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Mental Health of College Students and Their Non-college-attending Peers: Results from the National Epidemiologic Study on Alcohol and Related Conditions

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Abstract

Context—Although young adulthood is often characterized by rapid intellectual and social development, college-age individuals are also commonly exposed to circumstances that place them at risk for psychiatric disorders.

Objective—To assess 12-month prevalence of psychiatric disorders, sociodemographic correlates, and rates of treatment among individuals attending college and their non-college attending peers in the United States.

Design, Setting, Participants—Face-to-face interviews were conducted in the 2001-2002 National Epidemiologic Survey on Alcohol and Related Conditions ([NESARC] n=43,093). Analyses were done for the subsample of college-age individuals, defined as those aged 19-25 that were both attending (n=2,188) and not attending college (n=2,904) in the previous year.

Main Outcome Measure—Sociodemographic correlates and prevalence of 12-month DSM-IV psychiatric disorders, substance use, and treatment seeking among college-attending individuals and their non-college attending peers.

Results—Almost half of college-age individuals had a psychiatric disorder in the past year. The overall rate of psychiatric disorders was not different between college-attending individuals and their non-college attending peers. The unadjusted risk of alcohol use disorders was significantly greater for college students than their non-college attending peers (OR: 1.25, 95% CI: 1.04-1.50), though not after adjusting for background socio-demographic characteristics (AOR: 1.19, 95% CI: 0.98-1.44). College students were significantly less likely (unadjusted and adjusted) to have a diagnosis of drug use disorder or nicotine dependence or have used tobacco than their non-college-attending peers. Bipolar disorder was less common in individuals attending college. College students were significantly less likely to receive past year treatment for alcohol/drug use disorders than their non-college-attending peers.

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Conclusions—Psychiatric disorders, particularly alcohol use disorders, are common in the college-age population. Although treatment rates varied across disorders, overall, less than 25% of individuals with a mental disorder sought treatment in the year prior to the survey. These findings underscore the importance of treatment and prevention interventions among college-age individuals.

The tragic events of April 16, 2007 at the Virginia Polytechnic Institute and State University and February 14, 2008 at Northern Illinois University have called attention to the mental health needs of college students and other young adults.¹⁻³ For many, young adulthood is characterized by the pursuit of greater educational opportunities and employment prospects, development of personal relationships, and for some, parenthood. While all these circumstances offer opportunities for growth, they may also result in stress that precipitates the onset or recurrence of psychiatric disorders.

Reports regarding the mental health of the college-age population have indicated a growing concern⁴⁻¹⁰ and have been the subject of heightened attention by different agencies.^{5, 9} While no recent study actually examined time trends in the prevalence of psychiatric disorder of college-age individuals, analysis of client descriptors completed by therapists at case closure across a 13-year period in a large Midwestern university indicated a progressive increase in the complexity and severity of the center's caseload.⁸ According to the 2006 National Survey of Counseling Centers, 92% of college directors believe that the number of students with severe psychological problems has increased in recent years, representing a major concern for their centers.⁷ Recently, several professional journals published reviews of the treatment of psychiatric disorders among college-age individuals,^{4, 6, 10} and in response to the Virginia Polytechnic Institute tragedy, recent legislative initiatives also sought to increase regulation of firearm possession in individuals with mental disorders, and to improve communication between mental health providers and court officials.¹¹

Alcohol and drug use are common among college-age individuals,¹²⁻¹⁴ often leading to substance abuse and dependence.^{15, 16} Polysubstance abuse and dependence are more common among college-age individuals than among other drugusing populations.^{17, 18} An earlier survey of college students showed tobacco use to be common, although rates were not reported for non-college-attending peers.¹⁹ Furthermore, some reports indicate that the rate of depression has been steadily rising in the last few years among this age group,²⁰⁻²³ a particular concern given the high rates of suicide attempts in college-age individuals.²⁰⁻²⁴

Approximately one-half (46.7%) of US young people, age 18 to 24 years of age, are enrolled in college on a part-time or full-time basis.²⁵⁻²⁷ Considerable controversy surrounds the question of whether rates of psychiatric disorders and mental health treatment differ between college students and their non-college-attending peers. In one report, no significant difference in the rate of alcohol use disorders was found between the two groups.²⁸ It has also been suggested that college students are less likely to receive treatment for alcohol use disorders than their peers,²⁹ but whether this finding extends to other psychiatric disorders remains unknown. The importance of the mental health of college students is highlighted by studies suggesting that psychiatric disorders interfere with college attendance³⁰ and reduce the likelihood of successful college completion,^{30, 31} while others suggest that college students have higher rates of substance use and alcohol use disorders.³²⁻³⁴

