Depression and Suicide Ideation Among Students Accessing Campus Healthcare

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Abstract

Depression and suicide are of increasing concern on college campuses. This article presents data from the College Health Intervention Projects on the frequency of depression and suicide ideation among 1,622 college students who accessed primary care services in 4 university clinics in the Midwest, Northwest, and Canada. Students completed the Beck Depression Inventory and other measures related to exercise patterns, alcohol use, sensation seeking, and violence. The frequency of depression was similar for men (25%) and women (26%). Thought of suicide was higher for men (13%) than women (10%). Tobacco use, emotional abuse, and unwanted sexual encounters were all associated with screening positive for depression. "Days of exercise per week" was inversely associated with screening positive for depression. Because the majority of students access campus-based student health centers, medical providers can serve a key role in early identification and intervention. With every 4th student reporting symptoms of depression and every 10th student having suicidal thoughts, such interventions are needed.

Keywords

university students; full and reduced-form logistic regression; randomized controlled trials; depression; suicidal ideation; university health clinics

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Depression and other mental health disorders are a significant public health problem on college campuses. Many students experience their first psychiatric episode while at college, and 12 to 18% of students have a diagnosable mental illness (Mowbray, Megivern & Mandiberg, 2006). Epidemiological studies suggest that the 15 to 21 age category (typical college years) has the highest past-year prevalence rate of mental illness at 39%. Eisenberg (2007) reported that the general prevalence of depression and anxiety is 16% among undergraduate students and 13% among graduate students. Based on findings from the American College Health Association (ACHA) National College Health Assessment (NCHA), the rates of students reporting having been diagnosed with depression has increased from 10% in 2000 to 18% in 2008 (2000, 2008). A number of factors contribute to the initial presentation of depression during college. The transition itself from home to college places additional life stressors on young adults as they explore their identity, strive to master new skills, are away from established social support systems, and have increased time demands (Dyson & Renk, 2006).

The consequences of depression are significant. Depression has long been associated with academic impairment (Heiligenstein, Guenther, Hsu, & Herman, 1996). Depression and anxiety are consistently listed among the top 10 factors impairing academic performance in the past 12 months on the NCHA (ACHA, 2008). Diagnosed depression was associated with a 0.49 decrease in student GPA, and treatment was associated with a 0.44 protective effect (Hysenbegasi, Hass, & Rowland, 2005). Depression may also lead to increased risk of self-injury, dropping out or failing college, attempting or committing suicide, and other risky behaviors (Gollust, Eisenberg, & Golberstein, 2008; Kisch, Leino, & Silverman, 2005). In addition, there is an association between feeling functionally impaired by depression in the past 12 months and accumulation of credit card debt among students (Adams & Moore, 2007). Psychiatric disorders and depressive symptoms have been associated with tobacco use, alcohol consumption, physical inactivity, and partner violence (physical, psychological, or sexual victimization) (Sabina & Straus, 2008; Strine et al, 2006; Strine et al., 2008).

Suicide is the third leading cause of death among teenagers and young adults (Centers for Disease Control and Prevention, 2004). Depression has consistently been considered a risk factor in suicide, along with substance abuse, adverse life events, family history, a history of sexual abuse, troubled relationships, and difficulties with sexual identity (Agerbo, Nordentoft, & Mortensen, 2002; Cooper, Appleby, & Amos, 2002; Garlow, 2002; Nemeroff, Comptom, & Berger, 2001). The NCHA reveals that 6.1% of female and 6.4% of male respondents have seriously considered suicide in the past year, and 1.2% of female and 1.5% of male respondents have seriously considered suicide in the past 2 weeks (ACHA, 2008). A study by Garlow, Roesenberg, and Moore (2008) of suicidal ideation and depression among college students found that 11% of students endorsed current (past 4 weeks) suicidal ideation. The same study found suicidal ideation to be associated with screening positive for depression on the Patient Health Questionnaire-9.

