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10-23-2008

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Vohs, Charles; Gable, Robert; Ward, Cynthia; Barresi, Joseph; Martel, Ronald; and Slocumb, Dameian, "Anxiety and Depression as Comorbid Factors in Drinking Behaviors of Undergraduate Students in an Urban Private University" (2008). *NERA Conference Proceedings 2008*. Paper 28.
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Anxiety and Depression as Comorbid Factors in Drinking Behaviors of Undergraduate College Students Attending an Urban Private University in the Northeastern United States[1]

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[1]Paper presented at the 39th annual meeting of the Northeastern Educational Research Association, October 23, 2008, Rocky Hill, CT.

Abstract

High-risk drinking is the number one public health concern on college campuses (Berkowitz, 2003; Kapner, 2003; Wechsler, 2002). To date, high-risk drinking prevention programs have met with limited success (Kapner, 2003).

This study examined differences among four drinking behavior groups: non-drinkers [(ND), (n = 128)], low-risk drinkers [(LRD), (n = 252)], high-risk drinkers [(HRD), (n = 272)], and frequent high-risk drinkers [(FHRD), (n = 290)] with respect to anxiety and depression for male (n = 457) and female (n = 485) undergraduates (N = 942) attending an urban private university in the northeastern United States; and, the perceptions of two undergraduate focus groups (N = 10) and one faculty/staff group (N = 14) for why undergraduates engage in high-risk drinking and actions to reduce this behavior.

Volunteer participants completed a demographic questionnaire, the *Alcohol Use Disorders Identification Test,* the *Beck Anxiety Inventory,* and the *Beck Depression Inventory.* An ANOVA indicated differences among the groups with respect to anxiety (F = 6.49, $p < .001$), but not with respect to depression. The FHRD group had higher anxiety (M = .68) than the ND group (M = .33) and the LRD group (M = .44). A t-test indicated differences ($p < .01$) in the level of anxiety between HRD females (M = .69) and HRD males (M = .40), with no differences for depression. A chi-square analysis indicated differences between males and females with respect to drinking behavior group classification ($\chi^2 = 22.40$, $df = 3$, $p < .001$).

Focus group results suggested several reasons why students engage in high-risk drinking: it is the norm, easy access to alcohol, low accountability for drinking, cope with anxiety, relieve boredom, lift depression, cope with anger, family history of alcohol use, alcohol dependence, and poor self-esteem. Implications for educators are discussed.

INTRODUCTION

High-risk drinking, also known as binge drinking (see Appendix A for the definition of terms used in the study), is the number one public health concern on college campuses nationwide. High-risk drinking is the leading cause of death among college students, and is related to lower grade point averages, academic problems, and student attrition (Berkowitz, 2003; Carson, Butcher, & Mineka, 1998; Coll, 1998; Kapner, 2003).

The National College Health Risk Behavior Survey (NCHRBS), a one-time survey conducted in 1995 by the Centers for Disease Control and Prevention, reported that 35% of all students binge drink (Ottenritter & Frengel, 1998). Other research showed an even higher percentage of students who engaged in high-risk drinking, as much as 44% to 48% (Kapner, 2003; Wechsler, 2002). Jones, Oeltmann, Wilson, Brener, & Hill (2001) discovered that college students who engaged in high-risk drinking on six or more days within a 30 day period constituted 12% of the undergraduate student population.

Many institutions of higher education have responded to the problem of undergraduate high-risk drinking by implementing prevention education programs. Most current prevention efforts are based largely on social norms theories: social bonding theory, self-control theory, reasoned action and planned behavior theory, and social learning theory (Britton, 2004; Durkin, Wolfe, & Clark, 1999; Johnston & White, 2003; Piquero, Gibson, & Tibbetts., 2002). These prevention efforts attempt to dissuade students from engaging in high-risk drinking by focusing on the negative effects and consequences of heavy drinking. However, in spite of these programs, research indicates that the number of students who engage in frequent high-risk drinking has actually increased since the mid-1990s, from 20% in 1993 to 23% in 2001 (Kapner, 2003; Wechsler et al., 2002). As evidenced by this increase, prevention efforts have met with limited success (Jung, 2003; Kapner, 2003).

There is need for a new prevention approach to the phenomenon of high-risk drinking due to an increase in this behavior since the 1990's. Colleges are looking for more effective solutions to reduce high-risk drinking, mitigate institutional liability, and prevent the harmful effects such behavior has on the campus and surrounding communities (Tribbensee, 2004). In contrast to studies based on social theories are those that examine drinking behavior in individuals who have a substance use disorder

