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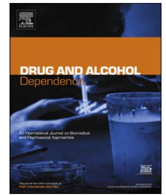
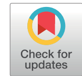


Full length article

A comprehensive model of predictors of suicide attempt in heavy drinkers: Results from a national 3-year longitudinal study



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ABSTRACT

Background: Heavy drinkers are at high risk for suicide attempt and suicide. Multiple factors, when examined in isolation, have been implicated in the risk of suicide attempt in this population. In this report, we present a comprehensive model of the 3-year risk of suicide attempt in heavy drinkers using a longitudinal nationally representative study, the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC; wave 1, 2001–2002; wave 2, 2004–2005).
Methods: We used structural equation modeling to simultaneously examine effects of four broad groups of clinical factors previously identified as potential predictors of attempted suicides: 1) alcohol use disorder severity, 2) severity of comorbidity, 3) sociodemographic characteristics and 4) help-seeking for alcohol problems. Heavy drinking was defined as drinking 5 or more drinks in a day more than once a week in the month prior to Wave 1.
Results: About 1.5% of the 1573 heavy drinker participants (i.e., 5.1% of the NESARC sample) attempted suicide during the 3-year follow-up period. After adjusting for all other factors, several factors independently predicted attempted suicides: the alcohol use disorder liability factor measured by DSM-IV-TR criteria for alcohol abuse and dependence and two dimensions of psychopathology, the general psychopathology factor accounting for the shared effects of all comorbid psychiatric disorders and the externalizing dimension accounting for the shared effects of comorbid substance use disorders. No other factor predicted this risk in addition.
Conclusion: This model may help identify individuals with heavy drinking at high risk of suicide and develop more effective suicide prevention strategies.

1. Introduction

Suicide attempt is associated with significant morbidity and is a strong predictor for completed suicide (Bostwick et al., 2016; Hawton and van Heeringen, 2009). Heavy drinkers are at high risk for suicide attempt and suicide (Grant et al., 2015; Kennedy et al., 2015; Norstrom and Rossow, 2016; Pridemore, 2006; Wilcox et al., 2004). Developing a comprehensive clinical model of suicide attempt for heavy drinkers is crucial to help prevent suicide attempts and suicides and to develop more effective suicide prevention strategies in this population (Pringle et al., 2013).

Prior research suggests that several factors from multiple domains increase the risk of suicide attempt among heavy drinkers, including severity of alcohol use disorder (AUD) (Jakubczyk et al., 2014; Preuss et al., 2003, 2002), specific AUD symptoms such as withdrawal (Preuss et al., 2002), daily volume of ethanol consumed (Preuss et al., 2003, 2002; Roy et al., 1990), number of heavy drinking days (Miller et al., 2007), acute alcohol intoxication (Kaplan et al., 2014, 2013, 2009), age at onset of regular drinking (Preuss et al., 2003, 2002; Roy et al., 1990), psychiatric comorbidity (e.g., mood disorders (Aharonovich et al.,

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2002; Duffy and Kreitman, 1993; Modesto-Lowe et al., 2006; Pirkola et al., 2004; Roy, 2003; Yaldizli et al., 2010), anxiety disorders (Roy et al., 1990), nicotine dependence (Le Strat et al., 2010), other drug use disorders (Roy et al., 1990; Sher, 2006), personality disorders (Modesto-Lowe et al., 2006; Preuss et al., 2006; Roy et al., 1990) such as antisocial and borderline personality disorders, chronic physical illness (Murphy et al., 1992; Preuss et al., 2003, 2002), family history of alcohol use disorder (Jakubczyk et al., 2014; Roy et al., 1990; Yaldizli et al., 2010), stressful life events (Conner et al., 2012; Heikkinen et al., 1994; Jakubczyk et al., 2014; Kaplan et al., 2016, 2015, 2009; Pompili et al., 2010; Roy, 2003; Sher, 2006), and certain sociodemographic characteristics such as age (Kaplan et al., 2009; Pirkola et al., 2004; Roy et al., 1990), female sex (Pirkola et al., 2004; Roy et al., 1990), race/ethnicity (Kaplan et al., 2009), and poverty (Pirkola et al., 2004; Pompili et al., 2010; Roy et al., 1990).

Despite this knowledge, prediction of suicide attempts in heavy drinkers remains difficult because of the elevated number of potential risk factors and their frequent co-occurrence (Mann et al., 1999; Murphy et al., 1992; Peyre et al., 2017), and is complicated by the fact that each risk factor, when examined in isolation, accounts only for a small proportion of the variance in risk. Therefore, there is a need to combine these multiple risk factors within integrative models to develop more powerful predictive approaches and help prioritize preventive measures.