Several key methodological issues have constrained research on the mental health of college age individuals in the United States. Previous reports have been limited by non-validated measures of psychiatric disorder,²⁰⁻²² focus on a narrow range of disorders,^{16, 28, 29, 33} and failure to use community samples or a non-college-attending comparison group.²⁰⁻²² The current investigation seeks to overcome these constraints by drawing on a large and nationally representative epidemiological study, the National Epidemiologic Survey on Alcohol and

Related Conditions (N=43,093) that included psychometrically sound measures of a broad range of psychiatric disorders. Specifically, we sought to: 1) compare the 12-month prevalence of psychiatric disorders in college individuals and their non-college-attending peers; 2) compare the sociodemographic characteristics of college-age individuals with and without psychiatric disorders; and, 3) compare rates of treatment-seeking in college individuals with psychiatric disorders versus their non-college-attending peers.

Method

Sample

The 2001-2002 National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) is a nationally representative sample of the adult population of the United States conducted by the US Census Bureau, under the direction of the National Institute of Alcoholism and Alcohol Abuse (NIAAA).³⁵ The NESARC target population was the civilian, non-institutionalized population, 18 years and older, residing in households in the 50 states and the District of Columbia. The final sample included 43,093 respondents drawn from individual households and group quarters that included military personnel living off base, boarding or rooming houses, non-transient hotels and motels, shelters, facilities for housing workers, college quarters, and group homes. African Americans, Latinos, and young adults (aged 18 to 24 years) were oversampled. Data were adjusted to account for oversampling and respondent and household response. The overall survey response rate was 81%. The weighted data were then adjusted using the 2000 Decennial Census, to be representative of the US civilian population for a variety of sociodemographic variables.

Although the age range of the college population varies widely, the American College Health Association²⁰ estimates that the vast majority of college students (87%) are ages 18-24. Thus, we focused our analyses on that age group. To match the timeframe of the diagnostic assessments (past 12 months), college students were not required to be enrolled in college at the time of the interview, but rather defined as those aged 19-25 who attended college in the past 12 months (i.e., when they were 18-24 at the time they were in college, n=2,188). Consistent with the published literature,^{20-22, 28, 29, 33} we included individual who attended on a part- or full-time basis, regardless of the nature or content of their courses. Non-college attending individuals were those aged 19-25 not attending college during the past 12 months (n=2,904). The phrase “college-age individuals” refers to both groups together (n=5,092).

Assessment

Sociodemographic measures included sex, race-ethnicity, nativity, marital status, place of residence, and region of the country. College students (although not their non-college-attending peers) were also queried on their living arrangements and enrollment status (part-time vs. full-time). Socioeconomic measures included personal and family income measured as categorical variables, and insurance type (i.e., source of funding for their medical care). All diagnoses were made according to the DSM-IV criteria using the NIAAA Alcohol Use Disorder and Associated Disabilities Interview Schedule-DSM IV Version (AUDADIS-IV),³⁶ a valid and reliable fully structured diagnostic interview designed for use by professional interviewers who are not clinicians.

Axis I diagnoses included in the AUDADIS-IV can be separated into three groups: 1) Substance use disorders (including alcohol abuse/dependence, drug abuse/dependence, and nicotine dependence); 2) Mood disorders (including major depressive disorder, dysthymia, and bipolar disorder); and 3) Anxiety disorders (including panic disorder, social anxiety disorder, specific phobia, and generalized anxiety disorder). The test-retest reliability of AUDADIS-IV measures of DSM-IV diagnoses has been reported elsewhere.^{36, 37} Test-retest reliability was good for

MDD ($\kappa=0.65-0.73$) and good to excellent for substance use disorders ($\kappa>0.74$). Reliability was fair to good for other mood and anxiety disorders ($\kappa=0.40-0.60$) and personality disorders ($\kappa=0.40-0.67$).³⁸⁻⁴⁴

History of Conduct Disorder and Personality disorders (PDs) were assessed on a lifetime basis. The latter included DSM-IV avoidant, dependent, obsessive-compulsive, paranoid, schizoid, histrionic, and antisocial personality disorders. Diagnoses required long term patterns of social and occupational impairment, and exclusion of substance-induced cases, as explained in detail elsewhere.⁴⁵

We also included variables measuring use of any substance, which included use of any drugs, alcohol or tobacco in the last 12 months. Number of stressful life events measured with 12 items from the Social Readjustment Rating Scale⁴⁶ such as having been fired from a job, having had to move or having had one's property intentionally damaged by someone in the last 12 months.