(SUD), mood, or depressive, disorder, or anxiety disorder as described in the *DSM-IV* (1994). Mental health professionals, in particular those who specialize in substance use disorders (SUDs), believe there is a significant relationship, or comorbidity, between SUDs, anxiety disorders, and depressive disorders (Agosti & Levin, 2006; Brady & Verduin, 2005; Buckner, Schmidt, & Eggleston, 2006; Bystritsky, 2006; Carey & Carey, 1995; Compton, Cottler, Phelps, Abdallah, & Spitznagel, 2000; Grant et al., 2004; Hippius, Stefanis, & Miller-Sspahn, 1994; Jane-LLopis & Matytinsa, 2006; Kendall & Watson, 1989; Kessler, Berglund, & Demler, Jin, Koretz, Merikangas, Rush, Walters, & Wang, 2003; Kessler, McGonagle, Zhao, Nelson, Hughes, Eschleman, Wittchen, & Kendler, 1994; Kessler et al., 2005; Kiddorf & Lang, 1999; Lewis & O'Neill, 2000; Marquenie et al., 2007; Marshall, 1994; Merikangas et al., 1998; Miller, 1996; Oliver, Reed, & Smith, 1998; Paparrigopoulos, Tzavellas, & Soldatos 2007; Pullen, 1994; Rehm, Room, Monteiro, Gmel, Graham, & Rehn, 2004; Reiger, Farmer, Rai, Locke, Keith, Judd, & Goodwin, 1990; Robins & Regier, 1991; Rohde, Lewinson, & Seeley, 1991; Shoenborn & Horm, 1993; Stewart, Morris, Mellings, & Komar, 2006; Thomas, Randall, & Carrigan, 2003).

A review of the literature indicated that, as was true for the general population, alcohol abuse and dependency were found to occur frequently in undergraduates; more commonly in males than in females. Anxiety and depression were also found to occur frequently in undergraduates; both being more common in females than males. The onset of anxiety disorders were found to occur more frequently before alcohol abuse, rather than vice versa; and, the onset of alcohol abuse was found to occur, or co-occur, more frequently before depression, particularly major depression. Depression was strongly linked to anxiety in undergraduates. Finally, reliance on alcohol to deal with anxiety was found to occur frequently in undergraduates, regardless of gender, and was found to lead to alcohol dependency.

The major findings from these studies generated an interest in further examining the relationship of drinking behavior in undergraduates by gender with respect to anxiety and depression. Specifically, the researcher wanted to know if differences in levels of anxiety and depression by gender were related to amount and frequency of drinking. In the literature, only a very few studies were found that examined differences specific to

undergraduates for amount and frequency of drinking by gender with respect to anxiety and depression. In addition, most studies that did examine drinking behavior in undergraduates were done using small student samples, most frequently less than 200 students, and this researcher wanted to confirm or reject previous findings in a much larger undergraduate sample.

In summary, studies based on constructs other than social norm theories may offer new solutions to the problem of undergraduate high-risk drinking. In particular, prevention strategies that target high-risk drinkers, in concert with current prevention strategies that target at-large undergraduate populations, may be more effective in reducing the incidence and consequences of undergraduate high-risk drinking. This investigation used a quantitative methodology to examine the relationship of anxiety and depression in undergraduate males (n = 457) and females (n = 485) attending an urban private university in the Northeastern United States to self-reported membership in one of four drinking behavior groups. The university selected for the study is a career-oriented institution that attracts students who are interested in earning an associate, baccalaureate, or graduate degree from one of three colleges or three schools: business, culinary arts, and hospitality, or technology, education, and arts and sciences. As such, the emphasis on career education makes this university an atypical institution of higher education; the students who matriculate are not interested in the typical academic programs offered by more traditional universities.

In addition, this investigation used a qualitative methodology to examine the perceptions of male and female undergraduates, as well as faculty and staff, to determine why students engage in high-risk drinking, particularly six or more times in a 30-day period, and what steps university leaders can take to curtail this behavior.

Research Questions

Primary

The four undergraduate drinking behavior groups that were used for Research Questions 1 and 2 are: non-drinkers, low-risk drinkers, high-risk drinkers, and frequent high-risk drinkers.

1. Is there a significant difference between the four undergraduate drinking behavior groups with respect to anxiety?

2. Is there a significant difference between the four undergraduate drinking behavior groups with respect to depression?

3. What perceptions do undergraduates and faculty/staff have about why undergraduates engage in high-risk drinking, particularly six or more times in a 30-day period, and what can be done to curtail this behavior?

Secondary

The undergraduate drinking behavior groups that were used for secondary Research Questions 1 and 2 are: non-drinkers, low-risk drinkers, high-risk drinkers, and frequent high-risk drinkers.

1. Is there a significant difference between female and male undergraduate drinking behavior groups with respect to anxiety?

2. Is there a significant difference between female and male undergraduate drinking behavior groups with respect to depression?

METHODOLOGY

Sample

For primary and secondary Research Questions 1 and 2 a volunteer sample of male (n = 457) and female (n = 485) undergraduates (N = 942), who were 18 years of age or older and who attended an urban private university located in the northeastern region of the United States, participated from a total university population of approximately 8,000 undergraduate students. To achieve a sample representation of the university, six residence halls were purposively selected by the university *Dean of Students*. Assuming medium effect sizes, probability $p = < .05$ and statistical power near .7, a sample size of 600 undergraduates with a proposed return rate of 60% was considered to be more than sufficient. The total sample size of 942 undergraduates exceeded expectations.

For primary Research Question 3, a volunteer sample of male (n = 4) and female (n = 6) undergraduate students was purposefully selected from among the 60 volunteer students who won Visa gift cards as a result of an incentive drawing held at the conclusion of the survey data collection. Each of the ten selected students was contacted by the *Director of Residential Life* to participate in one of two focus groups, a male only student focus group and a female only student focus group. A third focus

group was composed of volunteer faculty and staffs (*n* = 14). Selected faculty and staffs were invited by the researcher through the university email system from a list of (*N* = 15) university faculty chairs and staffs provided by members of the researcher's dissertation committee.

