Abstract

BATTs, KATHRYN ROURKede. Association Between Subthreshold Depression and Alcohol Misuse Among College Students. (Under the direction of Dr. Roger E. Mitchell.)

Alcohol misuse, (binge drinking, heavy drinking, alcohol abuse, or alcohol dependence) is a serious problem on college campuses. The 2013 National Survey on Drug Use and Health (NSDUH) found that 39.0% of full-time college students aged 18 to 22 were binge drinkers and 12.7%, were heavy drinkers in the past month. Rates of alcohol abuse and dependence were higher among college students than in the general population. Alcohol misuse has been associated with negative consequences such as interpersonal problems, alcohol-related unintentional injury deaths, and negative mental health outcomes.

Mental disorders have been identified as a risk marker for alcohol misuse. Research has established that alcohol use disorders (AUDs) and other mental disorders are often comorbid and that binge or heavy drinking and mental disorders often co-occur. One mental disorder that has received increased attention in the alcohol misuse research is major depressive disorder (MDD). Recently, attention has been given to the idea that depression may be dimensional rather than a discrete construct and research has begun to examine subthreshold depression (symptoms are present but not at a level sufficient to meet the diagnostic threshold). However, evidence establishing if the associations between threshold depression and other conditions are consistent with those found for subthreshold depression is lacking. This study addresses this by examining the association between past year subthreshold depression and alcohol misuse, including its components, among full-time college students aged 18 to 22.
Secondary data analyses were conducted on the combined 2008-2013 NSDUHs using simple and multivariable logistic regression models. Results indicated that subthreshold depression was significantly associated with any alcohol misuse (adjusted Odds Ratio (aOR) = 1.71, 95% CI = 1.20-2.43) and binge drinking (aOR = 1.64, 95% CI = 1.15-2.33). The association between subthreshold depression and heavy drinking, alcohol abuse, and alcohol dependence, did not reach statistical significance.

These findings suggest a moderate association between subthreshold depression and binge drinking and nonsignificant associations between subthreshold depression and other types of alcohol misuse. College mental health and substance use service providers should consider extending the target of screening programs for alcohol misuse among students presenting with threshold depression to include those with subthreshold depression as well.
Association Between Subthreshold Depression and Alcohol Misuse Among College Students

by
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Introduction

Alcohol misuse includes a spectrum of alcohol-related behaviors including: binge drinking (heavy episodic drinking); heavy drinking (frequent heavy episodic drinking), alcohol abuse, and alcohol dependence. Research conducted in the United States over the past decade indicates that alcohol misuse is a serious problem on college campuses. A growing body of literature indicates that young adults aged 18 to 25 have the highest rates of alcohol misuse when compared with all other age groups (Substance Abuse and Mental Health Services Administration [SAMHSA], 2014b; Wechsler, Lee, Kuo, & Lee, 2000). Findings from the nationally representative 2000-2001 National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) reveal that among young adults aged 18 to 24, 45.9% had exceeded the recommended daily drinking limit (having more than four drinks in a day for males and more than three drinks in a day for females), and 14.5% had exceeded the recommended weekly drinking limit (having, on average, more than 2 drinks per day for males and more than one drink per day for females) (Chen, Dufour, & Yi, 2004).

Rates of alcohol misuse are even higher among full-time college students in this age group than among their same-aged peers who do not attend college full time. Estimates from the nationally representative 2013 National Survey on Drug Use and Health (NSDUH) indicate that among young adults aged 18 to 22, those enrolled full time in college were more likely to use alcohol than their peers not enrolled full-time (i.e., part-time college students and persons not enrolled in college). Thirty-nine percent of full-time college students reported past month binge drinking, compared with 33.4% for their counterparts
who were not enrolled full time. The rate of past month heavy drinking was 12.7% for full
time college students compared with 9.3% for persons aged 18 to 22 who were not enrolled
full time in college (SAMHSA, 2014b). Similar findings are reported by Windle (2003),
based on data from the nationally representative Monitoring the Future follow-up study;
40.1% of college students were binge drinkers in the two weeks prior to the survey and 5.0%
had used alcohol on at least 20 or more occasions during the past 30 days.

These elevated rates of alcohol misuse represent a problem in U.S. colleges. A
growing body of evidence indicates that alcohol misuse contributes to a number of short-
term and longer-term negative consequences for young adults. The link between heavy
drinking among adolescents and young adults and subsequent risk of an alcohol use disorder
(AUD) has been well established (Bradley et al., 2001; Brook, Brook, Zhang, Cohen, &
Whiteman, 2002; O'Connell et al., 2011; O'Neill, Parra, & Sher, 2001; Pascual, Boix, Felipo,
& Guerri, 2009; Sartor et al., 2009), as have the associations between binge drinking and
other negative outcomes such as suicide (Glasheen, Pemberton, Lipari, Copello, & Mattson,
2015).

The extant literature contains ample evidence of associations between alcohol misuse
and negative outcomes (Ham & Hope, 2003). Binge and heavy drinking among college
students have been linked to increased rates of poor academic performance (Presley &
Pimentel, 2006; Sheffield, Darkes, Del Boca, & Goldman, 2005), academic attrition
(Martinez, Sher, & Wood, 2008), job problems (Sheffield et al., 2005), interpersonal
problems (Presley, Meilman, & Leichliter, 2002), alcohol-related unintentional injury deaths
(Hingson, Zha, & Weitzman, 2009), damage/injury to students and others (Bonomo et al., 2001), risk for physical assault victimization (Martino, Collins, & Ellickson, 2004), sexual aggression and victimization (Champion et al., 2004; Rapoza & Drake, 2009; Testa & Livingston, 1999), risky sexual behaviors (Cooper, 2002; Guo et al., 2002), legal problems (Sheffield et al., 2005), and negative mental health outcomes (Cranford, Eisenberg, & Serras, 2009). Moreover, several of the symptoms of alcohol abuse and dependence (e.g., recurrent use resulting in failure to fulfill major role obligations, recurrent substance-related legal problems, and important social, occupational, or recreational activities are given up or reduced because of substance use) are negative outcomes in and of themselves.

Given the prevalence of alcohol misuse among college students and the vast array of serious negative consequences of alcohol misuse, it is important to understand the risk markers and risk factors that are associated with alcohol misuse. This information can be particularly helpful to mental health and substance use service providers on college campuses by providing information to help them to better target prevention, intervention, and other health services.

**Correlates of Alcohol Misuse among College Students**

Research to date concerning correlates of alcohol misuse among adolescents and young adults has established several sociodemographic characteristics that are associated with alcohol misuse. Male college students are more likely than female students to engage in binge and heavy drinking, to have hallmark symptoms of alcohol abuse and dependence (e.g., tolerance, withdrawal, recurrent use resulting in failure to fulfill major role
obligations), Hispanic white college students are at increased odds of binge drinking and having an AUD when compared with college students of other racial/ethnic groups (Dawson, Grant, Stinson, & Chou, 2004; Wilke, Siebert, Delva, Smith, & Howell, 2005; L.-T. Wu, Pilowsky, Schlenger, & Hasin, 2007). Married college students and those living with parents are less likely than their peers to engage in binge and heavy drinking (Barnes, Welte, Hoffman, & Tidwell, 2010; Dawson et al., 2004; Gfroerer, Greenblatt, & Wright, 1997; L.-T. Wu et al., 2007). Research on age has shown that the odds of alcohol misuse increase between the ages 18 through 21 and begin to decrease at or about the age of 22 (Livingston, Laslett, & Dietze, 2008). With regard to working status, research by Wu and colleagues has found that employed male students aged 12 to 17 were more than twice as likely to binge drink and more than 3 times as likely to engage in heavy drinking when compared to their peers who were not employed (L.-T. Wu, Schlenger, & Galvin, 2003). Similarly, Butler, and colleagues found that the number of hours worked was positively and significantly associated with level of alcohol consumption among college students (Butler, Dodge, & Faurote, 2010).

**Major Depressive Disorder and Alcohol Misuse.**

Mental disorders have also been identified as a risk marker for alcohol misuse. Several research studies have established that AUDs and other mental disorders are often comorbid and that binge or heavy drinking and mental disorders often co-occur. One mental disorder that has received a lot of attention in the alcohol misuse research is major depressive disorder (MDD). A diagnosis of MDD based on criteria set forth in the Diagnostic and
Statistical Manual of Mental Disorders, 4th edition – text revision (DSM-IV-TR; American Psychiatric Association [APA], 2000) requires a period of two weeks or longer with at least five symptoms representing a change in behavior (e.g., sleep disturbance, eating disturbance, or fatigue) one of which must be a mood symptom (persistent low mood or anhedonia). Research evidence indicates that MDD is associated with increased rates of alcohol misuse and vice versa. Epidemiological studies provide evidence that adults and adolescents with alcohol misuse, such as an AUD, are more likely to develop MDD and persons with MDD are at greater risk of developing alcohol misuse when compared with adults and adolescents in the general population (Brook et al., 2002; Clark & Bukstein, 1998; Bridget F. Grant et al., 2006; Pacek, Martins, & Crum, 2013; Rao et al., 1999; P. Wu, Hoven, Okezie, Fuller, & Cohen, 2007). Epstein, Induni, and Wilson (2009) found that among adults, heavy drinkers were 3 times more likely than their non-drinking peers to have probable clinically significant depression, as indicated by a score on the PHQ-8 (Kroenke et al., 2009). Findings from the 2013 NSDUH show that adults aged 18 or older with a past year major depressive episode (MDE) were more than twice as likely as those who had not experienced a past year MDE to have an AUD in the past year (16.9% vs. 6.3%) (Substance Abuse and Mental Health Services Administration [SAMHSA], 2014a). Dawson, Grant, Stinson, and Chou (2005) found an increased risk of a mood or anxiety disorder associated with alcohol dependence among college students aged 18 to 29. Finding from cross sectional studies demonstrate correlation between alcohol misuse and depression. Longitudinal studies indicate that this is a reciprocal relationship in which the presence of alcohol misuse is associated with
increased risk of developing depression, and the presence of depression is associated with an increased risk of alcohol misuse (Pacek et al., 2013).

**Subthreshold Depression.**

Recently, more attention has been given to the dimensional nature of mental and substance use disorders, including subthreshold conditions (conditions in which symptoms are present but not at a level sufficient to meet the diagnostic threshold). One subthreshold condition that has received a good deal of attention is subthreshold depression. Several researchers note that although subthreshold conditions do not fit into established diagnostic categories, they may be clinically significant. Research by Fergusson and colleagues indicates that adolescents aged 17 or 18 with subthreshold depression are 2.4 times as likely to have threshold depression at age 25 and 2.3 times as likely to have experienced suicidal ideation by age 25 when compared with their peers who had no significant depression (Fergusson, Horwood, Ridder, & Beautrais, 2005). Similarly, Balázs and colleagues found that among adolescents aged 14 to 16, those with subthreshold depression, defined as having a score of less than 20 on the Beck Depression Inventory II (BDI-II; Beck, Steer, Ball, & Ranieri, 1996) and reporting at least one mood symptom, were over 3 times as likely to have suicidal thoughts/ideation when compared to their adolescents who had no mood symptoms (Balázs et al., 2013).

Several researchers have investigated whether subthreshold depression is categorically distinct from threshold depression or whether subthreshold and threshold
depression are categorically the same but occupy distinct places on a continuum (Rodríguez, Nuevo, Chatterji, & Ayuso-Mateos, 2012). Lewinsohn, Solomon, Seeley, and Zeiss (2000) examined the continuity between depressive threshold disorders and subthreshold conditions using both scores on a diagnostic instrument and the Center for Epidemiologic Studies Depression Scale (CESD; Radloff, 1977), a screening scale for depression, to discriminate between participants with threshold disorders, those with subthreshold conditions, and those with lesser levels of symptoms and/or impairment/distress. Their findings were that increasing levels of depressive symptoms were associated with increasing levels of psychological dysfunction and mental health treatment utilization across all levels of depressive symptomatology; they concluded that threshold depressive disorder is not categorically different from subthreshold conditions, but that these represent a continuum. Two reviews of the current literature on subthreshold depression among children and adolescents also conclude that a dimensional view of depression is appropriate and that subthreshold depression represents a condition that is associated with impairment and negative outcomes (Rodríguez et al., 2012; Wesselhoeft, Sørensen, Hieievang, & Bilenberg, 2013). Longitudinal research indicates that many subthreshold conditions have an increased probability of escalating over time to the full syndrome disorder (Hill, Pettit, Lewinsohn, Seeley, & Klein, 2014; Shankman et al., 2009).

There is great variation across studies in the ways that subthreshold depression is defined and operationalized. Bertha and Balázs (2013) provide a summary of research literature published between 1995 and 2012 on subthreshold depression among adolescents.
They note that subthreshold depression among adolescents has been assessed in some studies using a diagnostic interview, whereas in other studies it was assessed using a self-report screening instrument and in others a combination of the two have been used. They also note variation between operational definitions of subthreshold depression, comprising four basic types:

1. having at least one mood symptom (i.e., low mood or anhedonia) with or without one or more additional symptoms of MDD, but not meeting full criteria for MDD;
2. meeting the criteria of minor depressive disorder (at least one mood symptom and a total of at least 2 but fewer than 5 overall symptoms of MDD);
3. having any depressive symptoms without meeting full criteria for MDE, plus additional specific criteria (e.g., having a score within a defined range on a screening measure); and
4. having an elevated score on a screening measure.

The first two operational definitions, which could be utilized when diagnostic interview data are available, are relatively similar, though the second definition is more stringent (requiring at least 2 total depressive symptoms) than the first. The third operational definition also requires diagnostic interview data, but is less restrictive about the number of symptoms or the specific criterion that is not met, compared to the first two. The fourth operational definition can be utilized when only screening data are available. Operational definitions with less stringent criteria cast a wider net and include persons with lower levels
of symptomatology and/or impairment. Currently, there is no accepted method of operationalizing subthreshold depression, given each method has strengths and weaknesses with regard to specificity and sensitivity that are more or less appropriate to different study designs and research purposes. As study findings are replicated using different operational definitions of subthreshold depression, the field as a whole can be more assured of the validity of subthreshold depression.

Reported prevalence rates for subthreshold depression vary as a function of definition, study design, and population. For example, Fergusson et al. (2005) report that 7.3% of adolescents aged 17 or 18 from a community sample had past year subthreshold depression, as measured using the Composite International Diagnostic Interview (CIDI) and defined as having symptoms consistent with a diagnosis of probable minor depression made according to the criteria set forth in DSM-IV-TR (APA, 2000). Rohde, Beevers, Stice, and O'Neil (2009) present findings that indicate that approximately 2% of females aged 18 in a community sample had past year subthreshold depression as measured using an adapted version of the Schedule for Affective Disorder and Schizophrenia for School-Aged Children (K-SADS; Orvaschel & Puig-Antich, 1987) and defined as endorsing the requisite number of symptoms for major depression, but having one or more of those symptoms meeting only a subthreshold level of severity at the peak of its expression. It is likely that differences in measurement and operational definitions of subthreshold depression account for at least some of the variability between these rates. The operational definition applied by Rohde and
colleagues requires a higher burden of disorder than does the one used by Fergusson and colleagues.

A number of studies examining the relationship between depression and alcohol misuse have used a lower threshold of symptoms/impairment than the threshold required for clinical depression for their measure of depression. Several of these studies indicate that there is an association between depression (including both those at threshold and subthreshold levels of symptomatology/impairment) and the initiation of alcohol use among children and adolescents. Research conducted by Kubik, Lytle, Birnbaum, Murray, and Perry (2003) and Sihvola et al. (2008) indicates a significant association between elevated depressive symptoms (including both those at threshold and subthreshold levels of symptomatology) and early onset of alcohol use among adolescents. Other studies have provided evidence that early initiation of alcohol use is associated with greater subsequent risk of problematic alcohol use behaviors including heavy drinking and subsequent abuse or dependence (DeWit, Adlaf, Offord, & Ogborne, 2000; B. F. Grant & Dawson, 1997; Guttmannova et al., 2011; Muthen & Muthen, 2000; Warner & White, 2003). Harrell and Karim (2008) found that, among female college students, there was a positive association between moderate depressive symptoms and alcohol-related problems. Furthermore, previous research has shown a relationship between levels of anxiety and depressive symptoms and alcohol misuse (Fenzel, 2005).

The body of research concerning alcohol misuse among college students focuses on a variety of predictors and risk markers. For example, research indicates that pre-college
and personality traits of sensation seeking and impulsivity (Carlson, Johnson, & Jacobs, 2010; Cloninger, Sigvardsson, & Bohman, 1988; Quinn, Stappenbeck, & Fromme, 2011; Simons, 2003) are associated with alcohol misuse, as are positive family history for problematic alcohol use (LaBrie, Kenney, Lac, & Migliuri, 2009), and drinking motivation (Mohr et al., 2005).