Mental Health Treatment

To estimate rates of mental health service utilization, respondents were classified as receiving treatment for mood or anxiety disorders if they: (1) visited a physician, psychologist, or any other professional; (2) were a patient in a hospital for at least one night; (3) visited an emergency room; or (4) were prescribed medications. Respondents were classified as receiving treatment for substance use disorders if they: (1) visited a physician, psychologist, or any other professional; (2) were a patient in an inpatient ward of a hospital, an outpatient clinic, a drug detoxification or rehabilitation unit, or a methadone program; (3) visited an emergency department or crisis center; or (4) received treatment by a paraprofessional (e.g., a member of the clergy), an employee assistance program or through family/social services, or attended self-help groups.⁴⁷ Treatment utilization questions were disorder-specific, and analyses were conducted on those who were diagnosed with the disorder of interest in the time frame under consideration. For instance, prevalence of past year treatment seeking for a mood disorder is calculated among those with a past year diagnosis of a mood disorder using treatment utilization questions specifically asked about treatment for a mood disorder.

Statistical Analyses

Weighted means, frequencies and odds ratios (ORs) of sociodemographic correlates, prevalence of psychiatric disorders, and rates of treatment-seeking were computed. To provide a description of observable outcomes, most relevant from the perspective of need for provision of services, we focus our analyses on the unadjusted ORs. We also provide adjusted odds ratios (AORs) derived from multiple logistic regressions, which indicate associations between a specific outcome (e.g., psychiatric disorders or rates of treatment-seeking) and sociodemographic and socioeconomic correlates that differed between college students and their non-college-attending peers. Due to the cross-sectional nature of the study, both unadjusted and adjusted ORs are used as measures of association, without implying any causal association. We consider two percentages to be different if the 95% confidence interval (95% CI) of their OR does not include 1.⁴⁸ All standard errors and 95% CIs were estimated using SUDAAN⁴⁹ to adjust for design characteristics of the survey. For all analyses non-college-attending individuals were considered the reference group.

As noted, we focused our analyses on the subset of NESARC respondents aged 19-25. However, to guard against the possibility of variations in the results due to different definitions of "college age" and to increase the comparability of our results with those of prior reports that had used the 19-21 age range,^{28, 33} we conducted identical analyses with individuals aged 20-22 years at the time of the survey using the same considerations stated above (i.e., they were

19-21 at the time they were in college). Exclusion of 18 year olds likely minimized capture of drinking behaviors that predated college enrollment. Similarly, exclusion of individuals older than 21 served to restrict college graduates from the non-college-attending group.^{28, 33} We present the analyses conducted on the largest group (those aged 19-25) and indicate the main differences with the analyses of the more restricted sample. Full results of the additional analyses are available upon request.

Results

The odds of attending college were significantly lower for males than for females. Odds were also lower for Hispanics, Native Americans, and Blacks than for Whites, and for foreign-born compared to U.S-born individuals. Individuals who were married/cohabiting, widowed/separated/divorced, or were living in a rural area at the time of the survey also had lower odds of attending college. Although an annual family income greater than \$70,000 increased the odds of attending college, an income between \$20,000 and \$70,000 decreased the odds of college attendance when compared to an income less than \$20,000. College students were also less likely to have public insurance or to be uninsured when compared to individuals who were not attending college (Table 1).

Prevalence of Psychiatric Disorders

The most prevalent disorders in the college students were alcohol use disorders (20.37%), followed by personality disorders (17.68%). In the non-college students, personality disorders were most prevalent (21.55%) followed by nicotine dependence (20.66%). In the unadjusted analyses, the odds of “any psychiatric disorder” in the last 12-months were similar for college students and their non-college-attending peers (Table 2). The unadjusted likelihood of alcohol use in the previous 12-months was greater among college students, though drug use was similar across the two study groups. Consistent with the alcohol use association, college students were significantly more likely than their non-college-attending peers to have an alcohol use disorder in the last 12 months, a result that remained significant for alcohol dependence (although not abuse) when analyzed separately. College students were significantly less likely to have a diagnosis of drug use disorder or nicotine dependence (unadjusted or adjusted) or to have used tobacco than their non-college-attending peers (Table 2).

There were no differences in the odds of having at least one mood or anxiety disorders between college students and their non-college-attending peers. Overall, personality disorders were significantly more common among individuals who had not attended college than among college students of the same age. When examined individually, avoidant, dependent, paranoid, schizoid, and antisocial personality disorders were significantly less common among college students than among non-college-attending individuals. Odds for history of Conduct Disorder were significantly lower in the college-attending population. Most of the odds ratios (ORs) retained their level of significance after adjusting for sociodemographic and socioeconomic variables. “Any Axis I disorder” and “any substance use disorder” became significantly lower among college students in the adjusted models. By contrast, alcohol use and alcohol dependence no longer reached significance.