Instrumentation

Participants were asked to complete a survey packet containing:

- A questionnaire that included an introduction to the survey packet and five items pertaining to demographics: Gender, ethnicity, residential status, class year group, and age

- The *Alcohol Use Disorders Identification Test (AUDIT)* containing 10 items to identify participant membership in one of four groups of undergraduate college student drinking behavior: Non-drinkers, low-risk drinkers, high-risk drinkers, and frequent high-risk drinkers

- The *Beck Anxiety Inventory (BAI)* containing 21 items to identify one of four levels of anxiety: Minimal, mild, moderate, or severe

- The *Beck Depression Inventory (BDI-II)* containing 21 items to identify one of four levels of depression: Minimal, mild, moderate, or severe

(See Appendix B for a copy of the questionnaire and Appendix C for the *AUDIT*). Original versions of the *BAI* and the *BDI-II* were purchased from The Psychological Corporation, Harcourt Brace & Company, and were used in the study. Each questionnaire, *AUDIT*, *BAI*, and *BDI-II* was identified by a matching anonymous numerical code. Anonymity was preserved in data collection, analysis, and reporting through the use of this code.

Data Collection

A total of 1,000 collated and numerically coded survey packets were delivered to the Director of Residential Life who equally divided the survey packets and delivered them to the residence hall directors of the six selected residence halls. Data collection was

coordinated under the direction of the university Director of Residential Life through the residence hall directors along with one designated residential life staff member in each selected residence hall. The Director of Residential Life provided data collection instructions and training to residence hall directors and residential life staff. A data collection guide composed by the Director of Residential Life was used for this training. Staggered times of data collection were scheduled by the Director of Residential Life, with concurrence of the researcher and each of the residence hall directors, in order to maximize contact with students. The times chosen were usually during the evening hours.

To safeguard anonymity of the participants, students were not asked to provide their names or other personal identifiers on survey materials. However, participants were required to produce proof of age and a valid university picture ID to prove active undergraduate status prior to receiving a survey packet. Participant names were identified with a highlighter on a copy of a university roster to prevent survey duplication. Participants were provided information about survey anonymity and confidentiality, and were asked if they had any questions concerning these issues prior to being given a survey packet. Survey packets were completed in the presence of designated residential life staff in the residence hall lobbies. Participants were permitted to ask questions for clarification while completing surveys.

Participants placed completed survey packets face-down in a box provided in each residence hall. After placing the completed survey packet in the box, participants were given a 3” by 5” index card and asked to print their first and last names, their university e-mail addresses, and contact phone numbers. Participants who voluntarily furnished their contact information placed the cards in a separate slotted collection box and became eligible to win one of 60 Visa gift cards of varying denominations from $25 to $100 that were provided as an incentive by the researcher. Completed survey packets and index cards were kept locked at all times in their respective boxes in each residence hall director’s office until data collection efforts were completed. Residence hall directors turned completed survey packet boxes and index card boxes over to the Director of Residential Life who kept them locked in his office until the researcher took possession of all completed survey packets. The drawing for the 60 Visa gift cards was

completed at the time the researcher took possession of all completed survey packets from the Director of Residential Life. Equal numbers of Visa gift cards and denominations were distributed to the winners of each residence hall by the Director of Residential Life upon conclusion of the drawing. Index cards from each residence hall were randomly drawn by the researcher in the presence of the Director of Residential Life on October 4, 2007 after the researcher took possession of all completed surveys. The total value of all gift cards was $2,500.

Following the analyses of quantitative data, one focus group consisting of volunteer male students (n = 4), another consisting of volunteer female (n = 6) students, and a third consisting of volunteer faculty and staffs (n = 14) were conducted by the researcher for the purpose of gathering qualitative data. Data consisted of what group participants had to say about why undergraduates engage in high-risk drinking behavior, particularly frequent high-risk drinking, and what the university can do to curtail this behavior. The three focus groups met at separate times in a private conference room in the university student activities building. Focus group questions were designed to stimulate participant discussion (see Appendix D).

The participants of all three focus groups were given a consent form explaining confidentiality. Participants voluntarily signed the consent forms before the moderator proceeded into the data collection portion of the meeting. The proceedings of each focus group were tape recorded and notes were taken by the researcher.

Data Analysis

Questionnaire and survey data were entered into the SPSS statistical analysis software (2001) and descriptive statistics were generated for all variables in the study (i.e., frequencies, percents, means, and standard deviations). For primary Research Question 1, a 1-way ANOVA with a follow-up Scheffé were performed to examine differences between each of the four drinking behavior groups, the independent variables, with respect to the scores from the completed *BAI's* representing anxiety, the dependent variable. Participants were selected for membership into one of the four drinking behavior groups in accordance with their responses to the first three questions of the *AUDIT*, those addressing amount and frequency of alcohol consumption. Participants who responded as never drinking alcohol were placed into the non-drinker

group. Participants who responded as consuming less than four drinks for women and five drinks for men per drinking occasion, regardless of number of days per month they reported consuming alcohol, were placed into the low-risk drinking group. Participants who responded as consuming more than four drinks for women and five drinks for men per drinking occasion, at least one time and up to five times per month, were placed into the high-risk drinking group. Participants who responded as consuming more than four drinks for women and five drinks for men per drinking occasion, more than five times per month, were placed into the frequent high-risk drinking group. Scores for the *BAI* were derived using the scoring instructions contained in the *BAI* Manual (Beck & Steer, 1993) to arrive at one of four levels of anxiety: minimal, mild, moderate, or severe.