The importance of examining depression, and by extension subthreshold depression, as a risk marker for alcohol misuse is that within the campus community, students are going to college counseling centers and mental health service providers and self-identifying as having depressive symptoms as they seek help for dealing with these symptoms. Many college counseling offices ask students who present with complaints of sad mood or general mental distress to complete a screening instrument for depression. Understanding the association between depression/subthreshold depression and alcohol misuse will enable college counselors and mental health service providers to use the depression screening information already being collected for another purpose (to assess the level or severity of depression) to identify students at risk for alcohol misuse.

The overarching goal of this study was to further the body of research on risk markers for alcohol misuse and the construct of subthreshold depression by investigating if subthreshold depression, like threshold depression, is a risk marker for alcohol misuse among college students. As a means of accomplishing this, there were three specific goals:
To conduct a secondary data analysis using data from the nationally representative National Survey on Drug Use and Health to examine the association between subthreshold depression and any alcohol misuse among full-time college students aged 18 to 22. The NSDUH data include a measure of lifetime and past year major depressive episode (MDE) with additional questions about impairment resulting from the depressive symptoms. For this study, those data will be used to classify persons as having past year threshold depression, past year subthreshold depression, or no significant depression.

If subthreshold depression was shown to be a risk marker for any alcohol misuse, then examine the associations between the subthreshold depression and the individual components of alcohol misuse (binge drinking, heavy drinking, alcohol abuse, and alcohol dependence) to determine if subthreshold depression is a risk marker for any or all of them individually.

To also examine the association between threshold depression and alcohol misuse to provide context for the findings concerning subthreshold depression.

Based on prior research, it is hypothesized that:

1. subthreshold depression will be a significant positive predictor of any alcohol misuse, binge drinking, and alcohol abuse when controlling for covariates (age, gender, race/ethnicity, living with an adult family member, marital status, and work status); and threshold depression will be a significant positive predictor of
any alcohol misuse, binge drinking, heavy drinking, alcohol abuse, and alcohol dependence when controlling for covariates.

2. threshold depression will be a significant positive predictor of any alcohol misuse, binge drinking, heavy drinking, alcohol abuse, and alcohol dependence when controlling for covariates.

Methods

Data Source

Data for this study comes from the combined 2008 through 2013 NSDUHs public use files archived at: http://www.oas.samhsa.gov/SAMHDA.htm. NSDUH is an annual survey of approximately 67,500 people and is sponsored by the Substance Abuse and Mental Health Services Administration of the United States Department of Health and Human Services. Its purpose is to provide information on mental health and alcohol, tobacco, and illicit drug use in the civilian, noninstitutionalized population of the United States aged 12 or older. The survey procedures were approved by RTI International’s Committee for the Protection of Human Subjects and the Office of Management and Budget (OMB). Informed consent was obtained from all participants in the studies. The face-to-face household interviews, conducted using computer-assisted self-interview (CASI) technology, took approximately 1 hour each. A copy of the specifications for the NSDUH interview sections containing the questions used to gather the data analyzed in this study are included in Appendices A, B, C, & D.

The overall response rates for NSDUH ranged from 72% to 76% (2008: n = 68,736, response rate 74%; 2009: n = 68,700, response rate 76%; 2010: n = 67,804, response rate
Reliability of substance use responses to the NSDUH questionnaire was assessed in 2006, utilizing an interview/re-interview methodology. Reliability was assessed by comparing initial interview responses with those from a re-interview, which occurred 5 to 15 days later, and measured using the Cohen’s kappa (κ) statistic (Cohen, 1960). The kappa statistic is frequently interpreted in terms of standards posited by Landis and Koch (1977, pp., p. 165), which stipulate that kappa values less than 0.00 indicate poor agreement; kappas of 0.00 to 0.20 indicate slight agreement; kappas of 0.21 to 0.40 indicate fair agreement, kappas of 0.41 to 0.60 represent moderate agreement; kappas of 0.61 to 0.80 indicate substantial agreement; and kappa values 0.81 to 1.00 indicate almost perfect agreement. The kappa values for the past year alcohol use variable was 0.90 and kappa values for past year alcohol dependence and abuse were 0.75 and 0.62, respectively (SAMHSA, 2010a).

SAMHSA also sponsored a study to examine the clinical validity of diagnoses made using the substance use disorder questions contained in the NSDUH instrument when compared with diagnoses made using semi-structured clinical interviews administered by clinicians. Overall, the level of agreement between the NSDUH and the clinical interviews for both adolescents (aged 14 to 17) and adults (aged 18 or older) were in the fair to
moderate range (Jordan, Karg, Batts, Epstein, & Wiesen, 2008). It should be noted that NSDUH utilizes widely accepted methodological practices for enhancing the accuracy of self-reported information, such as providing assurances that information collected will remain confidential and promoting privacy of the data collection process through audio computer-assisted self-interviewing (ACASI). Comparisons using these methods within NSDUH have shown that they reduce reporting bias (Gfroerer, Eyerman, & Chromy, 2002).

Sample

The combined 2008-2013 NSDUH public use data sets include 85,417 respondents aged 18 to 22, of whom 28,642 were full-time college students at the time of the interview. Respondents who were missing data for one or more of the variables of interest were not included in the analyses, resulting in a loss of 207 sample members (7 were missing data about whether they were living with an adult; 196 were missing data on the number of symptoms of past year MDE; and 5 were missing data on impairment resulting from symptoms of MDE). Thus, analyses were performed on data from 28,435 respondents.

Measures

Outcome variables.

*Past year any alcohol misuse (summary measure).* A summary variable was included due to concerns about potential power issues for the less prevalent types of alcohol misuse. This variable was treated as a dichotomous variable. This was coded as positive if binge alcohol use, heavy alcohol use, alcohol abuse or alcohol dependence were positive;
this variable was coded as negative if none of binge alcohol use, heavy alcohol use, alcohol abuse, and alcohol dependence were positive.

*Past month binge drinking.* This variable was assessed in the NSDUH survey using the question, “During the past 30 days, that is, since (DATE 30 DAYS AGO), on how many days did you have 5 or more drinks on the same occasion? By ‘occasion,’ we mean at the same time or within a couple of hours of each other.” The range of acceptable responses was 0 to 30. This was treated as a dichotomous variable for which responses greater than 0 were coded as ‘binge drinking’ and responses of 0 were coded as ‘not binge drinking.’ Binge alcohol use was coded as present even if heavy alcohol use was also present.

*Past month heavy drinking.* This variable was assessed in the NSDUH survey using the question, “During the past 30 days, that is, since (DATE 30 DAYS AGO), on how many days did you have 5 or more drinks on the same occasion? By ‘occasion,’ we mean at the same time or within a couple of hours of each other.” The range of acceptable responses was 0 to 30. This was treated as a dichotomous variable where responses greater than 4 were coded as ‘heavy drinking’ and responses of 4 or less were coded as ‘not heavy drinking.’

*Past year alcohol abuse.* This variable was assessed in the NSDUH survey using questions based on DSM-IV-TR (APA, 2000) criteria for past year alcohol abuse. This was treated as a dichotomous variable with responses that indicated the presence of at least one of four symptoms of alcohol abuse ([1] alcohol use caused serious problems at home, work, or school; [2] regularly drinking alcohol and then doing something where being drunk might
have put the person in physical danger; [3] alcohol use caused repeated problems with the law; [4] continuing to use alcohol despite thinking that alcohol use caused problems with family or friends) were coded as ‘alcohol abuse’ and responses that indicated no symptoms of alcohol abuse were coded as ‘no alcohol abuse.’ Alcohol abuse was coded as present even if alcohol dependence was also present.

**Past year alcohol dependence.** This variable was assessed in the NSDUH survey using questions based on DSM-IV-TR (APA, 2000) criteria for past year alcohol dependence. This was treated as a dichotomous variable with responses that indicated the presence of at least three of seven alcohol dependence symptoms ([1] spent a lot of time obtaining, drinking, or getting over the effects of alcohol; [2] used more alcohol than intended or was unable to limit alcohol use; [3] tolerance; [4] two or more symptoms of alcohol withdrawal; [5] continued alcohol use despite thinking that alcohol caused problems with emotions, nerves or mental health; [6] continued alcohol use despite thinking that alcohol caused physical problems; [7] giving up or limiting important activities as a result of alcohol use) were coded as ‘alcohol dependence’ and responses that indicated less than three symptoms of alcohol dependence were coded as ‘no alcohol dependence.’

**Predictor variable.**

**Past year level of depression.** (no significant depression; subthreshold depression, threshold depression) MDE is assessed in the NSDUH using questions that assess the 9 DSM-IV-TR (APA, 2000) Criterion A symptoms of MDE (depressed mood, anhedonia, weight/appetite disturbance, sleep disturbance, psychomotor agitation/retardation, fatigue,
feelings of worthlessness/excessive guilt, suicidality). Respondents who answer yes to questions corresponding to 5 or more symptoms of MDE, including at least one mood symptom (2 weeks or longer of low mood or loss of interest that lasted most of the day nearly every day) are asked about how much their symptoms interfered with their functioning at home, at work, in relationships, and in their social life using a 0 to 10 scale where 0 corresponds to no interference, 1 to 3 correspond to mild interference, 4 to 6 correspond to moderate interference, 7 to 9 correspond to severe interference, and 10 corresponds to very severe interference. Impairment was coded as the single highest severity level of role impairment across the four role domains.

Past year level of depression was treated as a polytomous variable where responses that indicated four or fewer symptoms of past year MDE were coded as “no significant depression; responses that indicated five or more symptoms of past year MDE and a maximum impairment score of 3 or less as “subthreshold depression.” Responses that indicated five or more symptoms of past year MDE and a maximum impairment score greater than 3 were coded as “threshold depression.”

**Covariates.**

The NSDUH data include measures of several sociodemographic characteristics that have been identified as correlates of alcohol misuse among adolescents or your adults: age (Livingston et al., 2008), gender (Fenzel, 2005; Wilke et al., 2005); race/ethnicity (Getz & Bray, 2005; B. F. Grant et al., 2009), marital status (Leonard & Rothbard, 1999); living with an adult family member (a proxy for living with a parent) (Gfroerer et al., 1997;
The sociodemographic characteristics included in these analyses were:

- **Age.** (18, 19, 20, 21, 22);
- **Gender.** (male, female);
- **Race/ethnicity.** (Hispanic; non-Hispanic white; non-Hispanic black, non-Hispanic Other – including Native American or Alaska Native, Native Hawaiian or other Pacific Islander, Asian, and more than 1 race);
- **Living with an adult family member.** (yes, no);
- **Work status.** (employed full-time, employed part-time, unemployed, other [including not in labor force]);
- **Marital status.** (married, divorced or separated, widowed, never married), dichotomized to married and not married for analyses.

**Statistical Analysis**

Secondary data analyses of these data were approved by the North Carolina State University Institutional Review Board. Data were analyzed using SUDAAN Version 11.0, which applied a Taylor series linearization method to account for NSDUH's complex sample design features. Descriptive statistics and bivariate correlations were computed for all variables. Following this, simple logistic regression models were run for each of the sociodemographic covariates identified in the literature to establish that they were significantly associated with each of the outcome variables being studied. Simple logistic regression models were also run for the predictor variable of interest. Multivariable
Regression analyses were conducted to examine the associations between alcohol misuse, binge drinking, heavy drinking, alcohol abuse, and alcohol dependence and past year subthreshold depression, controlling for all significant covariates. A second set of multivariable regression analyses were conducted, restricting the predictor variable to only the subthreshold and no significant depression conditions to determine whether the inclusion of the threshold level of this variable affected the relationship with the outcomes of interest.

Post hoc power calculations were conducted using the sample sizes and effect sizes from each model and an alpha level of 0.05. Given the concerns about the power of the regression models to detect what may be a small effect of subthreshold depression with such a small number of respondents in the sample being categorized as having subthreshold depression (n = 176), a third set of multivariable regression analyses were run on the full sample of persons aged 18 to 22, regardless of college status, (n = 28,435) to examine whether insufficient power may be restricting the ability to detect an association between the predictor variable and the outcome variables.

**Results**

**Descriptive Statistics**

The sample included in these analyses was primarily non-Hispanic white (63.6%), employed part-time (43.3%), and living with an adult family member (63.0%). There were more female than male sample members (54.6 vs. 45.4%, respectively), and more sample members aged 19 (24.6%) than any other age. Over 90% of the sample had no significant depression, less than 1% had subthreshold depression, and 8.3% had threshold depression.
The weighted and unweighted distributions of the sample across the outcomes of interest (alcohol misuse, binge drinking, heavy drinking, alcohol abuse, and alcohol dependence), past year level of depression, and sociodemographic characteristics of interest are presented in Appendix E.

The weighted prevalence estimate of any alcohol misuse was 43.7%, which indicates that approximately 3.9 million students engaged in any alcohol misuse in a given year (Table 1a, Table 1b). Over 40% (40.9%, 3.7 million students) of students engaged in past month binge drinking and 15.1% (1.4 million students) were past month heavy drinkers. The weighted prevalence of alcohol abuse was 13.9% (1.2 million students) and the rate of alcohol dependence was 6.3% (563,000 students).

Prior to logistic regression modelling, bivariate correlations were calculated to examine intercorrelations between the predictor variable and covariates. None of the correlations were high enough to raise concerns of multicollinearity in the regression models (Appendix F). The two variables that were most highly correlated were living with an adult family member and work status, which had a correlation less than 0.20.

Findings reported for the “unadjusted models” refer to those related to the simple bivariate regression models, and findings reported for the “adjusted models” refer to the multivariable models which control for significant covariates identified in the bivariate models for the outcome variable. For all models that included the predictor variable, past year level of depression, the ‘no significant depression’ category was used as the reference category.
Table 1a
Weighted prevalence estimates (in 1,000s) and percentages of past year alcohol misuse by past year level of depression

<table>
<thead>
<tr>
<th>Predictor Variable/Covariate</th>
<th>Any Alcohol Misuse</th>
<th>Binge Drinking</th>
<th>Heavy Drinking</th>
<th>Alcohol Abuse</th>
<th>Alcohol Dependence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N in 1,000s %</td>
<td>N in 1,000s %</td>
<td>N in 1,000s %</td>
<td>N in 1,000s %</td>
<td>N in 1,000s %</td>
</tr>
<tr>
<td>TOTAL</td>
<td>3,931 43.7</td>
<td>3,677 40.9</td>
<td>1,362 15.1</td>
<td>1,249 13.9</td>
<td>563 6.3</td>
</tr>
<tr>
<td>Level of Depression</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Significant Past year MDE Symptoms (No Significant Depression)</td>
<td>3,528 43.1</td>
<td>3,331 40.7</td>
<td>1,241 15.2</td>
<td>1,057 12.9</td>
<td>440 5.4</td>
</tr>
<tr>
<td>Past Year MDE Symptoms with None to Mild Impairment (Subthreshold Depression)</td>
<td>27 50.7</td>
<td>25 47.0</td>
<td>8 15.2</td>
<td>8 15.6</td>
<td>5 8.8</td>
</tr>
<tr>
<td>Past year MDE Symptoms with Moderate to Severe Impairment (Threshold Depression)</td>
<td>375 49.8</td>
<td>321 42.5</td>
<td>112 14.9</td>
<td>185 24.5</td>
<td>118 15.7</td>
</tr>
<tr>
<td>Predictor Variable/Covariate</td>
<td>Any Alcohol Misuse</td>
<td>Binge Drinking</td>
<td>Heavy Drinking</td>
<td>Alcohol Abuse</td>
<td>Alcohol Dependence</td>
</tr>
<tr>
<td>------------------------------</td>
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<tr>
<td></td>
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<td>%</td>
<td>N in 1,000s</td>
<td>%</td>
<td>N in 1,000s</td>
</tr>
<tr>
<td>TOTAL</td>
<td>3,931</td>
<td>43.7</td>
<td>3,677</td>
<td>40.9</td>
<td>1,362</td>
</tr>
<tr>
<td>Age</td>
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<tr>
<td>18</td>
<td>557</td>
<td>32.6</td>
<td>516</td>
<td>30.2</td>
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<td>19</td>
<td>849</td>
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<tr>
<td>20</td>
<td>887</td>
<td>44.5</td>
<td>827</td>
<td>41.5</td>
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<td>21</td>
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<td>22</td>
<td>666</td>
<td>51.0</td>
<td>631</td>
<td>48.3</td>
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<td>252</td>
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<tr>
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<td>215</td>
<td>24.4</td>
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<td>519</td>
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<td>473</td>
<td>35.5</td>
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<td>36.8</td>
<td>2,002</td>
<td>33.8</td>
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<td>1,675</td>
<td>54.3</td>
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<td>44.0</td>
<td>3,633</td>
<td>41.2</td>
<td>1,356</td>
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<td>27.1</td>
<td>44</td>
<td>25.3</td>
<td>6</td>
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<td>44.0</td>
<td>3,633</td>
<td>41.2</td>
<td>1,356</td>
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<td>Work Status</td>
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<td>619</td>
<td>45.8</td>
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<tr>
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<td>45.3</td>
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<td>263</td>
<td>36.9</td>
<td>236</td>
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<td>81</td>
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<tr>
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<td>40.8</td>
<td>1,137</td>
<td>38.4</td>
<td>438</td>
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</table>
Post hoc power calculations conducted indicated that the model for any alcohol misuse had 87% power, the model for binge drinking had 38.7% power, the model for heavy drinking had 3.1% power, the model for alcohol abuse had 20.4% power, and the model for alcohol dependence had 50.8% power.