Sociodemographic Correlates of Psychiatric Disorders

When considering all individuals of college age, the overall risk of having a psychiatric disorder did not differ between college students and non-college-attending individuals. A number of other characteristics did increase risk, including being male, having a higher number of stressful life events in the past 12 months, having lost a steady relationship (e.g. broken up with a girlfriend/boyfriend), being widowed/divorced/separated, being U.S.-born, living in a rural setting, and living away from their parents (the latter examined only among college students,

but not their non-college-attending peers). By contrast, being Black, Asian, or Hispanic, being married/cohabiting, and rating overall health as good to excellent decreased the odds of having a psychiatric disorder. An individual income between \$20,000 and \$35,000 increased the odds of having a psychiatric disorder (Table 3). Odds for psychiatric disorders did not differ among part-time and full-time students.

Mental Health Treatment

Mental health treatment rates were low for all psychiatric disorders. The highest rates for treatment seeking in the previous year were reported for mood disorders, whereas the lowest rates were for reported for alcohol/drug use disorders. College students were significantly less likely to receive past year treatment for alcohol/drug use disorders than others in both the adjusted and the unadjusted analyses. There were no other differences in rates of mental health treatment between college students and their non-college-attending peers with psychiatric disorders.

Analyses of the Age 20-22 Year Sample

Although there were some minor differences between identical analyses of the 19-25 age range and those conducted when restricting the sample to the 20-22 age sample, the overall pattern of results remained the same (results available upon request). Most changes involved changes in the level of significance of the findings (but never change in direction) due to the smaller size of the 20-22 sample compared to the 19-25 sample. Two important exceptions were the lower prevalences of drug abuse and the rates of past year mental health treatment for any disorder among college students, which reached statistical significance only in the 20-22 age range sample.

Comment

This is the first study to examine a broad range of Axis I and Axis II DSM-IV disorders in a nationally representative sample of college students and their non-college-attending peers. We found that psychiatric disorders are common in this age group, that the distribution of disorder differs by educational status, and that treatment rates are low for both college students and their non-college-attending peers.

Almost one-half of the college students and their non-college-attending peers met DSM-IV criteria for at least one psychiatric disorder in the previous year. The most common disorders in college students were alcohol use disorders and personality disorders. In non-college respondents, the most common disorders were personality disorders and nicotine dependence. However the prevalence of mood and anxiety disorders was also high in both groups. The prevalence of psychiatric disorders in college-aged individuals was similar to the prevalence of psychiatric disorders in the US, with the exception of alcohol and substance use disorders, which were more than twofold the prevalence found in the general adult population.⁵⁰⁻⁵³ Previous research has shown that the hazard rate for onset of alcohol use disorders peaks at age 19 years and becomes much lower in the following years.⁵¹ Furthermore, about one-half of individuals with alcohol use disorders at age 19 continue to have these disorders at age 25.^{54, 55}

The high prevalence and low rate of treatment for alcohol disorders found in this study mirrors findings in the U.S. general population across all ages of adulthood⁵¹ but were even more accentuated in college students. Given the lifelong mental and general medical health consequences of alcohol use disorders, the implementation of effective interventions to reduce or prevent the onset of alcohol use disorders in college-aged individuals are important public health goals. Heavy drinking and alcohol use disorders in college have been associated with a

broad range of high-risk behaviors and adverse health outcomes, including driving while intoxicated, unsafe sex, physical and sexual assault, physical injuries, and death from unintentional injuries.^{14, 56} Interventions that decrease the rates of alcohol use and alcohol use disorders in this population are an important public health priority. Despite doubts about the effectiveness of treatment for drinking problems,⁵⁷⁻⁵⁹ recent reviews and meta-analyses have shown that brief interventions with college students, including skills-based interventions, motivational interviewing, and personalized normative feedback are effective methods for reducing college student drinking.^{60, 61} In view of the high prevalence and low rates of treatment of alcohol use disorders in college students, greater efforts to implement screening/intervention programs on college and university campuses are warranted. The centralized delivery of campus student health services might offer an advantageous structure for carrying out such screening and interventions. Additional prevention and intervention efforts could be implemented at many levels, including the organizational (fraternity/sorority, and campus- and community-wide).