For primary Research Question 2, a 1-way ANOVA with a follow-up Scheffé were performed to examine differences between each of the four drinking behavior groups, the independent variables, with respect to the scores from the completed *BDI-II's* representing depression, the dependent variable. Participants were selected for membership into one of the four drinking behavior groups in the same manner as for primary Research Question 1. Scores for the *BDI-II* were derived using the scoring instructions contained in the *BDI-II* Manual (Beck et al., 1996) to arrive at one of four levels of depression: minimal, mild, moderate, or severe.

For primary Research Question 3, the examination of data from each focus group was systematic, sequential, verifiable, and continuous based on transcripts and notes using the “long table” approach to review the comments and generate the themes (Morgan, 1997). The purpose of the focus groups was to determine participant’s thoughts and feelings about why students engage in high-risk drinking behavior.

For secondary Research Question 1, a 1-way ANOVA with a follow-up Scheffé, *t*-test, and chi-square were used to examine differences between each of the four drinking behavior groups by gender, the independent variables, with respect to the scores from the completed *BAI's* representing anxiety, the dependent variable. Participants were selected for membership into one of the four drinking behavior groups in the same manner as for primary Research Questions 1 and 2. Scores for the *BAI* were derived using the scoring instructions contained in the *BAI* Manual (Beck & Steer, 1993) to arrive at one of four levels of anxiety: minimal, mild, moderate, or severe.

For secondary Research Question 2, a 1-way ANOVA with a follow-up Scheffé, *t*-test, and chi-square were used to examine differences between each of the four drinking behavior groups by gender, the independent variable, with respect to the scores from the completed *BDI-II's* representing depression, the dependent variable. Participants were selected for membership into one of the four drinking behavior groups in the same manner as for primary Research Questions 1 and 2. Scores for the *BDI-II* were derived using the scoring instructions contained in the *BDI-II* Manual (Beck et al., 1996) to arrive at one of four levels of depression: minimal, mild, moderate, or severe.

RESULTS

Sample

For primary and secondary Research Questions 1 and 2, a sample ($N = 942$) of volunteer male ($n = 457$) and female ($n = 485$) students ($P = 49$ and 51, respectively) completed survey packets.

Table 1 lists the frequencies of students by gender in each drinking behavior group.

Table 1
Number and Percent of Students in Each Drinking Behavior Group by Gender

	Males		Females		
Drinking Behavior	*n*	*p*	*n*	*p*	Total
Non-Drinker	64	50.0	64	50.0	128
Low-Risk Drinker	103	40.8	149	59.2	252
High-Risk Drinker	118	43.4	154	56.6	272
Frequent High-Risk Drinker	172	59.3	118	40.7	290
Total	457	48.5	485	51.5	942

The demographics of the sample were in keeping with both the representation of students attending the university, and generally representative of undergraduates nationally. There were 68% Caucasians ($n = 638$), 12% African Americans ($n = 118$), 9% Hispanics ($n = 82$), 3% Asians ($n = 33$), and less than 1% Native Americans ($n = 4$).

Students who identified as other (n = 67) comprised 7% of the sample, and it is not known if these students did not want to be counted as a member of any other group, were of mixed ethnic descent, or identified as Pacific-Islander. Most students in the sample resided on-campus (n = 916) compared to off-campus (n = 26). Freshman comprised 57% of the sample (n = 538), with 25% sophomores (n = 241), 10% juniors (n = 91), and 8% seniors (n = 72). Membership by age consisted of students who identified as under the age of 21 (n = 819), and those who identified as 21 years of age or older (n = 123), which was expected.

Primary Questions One and Two

Tables 2 and 3 present the data for the analyses of anxiety and depression for the four drinking behavior groups. Table 2 presents the 1-way ANOVA data, which indicates that there were significant differences among the drinking groups with respect to anxiety (F = 6.49, p < .001), but not with respect to depression.

Table 2
ANOVA for Anxiety and Depression Among the Drinking Behavior Groups

	Sum of Squares	*df*	Mean Square	*F*	*p*
Anxiety					
Between Groups	14.164	3	4.721	6.490	.001*
Within Groups	682.316	938			
Total	696.480	941			
Depression					
Between Groups	1.792	3	.597	1.171	.320
Within Groups	478.659	938			
Total	480.451	941			

p < .001*

Table 3 contains the data for the follow-up Scheffé analyses for the respective group means for the anxiety variable. No follow-up was necessary for the depression variable because no significant differences were found among the groups. As indicated in the summary note listed in the bottom row of the table, these analyses indicate that the anxiety level for the frequent high-risk drinking group (M = .68) students was significantly greater than the level for the non-drinking group (M = .33) and the low-risk drinking group (M = .44) students. Means that are statistically significant have been

placed in bold type for emphasis. While not statistically significant, a “trend” for higher anxiety is present in the high-risk drinking group (*M* = .56) than for the non-drinking group (*M* = .33) and the low-risk drinking group (*M* = .44). That is, higher levels of anxiety were positively correlated with students who abused alcohol than with students who do not drink or who are low-risk drinkers.

