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Prevalence and correlates of depression and drinking behaviors among adolescents and emerging adults in a suburban emergency department

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Abstract

Background—Both alcohol use and depression are concerning health issues among youth. The Emergency Department (ED) is a critical location to access youth with depressive symptoms and alcohol misuse.

Objectives—To inform future interventions in the ED, this study examined the relationship between drinking behaviors and depressive symptoms among youth seeking ED care.

Methods—Youth ages 14-20 were recruited from a level-1 trauma ED located in the Midwest as part of a larger ongoing study. Participants completed an electronic screening survey, which included assessment of alcohol use, depressive symptoms, and demographic variables. Two logistic regression models were conducted to assess the relationship between depressive symptoms with alcohol consumption and specific alcohol-related consequences.

Results—Among 3,659 participants, bivariate analysis indicated that individuals screening positive for depression were more likely to be female, non-white, receive public assistance, and report higher scores on both alcohol consumption and alcohol-related consequences. Regression analyses indicated alcohol consumption, inability to stop drinking once starting, and feelings of

guilt or remorse after drinking were significantly positively related to screening positive for depression.

Conclusions/Importance—Current findings support use of the ED as a location for identifying youth who are experiencing co-morbid alcohol use and depressive symptoms. Future research should focus on the effectiveness of brief intervention in the ED that focuses on the co-occurrence of alcohol misuse and depressive symptoms among youth.

Keywords

alcohol consumption; alcohol consequences; depression; youth; emergency department

Introduction

While alcohol use and depression among youth have been widely studied, with findings overwhelmingly supporting the bidirectional influence between alcohol use and depression among this group (Espada et al., 2011; National Survey on Drug Use and Health, 2009; Saraceno et al., 2012), gaps still remain in the literature. The majority of reports have focused on recruiting youth through school settings or national community samples. However, we know that youth presenting to the emergency department (ED) for care differ from youth in the community. As these youth are at higher risk for both depressive symptoms and alcohol use, it is imperative to develop evidence-informed interventions to reduce co-occurring alcohol use and depressive symptoms. Further, prior alcohol research among youth has focused on consumption-related variables, without comparable examination of consequence-related variables. Understanding the relationship between depressive symptoms and both alcohol consumption and consequences may help improve intervention efforts as well.

Prior research examining depression and alcohol use among youth recruited from urban emergency departments has confirmed the association between alcohol use and depression among youth (Goldstein et al., 2007). For instance, in a case-control study examining depression and alcohol use among adolescents recruited from either an urban ED or community site, adolescents receiving ED services were significantly more likely to report both increased alcohol use disorders and major depression as compared to the community sample (Kelly et al, 2003). In another study, Becker et al (2012) examined the impact of depression on drinking trajectories after receiving urban ED services and found that baseline depressive symptoms significantly impacted drinking frequency over the following 12 months. Additionally, studies examining higher-risk subgroups of ED patients (e.g. youth presenting with suicidal ideation or history of peer violence) also support this association among youth (Horowitz et al, 2012; King et al., 2009; Ranney et al., 2011; Ranney et al., 2013).

While these ED-based studies have substantially added to our understanding of the relationship between alcohol use and depression on youth recruited through the ED, little research has been conducted examining the essential elements of an ED-based intervention for co-occurring alcohol and depressive disorders (e.g. Tait et al., 2004; Yuma-Guerrero et al., 2012). The present study adds to the current knowledge base by examining both alcohol

consumption and specific alcohol-related consequences in relation to depressive symptoms, in order to inform future interventions for youth presenting to a suburban ED.