Our study also documents that the correlates of psychiatric disorders among college students and their non-college-attending peers parallel those of the general population. Indicators of loss of social support (e.g., being widowed/separated/divorced or breaking up with a college romantic partner) were associated with increased the risk for psychiatric disorders. Alternatively, important social supports might have been lost by those with psychiatric disorders. These findings underscore the powerful influence of relationships in the lives of young people. The results also highlight the need to encourage youth to develop social support networks that may help to buffer the effects of romantic disappointments and other interpersonal losses. Life stressors were relatively uncommon in this population but, when present, they increased the risk for psychiatric disorders. College-age individuals may have less well-developed coping mechanisms or less experience than older adults with romantic disappointment and interpersonal losses, making them particularly vulnerable to the effect of these and related stressors. By contrast, foreign-born individuals and those from ethnic/racial minorities were at lower risk for psychiatric disorders, confirming reports in the general population.⁵¹ Identification of the mechanisms underlying the protective effect of racial/ethnic minorities may offer some clues to increase the resilience ethno-racial majority populations.

Most college-age individuals with psychiatric disorders did not seek treatment in the previous year, regardless of their educational status. Treatment rates were lowest for substance use and highest for mood disorders, consistent with patterns previously documented in the general population.⁵¹⁻⁵³ Lower treatment rates for substance use disorders may be related to the stigma often associated with these conditions⁶²⁻⁶⁷ and failure by the individuals or their friends and family members to recognize early signs and symptoms or their need for care.^{68, 69} It is also possible that the time lag between onset of substance use disorders and the manifestation of their more severe consequences^{70, 71} interferes with mental health seeking for behaviors that can be so powerfully reinforced during young adulthood, especially among college students. Higher treatment rates for mood disorders may be the result of educational campaigns by the government, advocacy groups and the pharmaceutical industry, which have led to the growing recognition of these disorders as medical conditions,⁷² although the fact that more than one-half the individuals with mood and over 80% of individuals with anxiety disorders did not seek treatment suggests substantial unmet need. Delays or failures to seek early treatment for substance use or other psychiatric disorders are important to avoid because they often lead to future relapses and a more chronic course of the disorder.^{15, 73, 74}

Our study has the limitations common to most large-scale surveys. First, information on educational status was based on self-report and not confirmed by collateral informants. However, the weighted numbers of college students in the NESARC match very closely to the yearly estimates of college enrollment,⁷⁵ suggesting the degree of possible misclassification

to be small in our study. Second, the cross-sectional design does not allow attribution of causality to the associations between psychiatric disorders and college attendance. Third, although the NESARC provides the most extensive assessment of psychiatric disorders among college students and their non-college-attending peers, some disorders including oppositional defiant disorder (ODD), attention-deficit hyperactivity disorder (ADHD), and learning disabilities were not assessed in this study. Fourth the NESARC did not systematically assess respondent's perceived need for treatment and its influence on rates of treatment-seeking. Fifth, the mental health treatment results, because they rely on respondent linkage to specific disorders, may underestimate the proportion of affected young people who received any mental health care during the past year.

Despite these limitations, the NESARC constitutes the largest nationally representative survey to date to include information on psychiatric disorders in college students and their non-college-attending peers. The prevalence of psychiatric disorders is high in this population at a particularly vulnerable time of their development. Groups with particularly high prevalence were identified and should be the focus of prevention, assessment, and intervention efforts. The vast majority of the disorders suffered by this population can be effectively treated with evidence-based psychosocial and pharmacological approaches. Early treatment could reduce the persistence of these disorders, and their associated functional impairment, loss of productivity and increased health care costs. As these young people represent our nation's future, urgent action is needed to increase detection and treatment of psychiatric disorders among college students and their non-college-attending peers.

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Table 1

Sociodemographic/Socioeconomic characteristics according to population subgroup: college and non-college attending individuals