Any Alcohol Misuse

Among full-time college students who were alcohol misusers, 89.8% had no significant depression, 0.7% had subthreshold depression, and 9.6% had threshold depression. Level of depression was associated with any alcohol misuse in the unadjusted model (Wald F = 18.26 (2), p < .001). However, the only significant odds ratio was comparing alcohol misuse in threshold depression to no significant depression (Table 2). All covariates were significantly associated with any alcohol misuse in the unadjusted models as well, and were retained in the adjusted model.

The adjusted model indicated a significant association between past year level of depression and any alcohol misuse (Wald F = 27.10 (2), p < .001) among college students. The model indicated that college students with subthreshold depression were 71% (aOR = 1.71, 95% CI = 1.20-2.43) more likely to engage in any alcohol misuse than those with no significant depression and students with threshold depression were 45% (aOR = 1.45, 95% CI = 1.28-1.65) more likely to engage in any alcohol misuse compared to those with no significant depression (Table 2). The adjusted model indicated significant associations between any alcohol misuse and age, gender, race/ethnicity, living with an adult family member, marital status, and work status among college students. Removing the threshold depression
<table>
<thead>
<tr>
<th>Predictor/Covariate</th>
<th>Unadjusted OR</th>
<th>95% CI</th>
<th>Adjusted OR</th>
<th>95% CI</th>
</tr>
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<tbody>
<tr>
<td><strong>Level of Depression</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No significant Past year MDE Symptoms (No Depression) (ref)</td>
<td>1.00</td>
<td>N/A</td>
<td>1.00</td>
<td>N/A</td>
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<tr>
<td>Past Year MDE symptoms with None to Mild Impairment (Subthreshold Depression)</td>
<td>1.36</td>
<td>0.96-1.91</td>
<td>1.71*</td>
<td>1.20-2.43</td>
</tr>
<tr>
<td>Past year MDE Symptoms with Moderate to Severe Impairment (Threshold Depression)</td>
<td>1.31*</td>
<td>1.17-1.47</td>
<td>1.45*</td>
<td>1.28-1.65</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
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<td></td>
</tr>
<tr>
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<td>N/A</td>
<td>1.00</td>
<td>N/A</td>
</tr>
<tr>
<td>19</td>
<td>1.31*</td>
<td>1.20-1.43</td>
<td>1.26*</td>
<td>1.14-1.38</td>
</tr>
<tr>
<td>20</td>
<td>1.66*</td>
<td>1.50-1.83</td>
<td>1.52*</td>
<td>1.37-1.67</td>
</tr>
<tr>
<td>21</td>
<td>2.44*</td>
<td>2.18-2.74</td>
<td>2.22*</td>
<td>1.96-2.51</td>
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<tr>
<td>22</td>
<td>2.16*</td>
<td>1.94-2.39</td>
<td>1.99*</td>
<td>1.78-2.23</td>
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<tr>
<td><strong>Gender</strong></td>
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<td></td>
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<tr>
<td>Male</td>
<td>1.62*</td>
<td>1.51-1.73</td>
<td>1.64*</td>
<td>1.53-1.75</td>
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<tr>
<td>Female (ref)</td>
<td>1.00</td>
<td>N/A</td>
<td>1.00</td>
<td>N/A</td>
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<tr>
<td><strong>Race/Ethnicity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Hispanic white</td>
<td>3.06*</td>
<td>2.75-3.40</td>
<td>2.86*</td>
<td>2.58-3.17</td>
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<tr>
<td>Non-Hispanic black (ref)</td>
<td>1.00</td>
<td>N/A</td>
<td>1.00</td>
<td>N/A</td>
</tr>
<tr>
<td>Non-Hispanic other</td>
<td>1.11</td>
<td>0.95-1.30</td>
<td>1.05</td>
<td>0.90-1.22</td>
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<tr>
<td>Hispanic or Latino</td>
<td>1.87*</td>
<td>1.62-2.16</td>
<td>2.14*</td>
<td>1.85-2.47</td>
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<td><strong>Living with an adult family member</strong></td>
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<td>N/A</td>
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<tr>
<td>No</td>
<td>2.28*</td>
<td>2.06-2.51</td>
<td>2.14*</td>
<td>1.95-2.36</td>
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<tr>
<td><strong>Marital Status</strong></td>
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<tr>
<td>Married</td>
<td>0.47*</td>
<td>0.36-0.62</td>
<td>0.50*</td>
<td>0.38-0.66</td>
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<td>Not married (ref)</td>
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<tr>
<td><strong>Work Status</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Employed full-time (ref)</td>
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<td>1.00</td>
<td>N/A</td>
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<tr>
<td>Employed part-time</td>
<td>0.87*</td>
<td>0.78-0.96</td>
<td>0.82*</td>
<td>0.72-0.92</td>
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<td>Unemployed</td>
<td>0.61*</td>
<td>0.53-0.71</td>
<td>0.74*</td>
<td>0.64-0.86</td>
</tr>
<tr>
<td>Other</td>
<td>0.72*</td>
<td>0.65-0.80</td>
<td>0.65*</td>
<td>0.58-0.72</td>
</tr>
</tbody>
</table>

Note. OR = odds ratio; CI = confidence interval; (ref) = reference group; NA = not applicable.
Overall model Wald F = 181.3 (16), p < .001. * Odds ratio is significantly different from the odds ratio of the reference group at the p < .05 level.
category from the adjusted model did not significantly change the association between subthreshold depression and any alcohol misuse (OR = 1.73, 95% CI = 1.21-2.47).

The multivariable model that included all respondents aged 18 to 22 indicated a significant association between past year level of depression and any alcohol misuse (Wald F = 102.06 (2), p < .001) and indicated that persons with subthreshold (aOR = 1.63, 95% CI = 1.32-2.01) and threshold depression (aOR = 1.47, 95% CI = 1.38-1.57) were more likely to engage in any alcohol misuse than those with no significant depression.

**Binge Drinking**

Among full-time college students who were binge drinkers, 90.6% had no significant depression, 0.7% had subthreshold depression, and 8.7% had threshold depression. Level of past year depression was not associated with binge drinking in the unadjusted regression model (Wald F = 2.69 (2), p = .076) although all other covariates were significantly associated with binge drinking.

Unlike the unadjusted model, the adjusted model indicated a significant association between past year level of depression symptoms and binge drinking (Wald F = 8.85 (2), p < .001) among college students. The model indicated that college students with subthreshold depression were 64% more likely to engage in binge drinking than those with no significant depression (aOR = 1.64, 95% CI = 1.15-2.33) and students with threshold depression were 18% more likely to engage in any alcohol misuse compared to those with no significant depression (aOR = 1.18, 95% CI = 1.03-1.34) (Table 3). Similar to the model of alcohol
Table 3
Unadjusted and adjusted odds ratios and 95% confidence intervals from logistic regression models predicting binge drinking

<table>
<thead>
<tr>
<th>Predictor/Covariate</th>
<th>Unadjusted</th>
<th></th>
<th>Adjusted</th>
<th></th>
</tr>
</thead>
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<td></td>
<td>OR</td>
<td>95% CI</td>
<td>OR</td>
<td>95% CI</td>
</tr>
<tr>
<td>Level of depression</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No significant Past year MDE Symptoms (No Depression) (ref)</td>
<td>1.00</td>
<td>N/A</td>
<td>1.00</td>
<td>N/A</td>
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<tr>
<td>Past Year MDE symptoms with None to Mild Impairment (Subthreshold Depression)</td>
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<td>0.91-1.84</td>
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<td>1.15-2.33</td>
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<td>Past year MDE Symptoms with Moderate to Severe Impairment (Threshold Depression)</td>
<td>1.08</td>
<td>0.96-1.22</td>
<td>1.18*</td>
<td>1.03-1.34</td>
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<td>Age</td>
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<td>1.95-2.41</td>
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<td>1.76-2.23</td>
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<tr>
<td>Race/Ethnicity</td>
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<tr>
<td>Work Status</td>
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<tr>
<td>Employed full-time (ref)</td>
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<td>N/A</td>
</tr>
<tr>
<td>Employed part-time</td>
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<td>0.79-0.97</td>
<td>0.82*</td>
<td>0.72-0.92</td>
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<tr>
<td>Unemployed</td>
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<td>0.50-0.69</td>
<td>0.72*</td>
<td>0.61-0.85</td>
</tr>
<tr>
<td>Other</td>
<td>0.74*</td>
<td>0.66-0.82</td>
<td>0.66*</td>
<td>0.58-0.74</td>
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</tbody>
</table>

Note. OR = odds ratio; CI = confidence interval; (ref) = reference group; NA = not applicable.
Overall model Wald F = 181.3 (16), p < .001.
* Odds ratio is significantly different from the odds ratio of the reference group at the p < .05 level.
misuse, the adjusted model indicated significant associations between any binge drinking and age, gender, race/ethnicity, living with an adult family member, marital status, and work status among college students. Removing the threshold depression category from the adjusted model did not significantly change the association between subthreshold depression and binge drinking (OR = 1.65, 95% CI = 1.16-2.36).

The multivariable model that included all respondents aged 18 to 22 indicated a significant association between past year level of depression and binge drinking (Wald F = 281.09 (2), p < .001) and indicated that persons with subthreshold (aOR = 1.35, 95% CI = 1.03-1.77) and threshold depression (aOR = 1.22, 95% CI = 1.14-1.30) were more likely to engage in binge drinking than those with no significant depression.

**Heavy Drinking**

Among full-time college students who were heavy drinkers, 91.2% had no significant depression, 0.6% had subthreshold depression, and 8.2% had threshold depression. Level of past year depression was not associated with heavy drinking in the unadjusted model (Wald F = 0.0265(2), p = .97) although all other covariates were significantly associated with heavy drinking.

The adjusted model also did not indicate a significant association between past year level of depression and heavy drinking (Wald F = 1.19 (2), p < .312) among college students. The direction of the associations between heavy drinking and both subthreshold depression (OR = 1.31, 95% CI = 0.77-2.22) and threshold depression (OR = 1.12, 95% CI = 0.94-1.34) were in the expected direction although they were not significant (Table 4).
### Table 4
Unadjusted and adjusted odds ratios and 95% confidence intervals from logistic regression models predicting heavy drinking

<table>
<thead>
<tr>
<th>Predictor/Covariate</th>
<th>Unadjusted</th>
<th></th>
<th>Adjusted</th>
<th></th>
</tr>
</thead>
<tbody>
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<td></td>
<td>OR</td>
<td>95% CI</td>
<td>OR</td>
<td>95% CI</td>
</tr>
<tr>
<td><strong>Level of depression</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No significant Past year MDE Symptoms (No Depression) (ref)</td>
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<td>N/A</td>
<td>1.00</td>
<td>N/A</td>
</tr>
<tr>
<td>Past Year MDE symptoms with None to Mild Impairment (Subthreshold Depression)</td>
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<td>0.57-1.75</td>
<td>1.31</td>
<td>0.77-2.22</td>
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<tr>
<td>Past year MDE Symptoms with Moderate to Severe Impairment (Threshold Depression)</td>
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<td>0.82-1.17</td>
<td>1.12</td>
<td>0.94-1.34</td>
</tr>
<tr>
<td><strong>Age</strong></td>
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</tr>
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<td>1.00</td>
<td>N/A</td>
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<td>1.18-1.61</td>
<td>1.28*</td>
<td>1.09-1.49</td>
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<td>1.51-2.15</td>
<td>1.57*</td>
<td>1.31-1.88</td>
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<td>1.83-2.61</td>
<td>1.81*</td>
<td>1.51-2.17</td>
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<tr>
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<td>1.47-2.22</td>
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<td>1.22-1.86</td>
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<td>2.00-2.47</td>
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<td>2.02-2.43</td>
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<td><strong>Race/Ethnicity</strong></td>
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<td>4.31*</td>
<td>3.52-5.27</td>
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<td>N/A</td>
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<td>Non-Hispanic other</td>
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<td>0.96-1.72</td>
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<td>0.85-1.56</td>
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<tr>
<td>Hispanic or Latino</td>
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<td>1.83-2.79</td>
<td>2.54*</td>
<td>2.04-3.17</td>
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<td></td>
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<td>Yes (ref)</td>
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<tr>
<td>No</td>
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<td>2.51-3.26</td>
<td>2.58*</td>
<td>2.27-2.93</td>
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<td>Married</td>
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<td>0.17-0.51</td>
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<td>Not married (ref)</td>
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<td>N/A</td>
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<tr>
<td><strong>Work Status</strong></td>
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<tr>
<td>Employed full-time (ref)</td>
<td>1.00</td>
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<td>N/A</td>
</tr>
<tr>
<td>Employed part-time</td>
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<tr>
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<td>0.55-0.81</td>
<td>0.81*</td>
<td>0.65-0.99</td>
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<tr>
<td>Other</td>
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<td>0.77-1.06</td>
<td>0.74*</td>
<td>0.63-0.87</td>
</tr>
</tbody>
</table>

**Note.** OR = odds ratio; CI = confidence interval; (ref) = reference group; NA = not applicable.

Overall model Wald F = 181.3 (16), p < .001.

* Odds ratio is significantly different from the odds ratio of the reference group at the p < .05 level.
Similar to the models of alcohol misuse and binge drinking among college students, the adjusted model indicated significant associations between heavy drinking and age, gender, race/ethnicity, living with an adult family member, marital status, and work status. Removing the threshold depression category from the adjusted model did not significantly change the association between subthreshold depression and heavy drinking (OR = 1.31, 95% CI = 0.78-2.27).

The multivariable model that included all respondents aged 18 to 22 indicated a significant association between past year level of depression and heavy drinking (Wald F = 13.04 (2), p < .001) and indicated that persons with threshold depression (aOR = 1.26, 95% CI = 1.15-1.38) were more likely to engage in heavy drinking than those with no significant depression. The association between subthreshold depression and heavy drinking was not significant in this model (aOR = 1.24, 95% CI = 0.87-1.76).

**Alcohol Abuse**

Among full-time college students who had past year alcohol abuse, 84.6% had no significant depression, 0.7% had subthreshold depression, and 14.7% had threshold depression. Level of past year depression was significantly associated with alcohol abuse in the unadjusted model (Wald F = 50.035 (2), p < .001). All covariates were also significantly associated with alcohol abuse in the unadjusted models and were retained in the adjusted model.

The adjusted model also showed a significant association between past year level of depression and heavy drinking (Wald F = 57.03 (2), p < .000) among college students. The
direction of the associations between alcohol abuse and both subthreshold depression (OR = 1.45, 95% CI = 0.90-2.35) and threshold depression (OR = 2.37, 95% CI = 2.02-2.78) were in the expected direction although only the association between threshold depression and alcohol abuse reached a level of significance (Table 5). Similar to the models of alcohol misuse, binge drinking, and heavy drinking, the adjusted model indicated significant associations between alcohol abuse and age, gender, race/ethnicity, living with an adult family member, marital status, and work status. Removing the threshold depression category from the adjusted model did not significantly change the association between subthreshold depression and alcohol abuse (OR = 1.47, 95% CI = 0.90-2.39).

The multivariable model that included all respondents aged 18 to 22 indicated a significant association between past year level of depression and alcohol abuse (Wald F = 201.80 (2), p < .001) and indicated that persons with subthreshold (aOR = 2.22, 95% CI = 1.65-2.98) and threshold depression (aOR = 2.44, 95% CI = 2.23-2.67) were more likely to have alcohol abuse than those with no significant depression.