Methods

Participants and Procedure

Screening data from of a larger ongoing project were used in the current study (Project U-Connect; Walton et al., 2014). The original study included a screening interview, a baseline interview and intervention for eligible participants, and follow-up interviews for those who completed the baseline. Only screening data were used in the current study. As part of the screening process, patients between 14 and 20 years old who presented to a Level 1 Trauma Center ED in the Midwest for care of injury, medical, or psychological complaints were recruited. Recruitment took place seven days per week during afternoon/evening shifts (2pm-12am) excluding holidays, with day and midnight shifts sampled (on a rotating basis) from October 2010-September 2011. Of those recruited, 186 (5.1%) were married. Reasons for presentation to the ED were diverse, including injury (n=798), medical (n=2812), and psychological complaints (n=44). Patients were ineligible for the study if they could not provide informed consent/assent due to insufficient cognitive orientation (e.g., intubated, unconscious, given medication, schizophrenia) (Walton et al., 2014). Patients who did not speak English, were visually or hearing impaired, under the age 18 without parent/ guardian consent or presenting for acute suicide attempt/sexual assault were also excluded. A research assistant approached each eligible patient and explained the study. After written assent/ consent was obtained from the patients or their parent/guardian (based on age), participants self-administered a 15-minute electronic screening survey. Patients were asked to complete the survey in private and were given a small incentive (gift valuing \$1.00) after completing the survey. The hospital's institutional review board approved all study activities and the National Institutes of Health issued a Certificate of Confidentiality.

Measures

Sample characteristics—Participants self-reported on age, gender, race, poverty (measured by the receipt of public assistance), and education level (Harris et al., 2003; Handelsman, Stein, & Grella, 2005; Smith et al., 1996).

Depression—The Patient Health Questionnaire (PHQ-2; Richardson et al., 2010) was used to assess participants' depressive symptoms. The PHQ-2 is a brief questionnaire comprised of two questions aimed at assessing: 1) little interest or pleasure in doing things, and 2) feeling down, depressed, or hopeless. Response options are: not at all (0), several days (1), more than half the days (2), and nearly every day (3). This measure has been widely tested and has shown adequate sensitivity and specificity for detecting major depression, with a cut off of 3 or more indicating a positive screen (Richardson et al., 2010). The current study used this cutoff (3 or more versus less than 3) to differentiate the depressed and non-depressed groups, respectively. It has been well validated in adolescents (Borner, Braunstein, Victor, & Pollack, 2010; Richardson et al., 2010). The PHQ-2 was added to the screener after initial launch of the study; hence, depression scores are missing for 263 participants. Based on prior methods research (Rubin et al., 2007), those participants who did not

complete the depression screener were not included in the analysis. According to the PHQ-2 summary score, 556 (15.2%) of respondents reported depressive symptoms.

Alcohol consumption—The AUDIT-C (Alcohol Use Disorders Identification Test - Consumption; Saunders et al., 1993) was used to assess alcohol consumption. The test comprises of three questions regarding participants' drinking frequency, quantity, and frequency of binge drinking (5 or more; Chung et al., 2000) in the past 3 months, with a possible summary score ranging from 0-12. For the current study, a summary score amalgamating the responses from the three variables was used to assess alcohol consumption (range 0-12).

Alcohol consequences—Seven questions from the AUDIT (Alcohol Use Disorders Identification Test; Saunders et al., 1993) were used to assess consequences (see Table 1). Each of the seven variables was measured dichotomously as yes/no. The AUDIT has an acceptable sensitivity and good criterion validity for identifying adolescent and/or young adults for alcohol consumption and consequences (Knight et al., 2003).

Data Analysis

Data were analyzed using SAS version 9.3 (SAS Institute Inc., 2012). Descriptive analyses were used to assess characteristics of the sample. Chi-square and independent t-test analysis were used to compare participants on demographic characteristics, alcohol consumption, and alcohol use consequences based on depressive symptoms (yes/no = 3). Finally, since alcohol consumption and consequences were correlated, two logistic regressions were conducted to evaluate the association between depressive symptoms, alcohol consumption (e.g., AUDIT-C score), and alcohol use consequences in order to avoid multicollinearity in the findings. Demographics that were found to be significant in the bivariate analysis were included in both models. There was no evidence of multicollinearity in either final model, as evidenced in a variance of inflation score of less than two for all variables.

Results

Sample Recruitment

A total of 5,671 patients were eligible to approach, of which 20.3% of patients were missed (primarily because research assistants were working with other participants). Of those approached (n=4,520), 3,922 participants completed the screening survey (87.8 % participation). There were no significant differences in gender ($\chi^2=2.03$; $p=0.15$) or age ($\chi^2=0.26$; $p=0.61$) between those refusing and completing the survey. Those who were missed were more likely to be male ($\chi^2=33.59$; $p<.001$) and were younger (under 18 versus over 18; $\chi^2=14.11$; $p<.001$) than those who participated. Participants who did not complete the PHQ-2 were excluded from analysis, resulting in a final sample size of n=3,659. Refer to Table 1 for sample characteristics.