While no significant differences were found among the groups with respect to depression, the data suggests a “trend” for higher levels of depression in students who abuse alcohol than for those who do not drink [FHRD (*M* = .34), ND (*M* = .23)].

Table 3
Means and Standard Deviations for Anxiety and Depression by Drinking Behavior Group

Variables	Drinking Groups										
	ND *n*= 128		LRD *n*= 252		HRD *n*= 272		FHRD *n* = 290				
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*F*	*p*	Summary of Sign. Diff.
Anxiety	**.33**	.80	**.44**	.78	.56	.84	**.68**	.94	6.49	.001	FHRD > ND, LRD
Depression	.23	.69	.24	.64	.29	.70	.34	.80	1.17	.320	

Note. ND = Non-Drinkers, LRD = Low-Risk Drinkers, HRD = High-Risk Drinkers, FHRD = Frequent High-Risk Drinkers

Secondary Questions One and Two

Tables 4 and 5 present the analyses for the anxiety and depression levels of the four drinking behavior groups for males and females. Table 4 indicates that there were significant differences among the groups for anxiety ($F = 4.484$, $p < .001$); no differences were found among the groups for depression.

Table 4
ANOVA for Anxiety and Depression Among Drinking Behavior/Gender Groups

		Sum of Squares	*df*	Mean Square	*F*	*p*
Anxiety						
	Between Groups	22.647	7	3.235	4.484	.001*
	Within Groups	673.833	934	.721		
	Total	696.480	941			
Depression						
	Between Groups	3.598	7	.514	1.007	.425
	Within Groups	476.853	934	.511		
	Total	480.451	941			

$p < .001$*

Table 5 (see Appendix E) presents the follow-up Scheffé analyses for the respective group means by gender. While not found to be statistically significant by the Scheffé follow-up test, a comparison of the means within gender groups suggests a “trend” for higher levels of anxiety in both females [FHRD ($M = .69$), FND ($M = .41$)] and males [MHRD ($M = .40$), MND ($M = .25$)] who abuse alcohol than for those who do not drink.

No significant statistical differences were found among the groups for depression ($F = 1.01$, $p = .425$), although a comparison of the means within gender groups suggests nearly as high a level of depression in males who drink socially as those who frequently abuse alcohol [MLRD ($M = .29$), MFHRD ($M = .34$)].

Tables 6 through 9 (see Appendix F) present the levels of anxiety and depression in each of the drinking groups (i.e., ND, LRD, HRD, and FRHD) by gender. Tables 6, 7, and 9 indicate no significant difference between males and females with respect to either anxiety or depression in each of the following drinking behavior groups: ND, LRD, and FRHD. However, Table 8 indicates a significant difference ($p < .01$) in the level of anxiety between HRD females ($M = .69$) and HRD males ($M = .40$), but no significant difference for depression; females report a greater level of anxiety than males for this group.

Table 10 presents the chi-square analyses which examined the relationship of gender to drinking behavior group. Significant differences were found between males and females with respect to drinking behavior group classifications ($\chi^2 = 22.40$, $df = 3$, p

< .001). For each gender and drinking behavior group classification, the data in the table lists the actual and the expected frequency of students in each group. The key to the analyses of the significant statistic is the follow-up inspection of the adjusted residual indices. Inspection of the residuals suggests that the largest contributors to the significant finding were found in the frequent high-risk drinking (FHRD) group for both males and females. Fewer females (*n* = 118) than expected (*n* = 149.3) were found in the female frequent high-risk drinking (FHRD) group, while more males (*n* = 172) than expected (*n* = 140.7) were found in the male frequent high-risk drinking (FHRD) group.

Table 10
Frequency of Membership for all Drinking Behavior Groups by Gender

Gender		Group			
		ND	LRD	HRD	FHRD
Female					
	N	64	149	154	**118**
	Expected *n*	65.9	129.7	140.0	**149.3**
	% within Gender	13.2%	30.7%	31.8%	24.3%
	Adjusted Residual	-0.4	2.8	2	-4.4
Male					
	N	64	103	118	**172**
	Expected *n*	62.1	122.3	132	**140.7**
	% within Gender	14.0%	22.5%	25.8%	37.6%
	Adjusted Residual	0.4	-2.8	-2	4.4
	$\chi^2 = 22.40$, $df = 3$, $p < .001$				

Note. ND = Non-Drinkers, LRD = Low-Risk Drinkers, HRD = High-Risk Drinkers, FHRD = Frequent High-Risk Drinkers

Primary Question Three - Reasons Students Engage in High-Risk Drinking

The qualitative data for the study was derived from the three focus groups, which were designed to determine what participants said were the reasons why undergraduates at the studied university engage in high-risk drinking, particularly frequent high-risk drinking. Themes were generated from an analysis of group transcripts.

Seven themes emerged when participant responses were analyzed; four of these themes were characterized as having major importance based on the frequency and vehemence of participant responses. The four major themes are:

- High-risk drinking is the social activity of choice for students; it is the cultural norm.
- There is easy access to alcohol for underage drinkers.
- Students use alcohol to cope with a high level of anxiety.
- Students are not held accountable for their drinking habits.