Identification and referral to treatment earlier in the course of a depression may reduce the serious consequences of depression and prevent suicide (Wang et al., 2007). Yet, in general U.S. populations, the median delay between onset of mental health symptoms and accessing services is 11 years (Wang, Berglund, Olfson, & Kessler, 2004). Despite access to health services on campuses, Eisenberg, Gollust, Golberstein, and Hefner (2007) showed that 37 % to 84% of students who screened positive for depression or anxiety did not receive services. An analysis of the Spring 2000 NCHA data revealed that less than 20% of students reporting suicidal ideation or attempts were receiving treatment (Kisch, Leino, & Silverman, 2000). Similarly, the study by Garlow, Rosenberg, and Moore (2008) found that 16% of students

endorsing current suicidal ideation and 14 % of students screening positive for depression were in treatment.

In community-based primary care settings, the point prevalence of major depression ranges from 4.8% – 8.6%. This is higher than the prevalence rates from community surveys, where the range tends to be 1.8% – 3.3%. Good evidence exists that screening for depression in clinical settings improves identification of patients with depression and decreases clinical mortality (U.S. Department of Health and Human Services, 2002). However, a search of the literature failed to find any studies that looked at the prevalence of depression among the sub-population of students who access student health facilities. This information would be particularly useful to practitioners who provide medical care to students in these clinical settings.

The purpose of our study is to determine the prevalence of depressive symptoms and suicide ideation among students seeking routine care at four college health primary care clinics. We expected the rate for depression among students accessing campus health facilities would be higher than in the general student population (Henk, Katzelnick, Koback, Greist, & Jefferson, 1996). In addition, we investigated the statistical relationships among depression, self-reported health behaviors, and other potential risk factors.

Method

Participants

Between October 2004 and February 2007, students with non-urgent and primary care appointments at their university's student health services centers were asked to complete a health screening survey. The systematic cross-sectional survey was completed by 1,622 university students who were approached upon entry to the health clinic. Student participation was voluntary, and none received compensation for taking part in the study.

Materials

Students completed a health screening survey which allowed for identification of those who met criteria for participation in a randomized controlled trial of brief physician alcohol intervention (Fleming, Barry, Manwell, Johnson, London, 1997; Fleming, Manwell, Barry, Adams, & Stauffacher, 1999). The study analyzed data from the general screen and students were not necessarily enrolled in the trial. The health survey used has been used in prior alcohol-related brief intervention trials (Fleming, Barry, Manwell, Johnson, London, 1997; Fleming, Lund, Wilton, Landry, & Scheets, 2008; Fleming, Manwell, Barry, Adams, & Stauffacher, 1999).

The Beck Depression Inventory for Primary Care (BDI-PC) was embedded within the survey. The BDI-PC is an accurate and effective screening test for major depression in primary care settings. The inventory consists of 7 items related to symptoms of sadness, past failure, loss of pleasure, self-dislike, self-criticism, and suicidal ideation from 0 (*I do not feel sad*), 1 (*I feel sad much of the time*), 2 (*I feel sad all of the time*), to 3 (*I feel so sad and unhappy that I can't stand it*). Participants are asked to describe their symptoms from the previous 2 weeks. Each item is scored on a 4-point scale (range 0–3) and a total score is calculated by adding the rating for each item (range: 0–21). Prior studies have shown that at a ≥4 cut off, the BDI-PC has a sensitivity of 97% and a specificity of 99% (Beck, Guth, Steer, & Ball, 1997; Steer, Cavalieri, Leonard, & Beck, 1999; Winter, Steer, Jones-Hicks, & Beck, 1999).

Other questions included in the health survey focused on potential risk behaviors or demographic characteristics potentially linked to depression including alcohol use, tobacco

use, and exercise in the past 3 months; sensation-seeking; living on or off campus; and emotional abuse, physical abuse, and unwanted sexual encounters in the last 6 months.

Questions related to alcohol use included frequency and quantity of drinking in an average week during the last 3 months and the number of heavy episodic drinking occasions in the last 30 days. At-risk weekly drinking was defined according to the criteria from the National Institute of Alcohol Abuse and Alcoholism (NIH, 2005), which is 7 or more drinks per week for females, and 14 or more drinks per week for males. Heavy episodic drinking in the past 30 days was defined as 5 or more drinks in a day for men and 4 or more drinks in a day for women (NIH, 2005).

Exercise was assessed by inquiring about the number of days per week in the last 3 months subjects exercised for at least 20 minutes. Examples included walking, jogging, biking, swimming, dancing, aerobics, and hard physical activity at home or work. Categories included *not at all; less than once a week; once a week; twice a week*; and *3, 4, 6, or 7 days per week*. Tobacco questions asked whether, in the last 3 months, the individual had smoked cigarettes at all, and if yes, how many cigarettes were smoked in a day. Response options were: *less than one, one to nine, 10–19*, or *20 or more*.