	In College (N=2,188) % (95%CI)	Not In College (N=2,904) % (95%CI)	OR (95%CI of OR)
Sex			
Male	47.44 (45.12-49.78)	51.42 (48.94-53.89)	0.85 (0.75-0.97)
Female	52.56 (50.22-54.88)	48.58 (46.11-51.06)	1.00
Race/Ethnicity			
White	69.45 (64.86-73.69)	56.41 (51.73-60.98)	1.00
Black	11.43 (9.43-13.78)	14.45 (12.34-16.86)	0.64 (0.52-0.80)
Native/American	1.18 (0.72-1.93)	1.80 (1.24-2.60)	0.53 (0.29-0.97)
Asian	7.62 (5.32-10.80)	3.88 (2.65-5.66)	1.59 (0.97-2.62)
Hispanic	10.32 (8.42-12.57)	23.46 (19.02-28.57)	0.36 (0.29-0.43)
Nativity			
US-born	87.13 (84.41-89.44)	80.66 (76.56-84.20)	1.62 (1.30-2.03)
Foreign-born	12.87 (10.56-15.59)	19.34 (15.80-23.44)	1.00
Marital Status			
Married/Cohabiting	21.475 (19.12-24.03)	34.48 (32.08-36.96)	0.51 (0.43-0.60)
Widowed/Separated/Divorced	1.76 (1.24-2.49)	2.76 (2.12-3.59)	0.52 (0.33-0.82)
Never married	76.77 (74.06-79.28)	62.76 (60.25-65.20)	1.00
Individual Income			
0-19999	73.25 (70.42-75.91)	72.72 (70.68-74.67)	1.00
20000-34999	19.35 (17.28-21.60)	21.29 (19.45-23.24)	0.90 (0.76-1.07)
35000 and more	7.40 (6.00-9.09)	5.99 (4.96-7.23)	1.23 (0.92-1.64)
Family Income			
0-19999	40.66 (37.44-43.95)	37.59 (35.26-39.98)	1.00
20000-34999	19.51 (17.76-21.39)	24.32 (22.32-26.43)	0.74 (0.61-0.90)
35000-69,999	24.38 (22.19-26.72)	27.77 (25.87-29.76)	0.81 (0.67-0.99)
70,000 or more	15.45 (13.50-17.63)	10.32 (8.61-12.31)	1.38 (1.06-1.81)
Urbanicity			
Urban	83.77 (79.91-87.01)	79.80 (75.49-83.53)	1.00
Rural	16.23 (12.99-20.09)	20.20 (16.47-24.51)	0.77 (0.62-0.95)
Region			
Northwest	18.73 (12.73-26.69)	17.53 (11.64-25.54)	1.14 (0.89-1.46)
Midwest	23.36 (17.17-30.96)	22.73 (17.10-29.56)	1.10 (0.87-1.38)
South	35.08 (28.25-42.58)	35.40 (28.81-42.60)	1.06 (0.84-1.32)
West	22.83 (15.89-31.66)	24.34 (17.40-32.94)	1.00
Insurance			
Private	65.42 (62.60-68.13)	44.15 (41.36-46.97)	1.00
Public	6.04 (4.84-7.50)	14.22 (12.53-16.09)	0.29 (0.22-0.37)
None	28.55 (26.17-31.05)	41.64 (38.80-44.53)	0.46 (0.40-0.54)

Table 2

12-month prevalence of any axis I psychiatric disorders, personality disorders, and substance use in college students and non-college-attending individuals