Bivariate Analysis

The results of the bivariate analysis can be found in Table 1. The depressed group reported significantly higher frequencies/means for the following variables: being female, older,

African American or other race (excluding Caucasian), receiving public assistance, being a high school graduate, and for all alcohol measures. The depressed group was significantly less likely to have at least some college experience.

Multivariate Analysis

Results from the logistic regression analyses can be found in Table 2. In the first model, the relationship between alcohol consumption and depressive symptoms was evaluated. In this model, female sex [or gender], other race (as compared to Caucasian), receiving public assistance, and alcohol consumption were significantly correlated with increased odds of screening positive for depressive symptoms, whereas being in college was significantly negatively associated with depressive symptoms.

The seven alcohol-related consequences questions were included in the second model. Similar to the first model, female, other race, and receiving public assistance were significantly associated with depressive symptoms, whereas being in college was negatively associated with depressive symptoms. In terms of drinking consequences, not able to stop drinking and feeling of guilt and remorse were positively significantly associated with depressive symptoms. Other drinking consequences were not significantly associated with depression.

Discussion

The current study provides novel data regarding the cross-sectional relationship between depressive symptoms and alcohol consumption and specific alcohol-related consequences among a sample of youth presenting for care to a suburban ED. The present findings reinforce that a substantial proportion (15.2%) of youth presenting to the ED screen positive for depressive symptoms, and as compared to 2-8% of children and adolescents among the general population and 28% of adolescents in primary care settings (National Alliance on Mental Illness, 2009). Further, the current findings reinforce prior research indicating that that substance use disorders are more strongly associated with depressive disorders in adolescent females as compared to males (Shrier et al., 2003). ED-based alcohol interventions may need to differentially address depressive symptoms and alcohol-related consequences for the two genders.

The study also confirms the relationship between depressive symptoms and self-reported alcohol consumption and consequences among a systematic sample of adolescents presenting to the ED for any chief complaint. Prior studies suggest that alcohol use increases longitudinal risk of mental health disorders (Balogun et al., 2014; Kenneson, Funderburk, & Maisto, 2013), as well as risk of suicide attempts among depressed adolescents (McManama-O'Brein et al., 2013). Other studies have demonstrated that reducing alcohol use is more difficult for patients with co-existing mental health disorders, including depression (Drake et al., 1996; Schier et al., 2003). Many practitioners and researchers are moving toward briefer, motivational-interviewing-informed interventions to reduce risky alcohol use in ED populations (Taggart et al., 2013). However, without acknowledgement of co-existing disorders, brief interventions may be less successful in these high-risk dual diagnosis populations (Clark & Bukstein, 1998). This study provides novel evidence

regarding potential foci for brief ED-based intervention techniques for these dual disorders in adolescents.

Of note, two particular consequences - not being able to stop drinking once starting and feelings of guilt or remorse after drinking - were significantly associated with screening positive for depressive symptoms. Previous research has indicated that the inability to stop drinking is indicative of more severe drinking problems, e.g. alcohol dependence, as opposed to hazardous use, as well as depressive symptomology (Boschloo et al., 2012). This finding in our adolescent ED population suggests that an ED-based intervention may benefit from specifically addressing strategies to stop drinking among youth with depressive symptoms.

The consequence of feeling guilty after drinking was also significantly associated with depression. Prior research has associated guilt with the process of rumination (Joormann & Siemer, 2011; Nolen-Hoeksema, 1991; Nolen-Hoeksema et al., 2008), and previous studies suggest a strong connection between rumination and depressive symptoms in both cross-sectional and longitudinal analyses (Goldstein, 2006; Nolen-Hoeksema & Harrel, 2002). Future research should focus on ED-based prevention and treatment of alcohol use targeting maladaptive thought processes related to one's depressive symptoms and alcohol use (Chung et al., 2000; Gottfredson & Hussong, 2013).