Sensation-seeking was assessed with the 8-item Brief Sensation Seeking Scale (BSSS) that has a proven reliability and validity record (Hoyle, Stephenson, Palmgreen, Lorch, & Donohew, 2002) and included statements such as, "I prefer friends who are excitingly unpredictable," and "I like wild parties," with a Likert-type set of five response options ranging from *strongly disagree* to *strongly agree*. Following the convention in other studies of sensation seeking (Evans et al., 2006; Henderson et al., 2005; Stephenson et al., 1999), subjects who scored three or more were categorized as higher sensation seekers and those below three as lower sensation seekers.

Emotional abuse was assessed by asking, "Within the last 6 months have you been emotionally abused?" Physical violence was assessed by asking, "Within the last 6 months have you been hit, slapped, kicked, or otherwise physically hurt by someone?" Unwanted sexual encounters were assessed by asking, "In the last 6 months have you had any unwanted sexual encounters?" For our analysis, these were either absent or present.

Procedures

Students completed the screening questionnaire while waiting for their appointment and returned the completed questionnaire to a locked box. Response rates were high with an average of >90% of students completing the questionnaire across the sites.

Health screening surveys were checked for completeness and scanned at the University of Wisconsin-Madison Scanning Lab. The scanned data were imported into an Oracle database and checked for data incongruences. Data analysis consisted of three steps: (a) examination of demographic variables, residence, tobacco use, exercise, alcohol, sensation seeking, and abuse by way of frequency; (b) correlations between individual variables and the outcome measure; and (c) a logistic regression model for predicting depression.

All analyses were conducted separately by gender. We recorded depression symptom scores on the BDI-PC as a dichotomous outcome variable of ≥ 4 (*present*) or 0–3 (*absent*). Descriptive statistics were used to document prevalence of variables and unadjusted individual chi-square associations with depression. Logistic regression was performed with both reduced-form and full models. The reduced-form models were included to show demographic variable effects that might otherwise be hidden by co-morbid factors such as abuse. The reduced-form models determined adjusted odds ratios of depression for

demographic and behavioral characteristics. The full form models added emotional, physical, and sexual abuse variables.

The University of Wisconsin Health Sciences Institutional Review Board (IRB) and the IRB of record at each of the other sites approved the study.

Results

Of the 1,626 currently enrolled students completing the survey, 1,102 (68%) were female and 520 (32%) were male. The respondents were predominantly White (78% females, 76% males), with Asians comprising the largest minority racial group (13% females, 15% males). Sixty-seven percent of the students were undergraduates (same for male and female respondents) and 31–32% lived on campus. Approximately 80% of respondents were non-smokers (81% female, 74% male; see Table 1 for a comparison of demographic characteristics based on whether the student screened positive or negative for depression).

Overall, 26.4% of female and 24.7% of male study participants screened positive for depression (BDI-PC ≥4). Females who screened positive for depression were more likely to be non-White, use tobacco, and exercise less than once a week. They were more likely to score high on the sensation-seeking scale and to report a history of emotional abuse, physical violence, and unwanted sexual encounters. Males who screened positive for depression were more likely to use tobacco, exercise less than three times per week, and report emotional abuse and unwanted sexual encounters. Thirty-two percent of students reported seeing a counselor for mental health concerns one or more times. Among students with a BPI score of less than four, only 13.5% had been to a counselor. Among students with a BPI score of four or more, 63.2% had seen a counselor. The difference was significant ($p < 0.001$). The relationship appears to be independent of gender.

Overall, 10% of females and 13% of males had thoughts of killing themselves. Whereas 2.2% of females and 2.8% of males screening negative for depression on the BDI-PC had thoughts of killing themselves, 31.7% of females and 39.9% of males screening positive for depression endorsed suicidal ideation (see Table 2).

Males and females were modeled separately in the full and reduced-form logistic regression models examining the relationship between variables and screening positive for depression, adjusted for potential confounders (see Table 3). More variation in the dependent variable is accounted for in the full models due to the inclusion of measures for emotional abuse, physical abuse, and unwanted sex. The effect sizes for demographic and behavioral variables did not vary substantially between the reduced-form and full models.