Alcohol Dependence

Among full-time college students who had past year alcohol dependence, 78.1% had no significant depression, 0.8% had subthreshold depression, and 21.0% had threshold depression. Level of past year depression among college students was significantly associated with alcohol dependence in the unadjusted model (Wald F = 66.40 (2), p < .001). Both threshold and subthreshold depression were associated with alcohol dependence.
Table 5
Unadjusted and adjusted odds ratios and 95% confidence intervals from logistic regression models predicting alcohol abuse

<table>
<thead>
<tr>
<th>Predictor/Covariate</th>
<th>Unadjusted</th>
<th>95% CI</th>
<th>Adjusted</th>
<th>95% CI</th>
</tr>
</thead>
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<tr>
<td><strong>Level of depression</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No significant Past year MDE Symptoms (No Depression) (ref)</td>
<td>1.00</td>
<td>N/A</td>
<td>1.00</td>
<td>N/A</td>
</tr>
<tr>
<td>Past Year MDE symptoms with None to Mild Impairment (Subthreshold Depression)</td>
<td>1.25</td>
<td>0.82-1.90</td>
<td>1.45</td>
<td>0.90-2.35</td>
</tr>
<tr>
<td>Past year MDE Symptoms with Moderate to Severe Impairment (Threshold Depression)</td>
<td>2.19*</td>
<td>1.87-2.56</td>
<td>2.37*</td>
<td>2.02-2.78</td>
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<tr>
<td><strong>Age</strong></td>
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</tr>
<tr>
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<td>1.00</td>
<td>N/A</td>
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<td>1.21*</td>
<td>1.07-1.37</td>
<td>1.17*</td>
<td>1.02-1.33</td>
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<tr>
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<td>1.42*</td>
<td>1.24-1.63</td>
<td>1.32*</td>
<td>1.15-1.52</td>
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<td>1.43-1.91</td>
<td>1.51*</td>
<td>1.29-1.76</td>
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<tr>
<td>22</td>
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<td>1.35*</td>
<td>1.15-1.59</td>
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<td></td>
</tr>
<tr>
<td>Male</td>
<td>1.43*</td>
<td>1.29-1.58</td>
<td>1.49*</td>
<td>1.36-1.64</td>
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<tr>
<td>Female (ref)</td>
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<td>N/A</td>
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<tr>
<td><strong>Race/Ethnicity</strong></td>
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<td></td>
<td></td>
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<tr>
<td>Non-Hispanic white</td>
<td>2.69*</td>
<td>2.25-3.21</td>
<td>2.44*</td>
<td>2.02-2.94</td>
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<td>Non-Hispanic black (ref)</td>
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<td>N/A</td>
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<tr>
<td>Non-Hispanic other</td>
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<td>0.95-1.60</td>
<td>1.17</td>
<td>0.90-1.52</td>
</tr>
<tr>
<td>Hispanic or Latino</td>
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<td>1.60-2.65</td>
<td>2.12*</td>
<td>1.64-2.76</td>
</tr>
<tr>
<td><strong>Living with an adult family member</strong></td>
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</tr>
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<tr>
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<td>N/A</td>
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<tr>
<td><strong>Work Status</strong></td>
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<td></td>
<td></td>
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<tr>
<td>Employed full-time (ref)</td>
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<td>N/A</td>
</tr>
<tr>
<td>Employed part-time</td>
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<td>0.64-0.95</td>
<td>0.87</td>
<td>0.71-1.06</td>
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<td>Other</td>
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<td>0.68-0.88</td>
<td>0.73*</td>
<td>0.64-0.84</td>
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</tbody>
</table>

Note. OR = odds ratio; CI = confidence interval; (ref) = reference group; NA = not applicable.
Overall model Wald F = 181.3 (16), p < .001.
* Odds ratio is significantly different from the odds ratio of the reference group at the p < .05 level.
although only the association between threshold depression and alcohol dependence was significant. Unlike the models for any alcohol misuse, binge drinking, heavy drinking, and alcohol abuse, not all covariates were significantly associated with alcohol dependence in the unadjusted models. Gender, marital status, and employment status were not significantly associated with alcohol dependence and were therefore not included in the adjusted model.

The adjusted model indicated a significant association among college students between past year level of depression and alcohol dependence (Wald $F = 67.15$ (2), $p < .001$). The direction of the associations between alcohol dependence and both subthreshold depression (OR = 1.79, 95% CI = 0.83-3.86) and threshold depression (OR = 3.30, 95% CI = 2.68-4.05) were in the expected direction although the association between subthreshold depression and alcohol dependence was not significant (Table 6). The covariates included in the adjusted model (age, race/ethnicity, and living with an adult family member), were found to be significantly associated with alcohol dependence among college student. Removing the threshold depression category from the adjusted model did not significantly change the association between subthreshold depression and heavy drinking (OR = 1.79, 95% CI = 0.83-3.88).

The multivariable model that included all respondents aged 18 to 22 indicated a significant association between past year level of depression and any alcohol misuse (Wald $F = 235.77$ (2), $p < .001$) and indicated that persons with subthreshold (aOR = 1.75, 95% CI = 1.13-2.72) and threshold depression (aOR = 3.26, 95% CI = 2.90-3.66) were more
### Table 6
Unadjusted and adjusted odds ratios and 95% confidence intervals from logistic regression models predicting alcohol dependence

<table>
<thead>
<tr>
<th>Predictor/Covariate</th>
<th>Unadjusted</th>
<th></th>
<th>Adjusted</th>
<th></th>
</tr>
</thead>
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<td></td>
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<td>95% CI</td>
<td>OR</td>
<td>95% CI</td>
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<tr>
<td><strong>Level of depression</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No significant Past year MDE Symptoms (No Depression) (ref)</td>
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<td>N/A</td>
<td>1.00</td>
<td>N/A</td>
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<tr>
<td>Past Year MDE symptoms with None to Mild Impairment (Subthreshold Depression)</td>
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<td>0.82-3.50</td>
<td>1.79</td>
<td>0.83-3.86</td>
</tr>
<tr>
<td>Past year MDE Symptoms with Moderate to Severe Impairment (Threshold Depression)</td>
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<td>2.66-4.02</td>
<td>3.30*</td>
<td>2.68-4.05</td>
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<td>1.07-1.78</td>
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<td>0.98-1.65</td>
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</tr>
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<td><strong>Race/Ethnicity</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>Non-Hispanic black (ref)</td>
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<td>1.00</td>
<td>N/A</td>
</tr>
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<td>Non-Hispanic other</td>
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</tr>
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<td>Hispanic or Latino</td>
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<td>1.16-2.26</td>
<td>1.65*</td>
<td>1.16-2.34</td>
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<td><strong>Living with an adult family member</strong></td>
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<td>Yes (ref)</td>
<td>1.00</td>
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<td>N/A</td>
</tr>
<tr>
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<td>1.89*</td>
<td>1.64-2.19</td>
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<td>N/A</td>
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<td>N/A</td>
<td>N/A</td>
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<tr>
<td><strong>Work Status</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employed full-time (ref)</td>
<td>1.00</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Employed part-time</td>
<td>1.09</td>
<td>0.90-1.33</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Unemployed</td>
<td>0.94</td>
<td>0.72-1.24</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Other</td>
<td>0.94</td>
<td>0.76-1.16</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

**Note.** OR = odds ratio; CI = confidence interval; (ref) = reference group; NA = not applicable.
Overall model Wald $F = 181.3$ (16), $p < .001$.
* Odds ratio is significantly different from the odds ratio of the reference group at the $p < .05$ level.
likely to engage in any alcohol misuse than those with no significant depression.

**Discussion**

The primary purpose of this study was to investigate the potential association between subthreshold depression and alcohol misuse, and its individual components: binge drinking, heavy drinking, alcohol abuse, and alcohol dependence among college students. Findings indicate that nearly half of full-time college students aged 18 to 22 had misused alcohol in the past year, over 40% had engaged in binge drinking, and about 15% had engaged in heavy drinking. More than 1 in 10 had behaviors consistent with a probable diagnosis of alcohol abuse in the past year and over 6% had behaviors consistent with a probable diagnosis of alcohol dependence. These prevalence estimates are consistent with those produced from other data sources (Chen et al., 2004; Wechsler et al., 2000; Windle, 2003).

Prevalence of subthreshold depression was less than 1% in both the weighted and unweighted distributions (0.59% and 0.62%, respectively). This is appreciably lower than published prevalence estimates of subthreshold depression among adolescents aged 17 or 18 (7.3%) reported by Fergusson and colleagues and the prevalence estimate of subthreshold depression among female adolescents aged 18 (2%) reported by Rohde and colleagues (Fergusson et al., 2005; Rohde et al., 2009). This difference is likely due to differences in the measures and operational definitions of subthreshold depression used in the 3 studies.

The Fergusson study used self-report data from a structured diagnostic interview and had a broad operationalization of subthreshold depression (having either depressed mood or
loss of interest for a period of at least 2 weeks, but not meeting the diagnostic cut point of 5 or more symptoms or not reporting significant distress or impairment of functioning). The Rohde study used data from a clinical interview and had a less broad operationalization than the Fergusson study (all of the necessary symptoms for MDD during the same period of 2 weeks or longer but at least one symptom was present only at a subthreshold level) and assessed impairment at the symptom level rather than across symptoms). The measure of subthreshold depression used in the present study is particularly narrow and stringent (5 or more symptoms of MDE with none to low impairment across symptoms). Using such a depressive symptoms would be classified as having subthreshold depression (false positives), stringent measure means that there is little concern that persons who do not have significant but it may result in the exclusion of persons with lower symptom and higher levels of impairment who would be classified as having subthreshold depression using other measures/operational definitions. Future research may consider this as part of an independent replication. The lack of a preferred operational definition of subthreshold depression or data concerning the equivalency across screening, structured diagnostic, and clinical instruments for the subthreshold level of depression make comparisons across studies difficult.

Differences in the populations studied may also affect the prevalence rates for subthreshold depression found in these three studies. The sample for the present study was drawn from a nationally representative probability sample. Rohde and colleagues study sample included 496 female adolescents, representative of the metropolitan area in the
southwestern United States in which it was conducted. The sample in the study by Fergusson et al., was a birth cohort if 1,265 children in Christchurch, New Zealand.

The models for any alcohol misuse provide an overall picture of the association between subthreshold depression and alcohol problems among students with problematic alcohol use. In the adjusted models, the odds of alcohol misuse was greater among students with subthreshold and threshold depression than among those with no significant depression. The odds ratio for threshold depression (1.45) was lower than the odds ratio for subthreshold depression (1.71) in this model, and the 95% confidence interval was much wider for subthreshold depression compared with that of threshold depression, suggesting some instability in the estimates due to lower statistical power. A logistic regression model was run using the subthreshold category of depression as the reference category to determine whether the differences between the odds ratios for threshold and subthreshold depression were at a significant level indicated that the two were not different at a significant level. Additional studies of these associations would be necessary to verify that this difference in odds ratios in the college models reflects a truly greater likelihood of alcohol misuse among college students with subthreshold depression than among those with threshold depression.

For binge drinking, as with any alcohol misuse, controlling for covariates resulted in a significant association between the level of past year depression and binge drinking not apparent in the unadjusted model, suggesting that the association in the bivariate models may have been obscured by confounding. For several of the covariates, the direction of the correlation between the covariate and the predictor variable is in the opposite direction of
the relationship between the covariate and the outcome variable, which could explain the lack of significance in the unadjusted models. For example, age is negatively associated with past year level of MDE and positively associated with past year binge drinking and alcohol misuse. This could lead to a reduced odds ratio in the unadjusted models which could not reach significance until the effect of age was controlled for. A similar pattern of correlations was found for gender and living with an adult family member.

Also consistent with the model for any alcohol misuse, the adjusted odds ratio for threshold depression (1.18) was lower than the adjusted odds ratio for subthreshold depression (1.64), although not at a significant level. In both cases, the 95% confidence interval was much wider for subthreshold than for threshold depression, suggesting that the precision of the subthreshold model may be lower than that of the threshold model. Contrary to expectations, the model for heavy drinking did not indicate a significant association between heavy drinking and past year level of depression symptoms. The multivariable past year level of depression and the outcome variable, as well as a significant association between model including all sample members aged 18 to 22 did indicate a significant association between threshold depression and heavy drinking. This supports the view that the lack of significant association in the college student model was likely due to insufficient power to detect differences among this subgroup for past year level of depression. The association between subthreshold depression and heavy drinking in the model containing all persons aged 18 to 22 remained nonsignificant.
In the models for both alcohol abuse and alcohol dependence, a significant association was found with past year level of depression. Odds ratios for subthreshold depression were in the expected direction (greater than 1), but not at a significant level. Significant associations were found between subthreshold depression and both alcohol abuse and alcohol dependence, indicating that the failure to detect a significant association in the college student models may have been a consequence of insufficient power. The association between threshold depression and both alcohol abuse and alcohol dependence was significant in the adjusted and unadjusted models. Persons with threshold depression were more than 2 times as likely to have alcohol abuse and more than 3 times as likely to have alcohol dependence as persons with no significant depressive symptoms. This indicates a moderate to strong association between threshold depression and alcohol abuse and dependence.

The associations found between sociodemographic covariates and alcohol misuse and its components reinforce several of the known risk markers for alcohol misuse (Barnes et al., 2010; Butler et al., 2010; Clements, 1999; Dawson et al., 2004; Gfroerer et al., 1997; Livingston et al., 2008; Wilke et al., 2005; L.-T. Wu et al., 2007; L.-T. Wu et al., 2003). Non-Hispanic white college students were 3 times more likely to misuse alcohol as their non-Hispanic black counterparts. College students who were 21 years of age were more than twice as likely as their 18 year old fellow students to engage in heavy drinking. Males in this group were more than twice as likely as females to engage in binge drinking. Unmarried college students were more than twice as likely as their married counterparts to
binge drink, and college students not living with an adult family member were nearly twice as likely as those who do to have alcohol dependence. The models for alcohol dependence, unlike the models run for the other outcomes of interest, did not indicate a significant association with gender, marital status, or work status. This may reflect true differences between the characteristics of persons who have developed alcohol dependence by the age of 22 and the characteristics of those who have other types of alcohol misuse.

Previous research on the association between depression and alcohol misuse has typically restricted the measure of depression to only threshold depression or to some combination of threshold and subthreshold conditions. The study contributes to the literature by discriminating between threshold and subthreshold levels to determine the relationship between subthreshold depression and alcohol misuse, which provides additional evidence of the importance of researching subthreshold depression. Additionally, these are important findings with potential implications for mental health and substance use service providers on college campuses. All types of alcohol misuse (i.e., binge drinking, heavy drinking, alcohol abuse, and alcohol dependence) are associated with a number of both long- and short-term negative consequences such as interpersonal problems (Presley et al., 2002), alcohol-related unintentional injury deaths (Hingson et al., 2009), sexual aggression and victimization (Champion et al., 2004; Rapoza & Drake, 2009; Testa & Livingston, 1999), legal problems (Sheffield et al., 2005), and negative mental health outcomes (Cranford et al., 2009). Identifying risk markers or risk factors for alcohol misuse, especially among college students, is an important step in prevention and early intervention.
Winters and colleagues indicate that 44% of college counseling centers use a formal alcohol problems screening instrument to identify students who misuse alcohol, although there is no description of who the target groups for these screening efforts are (Winters et al., 2011). In college environments where there are insufficient resources to implement a screening and brief intervention program (Shear et al.) targeted at all students who seek campus counseling or mental health services, a more specifically targeted SBI program may provide an alternative that requires less of an investment. The significant associations found between threshold depression and alcohol misuse, including several of its components, in this and other studies, suggest SBI programs targeted to students with threshold depression who seek campus mental health or counseling services may be an important prevention/early intervention tool. Likewise, the significant associations between subthreshold depression and any alcohol misuse and binge drinking among college students suggest that there may be a benefit to expanding the target of such an SBI program to also include students who have depressive symptoms but don’t meet the diagnostic threshold for MDE, as they too are at greater odds than their peers without significant depression for any alcohol misuse, and binge drinking specifically. Empirical studies will be necessary to determine the cost and benefits of such a targeted SBI program.

The significant associations between subthreshold depression and any alcohol misuse, binge drinking, alcohol abuse, and alcohol dependence among all persons aged 18 to 22 further indicate that subthreshold depression is a predictor across all types of alcohol misuse behaviors. Likewise, the odds ratio for any alcohol misuse was appreciably larger
than the odds ratio for binge drinking, suggesting an additive benefit of alcohol abuse and dependence to the model. The college community presents an environment that has been posited to encourage alcohol misuse. It also presents an opportunity, with little additional burden, to offer screening and intervention for alcohol misuse to students who present to campus mental health or counseling services with threshold or subthreshold levels of depression.

More research is needed to determine where the cutoffs between threshold and subthreshold depression as well as subthreshold depression and no significant depression should be set. The operationalization of subthreshold depression in this study was very narrow and stringent, which is a highly specific but not particularly sensitive measure of subthreshold depression. The findings of this study are tied to this highly specific but not particularly sensitive measure of subthreshold depression. They tell us that students in what is likely the upper range of the subthreshold category are more likely to misuse alcohol than their peers whose level of depression falls below that range. Other studies can and should be conducted to examine whether this relationship is true for students who have a lower level of symptoms/impairment but who nonetheless would be classified as having subthreshold depression using a less stringent measure. An optimal cut-off can only be determined by examining the association of alcohol misuse with subthreshold depression across a number of operational definitions of subthreshold depression to see which were associated with increased odds of alcohol misuse.
There are several strengths and limitations that need to be considered regarding this study. A strength is that the data are from a large, nationally representative data set with a large sample of full-time college students. There is also the limitation based on sample size. Although 6 years of NSDUH data were used, resulting in more than 28,000 adolescents/young adults in the sample, experiencing past year subthreshold depression as it was defined and measured in this study was a relatively rare event. Less than 1% of sample members were classified as having subthreshold depression, which may have decreased the power to detect significant differences in these models. Future studies may use a more inclusive operational definition of subthreshold depression to increase the size of this subgroup and improve the precision of the estimates.