	In College (N=2,188) % (95% CI)	Not In College (N=2,904) % (95% CI)	OR (95% CI)	Adjusted OR* (95% CI)
Any Psychiatric Diagnosis	45.79 (42.99-48.61)	47.74 (44.72-50.78)	0.92 (0.81-1.06)	0.87 (0.75-1.00)
Any Axis I Disorder	39.84 (37.00-42.75)	41.98 (39.10-44.92)	0.92 (0.80-1.05)	0.84 (0.72-0.97)
Any Substance Use disorder	29.15 (26.81-31.60)	31.51 (28.91-34.24)	0.89 (0.77-1.04)	0.83 (0.70-0.97)
Any Alcohol Use Disorder	20.37 (18.14-22.79)	16.98 (15.21-18.91)	1.25 (1.04-1.50)	1.19 (0.98-1.44)
Alcohol Abuse	7.85 (6.52-9.41)	6.76 (5.66-8.05)	1.17 (0.90-1.53)	1.16 (0.87-1.54)
Alcohol Dependence	12.52 (10.86-14.40)	10.22 (8.79-11.85)	1.26 (1.01-1.56)	1.16 (0.93-1.46)
Any Drug Disorder	5.08 (4.08-6.29)	6.85 (5.60-8.35)	0.73 (0.54-0.97)	0.70 (0.50-0.98)
Drug Abuse	4.25 (3.31-5.44)	5.35 (4.30-6.63)	0.78 (0.57-1.09)	0.73 (0.51-1.07)
Drug Dependence	1.40 (0.96-2.06)	2.26 (1.69-3.02)	0.62 (0.37-1.02)	0.63 (0.37-1.07)
Nicotine Dependence	14.55 (12.96-16.31)	20.66 (18.41-23.11)	0.65 (0.54-0.79)	0.60 (0.50-0.73)
Any Mood Disorder	10.62 (9.10-12.35)	11.86 (10.31-13.60)	0.88 (0.71-1.10)	0.81 (0.64-1.02)
MDD	7.04 (5.84-8.47)	6.67 (5.63-7.89)	1.06 (0.82-1.37)	0.96 (0.72-1.26)
Dysthymia	0.81 (0.49-1.35)	1.12 (0.74-1.71)	0.72 (0.37-1.40)	0.69 (0.35-1.36)
Bipolar disorder	3.24 (2.41-4.35)	4.62 (3.64-5.85)	0.69 (0.48-1.00)	0.67 (0.44-1.00)
Any Anxiety Disorder	11.94 (10.28-13.82)	12.66 (11.06-14.47)	0.93 (0.76-1.15)	0.84 (0.67-1.04)
Panic disorder	1.95 (1.39-2.72)	2.74 (2.00-3.73)	0.71 (0.44-1.13)	0.61 (0.37-1.03)
Social Anxiety Disorder	3.24 (2.43-4.30)	3.54 (2.74-4.56)	0.91 (0.61-1.36)	0.81 (0.53-1.24)
Specific Phobia	8.06 (6.76-9.57)	8.75 (7.43-10.27)	0.91(0.72-1.16)	0.83 (0.65-1.07)
GAD	1.64 (1.16-2.30)	2.07 (1.52-2.81)	0.79 (0.50-1.24)	0.77 (0.47-1.28)
Pathological Gambling	0.35 (0.14-0.88)	0.23 (0.10-0.55)	1.51 (0.41-5.50)	1.27 (0.40-3.99)
Conduct Disorder**	1.18 (0.80-1.74)	2.28 (1.70-3.04)	0.51 (0.31-0.86)	0.55 (0.30-0.99)
Any Personality Disorder**	17.68 (15.83-19.70)	21.55 (19.41-23.85)	0.78 (0.65-0.94)	0.82 (0.67-1.00)
Avoidant	2.31 (1.69-3.15)	4.61 (3.74-5.68)	0.34 (0.49-0.71)	0.47 (0.32-0.66)
Dependant	0.51(0.24-1.07)	1.29 (0.87-1.91)	0.39 (0.16-0.93)	0.46 (0.20-1.03)
Obsessive-compulsive	8.24 (6.91-9.79)	8.00 (6.73-9.49)	1.03 (0.79-1.35)	1.02 (0.76-1.35)
Paranoid	4.86 (3.95-5.98)	8.74 (7.55-10.09)	0.53 (0.41-0.70)	0.63 (0.48-0.83)
Schizoid	3.31 (2.62-4.18)	5.58 (4.46-6.94)	0.58 (0.42-0.81)	0.67 (0.48-0.96)
Histrionic	3.47 (2.62-4.59)	4.43 (3.54-5.52)	0.78 (0.55-1.09)	0.79 (0.56-1.10)
Antisocial	4.70 (3.70-5.95)	8.51 (7.19-10.05)	0.53 (0.39-0.73)	0.55 (0.40-0.75)
Any Substance Use	79.29 (76.94-81.47)	76.60 (74.02-78.99)	1.17 (1.00-1.37)	0.94 (0.79-1.12)
Any Tobacco Use	29.45 (27.26-31.74)	41.48 (38.11-44.93)	0.59 (0.59-0.70)	0.53 (0.44-0.64)
Any Alcohol use	77.09 (74.61-79.39)	71.97 (69.36-74.43)	1.31 (1.12-1.53)	1.07 (0.90-1.27)
Any Drug Use	15.21 (13.34-17.29)	15.63 (13.69-17.78)	0.97 (0.79-1.18)	0.84 (0.68-1.04)

* Adjusted for age, sex, race, nativity, marital status, urbanicity, insurance and family income

** Assessed on a lifetime basis

Table 3
Sociodemographic/Socioeconomic correlates of college-age individuals with and without psychiatric disorders