Other themes included: high-risk drinking is fun and relieves boredom; it can lift a depressed mood; and it is a way to cope with anger. Participants were also asked to give reasons for why undergraduates engage in high-risk drinking six or more times in a 30-day period. In response, three themes emerged: a family history of frequent and excessive use of alcohol, including a genetic predisposition to alcoholism, alcohol dependence, and low self-esteem.

SUMMARY, CONCLUSIONS, AND IMPLICATIONS

The purpose of this investigation was to examine the relationship of anxiety and depression to four drinking behaviors in male and female undergraduates attending an urban private university located in the northeastern United States. The two dependent variables in the study were anxiety and depression. The independent variable was drinking behavior group. Further, the investigation examined the perceptions of undergraduates and faculty/staffs to determine why undergraduates engage in high-risk drinking, particularly frequent high-risk drinking.

Major Quantitative Findings

This investigation indicated a significant positive relationship for high anxiety and frequent high-risk drinking in undergraduates for both males and females. However, depression was not significantly related to drinking behavior in either male or female undergraduates. Three significant quantitative findings were indicated:

- Among the four drinking behavior groups, anxiety for frequent high-risk drinkers ($M = .68$) was significantly greater ($F = 6.49$, $p < .001$) than for non-drinkers ($M = .33$) and low-risk drinkers ($M = .44$).

- Levels of anxiety increased along with intensity and frequency of drinking for both genders. Anxiety in male frequent high-risk drinkers was much higher ($M = .62$) than for male non-drinkers ($M = .25$) or male low-risk drinkers ($M = .39$). Likewise, anxiety for female frequent high-risk drinkers was much higher ($M = .77$) than for female non-drinkers ($M = .41$) and female low-risk drinkers ($M = .47$).

- A significant difference ($p < .01$) was found in the level of anxiety between high-risk drinking females ($M = .69$) and high-risk drinking males ($M = .40$). Female high-risk drinkers were much more anxious than male high-risk drinkers.

Although depression was not significantly related to high-risk drinking for either gender, a trend for increased levels of depression along the continuum of drinking behavior from non-drinkers ($M = .23$) to low-risk ($M = .24$) to high-risk ($M = .29$) to frequent high-risk drinking ($M = .34$) was suggested. Also, for gender, male non-drinkers ($M = .17$) were less depressed than male low-risk drinkers ($M = .29$), male high-risk drinkers ($M = .22$) and male frequent high-risk drinkers ($M = .34$).

As expected, more males belonged to the frequent high-risk drinking group than females ($n = 172$ and $n = 118$, respectively). However, more females than males belonged to the high-risk drinking group ($n = 154$ and $n = 118$, respectively), and this finding was unexpected.

Major Qualitative Findings

In order of importance, seven reasons were given by the focus groups for why students engage in high-risk drinking:

1. High-risk drinking is the social activity of choice for students.
2. There is easy access to alcohol for underage drinkers.
3. Students use alcohol to cope with a high level of anxiety.
4. Students have low accountability for their drinking habits.
5. High-risk drinking is fun and relieves boredom.

6. High-risk drinking can lift a depressed mood.
7. High-risk drinking is a way to cope with anger.

Also, the focus groups indicated three factors that cause undergraduates to engage in frequent high-risk drinking:

1. Family history of frequent and excessive use of alcohol, including a genetic predisposition to alcoholism.
2. Alcohol dependence.
3. Low self-esteem.

Conclusions

From a sample of 942 undergraduates, 814 students, or 86% of the sample, reported drinking alcohol with more than half (n = 562, P = 60) reporting as high-risk (n = 272) or frequent high-risk drinkers (n = 290). Students attending the university selected for this study are more inclined to use alcohol, a fact mitigated by the atypical curriculum of the university; many students come into contact with alcohol as a requirement of their culinary coursework. However, this finding concurs with other studies that heavy drinking is a norm among undergraduates, and that alcohol use and abuse is common and frequent among students (Deykin, et al., 1987; Ham & Hope, 2005; Knight et al., 2002; Ottenritter & Frengel, 1988; Presley, et al., 1993, 1995; Wechsler et al., 2002). More significantly, almost one-third of the participants, or 31%, reported to be frequent high-risk drinkers. As expected, based on previous studies, more males (n = 172) than females (n = 118) reported to be in this group. However, more undergraduate females (n = 154) than males (n = 118) reported to be high-risk drinkers (χ^2 = 22.40, df = 3, p = .001), an unexpected result. Findings from previous studies indicated that more males than females would report membership in this group (Kessler, et al., 1994, 1997; Oliver, 1998; Piquero et al., 2002; Robins & Rigier, 1991; Wechsler et al., 1995: Wittchen & Jacobi, 2005). This anomaly may be explained by the fact that a significant difference (p < .01) was found in the level of anxiety between high-risk drinking females (M = .69) and high-risk drinking males (M = .40); the literature indicates that more anxious undergraduates drink more than less anxious students (Kalodner et al., 1989; Stewart et al., 1995). Female high-risk drinkers were much more anxious than male high-risk drinkers.

The percentage of reported frequent high-risk drinkers, 31%, is much higher than expected. The literature predicted that less than 25% of the sample would fall into this group. Major findings from this study give clues as to why there are more frequent high-risk drinkers attending this university than predicted.