While the current study extends prior research by examining the relationship between alcohol and depression among an ED sample, several limitations are noted. As this is a cross-sectional study of secondary data, causality cannot be determined and longitudinal associations between the variables could not be discerned. Longitudinal research assessing depressive symptoms and alcohol consumption/consequences may elucidate causal influences in these variables over time and should be explored in future research using ED samples. Further, future research is needed to parse out the possible confounding effects of substance abuse on depressive symptoms among participants recruited from the ED. Overall, since the current findings indicate that the co-occurrence of alcohol use and depressive symptoms is common among youth presenting for care in the ED, comprehensive screening and brief interventions tailored to address this co-occurrence should be explored among youth in the ED.

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Table 1
Bivariate Analysis Comparing Depressed versus Non-depressed Groups (N=3,659)

	Total (N=3,659)	Depressed (N=556, 15.2%)	Not Depressed (N=3103, 84.8%)
<i>Demographics</i>			
Female***	2108(57.6%)	356(64.0%)	1752(56.5%)
Age**	17.5(2.0)	17.6(1.9)	17.4(2.1)
Caucasian***	2662(72.8%)	366(65.8%)	2296(74.0%)
African-American**	548(15.0%)	101(18.2%)	447(14.4%)
Other**	449(12.3%)	89(16.0%)	360(11.6%)
Education (Some college)***	1516(41.6%)	188(33.9%)	1328(42.9%)
High School Graduate*	673(18.4%)	127(22.9%)	546(17.7%)
High School or working GED	1326 (36.3%)	223(40.2%)	1103(35.7%)
Public Assistance***	971(26.5%)	209(37.6%)	762(24.6%)
<i>Alcohol Variables</i>			
- AUDIT score (3 months; range 0-38)***	2.86(4.89)	3.82(6.05)	2.68(4.64)
- Audit-C (rage 0-12)	1.73(2.58)	1.88(2.59)	1.70(2.58)
- Not able to stop drinking***	303(8.3%)	88(15.8%)	215(6.9%)
- Failed to do things***	395(10.8%)	89(16.0%)	306(9.9%)
- Drink in the morning***	179(4.9%)	47(8.5%)	132(4.3%)
- Guilt after drink***	528(14.4%)	119(21.4%)	409(13.2%)
- Blackout***	509(13.9%)	102(18.4%)	407(13.1%)
- Injured because of your drinking***	311(8.5%)	69(12.4%)	242(7.8%)
- People concern your drinking***	161 (4.4%)	45(8.1%)	116(3.7%)

Table 2

Logistic Regression Analysis Comparing Depressed versus Non-depressed Groups Based on Alcohol Consumption (Model 1) and Alcohol Consequences (Model 2).

Variable	Model 1		Model 2	
	AOR	95% CI	AOR	95% CI
Female	1.41 ^{***}	1.17-1.71	1.37 ^{**}	1.13-1.66
African-American (White reference)	1.29	1.00-1.67	1.28	0.99-1.67
Other Race (White reference)	1.55 ^{**}	1.19-2.02	1.52 ^{**}	1.17-1.99
Public Assistance	1.65 ^{***}	1.35-2.02	1.63 ^{***}	1.33-2.00
High School Grad (< high school reference)	1.01	0.79-1.29	1.00	0.78-1.28
College (< high school reference)	0.59 ^{***}	0.47-0.74	0.60 ^{***}	0.48-0.75
<i>Alcohol Variables</i>				
AUDIT-C (3 months)	1.09 ^{***}	1.05-1.13	--	--
Not able to stop drinking	--	--	2.05 ^{***}	1.42-2.95
Failed to do things	--	--	1.04	0.72-1.50
Drink in the morning	--	--	1.30	0.85-1.98
Guilt after drink	--	--	1.50 ^{**}	1.11-2.03
Blackout	--	--	0.94	0.66-1.32
You or someone injured because of your drinking	--	--	1.10	0.78-1.56
People concern your drinking	--	--	1.29	0.83-2.01

Notes.

^{***}
 $p < .001$;

^{**}
 $p < .01$;

^{*}
 $p < 0.05$