An additional concern over the depression measure available in the NSDUH is that it is designed to collect self-report information regarding the symptoms of depression and resulting impairment based on a fully structured interview. In structured self-report interviews such as the NSDUH, the respondent is the person who makes the determination of whether or not their experience matches the symptom being asked about. Having data from clinical interviews, administered by a clinical interviewer who can ask probing questions to determine whether a person’s experience matches the symptom being queried and is present at a clinically significant level, may allow a more precise discrimination between the no significant depression, subthreshold depression, and threshold depression groups. At the same time, measures based on clinical judgement have been found to be less reliable than self-report measures (Angold & Fisher, 1999) making fully structured versus
clinical determination a tradeoff. Moreover, those types of studies are rarely conducted with large samples due to time, complexity, and expense.

The data are based on self-report measures of drinking, alcohol-related behaviors, and the experience of depressive symptoms and diagnoses not validated by clinicians. Concerns about accuracy of recall and social desirability bias have been raised about data gathered in this way. However, there is support for the reliability and validity of the substance use and substance use disorder questions used and the use of ACASI helps to reduce the possibility of socially appropriate responding (Gnambs & Kaspar, 2014). Moreover, as the reference period of the questions is restricted to the past year, there is less concern over recall bias.

Finally, this research must be considered as preliminary due to the correlational nature of the dataset. The findings indicate a significant association between any alcohol misuse, and specifically binge drinking, and both subthreshold and threshold depression. This does not imply that depression causes alcohol misuse or that alcohol misuse causes depression. Longitudinal data on this relationship indicates that it is bidirectional. However, there are no implications for intervention that causality is not established. Rather, it is important to identify risk factors or risk markers that convey increased odds of the behavior.

This study has extended the prior work done in understanding the potential relationship between subthreshold depression and alcohol misuse and focused on a population at great risk of misusing alcohol and suffering the associated consequences. The findings of this study add to the existing evidence that a significant association exists
between subthreshold depression and binge drinking and any alcohol misuse among college students aged 18 to 22. Likewise, the findings indicate that an association may exist between subthreshold depression and heavy drinking, alcohol abuse, and alcohol dependence. This information can be of use to mental health and substance use service providers on college campuses to better identify students who may be at risk for misusing alcohol. The study is preliminary, and replication with other measures of subthreshold depression is important. Further research is needed to determine whether these associations are present in studies where alternate operational definitions of subthreshold are used.
References


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Substance Abuse and Mental Health Services Administration. (2010a). Reliability of key measures in the National Survey on Drug Use and Health (Methodology Series M-8, HHS Publication No. SMA 09-4425). Rockville, MD.


Substance Abuse and Mental Health Services Administration. (2012). Results from the 2011 National Survey on Drug Use and Health: Summary of national findings (NSDUH Series H-44, HHS Publication No. SMA 12-4713). Rockville, MD.


Appendices
Appendix A. Specifications for NSDUH Sociodemographic Questions
Core Demographics

Age1 What is your date of birth?

ENTER M-DD-YYYY

DOB: _________________
DK/REF

confdob [IF AGE1 NE DK OR REF] I have entered your date of birth as [AGE1]. Is that correct?

1  YES
2  NO
DK/REF

HARD ERROR: [IF CONFDOB = 2] INTERVIEWER: PRESS [ENTER] TO GO BACK AND CORRECT THERESPONDENT'S DATE OF BIRTH.

[NOTE: DO NOT DEFINE CALCAGE UNTIL CONFDOB=YES]

confirm [IF AGE1 NE DK/REF AND CONFDODB NE DK/REF] That would make you [CALCAGE] years old. Is this correct?

1  YES
2  NO
DK/REF

HARD ERROR: [IF CONFIRM = 2] INTERVIEWER: PRESS [ENTER] TO GO BACK AND CORRECT THE RESPONDENT'S DATE OF BIRTH.

under12 [IF CONFIRM = 1 OR DK/REF AND CALCAGE < 12] Since you are [CALCAGE] years old, we cannot interview you for this study. Thank you for your cooperation.

PRESS [ENTER] TO CONTINUE. PROGRAM SHOULD ROUTE TO FIEXIT.

dkrefage [IF (CALCAGE IS 12 OR OLDER AND CONFIRM = DK/REF) OR AGE1 = DK/REF OR CONFDODB = DK/REF] I need your correct age so I can ask you the right questions. What is your correct age?

AGE: [RANGE: 1 - 110]
DK/REF

IF DKREFAGE NOT (BLANK OR DK/REF) THEN CALCAGE = DKREFAGE

under12b [IF DKREFAGE < 12] Since you are [CALCAGE] years old, we cannot interview you for this study. Thank you for your cooperation.
PRESS [ENTER] TO CONTINUE. PROGRAM SHOULD ROUTE TO FIEXIT

lastchance  [IF DKREFAGE = DK/REF] Since I am not certain what your age is, I cannot interview you for this study. Thank you for your cooperation.

PRESS [ENTER] TO CONTINUE. PROGRAM SHOULD ROUTE TO FIEXIT

DEFINE CURNTAGE:
IF CALCAGE > 11 AND CONFIRM = 1, CURNTAGE = CALCAGE
IF CALCAGE > 11 AND CONFIRM = DK/REF AND DKREFAGE > 11, CURNTAGE = DKREFAGE
IF AGE1 = DK/REF AND DKREFAGE > 11, CURNTAGE = DKREFAGE
ELSE RESPONDENT IS INELIGIBLE; ROUTE TO FIEXIT

FIPE1 INTERVIEWER: WERE 2 PERSONS SELECTED FOR AN INTERVIEW AT THIS SDU?

1 YES
2 NO

FIPE2 [IF FIPE1 = 1 AND CURNTAGE = 18 OR OLDER] INTERVIEWER: WAS A 12 - 17 YEAR OLD CHILD SELECTED FOR AN INTERVIEW AT THIS SDU?

1 YES
2 NO

FIPE3 [IF FIPE2 = 1] INTERVIEWER: IS THIS RESPONDENT THE PARENT OR LEGAL GUARDIAN OF THE 12 – 17 YEAR OLD CHILD WHO WAS SELECTED FOR AN INTERVIEW? (VERIFY THIS WITH THE RESPONDENT IF YOU ARE UNSURE.)

1 YES
2 NO

NOTE: IF FIPE3 = 1, SET THE FLAG TO ADMINISTER THE PARENTING EXPERIENCES MODULE DURING ACASI.

FIPE4 INTERVIEWER: IN WHAT STATE IS THIS SAMPLE DWELLING UNIT (SDU) LOCATED?

1 ALABAMA 27 MONTANA
2 ALASKA 28 NEBRASKA
3 ARIZONA 29 NEVADA
4 ARKANSAS 30 NEW HAMPSHIRE
5 CALIFORNIA 31 NEW JERSEY
6 COLORADO 32 NEW MEXICO
7 CONNECTICUT 33 NEW YORK
8 DELAWARE 34 NORTH CAROLINA
9 THE DISTRICT OF COLUMBIA (WASHINGTON, DC) 35 NORTH DAKOTA
10 FLORIDA 36 OHIO
11 GEORGIA 37 OKLAHOMA
12 HAWAII 38 OREGON
13 IDAHO 39 PENNSYLVANIA
14 ILLINOIS 40 RHODE ISLAND

64
The first few questions are for statistical purposes only, to help us analyze the results of the study.

**INTERVIEWER: RECORD RESPONDENT’S GENDER.**

5       MALE
9       FEMALE

**INTERVIEWER: YOU HAVE ENTERED THAT THE RESPONDENT IS [FILL QD01]. IS THIS CORRECT?**

4       YES
6       NO

**INTERVIEWER: PRESS [ENTER] TO GO BACK AND CORRECT THE RESPONDENT'S GENDER.**

Are you of Hispanic, Latino, or Spanish origin or descent?

1       YES
2       NO
DK/REF

**[IF QD03 = 1] HAND R SHOWCARD 1. Which of these Hispanic, Latino, or Spanish groups best describes you? Just give me the number or numbers from the card.**
TO SELECT MORE THAN ONE CATEGORY, PRESS THE SPACE BAR BETWEEN EACH CATEGORY YOU SELECT.

1 MEXICAN / MEXICAN AMERICAN / MEXICANO / CHICANO
2 PUERTO RICAN
3 CENTRAL OR SOUTH AMERICAN
4 CUBAN / CUBAN AMERICAN
5 DOMINICAN (FROM DOMINICAN REPUBLIC)
6 SPANISH (FROM SPAIN)
7 OTHER (SPECIFY)

QD04othr [IF QD04 = 7] Please tell me which other Hispanic, Latino or Spanish group best describes you.

DK/REF

QD05 HAND R SHOWCARD 2. Which of these groups describes you? Just give me the number or numbers from the card.

TO SELECT MORE THAN ONE CATEGORY, PRESS THE SPACE BAR BETWEEN EACH CATEGORY YOU SELECT.

RESPONDENTS WHO REPORT THEIR RACE AS NATIVE AMERICAN SHOULD BE INCLUDED IN RESPONSE CATEGORY 3.

1 WHITE
2 BLACK / AFRICAN AMERICAN
3 AMERICAN INDIAN OR ALASKA NATIVE (AMERICAN INDIAN INCLUDES NORTH AMERICAN, CENTRAL AMERICAN, AND SOUTH AMERICAN INDIANS)
4 NATIVE HAWAIIAN
5 OTHER PACIFIC ISLANDER
6 ASIAN (FOR EXAMPLE: ASIAN INDIAN, CHINESE, FILIPINO, JAPANESE, KOREAN, AND VIETNAMESE)
7 OTHER (SPECIFY)

QD05ASIA [IF QD05 = 6] HAND R SHOWCARD 3. Which of these Asian groups describes you? Just give me the number or numbers from the card.

TO SELECT MORE THAN ONE CATEGORY, PRESS THE SPACE BAR BETWEEN EACH CATEGORY YOU SELECT.

1 ASIAN INDIAN
2 CHINESE
3 FILIPINO
4 JAPANESE
5 KOREAN
6 VIETNAMESE
7 OTHER (SPECIFY)
DK/REF

QD05OTHA [IF QD05ASIA = 7] Please tell me which other Asian group or groups describes you.
OTHER ASIAN GROUP: _____________
DK/REF

QD05OTHR [IF QD05 = 7] Please tell me which other racial group or groups describes you.
OTHER RACIAL GROUP: _____________
DK/REF

QD07 [IF CURNTAGE = 15 OR OLDER] Are you now married, widowed, divorced or separated, or have you never married?
1 MARRIED
2 WIDOWED
3 DIVORCED OR SEPARATED
4 HAVE NEVER MARRIED
DK/REF

INTERVIEWER NOTE: If the respondent is divorced but currently remarried, code as married. By “divorce” we mean a legal cancellation or annulment of a marriage. By “separated” we mean legally or informally separating due to marital discord.

QD08 [IF QD07 = 1 OR 2 OR 3] How many times have you been married?
NUMBER OF TIMES: __________ [RANGE: 1 - 9]
DK/REF

QD09 [IF CURNTAGE = 17 OR OLDER] Have you ever been in the United States’ armed forces?
1 YES
2 NO DK/REF

QD10 [IF QD09 = 1 OR DK/REF] Are you currently on active duty in the United States’ armed forces, in a reserves component, or now separated or retired from either reserves or active duty?
1 ON ACTIVE DUTY IN THE ARMED FORCES
2 IN A RESERVES COMPONENT
3 NOW SEPARATED OR RETIRED FROM EITHER RESERVES OR ACTIVE DUTY
DK/REF

MILTERM1 [IF QD10 = 1] I need to verify what I just entered into the computer. You said you are currently on active duty in the armed forces. Is that correct?
1 YES
2 NO
HARD ERROR: [IF MILTERM1 = 2 OR DK/REF] INTERVIEWER: PRESS [ENTER] TO GO BACK AND CORRECT THE RESPONDENT'S CURRENT MILITARY STATUS.

MILTERM2 [IF MILTERM1 = 1] People who are currently on active duty in the armed forces are not eligible to be interviewed in this study. I appreciate you taking the time to speak with me. Thank you.

PRESS [ENTER] TO CONTINUE.
[ROUTE TO FIEXIT]

QD11 HAND R SHOWCARD 4. What is the highest grade or year of school you have completed?

Please tell me the number from the card.

INCLUDE JUNIOR OR COMMUNITY COLLEGE ATTENDANCE; DO NOT INCLUDE TECHNICAL SCHOOLS (BEAUTICIAN, MECHANIC, ETC.).

0 NEVER ATTENDED SCHOOL
1 1ST GRADE COMPLETED
2 2ND GRADE COMPLETED
3 3RD GRADE COMPLETED
4 4TH GRADE COMPLETED
5 5TH GRADE COMPLETED
6 6TH GRADE COMPLETED
7 7TH GRADE COMPLETED
8 8TH GRADE COMPLETED
9 9TH GRADE COMPLETED
10 10TH GRADE COMPLETED
11 11TH GRADE COMPLETED
12 12TH GRADE COMPLETED
13 COLLEGE OR UNIVERSITY / 1ST YEAR COMPLETED
14 COLLEGE OR UNIVERSITY / 2ND YEAR COMPLETED
15 COLLEGE OR UNIVERSITY / 3RD YEAR COMPLETED
16 COLLEGE OR UNIVERSITY / 4TH YEAR COMPLETED
17 COLLEGE OR UNIVERSITY / 5TH OR HIGHER YEAR COMPLETED
DK/REF

QD12 This question is about your overall health. Would you say your health in general is excellent, very good, good, fair, or poor?

1 EXCELLENT
2 VERY GOOD
3 GOOD
4 FAIR
5 POOR
DK/REF
Appendix B. Specifications for NSDUH Alcohol Use Questions
## Alcohol

**ALCINTR1** The next questions are about alcoholic beverages, such as beer, wine, brandy, and mixed drinks. Listed on the next screen are examples of the types of beverages we are interested in.

Please review this list carefully before you answer these questions.

Press [ENTER] to continue.

**CARD3a** Types of Alcoholic Beverages

<table>
<thead>
<tr>
<th>Beer</th>
<th>Wine</th>
<th>Liquor</th>
<th>Mixed Drinks and Cocktails</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular Beer</td>
<td>Red, white, blush wine, Sherry</td>
<td>Bourbon</td>
<td>Bloody Mary</td>
</tr>
<tr>
<td>Lite or light beer</td>
<td>Wine coolers, Homemde wines, Fortified</td>
<td>Gin</td>
<td>Bourbon and water</td>
</tr>
<tr>
<td>Low-alcohol (LA) beer</td>
<td>wines, such as muscadine,</td>
<td>Rum</td>
<td>Daiquiri</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Gin and tonic</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Press [ENTER] to continue.**

**ALCINTR2** These questions are about drinks of alcoholic beverages. Throughout these questions, by a “drink,” we mean a can or bottle of beer, a glass of wine or a wine cooler, a shot of liquor, or a mixed drink with liquor in it. We are not asking about times when you only had a sip or two from a drink.

Press [ENTER] to continue.
AL01 Have you ever, even once, had a drink of any type of alcoholic beverage? Please do not include times when you only had a sip or two from a drink.
1  Yes
2  No
DK/REF

ALREF [IF AL01 = REF] The answers that people give us about their use of alcohol are important to this study’s success. We know that this information is personal, but remember your answers will be kept confidential.

Please think again about answering this question: Have you ever, even once, had a drink of any type of alcoholic beverage? Please do not include times when you only had a sip or two from a drink.
1  Yes
2  No
DK/REF

AL02 [IF AL01 = 1 OR ALREF = 1] Think about the first time you had a drink of an alcoholic beverage. How old were you the first time you had a drink of an alcoholic beverage? Please do not include any time when you only had a sip or two from a drink.

AGE: ______ [RANGE: 1 - 110]
DK/REF

DEFINE AGE1STAL:
IF AL02 NE (BLANK OR DK/REF) THEN AGE1STAL = AL02
ELSE AGE1STAL = BLANK

IF CURNTAGE < AGE1STAL:
ALCC01 The computer recorded that you were [AGE1STAL] years old when you first drank an alcoholic beverage. Is this correct?
4  Yes
6  No
DK/REF

ALCC02 [IF ALCC01 = 4] The answers for the last question and an earlier question disagree. Which answer is correct?
1  I am currently [CURNTAGE] years old
2  I was [AGE1STAL] years old the first time I drank an alcoholic beverage
3  Neither answer is correct
DK/REF
ALCC03  
[IF ALCC02=2 OR ALCC02=3] Please answer this question again. What is your current age?
AGE: _____[RANGE: 1 - 110]
DK/REF

ALCC03a  
[IF ALCC03 < 12] Since you have indicated that you are [ALCC03] years old, we cannot interview you for this study. Please tell your interviewer that you have finished the survey. Thank you for your cooperation. PROGRAM SHOULD ROUTE TO PENTER1.