Previous studies concluded that highly anxious undergraduates drink substantially more than undergraduates with low anxiety (Kalodner, et al., 1989; Stewart et al., 1995), that there is a reliance on alcohol to deal with anxiety (Cheng et al., 2004; Miller et al., 2002; Windle & Barnes, 1988)), that anxiety is common and frequent among students (Borden, Peterson, & Jackson, 1991; Craske & Kruger, 1990; Gotlib, 1984; Linder, Paulhus, & Dobson, 1986; Nezu, Nezu, & Nezu, 1986; Tanaka-Matsumi & Kameoka, 1986), and that the onset of anxiety precedes high-risk drinking (Brady & Verduin, 2005; Carey & Carey, 1995; Cargiulo, 2007; Kieffer et al., 2006; Paparrigopoulos et al. 2007; Stewart et al., 1997). For this study, a significant positive relationship for high anxiety and frequent high-risk drinking for both genders was indicated; no significant relationships were indicated for depression. Frequent high-risk drinking males reported more than twice the level of anxiety ($M = .62$) than non-drinkers ($M = .35$), and nearly twice the level than low-risk drinkers ($M = .39$). Frequent high-risk drinking females reported nearly twice the level of anxiety ($M = .77$) than non-drinkers ($M = .41$), and nearly twice the level than low-risk drinkers ($M = .47$). As predicted from previous studies, females were more anxious overall than males (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995; Oliver et al, 1998; Wittchen & Jacobi, 2005). This high level of anxiety, when combined with significant findings from the focus groups, becomes a recipe for undergraduate frequent high-risk drinking.

Focus groups indicated that drinking is the preferred social activity for students; it is the easiest and most opportune way to gather, mingle, and meet other students. Intense and frequent drinking brings students together and provides a strong sense of communal belonging.

Implications and Recommendations for Research

This investigation confirms the hypothesis that the presence of anxiety is greatest for undergraduates, more particularly for females, who engage in frequent and high-risk drinking behaviors. This finding poses serious implications for institutions of higher

education who are interested in developing and implementing innovative programs that effectively reduce the incidence of undergraduate high-risk and frequent high-risk drinking. Before best practices can be put into place, university leaders must first have valid and reliable data that increases their understanding of students' anxieties.

For example, it may be surmised that undergraduates today are less prepared than previous generations of students for the rigors of collegiate life; this lack of preparation may cause unnecessary anxiety for which students hypothetically self-medicate with alcohol (Stuber & Otto, 1995). For this study, all three focus groups mentioned the need for undergraduates to improve their life skills: organizational skills, interpersonal skills, and problem solving skills. Additionally, it is well known that many parents fit the definition of the 'helicopter parent'; those who hover over their college student and parent them as if they were still in high school (Howe & Strauss, 2000; Levine & Cureton, 1998). Such hovering can make it difficult for undergraduates to free themselves of their dependency on parental authority and learn life skills necessary to effectively lead their own lives. Research is needed to confirm whether poor academic preparation, poor life skills, and 'helicopter parents' are factors that significantly contribute to students' anxieties before best practices that address these factors can be instituted.

In summary, a subjective understanding of what causes anxiety in students alone will not give university leaders the reliable information needed to understand why significantly high numbers of anxious undergraduates engage in high-risk and frequent high-risk drinking. Dependable and reliable research to determine the causality of anxiety in today's undergraduate is recommended. Institutional leaders need this knowledge base to develop best practices that work to effectively improve students' ability to cope with anxiety without self-medicating with alcohol.

Implications and Recommendations for Intervention

In order to effectively reduce high-risk drinking, and limit institutional liability, it is necessary to effectively identify, refer for services, and provide support to frequent high-risk drinking undergraduates, as these students are perceived as setting a norm for high-risk drinking behavior on campus. Effectively educating the larger student body about misperceived norms can be accomplished with social norms interventions.

Finally, university leaders must review existing student alcohol use policies and find better ways to promote student wellness, parental involvement, and overall accountability toward the university and surrounding community for drinking behavior. In brief, university leaders must effectively transform a culture of drinking into a culture of wellness.

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Appendix A

Definition of Terms

Anxiety: an uneasiness or distress about future uncertainties; a perceived threat to one's safety and security.

Comorbidity: the concurrent presence of two or more unhealthy, or morbid, events. For example, the presence of high-risk drinking and anxiety and/or depression at the same time.

Depression: a condition marked by insomnia, inability to concentrate, feelings of sadness, melancholy, grief, dejection, or guilt.

Drinking behavior groups: there are four types of drinking behavior for the purposes of this study; non-drinking, low-risk drinking, high-risk drinking, and frequent high-risk drinking.

Frequent high-risk drinking: high-risk drinking on at least six occasions over a 30 day period.

High-risk or binge drinking: heavy, episodic drinking on the part of a male student who consumes five or more alcoholic drinks on at least one occasion over a 2 week period, and for women as four or more drinks (Durodoye, Harris, & Bolden, 2000; Kapner, 2003; Wechsler, Dowdall, Davenport, & Castillo, 1995); considered an alcohol abuse disorder as defined in the DSM-IV, 4th edition.

Low-risk drinking: the consumption of less than five drinks by a male student and four drinks by a female student on at least one occasion over a two week period; also known as social drinking.

Substance Use Disorder: alcohol abuse or dependency as defined in the DSM-IV.

