million adults with suicidal thoughts

in the past year, only 4.3 million had past year major depressive episodes (MDEs) (Center for Behavioral Health Statistics and Quality, 2013b). Identifying risk factors associated with suicide in the absence of depression is important for targeting prevention and treatment activities to at-risk individuals.

Alcohol consumption is a well-established risk factor in studies of suicidal indicators (thoughts, plans, and attempts) (Cherpitel, Borges, & Wilcox, 2004; Powell et al., 2002; Schaffer, Jeglic, & Stanley, 2008), and in postmortem studies of suicide (Billan & Skibin, 2005; Cherpitel et al., 2004; Innamorati et al., 2010; Kaplan et al., 2013). Acute intoxication may be a greater risk factor for suicide than chronic alcohol use (Cherpitel et al., 2004), suggesting that binge drinking (i.e., heavy episodic drinking) may elevate the risk of suicide because it rapidly produces acute intoxication (National Institute of Alcohol Abuse and

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Alcoholism, 2004). Several studies support this hypothesis (Archie, Zangeneh Kazemi, & Akhtar-Danesh, 2012; Goldstein & Levitt, 2006; Hallfors et al., 2004; Powell et al., 2002) but have limitations, including the use of small nongeneralizable convenience samples (e.g., college students) (Goldstein & Levitt, 2006), only examining adolescents or young adults (Archie et al., 2012; Hallfors et al., 2004; Powell et al., 2002). Moreover, these studies did not consider the interactions between binge drinking and depression (Hallfors et al., 2004; Powell et al., 2002) despite studies suggesting that binge drinking is more prevalent among depressed individuals (Dawson, Grant, Stinson, & Chou, 2005) and predicts the development of depression symptoms (Paljärvi et al., 2009). To date, no nationally representative studies examining the association of binge drinking and suicidal indicators among males and females with and without depression have been identified.

This study builds on previous research by using a nationally representative dataset to examine past year suicidal thoughts, plans, and attempts among binge drinking and nonbinge drinking (consumed alcohol but did not binge) adults with and without past year MDEs. Moreover, we provide sex-specific results because previous research suggests that the association between alcohol consumption and suicide may differ in males and females (Goldstein & Levitt, 2006; Innamorati et al., 2010; Ramstedt, 2005).

2. Methods

2.1. Sample

For these analyses, 2008–2012 National Survey on Drug Use and Health (NSDUH) data were combined. NSDUH is a nationally representative, cross-sectional survey of the U.S. civilian, noninstitutionalized population aged 12 or older, sponsored by the Substance Abuse and Mental Health Services Administration (SAMHSA). NSDUH is conducted face-to-face using computer-assisted personal interviewing and audio computer-assisted self-interviewing to maximize accurate reporting of sensitive information. Between 2008 and 2012, NSDUH was administered to an annual average of 68,400 residents of households and noninstitutional group quarters (e.g., shelters, college dormitories). NSDUH does not include persons with no fixed household address, active-duty military personnel, or residents of institutional group quarters. Data collection was completed in compliance with the RTI International Institutional Review Board. More information on NSDUH methods can be found in the 2012 National Findings Report (Center for Behavioral Health Statistics and Quality, 2013c).

These analyses included adults (aged 18 or older) who had had at least one drink in the past month (unweighted $n \sim 136,500$; 46% females, 54% males). Of these, 5% of females and 4% of males reported suicidal thoughts; 1% of females and males reported suicidal plans, and <1% of females and males reported suicide attempts in the past year.

2.2. Measures

The outcomes of interest included three past year suicide indicators: serious thoughts of suicide (suicidal thoughts), suicide plans, and suicide attempts. Suicidal thoughts were assessed by asking, "At any time in the past 12 months ... did you seriously think about trying to kill yourself?" Among respondents who reported suicidal thoughts, suicide plans and attempts were assessed by asking, "During the past 12 months, did you make any plans to kill yourself?" and "During the past 12 months, did you try to kill yourself?"

The independent variable of interest was past month binge drinking. Binge drinking is defined in NSDUH as consuming five or more drinks on the same occasion (i.e., at the same time or within a couple of hours of each other) on at least 1 day in the past 30. For these analyses, adults who reported binge drinking were compared to adults who reported

alcohol consumption but no binge drinking (nonbinge drinkers) in the past month. Individuals who did not report alcohol consumption were excluded to ensure the comparisons focused on binge drinking rather than any alcohol consumption.

The suicidal indicators were examined by sex and past year MDE status. Past year MDE is assessed in the NSDUH using criteria from the fourth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV) (American Psychiatric Association, 1994), which specifies a period of at least 2 weeks when a person experienced a depressed mood or loss of interest or pleasure in daily activities and had a majority of specified depression symptoms. Other covariates included age, race/ethnicity; marital status; education; employment; income; and past year illicit drug use disorder (dependence or abuse), based on DSM-IV criteria (American Psychiatric Association, 1994). Illicit drugs included marijuana, cocaine, heroin, hallucinogens, inhalants, and nonmedical use of prescription-type psychotherapeutic drugs.

2.3. Analyses

2.3.1. Prevalence

Unadjusted prevalence estimates of the three suicide indicators by binge drinking and MDE status were generated for males and females. T-tests were used to test for differences in the prevalence estimates by binge drinking status in each subgroup (males, females, and MDE status). T-tests were chosen over chi-square because the t-distribution more accurately describes the test statistic under finite sample sizes when the variances of the test statistic are estimated. Additional details on this method can be found in the 2012 NSDUH Statistical Inference Report (Center for Behavioral Health Statistics and Quality, 2013a).

Adjusted prevalence estimates were calculated by standardizing the nonbinge drinkers' survey weights to match the marginal distributions of the binge drinkers on all the analytical covariates, including the two-way interactions between gender and all the other covariates. This adjustment was operationalized using SUDAAN's Proc Wtadjust. Comparisons of adjusted prevalence estimates were conducted using t-tests.

2.3.2. Interaction effects

Logistic regression models were used to test for the interaction between a four-level MDE by binge drinking variable (no binge/no MDE, binge/no MDE, no binge/MDE, and binge/MDE) and sex on the odds of the three suicide indicators. This tested whether the relationship between binge drinking and MDE on the suicide indicators varied by sex.

2.3.3. Regression analyses

Unadjusted and adjusted sex-stratified logistic regression analyses were used to examine the association between binge drinking and the suicide indicators among males and females with and without past year MDE. Each model was run twice: once using nonbinge drinkers without MDE as the reference group and once using nonbinge drinkers with MDE as the reference group; all other parameters remained the same. All models were tested for collinearity, with no issues identified.

Analyses were conducted using SUDAAN® to account for the complex sampling design of NSDUH (RTI International, 2012). Statistical tests were two-tailed with an alpha level of $p < .05$. Results are presented by outcome (suicidal thoughts, plans, and attempts). Prevalence estimates are presented first (unadjusted then adjusted), then tests for sex interactions, and finally logistic regression analyses (unadjusted then adjusted). As an additional test for robustness, sex-stratified multinomial logistic regression analyses, adjusted for covariates, were conducted treating the suicide indicators as a single multi-category dependent variable.

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