Male and female students with a history of emotional abuse were significantly more likely to be depressed than were students who did not report abuse. Female students with a history of unwanted sexual encounters were significantly more likely to report depressive symptoms. Being a non-Hispanic White female (based on self-report) appeared to slightly reduce the risk of depression, and for males, self-reporting as Asian had an increased positive association. Exercise had a negative association with depression in that exercising more reduced the odds of a positive depression screen for males and females. For both males and females, the frequency of heavy drinking was not significantly associated with probable depression.

Discussion

This article provides new information about the frequency of depression and suicide ideation among college students seeking routine care in university health centers. Prior studies have

been conducted by surveying general college samples or students in counseling centers. The frequency of depression and suicide ideation among college health clinic users was nearly twice as high as rates reported in general college samples. Associated factors include interpersonal violence, tobacco use, and unwanted sexual experiences. Protective factors include regular exercise. There was no association with heavy drinking using the NIAAA criteria for at-risk drinking.

Implications for Service Delivery

Campus-wide approaches to reduce the impact of depression and suicide recommend targeting groups at increased risk. This study supports previous studies in non-campus primary care settings that persons utilizing primary health care have higher rates of depression than the general population. As such, this study supports the efficacy of routine screening for depression in all students seeking routine care in college health clinics as one component of a comprehensive campus health program.

Nearly one in four students in our sample reported symptoms of depression, which makes it one of the most common treatable health problems seen in college health clinics. Because the majority of students in our four university study sites utilized college clinics for routine and acute care, these centers provide a great opportunity to identify and potentially treat depressed students. In addition, a third of students screening positive for depression had not sought previous help.

Although this study utilized the 7-item BDI-PC, there are a number of self-administered questionnaires that can be used as part of routine care (Williams, Hitchcock, Cordes, Ramirez, & Pignone, 2002). Studies have found that the two questions may be just as effective as longer questionnaires and can be administered by clinic staff checking a student into an examination room (U.S. Department of Health and Human Services, 2002; Whooley, Avins, Miranda, & Browner, 1997). These two questions are, "over the past 2 weeks, have you felt down, depressed, or hopeless?" and "over the past 2 weeks, have you felt little interest or pleasure in doing things?"

One in 10 students in our sample ($n = 161$) reported suicide ideation within the past 2 weeks. This is substantially higher than the rates of 1.2% and 1.5% reported in NCHA's general student population data. Although the annual rate of completed suicides in college students is reported to be 7.5/100,000 (Silverman, Meyer, Sloane, Raffel, & Pratt, 1997), suicidal thoughts reflect the severity of hopelessness and despair that directly affects academic performance, relationships with peers, and risk-taking behavior. Suicide prevention on campus is dependent on identifying those students at greatest risk. The data suggests that students accessing health centers for general health care and urgent care needs have higher rates of depression and suicidal ideation than the general student population. The data also suggests that targeting students screening positive for depression will identify 83% (133/161) of students with suicidal ideation (see Table 2).

We found that depression is associated with a number of health issues including tobacco use, unwanted sexual experiences, and other forms of victimization or violence. The data suggests that if students screen positive for depression, simultaneous screenings for these other issues should be performed. Treatment of one condition (e. g., use of selective serotonin reuptake inhibitors for depression) without dealing with potential contributing factors (e.g., interpersonal violence) may limit the effectiveness of treatment.

Exercise was strongly associated with lower rates of depression. This was not unexpected given previous studies showing increased rates of depression associated with sedentary lifestyle. Our finding suggests exercise may be protective and thus helps prevent the

development of depression in college students. While this is not a new finding, it does provide physicians with additional evidence to motivate students at risk for depression to exercise on a regular basis.

In our data, self-reporting as a non-Hispanic White appeared to be associated with a lower risk of depression for females, and self-reporting as Asian appeared associated with a slight increase in risk for males. However, a limitation of our study was the lower proportion of minorities included. We did not intentionally oversample minorities and our rates are consistent with rates from the NCHA data. Future studies may need to oversample minority populations to further explore this finding. Academic and social challenges increase potential for stress. It is possible that some of the Asian students who participated in the study were international students. Given that international students have been shown to have higher rates of depression potentially linked to increased rates of isolation, less family support, and financial pressures, this could explain our finding. Other social supports may play a role, but our study did not collect measures of social support or identify international students specifically, and thus, this is an area for future exploration (Suicide Prevention Resource Center, 2004).