	College-Age Individuals with psychiatric disorders (N=2,323) % 95% CI	College-Age Individuals without psychiatric disorders (N=2,769) % 95% CI	OR 95% CI of OR
In College	45.12 (42.22-48.05)	47.07 (44.58-49.58)	0.92 (0.81-1.06)
Sex			
Male	52.27 (49.72-54.81)	47.22 (44.63-49.83)	1.22 (1.05-1.42)
Female	47.73 (45.19-50.28)	52.78 (50.17-55.37)	1.00
Race/Ethnicity			
White	68.08 (63.78-72.09)	57.45 (52.88-61.89)	1.00
Black	11.58 (9.81-13.61)	14.36 (12.23-16.79)	0.68 (0.57-0.81)
Native/American	1.98 (1.39-2.82)	1.10 (0.68-1.79)	1.52 (0.85-2.71)
Asian	4.24 (3.10-5.78)	6.81(4.93-9.33)	0.53 (0.37-0.74)
Hispanic	14.12 (11.12-17.76)	20.28 (16.80-24.27)	0.59 (0.49-0.70)
Nativity			
US-born	89.58 (87.08-91.64)	78.42 (74.48-81.90)	2.37 (1.91-2.92)
Foreign-born	10.42 (8.36-12.92)	21.58 (18.10-25.52)	1.00
Marital Status			
Married/Cohabiting	26.43 (24.03-28.97)	30.28 (27.83-32.85)	0.85 (0.73-0.98)
Widowed/Separated/Divorced	3.29 (2.54-4.26)	1.42 (1.04-1.95)	2.25 (1.50-3.36)
Never married	70.28 (67.67-72.76)	68.30 (65.72-70.76)	1.00
Individual Income			
0-19999	71.87 (69.32-74.28)	73.93 (71.61-76.13)	1.00
20000-34999	22.04 (19.98-24.25)	18.94 (17.17-20.85)	1.20 (1.02-1.40)
35000+	6.09 (5.03-7.37)	7.13 (5.84-8.66)	0.88 (0.66-1.17)
Family Income			
0-19999	39.38 (36.50-42.34)	38.67 (36.30-41.10)	1.00
20000-34999	23.94 (22.08-25.90)	20.48 (18.65-22.44)	1.15 (0.96-1.37)
35000-69,999	25.26 (23.19-27.45)	27.04 (25.12-29.05)	0.92 (0.77-1.09)
70,000+	11.42 (9.73-13.35)	13.80 (11.95-15.89)	0.81 (0.64-1.04)
Urbanicity			
Urban	79.79 (75.47-83.51)	83.26 (79.39-86.54)	1.00
Rural	20.21 (16.49-24.53)	16.74 (13.46-20.61)	1.26 (1.02-1.56)
Region			
Northwest	16.47 (11.68-22.71)	19.51(12.52-29.10)	0.83 (0.59-1.17)
Midwest	26.64 (20.81-33.42)	19.83 (13.96-27.39)	1.32 (0.98-1.78)
South	33.04 (27.08-39.59)	37.21 (29.85-45.21)	0.87 (0.67-1.13)
West	23.85 (17.51-31.61)	23.45 (15.85-33.26)	1.00
Student status *			
Full-time	72.89 (69.49-76.04)	73.92 (70.36-77.20)	0.95 (0.75-1.20)
Part-time	27.11 (23.96-30.51)	26.08 (22.80-29.64)	1.00

	College-Age Individuals with psychiatric disorders (N=2,323) % 95% CI	College-Age Individuals without psychiatric disorders (N=2,769) % 95% CI	OR 95% CI of OR
Living arrangement *			
Living with parents	39.00 (35.54-42.58)	46.42 (42.29-50.59)	0.74 (0.61-0.89)
Living away from parents	61.00 (57.42-64.46)	53.58 (49.41-57.71)	1.00
Broke off a steady relationship	18.60 (16.99-20.34)	7.99 (6.76-9.42)	2.63 (2.10-3.30)
Overall Health (Good, very good, or excellent)	87.51 (85.17-89.53)	94.52 (93.25-95.57)	0.41 (0.31-0.54)
	Mean 95% CI	Mean 95% CI	T-test score
			22.37
			<0.0001
Mean # of Stressful Life events	3.22 (3.10-3.35)	1.64 (1.55-1.73)	

* Information queried only to students

Table 4

Prevalence of mental health service utilization among college students and non-college attending individuals

	In College (N=998) % (95%CI)	Not In College (N=1,325) % (95%CI)	OR 95%CI of OR	Adjusted OR* 95%CI of Adjusted OR
Past year mental health treatment for any disorder ^a	18.45 (15.49-21.83)	21.49 (18.46-24.87)	0.83 (0.63-1.09)	0.78 (0.59-1.05)
Past year mental health treatment for mood disorder ^b	34.11 (27.31-41.62)	34.80 (28.71-41.43)	0.97 (0.63-1.50)	0.99 (0.63-1.55)
Past year mental health treatment for anxiety disorder ^c	15.93 (11.48-21.68)	12.37 (9.10-16.60)	1.34 (0.81-2.23)	1.33 (0.78-2.27)
Past year mental health treatment for alcohol/drug disorder ^d	5.36 (3.59-7.94)	9.82 (7.25-13.17)	0.52 (0.30-0.90)	0.49 (0.28-0.87)

* Adjusted for **age**, sex, race, nativity, marital status, individual income, urbanicity, and family income.

^a = among those with a past year diagnosis of alcohol use disorder, drug use disorder, any mood disorder, or any anxiety disorder

^b = among those with a past year diagnosis of major depressive disorder, dysthymia, or bipolar disorder

^c = among those with a past year diagnosis of panic disorder, social anxiety disorder, specific phobia, or generalized anxiety disorder

^d = among those with a past year diagnosis of alcohol or drug abuse/dependence