ALCC04  
[IF ALCC02=1 OR ALCC02=3 OR ALCC01=6] Please answer this question again. Think about the first time you had a drink of an alcoholic beverage. How old were you the first time you had a drink of any alcoholic beverage? Please do not include times when you only had a sip or two from a drink.
AGE: _____[RANGE: 1 - 110]
DK/REF

UPDATE: IF ALCC04 NOT (BLANK OR DK/REF) THEN AGE1STAL = ALCC04

UPDATE: IF ALCC03 NOT (BLANK OR DK/REF) THEN CURNTAGE = ALCC03

IF AGE1STAL = CURNTAGE OR AGE1STAL < 10:

ALCC05  
The computer recorded that you were [AGE1STAL] years old the first time you had a drink of any alcoholic beverage. Is this correct?
4 Yes
6 No
DK/REF

ALCC06  
[IF ALCC05=6] Please answer this question again. Think about the first time you had a drink of an alcoholic beverage. How old were you the first time you had a drink of any alcoholic beverage? Please do not include times when you only had a sip or two from a drink.
AGE: _____[RANGE: 1 - 110]
DK/REF

UPDATE: IF ALCC06 NOT (BLANK OR DK/REF) THEN AGE1STAL = ALCC06

AL02a  
[IF ALCC05 NE DK/RE AND ALCC06 NE DK/REF AND AGE1STAL = CURNTAGE AND DATE OF INTERVIEW < DOB OR IF AGE1STAL = CURNTAGE - 1 AND DATE OF INTERVIEW ≥ DOB] Did you first have a drink of an alcoholic beverage in [CURRENT YEAR - 1] or [CURRENT YEAR]?
1 CURRENT YEAR - 1
2 CURRENT YEAR
DK/REF

AL02b  
[IF AGE1STAL = CURNTAGE - 1 AND DATE OF INTERVIEW < DOB] Did you first have a drink of an alcoholic beverage in [CURRENT YEAR - 2] or [CURRENT YEAR - 1]?
1 CURRENT YEAR - 2
2 CURRENT YEAR - 1
DK/REF
**AL02c**  IF ALCC05 NE DK/RE AND ALCC06 NE DK/REF AND AGE1STAL = CURNTAGE AND DATE OF INTERVIEW ≥ DOB] In what month in [CURRENT YEAR] did you first have a drink of an alcoholic beverage?

1  January  
2  February  
3  March  
4  April  
5  May  
6  June  
7  July  
8  August  
9  September  
10  October  
11  November  
12  December  
DK/REF  

**HARD ERROR:** [IF AL02c > CURRENT MONTH] THE MONTH IN [CURRENT YEAR] YOU ENTERED HAS NOT BEGUN YET. TO MAKE THIS BOX DISAPPEAR, PRESS THE [ENTER] KEY. YOU CAN THEN ANSWER THE QUESTION AGAIN. PRESS [ENTER] TO CONTINUE.

**AL02d**  [IF AL02a = 1 OR 2 OR AL02b = 1 OR 2] In what month in [YEAR FROM AL02a or AL02b] did you first have a drink of an alcoholic beverage?

1  January  
2  February  
3  March  
4  April  
5  May  
6  June  
7  July  
8  August  
9  September  
10  October  
11  November  
12  December  
DK/REF  

**HARD ERROR:** [IF AL02d > CURRENT MONTH] THE MONTH IN [CURRENT YEAR] YOU ENTERED HAS NOT BEGUN YET. TO MAKE THIS BOX DISAPPEAR, PRESS THE [ENTER] KEY. YOU CAN THEN ANSWER THE QUESTION AGAIN. PRESS [ENTER] TO CONTINUE.

**DEFINE MYR1STAL:**  
MYR1STAL = AGE AT FIRST USE CALCULATED BY “SUBTRACTING” DATE OF BIRTH FROM MONTH AND YEAR OF FIRST USE (AL02a-d). IF MONTH OF FIRST USE = MONTH OF BIRTH, THEN MYR1STAL IS BLANK.
IF MYR1STAL NE 0 AND NE AGE1STAL:
ALCC31 The computer recorded that you first had a drink of an alcoholic beverage in [AL02a-d fill]
That would make you [MYR1STAL] years old when you first had a drink of an alcoholic beverage. Is this correct?

4 Yes
6 No
DK/REF
ALCC32 [IF ALCC31 = 4] Earlier, the computer recorded that you were [AGE1STAL] years old when you first had a drink of an alcoholic beverage. Which answer is correct?

1 I first had a drink of an alcoholic beverage in [AL02a-d fill] when I was [MYR1STAL] years old
2 I was [AGE1STAL] years old the first time I had a drink of an alcoholic beverage
3 Neither answer is correct
DK/REF
UPDATE: IF ALCC32 = 1, THEN AGE1STAL = MYR1STAL.

ALCC33 [IF ALCC32=2 OR ALCC32=3 OR ALCC31=6] Please answer this question again. Did you first have a drink of an alcoholic beverage in [CURRENT YEAR-2], [CURRENT YEAR-1], or [CURRENT YEAR]?

1 CURRENT YEAR -2
2 CURRENT YEAR -1
3 CURRENT YEAR
DK/REF

ALCC33a [IF ALCC33 NE (BLANK OR DK/REF)] Please answer this question again. In what month in [ALCC33] did you first have a drink of an alcoholic beverage?

1 January
2 February
3 March
4 April
5 May
6 June
7 July
8 August
9 September
10 October
11 November
12 December
DK/REF
HARD ERROR: [IF ALCC33a > CURRENT MONTH] THE MONTH IN [CURRENT YEAR] YOU ENTERED HAS NOT BEGUN YET. TO MAKE THIS BOX DISAPPEAR, PRESS THE [ENTER] KEY. YOU CAN THEN ANSWER THE QUESTION AGAIN. PRESS [ENTER] TO CONTINUE.

UPDATE: IF ALCC33a NE (0 OR DK/REF) THEN UPDATE MYR1STAL.
MYR1STAL = AGE AT FIRST USE CALCULATED BY “SUBTRACTING” DATE OF BIRTH FROM MONTH AND YEAR OF FIRST USE (ALCC33 AND ALCC33a). IF MONTH OF FIRST USE = MONTH OF BIRTH, THEN MYR1STAL IS BLANK. IF MYR1STAL = AGE1STAL THEN MYR1STAL = BLANK

ALCC34  [IF ALCC32 NE 1 AND MYR1STAL NE 0 AND (ALCC33 AND ALCC33a NE AL02a-d)]
The computer recorded that you first had a drink of an alcoholic beverage in [ALCC33-ALCC33afill]. That would make you [MYR1STAL] years old when you first had a drink of an alcoholic beverage. Is this correct?

4   Yes
6   No
DK/REF

UPDATE: IF ALCC34 NE (6, BLANK OR DK/REF) AND (ALCC33 AND ALCC33a NE AL02a-d) THEN AGE1STAL = MYR1STAL

ALLAST3  [IF AL01 = 1 OR ALREF = 1] How long has it been since you last drank an alcoholic beverage?

1   Within the past 30 days — that is, since [DATEFILL]
2   More than 30 days ago but within the past 12 months
3   More than 12 months ago
DK/REF

ALRECDK  [IF ALLAST3 = DK] What is your best guess of how long it has been since you last drank an alcoholic beverage?

1   Within the past 30 days — that is, since [DATEFILL]
2   More than 30 days ago but within the past 12 months
3   More than 12 months ago
DK/REF

ALCREC  [IF ALLAST3 = REF] The answers that people give us about their use of alcohol are important to this study’s success. We know that this information is personal, but remember your answers will be kept confidential.

Please think again about answering this question: How long has it been since you last drank an alcoholic beverage?

1   Within the past 30 days — that is, since [DATEFILL]
2   More than 30 days ago but within the past 12 months
3   More than 12 months ago
DK/REF
ALFRAME3  [IF ALLAST3 = 1 OR 2 OR ALRECDK = 1 OR 2 OR ALRECRE = 1 OR 2] Now think about the past 12 months, from [DATEFILL] through today. We want to know how many days you’ve had a drink of an alcoholic beverage during the past 12 months. What would be the easiest way for you to tell us how many days you drank alcoholic beverages?

1  Average number of **days per week** during the past 12 months
2  Average number of **days per month** during the past 12 months
3  Total number of days during the past 12 months

DK/REF

ALYRAVE  [IF ALFRAME3 = 3 OR DK/REF] On how many days in the past 12 months did you drink an alcoholic beverage?

TOTAL # OF DAYS: _____ [RANGE: 1 - 366]

DK/REF

ALMONAVE  [IF ALFRAME3 = 2 OR ALYRAVE = DK/REF] On average, how many days did you drink an alcoholic beverage **each month** during the past 12 months?

AVG # OF DAYS PER MONTH: _____ [RANGE: 1 - 31]

DK/REF

ALWKAVE  [IF ALFRAME3 = 1 OR ALMONAVE = DK/REF] On average, how many days did you drink an alcoholic beverage **each week** during the past 12 months?

AVG # OF DAYS PER WEEK: _____ [RANGE: 1 - 7]

DEFINE TOTDRINK:
IF ALYRAVE NOT (BLANK OR DK/REF) THEN TOTDRINK=ALYRAVE
ELSE IF ALMONAVE NOT(BLANK OR DK/REF) THEN TOTDRINK=ALMONAVE*12
ELSE IF ALWKAVE NOT (BLANK OR DK/REF) THEN TOTDRINK = ALWKAVE*52
ELSE TOTDRINK=DK/REF

DEFINE FILL1:
IF ALYRAVE > 1, THEN FILL1 = “[ALYRAVE] days”
ELSE IF ALYRAVE = 1, THEN FILL1 = “1 day”
ELSE IF ALMONAVE > 1, THEN FILL1 = “[ALMONAVE] days per month”
ELSE IF ALMONAVE = 1, THEN FILL1 = “1 day per month”
ELSE IF ALWKAVE > 1, THEN FILL1 = “[ALWKAVE] days per week”
ELSE IF ALWKAVE = 1, THEN FILL1 = “1 day per week”

DEFINE FILL1A:
IF FILL1 = “[ALMONAVE] day(s) per month” OR “[ALWKAVE] day(s) per week” THEN FILL1A = “for a total of [TOTDRINK] days”
ELSE FILL1A = BLANK

AL06  [IF ALLAST3 = 1 OR ALRECDK = 1 OR ALRECRE = 1] Think specifically about the past 30 days, from [DATEFILL], up to and including today. During the past 30 days, on how many days did you drink one or more drinks of an alcoholic beverage?

# OF DAYS: _____ [RANGE: 0 - 30]

DK/REF
**AL06DKRE** [IF AL06 = DK/REF] What is your **best estimate** of the number of days you drank alcohol during the past 30 days?

1 1 or 2 days
2 3 to 5 days
3 6 to 9 days
4 10 to 19 days
5 20 to 29 days
6 All 30 days

DK/REF

DEFINE ALC30DAY
ALC30DAY = AL06

DEFINE ALC3EST0
ALC3EST0 = AL06DKRE

DEFINE ESTIALC
IF ALC3EST0 = 1, THEN ESTIALC = 1
IF ALC3EST0 = 2, THEN ESTIALC = 3
IF ALC3EST0 = 3, THEN ESTIALC = 6
IF ALC3EST0 = 4, THEN ESTIALC = 10
IF ALC3EST0 = 5, THEN ESTIALC = 20
IF ALC3EST0 = 6, THEN ESTIALC = 30
ELSE ESTIALC = BLANK

DEFINE ALC3ESTFL
IF AL06DKRE = 1 ALC3ESTFL = “1 or 2”
IF AL06DKRE = 2 ALC3ESTFL = “3 to 5”
IF AL06DKRE = 3 ALC3ESTFL = “6 to 9”
IF AL06DKRE = 4 ALC3ESTFL = “10 to 19”
IF AL06DKRE = 5 ALC3ESTFL = “20 to 29”
IF AL06DKRE = 6 ALC3ESTFL = “all 30”
ELSE ALC3ESTFL FILL = BLANK

IF TOTDRINK NOT DK/REF AND (ALC30DAY > TOTDRINK OR ESTIALC > TOTDRINK):

**ALCC17a** [IF ALC30DAY > TOTDRINK] For the last question, the computer recorded that you drank one or more alcoholic beverages on [**ALC30DAY**] of the past 30 days. Is this correct?

4 Yes
6 No

DK/REF

**ALCC17b** [IF ESTIALC > TOTDRINK] For the last question, the computer recorded that you drank one or more alcoholic beverages on [**ALCESTFL**] of the past 30 days. Is this correct?

4 Yes
6 No

DK/REF
**ALCC18**

[IF ALCC17a = 4 OR ALCC17b = 4] The answers for the last question and an earlier question disagree. Which answer is correct?

1. I drank alcohol on [FILL1] in the past 12 months [FILL1A]
2. I drank alcohol on [ALC30DAY / ALCESTFL] days in the past 30 days
3. Neither answer is correct

DK/REF

**ALCC19**

[IF ALCC18 = 2 OR ALCC18 = 3] Please answer this question again. Think about the past 12 months, from [DATEFILL] through today. We want to know how many days you’ve had a drink of an alcoholic beverage during the past 12 months.

What would be the easiest way for you to tell us how many days you drank alcoholic beverages?

1. Average number of days per week during the past 12 months
2. Average number of days per month during the past 12 months
3. Total number of days during the past 12 months

DK/REF

**ALCC20**

[IF ALCC19 = 3] On how many days in the past 12 months did you drink an alcoholic beverage?

TOTAL # OF DAYS: _____ [RANGE: 1 - 366]

DK/REF

**ALCC21**

[IF ALCC19 = 2] On average, how many days did you drink an alcoholic beverage each month during the past 12 months?

# OF DAYS/MONTH: _____ [RANGE: 1 - 31]

DK/REF

**ALCC22**

[IF ALCC19 = 1] On average, how many days did you drink an alcoholic beverage each week during the past 12 months?

# OF DAYS PER WEEK: _____ [RANGE: 1 - 7]

DK/REF

**UPDATE TOTDRINK:**

IF ALCC20 NOT(BLANK OR DK/REF) THEN TOTDRINK = ALCC20
ELSE IF ALCC21 NOT(BLANK OR DK/REF) THEN TOTDRINK = ALCC21*12
ELSE IF ALCC22 NOT(BLANK OR DK/REF) THEN TOTDRINK = ALCC22*52
ELSE TOTDRINK=DK/REF
ALCC23a [IF (ALCC17a = 6 OR ALCC18 = 1 OR ALCC18 = 3) AND ALC30DAY NE (BLANK OR DK/REF)] Please answer this question again. Think specifically about the past 30 days, from [DATEFILL], up to and including today. During the past 30 days, on how many days did you drink one or more drinks of an alcoholic beverage?

# OF DAYS: ______ [RANGE: 0 - 30]

DK/REF

ALCC23b [IF (ALCC17b = 6 OR ALCC18 = 1 OR ALCC18 = 3) AND ALCEST30 NE (BLANK OR DK/REF)] Please answer this question again. Think specifically about the past 30 days, from [DATEFILL], up to and including today. What is your best estimate of the number of days you drank alcohol during the past 30 days?