Strengths of the study include the large sample size, high response rate, data collection process, representation from four geographically separated colleges, ability to collect co-morbid disorders information, and use of the state-of-the-art instruments. Limitations include: lack of information on anxiety disorders, cross-sectional nature of the data, limited diversity in the sample, and limited information on current depression treatment or reason for accessing a clinic.

Nearly one in four university students attending health clinics in diverse regions of the United States and Canada reported depressive symptoms, and one in 10 reported suicidal ideation. Although there is limited information on the frequency of routine screening in college health clinics, studies in primary care sites suggest depression is underdiagnosed and often missed (Coyne, Schwenk, & Fechner-Bates,1995; Katon & Schulberg, 1992; Simon & VonKorff, 1995). Clinicians in college health centers have a unique opportunity to identify and treat mental health problems in university students as well as to prevent the serious sequelae of untreated depression.

Acknowledgments

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Table 1

Sample Profile

	Females		Males	
	n	**% Depressed (BDI≥4)**	*n*	**% Depressed (BDI≥4)**
All Participants	1102	26.4	520	24.7
Age				
18–21	555	28.3	238	23.1
22–24	252	28.2	112	22.3
25+	295	21.4	170	28.8
Race				
White	858	24.6	398	22.4
Asian	142	28.9	76	36.8
Other/Multiple	102	38.2	46	26.1
Ethnicity				
Hispanic	44	36.4	21	28.6
Education level				
Freshman	147	30.6	70	20.0
Sophomore	139	29.5	67	26.9
Junior	205	29.8	100	27.0
Senior	256	26.9	116	25.9
Master's	147	19.1	55	23.6
Doctoral or professional	191	20.9	103	23.3
Other	17	41.2	9	33.3
Residence location				
On-campus	345	28.4	166	24.7
Off-campus	757	25.5	354	24.9
Tobacco use				
Yes	207	33.8	134	34.3
No	892	24.7	386	21.5
Exercise				
< once per week	189	34.9	69	31.9
1–2 times per week	312	23.7	152	35.5
3+ times per week	599	25.2	298	17.4
No. of binge occasions[a]				
0	572	25.2	196	25.0
1 or more	517	27.8	130	23.6
Exceed NIAAA consumption guidelines				
Yes (>7 F, >14 M)	270	30.6	114	27.2
No	711	25.1	406	24.1
Sensation seeking				
Low (scale score<3)	602	23.4	189	21.7

	Females		Males	
	n	**% Depressed (BDI≥4)**	**n**	**% Depressed (BDI≥4)**
High (scale score≥3)	500	30.0	331	26.6
Emotionally abused				
Yes	155	44.5	43	53.5
No	947	23.4	476	22.1
Physical violence victim				
Yes	30	46.7	43	20.9
No	1071	25.9	476	25.0
Unwanted sexual encounters				
Yes	65	49.2	33	45.5
No	1035	25.0	485	23.5

Note. BDI = Beck Depression Inventory; NIAAA = National Institute of Alcohol Abuse and Alcoholism.

[a]Defined as five or more drinks in the last 30 days.

Table 2

Participant Responses to Each Suicidal Ideation-Item on the BDI

	Females		Males	
	Not depressed (*n*=810)	Depressed (*n*=290)	Not depressed (*n*=390)	Depressed (*n*=128)
I don't have any thoughts of killing myself.	97.8	66.2	97.2	57.0
I have thoughts of killing myself, but I would not carry them out.	2.2	31.7	2.8	39.9
I would like to kill myself.	0.0	2.1	0.0	3.1
I would kill myself if I had the chance.[a]				

Note. BDI = Beck Depression Inventory. Not depressed is defined as a BDI-PC score of 0–3. Depressed is defined as a BDI-PC score of 4 or greater. All numbers are percentages.

[a]No participants endorsed the item "I would kill myself if I had the chance."