Appendix B
Questionnaire for Students

Please complete each of the following items. The items are included to assist in more accurately reviewing the information.

1. Your gender:

   _____ Female

   _____ Male

2. Your ethnic descent:

   _____ Caucasian

   _____ Non-Caucasian

3. Your student residency:

   _____ Campus housing

   _____ Off-campus housing

4. Your class group:

   _____ Freshman/1st Yr.

   _____ Sophomore/2cnd Yr.

   _____ Junior/3rd Yr.

   _____ Senior/4th Yr.

5. Your age:

   _____ 18 to 22

   _____ 23 and older

Appendix C

Alcohol Use Disorders Identification Test

Questions 1-10 **Please CIRCLE your answer.**
1. How often do you have a drink containing alcohol? Never Monthly 2-4 time per month 2-3 days a week 4,5,6,or 7 days a week
2. How many drinks containing alcohol do you have on a typical day when you are drinking? 0,1 ,or 2 drinks 3 or 4 drinks 5 or 6 drinks 7,8,or 9 drinks 10 drinks and above
3. For women: How often do you have 4 or more drinks a day? For men: How often do you have 5 or more drinks a day? Never Less than monthly Monthly Weekly Daily or almost daily
4. How often during the last year have you found that you were not able to stop drinking once you started? Never Less than monthly Monthly Weekly Daily or almost daily
5. How often during the last year have you failed to do what was normally asked of you because of drinking? Never Less than monthly Monthly Weekly Daily or almost daily
6. How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session? Never Less than monthly Monthly Weekly Daily or almost daily
7. How often during the last year have you had a feeling of guilt or remorse after drinking? Never Less than monthly Monthly Weekly Daily or almost daily
8. How often during the last year have you been unable to remember what happened the night before because you had been drinking? Never Less than monthly Monthly Weekly Daily or almost daily
9. Have you or has someone else been injured as a result of your drinking? No Yes, but not in the last year Yes, during the last year
10. Has a relative, friend, doctor or other health worker been concerned about your drinking or suggested you cut down? No Yes, but not in the last year Yes, during the last year

Appendix D
Qualitative Focus Group Questions

Opening Question

1. What do you consider to be the single biggest social problem facing students attending this university today.

Introductory Questions

2. Describe, in your own words, what high-risk drinking, also known as binge drinking, means to you and how you feel about high-risk drinking.

Key Questions

3. What explanation would you give for why students engage in high-risk drinking?
4. What circumstances, conditions, or situations would you think increase the chances that a student would engage in high-risk drinking?
5. What reasons would you give for a student who engages in high-risk drinking six or more times in a 30 day period?

Ending Question

6. If you had an opportunity to give advice to the university as to how to reduce high-risk drinking among students, what advice would you give?

Appendix E

Table 5
Means and Standard Deviations for Anxiety and Depression for Drinking Behavior Groups by Gender

		Anxiety		Depression	
Gender	*n*	*M*	*SD*	*M*	*SD*
Female					
ND	64	.41	.89	.28	.77
LRD	149	.47	.78	.20	.56
HRD	154	.69	.92	.34	.77
FHRD	118	**.77**	.94	.33	.74
Male					
ND	64	**.25**	.71	.17	.61
LRD	103	.39	.80	.29	.74
HRD	118	.40	.71	.22	.60
FHRD	172	.62	.93	.34	.83
F – Value		4.480		1.01	
Significance		.001*		.425	
Summary of Significant Differences		Female FHRD > Male ND			

Note. FND = Female Non-Drinkers, FLRD = Female Low-Risk Drinkers, FHRD = Female High-Risk Drinkers, FFHRD = Female High-Risk Drinkers, MND = Male Non-Drinkers MLRD = Male Low-Risk Drinkers, MHRD = Male High-Risk Drinkers, MFHRD = Male Frequent High-Risk Drinkers

Appendix F

Table 6
Levels of Anxiety and Depression in the Non-Drinking Group by Gender

	Gender					
	Male		Female			
	n = 64		*n* = 64		*t*	Significance
	M	*SD*	*M*	*SD*		(2 -tailed)
Anxiety	.25	.71	.41	.89	1.099	.274
Depression	.17	.61	.28	.77	.896	.372

Table 7
Levels of Anxiety and Depression in the Low-Risk Drinking Group by Gender

	Gender					
	Male		Female			
	n = 103		*n* = 149		*t*	Significance
	M	*SD*	*M*	*SD*		(2 -tailed)
Anxiety	.39	.80	.47	.78	.811	.418
Depression	.29	.74	.20	.56	-1.103	.271

Table 8
Levels of Anxiety and Depression in the High-Risk Drinking Group by Gender

	Gender					
	Male		Female			
	n = 118		*n* = 154		*t*	Significance
	M	*SD*	*M*	*SD*		(2 -tailed)
Anxiety	**.40**	.71	**.69**	.92	2.945	.004*
Depression	.22	.60	.34	.77	1.368	.173

Table 9
Levels of Anxiety and Depression in the Frequent High-Risk Drinking Group by Gender

	Gender					
	Male		Female			
	n = 172		*n* = 118		*t*	Significance
	M	*SD*	*M*	*SD*		(2 -tailed)
Anxiety	.62	.93	.77	.94	1.387	.167
Depression	.34	.83	.33	.74	-.131	.896