1 1 or 2 days
2 3 to 5 days
3 6 to 9 days
4 10 to 19 days
5 20 to 29 days
6 All 30 days

DK/REF

UPDATE: IF ALCC23a NOT (BLANK OR DK/REF) THEN ALC30DAY = ALCC23a

UPDATE: IF ALCC23b NOT (BLANK OR DK/REF) THEN ALCEST30 = ALCC23b

UPDATE ESTIALC
IF ALCC23b = 1 THEN ESTIALC = 1
IF ALCC23b = 2 THEN ESTIALC = 3
IF ALCC23b = 3 THEN ESTIALC = 6
IF ALCC23b = 4 THEN ESTIALC = 10
IF ALCC23b = 5 THEN ESTIALC = 20
IF ALCC23b = 6 THEN ESTIALC = 30
ELSE ESTIALC = BLANK

DEFINE ESTIALC2
IF ESTIALC = 1 THEN ESTIALC2 = 2
IF ESTIALC = 3 THEN ESTIALC2 = 5
IF ESTIALC = 6 THEN ESTIALC2 = 9
IF ESTIALC = 10 THEN ESTIALC2 = 19
IF ESTIALC = 20 THEN ESTIALC2 = 29
IF ESTIALC = 30 THEN ESTIALC2 = 30
UPDATE ALCESTFL
IF ALCC23b = 1 THEN ALCESTFL = "1 or 2"
IF ALCC23b = 2 THEN ALCESTFL = "3 to 5"
IF ALCC23b = 3 THEN ALCESTFL = "6 to 9"
IF ALCC23b = 4 THEN ALCESTFL = "10 to 19"
IF ALCC23b = 5 THEN ALCESTFL = "20 to 29"
IF ALCC23b = 6 THEN ALCESTFL = "all 30"
ELSE ALCESTFL = BLANK
IF ALC30DAY = 0:
ALCC24  The computer recorded that you drank alcoholic beverages on 0 days during the past 30 days. Is this correct?
        4   Yes
        6   No
        DK/REF
ALCC26  [IF ALCC24 = 6] Please answer this question again. During the past 30 days, that is, since [DATEFILL], on how many days did you drink one or more drinks of an alcoholic beverage?
        # OF DAYS: ______ [RANGE: 0 - 30]
        DK/REF
UPDATE: IF ALCC26 NOT (BLANK OR DK/REF) THEN ALC30DAY = ALCC26
AL07   [IF ALC30DAY = 2 - 30 OR ALCEST30 = 1 - 6] On the [ALC30DAY / ALCESTFL] days that you drank during the past 30 days, how many drinks did you usually have each day? Count as a drink a can or bottle of beer; a wine cooler or a glass of wine, champagne, or sherry; a shot of liquor or a mixed drink or cocktail.
        [IF ALC30DAY = 1] On the 1 day that you drank during the past 30 days, how many drinks did you have? Count as a drink a can or bottle of beer; a wine cooler or a glass of wine, champagne, or sherry; a shot of liquor or a mixed drink or cocktail.
        [IF ALCEST30 = DK/REF] On the days that you drank during the past 30 days, how many drinks did you usually have each day? Count as a drink a can or bottle of beer; a wine cooler or a glass of wine, champagne, or sherry; a shot of liquor or a mixed drink or cocktail.
        # OF DRINKS: ______ [RANGE: 1 - 90]
        DK/REF
DEFINE FOURORMOREFLAG:
IF AL07 = 4 THEN FOURORMOREFLAG = 1
IF AL07 > 4 THEN FOURORMOREFLAG = 2
ELSE FOURORMOREFLAG = 0
**AL08** [IF ALC30DAY = 1 – 30 OR ALCEST30 = (1 – 6, DK OR REF)] During the past 30 days, that is, since [DATEFILL], on how many days did you have 5 or more drinks on the same occasion? By ‘occasion,’ we mean at the same time or within a couple of hours of each other.

# OF DAYS: ______ [RANGE: 0 - 30]

DK/REF

UPDATE FOURORMOREFLAG:
IF AL08 = 1-30 THEN FOURORMOREFLAG = 2
IF AL08 = 0 AND AL07 NE 4 THEN FOURORMOREFLAG = 0

IF AL08 > ALC30DAY OR AL08 > ESTIALC2:
**ALCC27** The computer recorded that in the past 30 days you drank 5 or more alcoholic beverages on [AL08] days. Is this correct?

4 Yes
6 No

DK/REF

UPDATE FOURORMOREFLAG:
IF ALCC27 = 6 AND AL07 NE 4 THEN FOURORMOREFLAG = 0
IF ALCC27 = 6 AND AL07 = 4 THEN FOURORMOREFLAG = 1
IF ALCC27 = 4 THEN FOURORMOREFLAG = 2

**ALCC28** [IF ALCC27 = 4] The answers for the last question and an earlier question disagree. Which answer is correct?

1 I drank one or more alcoholic beverages on [ALC30DAY/ALCESTFL] days in the past 30 days
2 I drank 5 or more alcoholic beverages on [AL08] days in the past 30 days
3 Neither answer is correct

DK/REF

UPDATE FOURORMOREFLAG:
IF (ALCC28 = 1 OR ALCC28 = 3) AND AL07 = 4 THEN FOURORMOREFLAG = 1
IF (ALCC28 = 1 OR ALCC28 = 3) AND AL07 NE 4 THEN FOURORMOREFLAG = 0
IF ALCC28 = 2 THEN FOURORMOREFLAG = 2

**ALCC29a** [IF ALCC28 = 2 OR 3 AND ALC30DAY NE (BLANK OR DK/REF)] Please answer this question again. Think specifically about the past 30 days, that is from [DATEFILL] through today. During the past 30 days, on how many days did you drink one or more drinks of an alcoholic beverage?

# OF DAYS: ______ [RANGE: 0 -30]

DK/REF
ALCC29b  [IF ALCC28 = 2 OR 3 AND ALCEST30 NE (BLANK OR DK/REF)] Please answer this question again. Think specifically about the past 30 days, that is from [DATEFILL] through today. What is your best estimate of the number of days you drank alcohol during the past 30 days?

1  1 or 2 days
2  3 to 5 days
3  6 to 9 days
4  10 to 19 days
5  20 to 29 days
6  All 30 days
DK/REF

ALCC30  [IF ALCC27 = 6 OR ALCC28 = 1 OR ALCC28 = 3] Please answer this question again. During the past 30 days, on how many days did you drink 5 or more alcoholic beverages on the same occasion? By 'occasion' we mean at the same time or within a couple of hours of each other.

# OF DAYS: ______ [RANGE: 0 - 30]
DK/REF

UPDATE FOURORMOREFLAG:
IF ALCC30 > 0 THEN FOURORMOREFLAG = 2
IF ALCC30 = 0 AND AL07 NE 4 THEN FOURORMOREFLAG = 0
Appendix C. Specifications for Alcohol Abuse and Dependence Questions
Alcohol Abuse and Dependence

**DRALC**  [IF ALC12MON = 1 - 3] Think about your use of alcohol during the past 12 months as you answer these next questions.

Press [ENTER] to continue.

**DRALC01**  [IF ALC12MON = 1 - 3] During the past 12 months, was there a month or more when you spent a lot of your time getting or drinking alcohol?

1. Yes
2. No
DK/REF

**DRALC02**  [IF DRALC01 = 2 OR DK/REF] During the past 12 months, was there a month or more when you spent a lot of time getting over the effects of the alcohol you drank?

1. Yes
2. No
DK/REF

**DRALC04**  [IF ALC12MON = 1 - 3] During the past 12 months, did you try to set limits on how often or how much alcohol you would drink?

1. Yes
2. No
DK/REF

**DRALC05**  [IF DRALC04 = 1] Were you able to keep to the limits you set, or did you often drink more than you intended to?

1. Usually kept to the limits set
2. Often drank more than intended
DK/REF

**DRALC06**  [IF ALC12MON = 1 - 3] During the past 12 months, did you need to drink more alcohol than you used to in order to get the effect you wanted?

1. Yes
2. No
DK/REF

**DRALC07**  [IF DRALC06=2 OR DK/REF] During the past 12 months, did you notice that drinking the same amount of alcohol had less effect on you than it used to?

1. Yes
2. No
DK/REF
**DRALC08** [IF ALC12MON = 1 - 3] During the past 12 months, did you want to or try to cut down or stop drinking alcohol?

1 Yes
2 No
DK/REF

**DRALC09** [IF DRALC08 = 1] During the past 12 months, were you able to cut down or stop drinking alcohol every time you wanted to or tried to?

1 Yes
2 No
DK/REF

**DRALC10** [IF DRALC08 = 2 OR DK/REF OR DRALC09 = 2 OR DK/REF] During the past 12 months, did you cut down or stop drinking at least one time?

1 Yes
2 No
DK/REF

**DRALC11** [IF DRALC09 = 1 OR DRALC10 = 1] Please look at the symptoms listed below. During the past 12 months, did you have 2 or more of these symptoms after you cut back or stopped drinking alcohol?

- Sweating or feeling that your heart was beating fast
- Having your hands tremble
- Having trouble sleeping
- Vomiting or feeling nauseous
- Seeing, hearing, or feeling things that weren’t really there
- Feeling like you couldn’t sit still
- Feeling anxious  •  Having seizures or fits

1 Yes
2 No
DK/REF
[IF DRALC11 = 1] Please look at the symptoms listed below. During the past 12 months, did you have 2 or more of these symptoms at the same time that lasted for longer than a day after you cut back or stopped drinking alcohol?

- Sweating or feeling that your heart was beating fast
- Having your hands tremble
- Having trouble sleeping
- Vomiting or feeling nauseous
- Seeing, hearing, or feeling things that weren’t really there
- Feeling like you couldn’t sit still
- Feeling anxious
- Having seizures or fits

1  Yes  
2  No  
DK/REF

[IF ALC12MON = 1 - 3] During the past 12 months, did you have any problems with your emotions, nerves, or mental health that were probably caused or made worse by drinking alcohol?

1  Yes  
2  No  
DK/REF

[IF DRALC13 = 1] Did you continue to drink alcohol even though you thought drinking was causing you to have problems with your emotions, nerves, or mental health?

1  Yes  
2  No  
DK/REF

[IF DRALC13 = 2 OR DK/REF OR DRALC14 = 2 OR DK/REF] During the past 12 months, did you have any physical health problems that were probably caused or made worse by drinking alcohol?

1  Yes  
2  No  
DK/REF

[IF DRALC15 = 1] Did you continue to drink alcohol even though you thought drinking was causing you to have physical problems?

1  Yes  
2  No  
DK/REF

[IF ALC12MON = 1 - 3] This question is about important activities such as working, going to school, taking care of children, doing fun things such as hobbies and sports, and spending time with friends and family.
During the past 12 months, did drinking **alcohol** cause you to give up or spend less time doing these types of important activities?

1  Yes  
2  No  
DK/REF

**DRALC18**  
[IF ALC12MON = 1 - 3] Sometimes people who drink alcohol have serious problems at home, work or school — such as:

- neglecting their children
- missing work or school
- doing a poor job at work or school
- losing a job or dropping out of school

During the past 12 months, did drinking **alcohol** cause you to have serious problems like this either at home, work, or school?

1  Yes  
2  No  
DK/REF

**DRALC19**  
[IF ALC12MON = 1 - 3] During the past 12 months, did you regularly drink alcohol and then do something where being drunk might have put you in physical danger?

1  Yes  
2  No  
DK/REF

**DRALC20**  
[IF ALC12MON = 1 - 3] During the past 12 months, did drinking **alcohol** cause you to do things that repeatedly got you in trouble with the law?

1  Yes  
2  No  
DK/REF

**DRALC21**  
[IF ALC12MON = 1 - 3] During the past 12 months, did you have any problems with family or friends that were probably caused by your drinking?

1 Yes  
2 No  
DK/REF

**DRALC22**  
[IF DRALC21 = 1] Did you continue to drink alcohol even though you thought your drinking caused problems with family or friends?

1 Yes  
2 No  
DK/REF
Appendix D. Specifications for NSDUH Depression and Impairment Questions
Adult Depression

[Questions administered only to respondents 18 years of age and older]

ASC21  [IF CURNTAGE = 18 OR OLDER] Have you ever in your life had a period of time lasting several days or longer when most of the day you felt sad, empty or depressed?

1 Yes
2 No
DK/REF

ASC22  [IF ASC21 = 2 OR DK/REF] Have you ever had a period of time lasting several days or longer when most of the day you were very discouraged about how things were going in your life?

1 Yes
2 No
DK/REF

ASC23  [IF ASC22 = 2 or DK/REF] Have you ever had a period of time lasting several days or longer when you lost interest in most things you usually enjoy like work, hobbies, and personal relationships?

1 Yes
2 No
DK/REF

AD01  [IF ASC21 =1] During times when you felt sad, empty, or depressed most of the day, did you ever feel discouraged about how things were going in your life?

1 Yes
2 No
DK/REF

AD01a  [IF AD01 = 1] During the times when you felt sad, empty, or depressed, did you ever lose interest in most things like work, hobbies, and other things you usually enjoy?

1 Yes
2 No
DK/REF

AD01b  [IF AD01 = 2 OR DK/REF] During the times when you felt sad, empty, or depressed, did you ever lose interest in most things like work, hobbies, and other things you usually enjoy?

1 Yes
2 No
DK/REF
AD02  [IF ASC22 = 1] During times when you felt discouraged about how things were going in
your life, did you ever **lose interest** in most things like work, hobbies, and other things you
usually enjoy?

1   Yes
2   No
DK/REF

AD09  [IF ASC23= 1] Did you ever have a period of time like this that lasted most of the day nearly every
day for two weeks or longer?

1   Yes
2   No
DK/REF

DEFINE FEELFILL:
IF (AD01a = 1), THEN FEELFILL = “were sad, discouraged, or lost interest in most things”
IF (AD01a = 2 OR DK/REF), THEN FEELFILL = “were sad or discouraged”
IF (AD01b = 1), THEN FEELFILL = “were sad or lost interest in most things”
IF (AD01b = 2 OR DK/REF) THEN FEELFILL = “were sad”
IF (AD02 = 1), THEN FEELFILL = “were discouraged or lost interest in most things”
IF (AD02 = 2 OR DK/REF), THEN FEELFILL = “were discouraged about the way things were going in your
life”
IF (AD09 = 1), THEN FEELFILL = “lost interest in most things”
ELSE, FEELFILL = BLANK

DEFINE FEELNOUN:
IF (AD01a = 1), THEN FEELNOUN = “sadness, discouragement, or lack of interest” IF (AD01a = 2 OR
DK/REF), THEN FEELNOUN = “sadness or discouragement”
IF (AD01b = 1), THEN FEELNOUN = “sadness or lack of interest”
IF (AD01b = 2 OR DK/REF), THEN FEELNOUN = “sadness”
IF (AD02 = 1), THEN FEELNOUN = “discouragement or lack of interest”
IF (AD02 = 2 OR DK/REF), THEN FEELNOUN = “discouragement”
IF (AD09 = 1), THEN FEELNOUN = “lack of interest in most things”
ELSE FEELNOUN = BLANK

DEFINE NUMPROBS
IF AD01a NE BLANK OR AD01b = 1 OR AD02 = 1, THEN NUMPROBS = “these problems”
IF AD01b = (2 OR DK/REF) OR AD02 = (2 OR DK/REF) OR AD09 = 1, THEN NUMPROBS = “this
problem”
ELSE NUMPROBS = BLANK

DEFINE WASWERE:
IF AD01a NE BLANK OR AD01b = 1 OR AD02 = 1, THEN WASWERE = “were”
IF AD01b = (2 OR DK/REF) OR AD02 = (2 OR DK/REF) OR AD09 = 1, THEN WASWERE = “was”
ELSE WASWERE = BLANK
AD12 [IF AD01a NE BLANK OR AD01b NE BLANK OR AD02 NE BLANK] Think about the times when you [FEELFILL]. Did you ever have a period of time like this that lasted most of the day, nearly every day, for two weeks or longer?

1 Yes
2 No
DK/REF

AD16 [IF AD09 = 1 OR AD12 = 1] Think of times lasting two weeks or longer when [NUMPROBS] with your mood [WASWERE] most severe and frequent. During those times, how long did your [FEELNOUN] usually last?

1 Less than 1 hour
2 At least 1 hour but no more than 3 hours
3 At least 3 hours but no more than 5 hours
4 5 hours or more
DK/REF

AD17 [IF AD16 = 2, 3, 4, OR DK/REF] Still thinking of times lasting two weeks or longer when [NUMPROBS] with your mood [WASWERE] most severe and frequent, how severe was your emotional distress during those times?

1 Mild
2 Moderate
3 Severe
4 Very severe
DK/REF

AD18 [IF AD16 = 2, 3, 4, OR DK/REF] Again, think of times lasting two weeks or longer when [NUMPROBS] with your mood [WASWERE] most severe and frequent.

How often, during those times, was your emotional distress so severe that nothing could cheer you up?

1 Often
2 Sometimes
3 Rarely
4 Never
DK/REF
AD19 [IF AD16 = 2, 3, 4, OR DK/REF] Once again, please think of times lasting two weeks or longer when [NUMPROBS] with your mood [WASWERE] most severe and frequent.

How often, during those times, was your emotional distress so severe that you could not carry out your daily activities?

1. Often
2. Sometimes
3. Rarely
4. Never

AD21 [IF AD16 = (2, 3, 4 OR DK/REF) AND NOT (AD17 = 1 AND AD18 = 4 AND AD19 = 4) AND (ASC21=1 OR ASC22=1 OR ASC23=1) AND AD09 NE (2 OR DK/REF)] People who have problems with their mood often have other problems at the same time. These problems may include things like changes in:

- sleep
- appetite
- energy
- the ability to concentrate and remember
- feelings of low self-worth

Did you ever have any of these problems during a period of time when you [FEELFILL] for two weeks or longer?

1. Yes
2. No

AD22 [IF AD21 = 1] Think again about these other problems we just mentioned. They include things like changes in

- sleep
- appetite
- energy
- the ability to concentrate and remember
- feelings of low self-worth

Please think of a time when you [FEELFILL] for two weeks or longer and you also had the largest number of these other problems at the same time.

Is there one particular time like this that stands out in your mind as the worst one you ever had?

1. Yes
2. No

DK/REF
AD22a  [IF AD22 = 1] How old were you when that worst period of time started?