Table 3

Logistic Regression Results of Probable Depression (BDI-PC ≥4)

	Females		Males	
	OR (95% CI)		OR (95% CI)	
	Reduced model	Full model	Reduced model	Full model
Age				
18–21	0.95 (0.55 – 1.64)	0.92 (0.53 – 1.61)	0.47[*] (0.23 – 0.97)	0.46[*] (0.22 – 0.97)
22–24	1.21 (0.77 – 1.90)	1.16 (0.73 – 1.84)	0.53 (0.27 – 1.03)	0.48[*] (0.24 – 0.95)
25+	.	.	.	.
Race				
White	0.52[**] (0.32 – 0.84)	0.58[*] (0.36 – 0.95)	0.98 (0.45 – 2.13)	1.06 (0.49 – 2.33)
Asian	0.66 (0.37 – 1.19)	0.73 (0.40 – 1.32)	2.46 (0.99 – 6.12)	2.61[*] (1.04 – 6.54)
Other	.	.	.	.
Ethnicity				
Hispanic	1.24 (0.62 – 2.50)	1.47 (0.80 – 2.00)	1.24 (0.42 – 3.61)	1.39 (0.46 – 4.24)
Education Level				
Freshman	1.14 (0.67 – 1.93)	1.08 (0.63 – 1.85)	0.65 (0.28 – 1.51)	0.57 (0.24 – 1.37)
Sophomore	.	.	.	.
Junior	0.98 (0.60 – 1.61)	0.94 (0.57 – 1.55)	0.97 (0.46 – 2.04)	1.00 (0.46 – 2.16)
Senior	0.77 (0.45 – 1.32)	0.78 (0.45 – 1.34)	0.88 (0.39 – 2.00)	0.84 (0.36 – 1.95)
Master's	0.52 (0.25 – 1.06)	0.52 (0.25 – 1.08)	0.62 (0.22 – 1.75)	0.67 (0.23 – 1.91)
Doctoral or Professional	0.65 (0.33 – 1.28)	0.62 (0.31 – 1.25)	0.52 (0.20 – 1.37)	0.53 (0.20 – 1.43)
Residence				
On Campus	0.96 (0.68 – 1.37)	0.95 (0.66 – 1.36)	1.26 (0.75 – 2.12)	1.34 (0.78 – 2.30)
Off Campus	.	.	.	.
Days of exercise per week				
0	.	.	.	.
1–2	0.58[**] (0.38 – 0.86)	0.57[**] (0.38 – 0.87)	1.22 (0.65 – 2.28)	1.17 (0.61 – 2.23)
3–7	0.66[*] (0.46 – 0.96)	0.68[*] (0.47 – 0.99)	0.45[**] (0.24 – 0.83)	0.45[*] (0.24 – 0.85)
Exceed NIAAA consumption guidelines				
No	.	.	.	.
Yes	0.85 (0.61 – 1.19)	0.93 (0.65 – 1.31)	0.81 (0.47 – 1.40)	0.86 (0.48 – 1.55)
Tobacco use				
Yes	1.44[*] (1.01 – 2.06)	1.41 (0.98 – 2.03)	1.69[*] (1.03 – 2.75)	1.69[*] (1.02 – 2.79)
No	.	.	.	.
Sensation Seeking				
Low (< 3)	.	.	.	.
High (≥ 3)	1.27 (0.95 – 1.69)	1.17 (0.87 – 1.57)	1.61 (0.98 – 2.66)	1.55 (0.93 – 2.58)
Emotional Abuse	.	2.14[**] (1.47 – 3.12)	.	3.81[**] (1.90 – 7.62)
Physical Violence	.	1.68 (0.76 – 3.71)	.	0.61 (0.26 – 1.45)

	Females		Males	
	OR (95% CI)		*OR* (95% CI)	
	Reduced model	**Full model**	**Reduced model**	**Full model**
Unwanted Sex	.	2.39[**] (1.39 – 4.10)	.	2.30 (0.99 – 5.33)
	Chisquare(17)=41.95, *p* < .001	Chisquare(20)=75.01, *p* < .001	Chisquare(17)=44.88, *p* < .001	Chisquare(20)=65.16, *p* < .001

Note. OR= Odds Ratio; CI = Confidence Interval; BDI = Beck Depression Inventory; NIAAA = National Institute of Alcohol Abuse and Alcoholism.

[*] *p*<.05.

[**] *p* < .01.