To date, few integrative models have been proposed to predict suicide attempts in individuals with alcohol use disorder (Brady, 2006; Conner and Duberstein, 2004; Lamis and Malone, 2012; Yaldizli et al., 2010). These models suggest that alcohol use disorder predisposes to suicidal behavior through its depressogenic effects (Brady, 2006; Conner and Duberstein, 2004; Lamis and Malone, 2012; Yaldizli et al., 2010), hopelessness (Conner and Duberstein, 2004; Lamis and Malone, 2012), lower social support (Lamis and Malone, 2012), and promotion of adverse life events (Brady, 2006; Lamis and Malone, 2012), and that both alcohol misuse and suicidal behavior may share a common genetic predisposition (Brady, 2006; Yaldizli et al., 2010). They also suggest that acute alcohol use can precipitate suicidal behaviors through induction of negative affect (Brady, 2006; Conner and Duberstein, 2004; Lamis and Malone, 2012), impairment of problem-solving skills (Brady, 2006), interpersonal difficulties (Conner and Duberstein, 2004; Lamis and Malone, 2012), and exacerbation of impulsive personality traits (Brady, 2006; Conner and Duberstein, 2004; Lamis and Malone, 2012), possibly through effects on serotonergic neurotransmission (Brady, 2006). However, to our knowledge, no integrative model has been specifically applied to a general population sample of heavy drinkers.

This report presents a comprehensive prospective model of the 3-year risk of suicide attempt in heavy drinkers using a longitudinal nationally representative cohort study, the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC). We used structural equation modeling to simultaneously examine effects of four broad groups of clinical factors previously identified as potential predictors of suicide attempts: 1) alcohol use disorder severity, 2) severity of psychiatric and other physical comorbidities, 3) sociodemographic characteristics and 4) help-seeking for alcohol problems.

2. Material and methods

2.1. Sample

Data were drawn from the from the Wave 1 and Wave 2 of the NESARC, a nationally representative face-to-face survey of the U.S adult population, conducted in 2001–2002 (wave 1) and 2004–2005 (wave 2) by the National Institute on Alcoholism and Alcohol Abuse (NIAAA) (Grant et al., 2009). The target population included the civilian non-institutionalized population, aged 18 years and older, residing in the United States. The overall response rate at Wave 1 was 81%, and the cumulative response rate at Wave 2 was 70.2%, resulting in 34,653 Wave 2 interviews (Grant et al., 2009). The Wave 2 NESARC data were weighted to adjust for non-response, demographic factors and psychiatric diagnoses, to ensure that the Wave 2 sample approximated the target population, that is, the original sample minus attrition between the two waves. The research protocol, including written informed consent procedures, received full human subjects review and approval from the U.S. Census Bureau and the Office of Management and Budget.

2.2. Measures

2.2.1. Alcohol use measures at wave 1

Heavy drinking is defined by the Substance Abuse and Mental Health Services Administration (Substance Abuse and Mental Health Services Administration, 2014) as drinking five or more drinks on the same occasion (i.e., at the same time or within a couple of hours of each other) on each of five or more days in the past month (Dawson et al., 2008; Welch et al., 2014). In our study, we approximated this definition by considering participants drinking five or more drinks in a day more than once a week in the month prior to Wave 1 as heavy drinkers. For each beverage type (coolers, beer, wine, and liquor), participants were asked at Wave 1 about the usual frequency of drinking, usual and largest quantities consumed, frequency of consuming the largest quantity, frequency of consuming more than 5 drinks, and size of drinks (Sarsour et al., 2012). Flashcards with life-sized photographs of different types of glasses, with various fill levels designated in ounces, were provided to help respondents report drink size. The amount of ethanol in each drink was calculated by using ethanol conversion factors (i.e., the proportion of each beverage type that is pure alcohol), as detailed elsewhere (Dawson et al., 2007; NIAAA, 2010). Assuming that 1 standard drink contains 0.60 ounces of ethanol, the average daily volume has been converted to the number of drinks (Dawson et al., 2007; NIAAA, 2010).

The test-retest reliability of ethanol intake, adjusted for the frequencies of consuming five drinks or more and the largest quantities of drinks, was good (ICC = 0.68) (Dawson et al., 2007; NIAAA, 2010). Age at onset of regular drinking was also assessed for all participants with heavy drinking.

2.2.2. Assessments of DSM-IV past-Year axis I and lifetime axis II diagnoses at wave 1

Psychiatric disorders were assessed using the Alcohol Use Disorder and Associated Disabilities Interview Schedule, DSM-IV-TR version (AUDADIS-IV), a structured diagnostic instrument administered by trained lay interviewers (Grant et al., 2009). Axis I diagnoses included substance use disorders (alcohol use disorder, drug use disorder and nicotine dependence), mood disorders (major depressive episode, dysthymic disorder, and mania/hypomania episode) and anxiety disorders (panic disorder, social anxiety disorder, specific phobia, and generalized anxiety disorder). Axis I disorder diagnoses were made in the 12 months prior to Wave 1. Axis II disorders (including avoidant, dependent, obsessive-compulsive, histrionic, paranoid, schizoid, and antisocial personality disorders) were assessed on a lifetime basis. The test-retest reliability and validity of AUDADIS-IV measures of DSM-IV psychiatric disorders are good to excellent for substance use disorders and fair to good for other disorders (Canino et al., 1999; Grant et al., 2003).

2.2.3. Sociodemographic characteristics in wave 1

Sociodemographic characteristics included sex, age, marital status (married vs. non-married), race-ethnicity (White vs. non-White), employment status (employed, retired or student vs. unemployed), household income (< $20000, $20000–$35000, $35000–$60000 vs. > $60000) and living alone or not. In addition, participants were asked about 12 stressful life events concerning a variety of occupational, familial, financial, and legal issues and whether they had experienced these events in the past year of Wave 1 (Grant et al., 2009).

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