__________ YEARS OLD [RANGE: 1-110]
DK/REF

AD22c  [IF AD22 = 2 OR DK/REF] Then think of the most recent time when you [FEELFILL] for two weeks or longer and you also had the largest number of these other problems at the same time. How old were you when that time started?

__________ YEARS OLD
DK/REF

DEFINE TIMEFILL:
IF AD22a NE BLANK, THEN TIMEFILL = ‘worst’
IF AD22c NE BLANK, THEN TIMEFILL = ‘most recent’

AD24a  [IF AD22a NE BLANK] In answering the next questions, think about the period of time when your [FEELNOUN] and other problems were the worst.

[IF AD22c NE BLANK] In answering the next questions, think about the most recent period of time when you [FEELFILL] and had other problems at the same time.

During that time, did you feel sad, empty, or depressed most of the day nearly every day?

1 Yes
2 No
DK/REF

AD24c  [IF AD22a NE BLANK OR AD22c NE BLANK] During that [TIMEFILL] period of time, did you feel discouraged about how things were going in your life most of the day nearly every day?

1 Yes
2 No
DK/REF

AD24e  [IF AD22a NE BLANK OR AD22c NE BLANK] During that [TIMEFILL] period of time, did you lose interest in almost all things like work and hobbies and things you like to do for fun?

1 Yes
2 No
DK/REF
[IF AD22a NE BLANK OR AD22c NE BLANK] During that [TIMEFILL] period of time, did you lose the ability to take pleasure in having good things happen to you, like winning something or being praised or complimented?

1. Yes
2. No
DK/REF

[IF ANY AD24a – AD24f = 1] The next questions are about changes in appetite and weight.

[IF AD22a NE BLANK] In answering the next questions, think about the period of time when your [FEELNOUN] and other problems were the worst.

[IF AD22c NE BLANK] In answering the next questions, think about the most recent period of time when you [FEELFILL] and had other problems at the same time.

Did you have a much smaller appetite than usual nearly every day during that time?

1. Yes
2. No
DK/REF

[IF AD26a = 2 OR DK/REF] Did you have a much larger appetite than usual nearly every day?

1. Yes
2. No
DK/REF

[IF AD26a = 2 OR DK/REF] Did you gain weight without trying to during that [TIMEFILL] period of time?

1. Yes
2. No
DK/REF

[IF AD26c = 1 AND (AD22a ≤ 21 OR AD22c ≤ 21)] Did you gain weight without trying to because you were growing?

1. Yes
2. No
DK/REF

[IF AD26c = 1 AND AD26c1 NE YES AND QD01 = 9] Did you gain weight without trying to because you were pregnant?

1. Yes
2. No
DK/REF
AD26d  [IF AD26c = 1 AND AD26c1 NE YES AND AD26c2 NE YES] How many pounds did you gain?

Please enter your answer as a whole number.

# OF POUNDS: __________ [RANGE: 0-200]
DK/REF

AD26e  [IF (AD26a = 1 OR AD26c=(2 OR DK/REF)] Did you lose weight without trying to?

1  Yes
2  No
DK/REF

AD26e1  [IF AD26e = 1] Did you lose weight without trying to because you were sick or on a diet?

1  Yes
2  No
DK/REF

AD26f  [IF AD26e1 = 2 OR DK/REF] How many pounds did you lose?

Please enter your answer as a whole number.

# OF POUNDS: __________ [RANGE: 0-200]
DK/REF

AD26g  [IF AD26a NE BLANK]

[IF AD22a NE BLANK] Again, please think about the period of time when your [FEELNOUN] and other problems were the worst.

[IF AD22c NE BLANK] Again, please think about the most recent period of time when you [FEELFILL] and had other problems at the same time.

Did you have a lot more trouble than usual falling asleep, staying asleep, or waking too early nearly every night during that [TIMEFILL] period of time?

1  Yes
2  No
DK/REF

AD26h  [IF AD26g = 2 OR DK/REF] During that [TIMEFILL] period of time, did you sleep a lot more than usual nearly every night?

1  Yes
2  No
DK/REF
AD26j [IF AD26a NE BLANK] During that [TIMEFILL] period of time, did you feel tired or low in energy nearly every day, even when you had not been working very hard?

1 Yes
2 No
DK/REF

AD26l [IF AD26a NE BLANK] Did you talk or move more slowly than is normal for you nearly every day?

1 Yes
2 No
DK/REF

AD26m [IF AD26l = 1] Did anyone else notice that you were talking or moving slowly?

1 Yes
2 No
DK/REF

AD26n [IF AD26l = 2 OR DK/REF] Were you so restless or jittery nearly every day that you paced up and down or couldn't sit still?

1 Yes
2 No
DK/REF

AD26o [AD26n = 1] Did anyone else notice that you were restless?

1 Yes
2 No
DK/REF

AD26p [IF AD26a NE BLANK] The next questions are about changes in your ability to concentrate, and your feelings about yourself.

[IF AD22a NE BLANK] Again, in answering these questions, think about the period of time when your [FEELNOUN] and other problems were the worst.

[IF AD22c NE BLANK] Again, in answering these questions, think about the most recent period of time when you [FEELFILL] and had other problems at the same time.

During that [TIMEFILL] time, did your thoughts come much more slowly than usual or seem confused nearly every day?

1 Yes
2 No
DK/REF
AD26r  [IF AD26a NE BLANK] Did you have a lot more trouble concentrating than usual nearly every day?

1  Yes  
2  No  
DK/REF

AD26s  [IF AD26a NE BLANK] Were you unable to make decisions about things you ordinarily have no trouble deciding about?

1  Yes  
2  No  
DK/REF

AD26u  [IF AD26a NE BLANK] Did you feel that you were not as good as other people nearly every day?

1  Yes  
2  No  
DK/REF

AD26v  [IF AD26u = 1] Did you feel totally worthless nearly every day?

1  Yes  
2  No  
DK/REF

AD26aa  [IF AD26a NE BLANK] The next questions are about thoughts of death or suicide.

[IF AD22a NE BLANK] Again, in answering these questions, think about the period of time when your [FEELNOUN] and other problems were the **worst**.

[IF AD22c NE BLANK] Again, in answering these questions, think about the **most recent** period of time when you [FEELFILL] and had other problems at the same time.

Did you often think a lot about death, either your own, someone else’s, or death in general?

1  Yes  
2  No  
DK/REF

AD26bb  [IF AD26a NE BLANK] During that period, did you ever think that it would be better if you were dead?

1  Yes  
2  No  
DK/REF
AD26cc  [IF AD26a NE BLANK] Did you think about committing suicide?
1 Yes
2 No
DK/REF

AD26dd  [IF AD26cc = 1] Did you make a suicide plan?
1 Yes
2 No
DK/REF

AD26ee  [IF AD26cc = 1] Did you make a suicide attempt?
1 Yes
2 No
DK/REF

DEFINE D_MDEA1:
IF AD24A = 1 OR AD24C = 1, THEN D_MDEA1= 1
ELSE IF AD24A = 2 AND AD24C = 2, THEN D_MDEA1= 2
ELSE IF AD24A = DK OR AD24C = DK, THEN D_MDEA1= DK
ELSE IF AD24A = REF OR AD24C = REF, THEN D_MDEA1= REF
ELSE D_MDEA1= BLANK

DEFINE D_MDEA2:
IF AD24E = 1 OR AD24F = 1, THEN D_MDEA2= 1
ELSE IF AD24E = 2 AND AD24F = 2, THEN D_MDEA2= 2
ELSE IF AD24E = DK OR AD24F = DK, THEN D_MDEA2= DK
ELSE IF AD24E = REF OR AD24F = REF, THEN D_MDEA2= REF
ELSE D_MDEA2= BLANK

DEFINE D_MDEA3:
IF AD26A = 1 OR AD26B = 1 OR AD26D ≥10 OR AD26F ≥10, THEN D_MDEA3= 1
ELSE IF AD26A = 2 AND AD26B = 2 AND ((AD26D < 10 OR AD26F < 10) OR (AD26C = (2 OR BLANK) AND AD26E = (2 OR BLANK)) OR (AD26C = 1 AND (AD26C1 = 1 OR AD26C2 = 1)) OR (AD26E = 1 AND AD26E1 = 1)), THEN D_MDEA3= 2
ELSE IF AD26A = DK OR AD26B = DK OR AD26C = DK OR AD26D = DK OR AD26E = DK OR AD26F = DK, THEN D_MDEA3= DK
ELSE IF AD26A = REF OR AD26B = REF OR AD26C = REF OR AD26D = REF OR AD26E = REF OR AD26F = REF, THEN D_MDEA3= REF
ELSE D_MDEA3= BLANK

DEFINE D_MDEA5:
IF AD26M = 1 OR AD26O = 1, THEN D_MDEA5= 1
ELSE IF (AD26L = (2 OR DK/REF) AND (AD26N = (2 OR DK/REF) OR AD26O = 2)) OR AD26M = 2, THEN D_MDEA5= 2
ELSE IF AD26L = DK OR AD26M = DK OR AD26N = DK OR AD26O = DK, THEN D_MDEA5 = DK
ELSE IF AD26L = REF OR AD26M = REF OR AD26N = REF OR AD26O = REF, THEN D_MDEA5 = REF
ELSE D_MDEA5 = BLANK

DEFINE D_MDEA6:
D_MDEA6 = AD26J

DEFINE D_MDEA7:
IF AD26V = 1, THEN D_MDEA7 = 1
ELSE IF AD26U = (2 OR DK/REF) OR AD26V = 2, THEN D_MDEA7 = 2 ELSE D_MDEA7 = AD26V
ELSE D_MDEA7 = BLANK

DEFINE D_MDEA8:
IF AD26P = 1 OR AD26R = 1 OR AD26S = 1, THEN D_MDEA8 = 1
ELSE IF AD26P = 2 AND AD26R = 2 AND AD26S = 2, THEN D_MDEA8 = 2 ELSE IF AD26P = DK OR AD26R = DK OR AD26S = DK, THEN D_MDEA8 = DK
ELSE IF AD26P = REF OR AD26R = REF OR AD26S = REF, THEN D_MDEA8 = REF
ELSE D_MDEA8 = BLANK

DEFINE D_MDEA9:
IF AD26AA = 1 OR AD26BB = 1 OR AD26CC = 1 OR AD26DD = 1 OR AD26EE = 1, THEN D_MDEA9 = 1
ELSE IF AD26AA = 2 AND AD26BB = 2 AND AD26CC = 2, THEN D_MDEA9 = 2
ELSE IF AD26AA = DK OR AD26BB = DK OR AD26CC = DK OR AD26DD = DK OR AD26EE = DK, THEN D_MDEA9 = DK
ELSE IF AD26AA = REF OR AD26BB = REF OR AD26CC = REF OR AD26DD = REF OR AD26EE = REF, THEN D_MDEA9 = REF
ELSE D_MDEA9 = BLANK

DEFINE DSMMDEA2:
IF SUM (D_MDEA1 = 1, D_MDEA2 = 1, D_MDEA3 = 1, D_MDEA4 = 1, D_MDEA5 = 1, D_MDEA6 = 1, D_MDEA7 = 1, D_MDEA8 = 1, D_MDEA9 = 1) ≥ 5, THEN DSMMDEA2 = 1
ELSE IF SUM (D_MDEA1 = (1 OR DK/REF), D_MDEA2 = (1 OR DK/REF), D_MDEA3 = (1 OR DK/REF), D_MDEA4 = (1 OR DK/REF), D_MDEA5 = (1 OR DK/REF), D_MDEA6 = (1 OR DK/REF), D_MDEA7 = (1 OR DK/REF), D_MDEA8 = (1 OR DK/REF), D_MDEA9 = (1 OR DK/REF)) < 5 AND N(OF D_MDEA1-D_MDEA9) > 0, THEN DSMMDEA2 = 2
ELSE IF D_MDEA1 = DK OR D_MDEA2 = DK OR D_MDEA3 = DK OR D_MDEA4 = DK OR D_MDEA5 = DK OR D_MDEA6 = DK OR D_MDEA7 = DK OR D_MDEA8 = DK OR D_MDEA9 = DK, THEN DSMMDEA2 = DK
ELSE IF D_MDEA1 = REF OR D_MDEA2 = REF OR D_MDEA3 = REF OR D_MDEA4 = REF OR D_MDEA5 = REF OR D_MDEA6 = REF OR D_MDEA7 = REF OR D_MDEA8 = REF OR D_MDEA9 = REF, THEN DSMMDEA2 = REF
AD28  [IF D_MDEA9 = 1 OR DSMMDEA2 = 1] You mentioned having some of the problems I just asked you about.

During that [TIMEFILL] period of time, how much did your [FEELNOUN] and these other problems interfere with your work, your social life, or your personal relationships?

1  Not at all
2  A little
3  Some
4  A lot
5  Extremely

DK/REF

AD28a  [IF AD28 NE (BLANK OR 1)] During that [TIMEFILL] period of time, how often were you unable to carry out your daily activities because of these problems with your mood?

1  Often
2  Sometimes
3  Rarely
4  Never

DK/REF

AD37  [IF AD28 NE BLANK] Think of the very first period of time in your life lasting two weeks or longer when you [FEELFILL] for most of the day nearly every day and also had some of the other problems we just asked about.

Can you remember your exact age?

1  Yes
2  No

DK/REF

AD37a  [IF AD37 = 1] How old were you?

__________ YEARS OLD [RANGE: 1-110]

DK/REF

AD37b  [IF AD37 = 2 OR DK] About how old were you when you first had a period of time like this?

AGE: __________ [RANGE: 1-110]

DK/REF

AD52  [IF AD28 NE BLANK] In your entire life, how many times did you feel [FEELNOUN] for two weeks or longer while also having some of the other problems we asked about?

If you are not sure of your answer, just make your best guess.

__________ NUMBER [RANGE: 1-1000]

DK/REF
AD38  [IF AD28 NE BLANK ] In the past 12 months, did you have a period of time when you felt [FEELNOUN] for two weeks or longer while also having some of the other problems we asked about?
1 Yes
2 No
DK/REF

AD66a  [IF AD38 = 1] Think about the time in the past 12 months when [NUMPROBS] with your mood [WASWERE] most severe.

Using the 0 to 10 scale shown below, where 0 means no interference and 10 means very severe interference, select the number that describes how much [NUMPROBS] interfered with your ability to do each of the following activities during that period. You can use any number between 0 and 10 to answer.

How much did your [FEELNOUN] interfere with your ability to do home management tasks, like cleaning, shopping, and working around the house, apartment, or yard?

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<tr>
<th>No</th>
<th>Interference</th>
<th>Mild</th>
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DK/REF

AD66b  [IF AD38 = 1] During that time in the past 12 months when your [FEELNOUN] was most severe, how much did this interfere with your ability to work?
You can use any number between 0 and 10 to answer.

<table>
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<tr>
<th>No</th>
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<th>Severe</th>
<th>Very Severe Interference</th>
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DK/REF

AD66c  [IF AD38 = 1] How much did your [FEELNOUN] interfere with your ability to form and maintain close relationships with other people during that time?
You can use any number between 0 and 10 to answer.

<table>
<thead>
<tr>
<th>No</th>
<th>Interference</th>
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</table>

DK/REF
AD66d  [IF AD38 = 1] How much did your [NUMPROBS] interfere with your ability to have a social life during that time?

You can use any number between 0 and 10 to answer.

<table>
<thead>
<tr>
<th>No Interference</th>
<th>Mild</th>
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DK/REF

AD68  [IF ANY RESPONSES TO AD66a – AD66d = 1-10] About how many days out of 365 in the past 12 months were you totally unable to work or carry out your normal activities because of your [FEELNOUN]?

You can use any number between 0 and 365 to answer.

# OF DAYS:__________ [RANGE: 0-365]

DK/REF
Appendix E. Unweighted and Weighted Distributions of Alcohol Misuse, Past Year Depression and Sociodemographic Covariates
Appendix E.
Unweighted and Weighted Distributions of Alcohol Misuse, Past Year Level of Major Depressive Episode (MDE) Symptomatology and Sociodemographic Covariates (n = 28,435)

<table>
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<tr>
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<th>Weighted %</th>
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<tr>
<td>Non-Hispanic black</td>
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<td>12.47</td>
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<td>Non-Hispanic other</td>
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<td>Hispanic or Latino</td>
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<tr>
<td>Other</td>
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<td>32.94</td>
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Appendix F. Bivariate Pearson Correlations among Predictor Variable and Covariates
### Appendix F
Bivariate Pearson Correlations among Predictor Variable and Covariates

<table>
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<tr>
<th>Variable</th>
<th>1.</th>
<th>2.</th>
<th>3.</th>
<th>4.</th>
<th>5.</th>
<th>6.</th>
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</table>

Note: None of the bivariate correlations were significant at the .05 level or below.

* Depression Status refers to the past year level of depression - no significant depression, subthreshold depression, threshold depression.