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Associations among trauma, depression, and alcohol use profiles and treatment motivation and engagement in college students

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Abstract

Objective—This study examined how profiles of alcohol use and symptoms of common mental health disorders (depression and posttraumatic stress disorder [PTSD]) influenced the perceived need for and actual seeking of different types of treatment (for alcohol versus psychological distress) in college student drinkers.

Participants—Undergraduate students ($n = 164$) were assessed between September 2009 and August 2015.

Methods—We classified students into different symptom profiles using model-based clustering and compared these profiles on a variety of variables.

Results—The cluster model yielded three profiles: Low Risk ($n = 66$), Concomitant ($n = 35$), and Heavy Drinking ($n = 63$). Students in these profiles significantly differed in alcohol consumption, alcohol-related cognitions and problems, and perceptions of need and prior engagement in treatment.

Conclusion—A variety of strategies can be used to engage students experiencing heavy drinking and/or mental health problems into treatment on campus.

Keywords

Alcohol; college students; depression; PTSD; treatment seeking

Recent national studies estimate that approximately 65% of college students drink alcohol on a monthly basis.¹ However, many consume alcohol at or above the heavy episodic drinking (HED) threshold (ie “binge” drinking, defined as 5+/4+ drinks in a single setting for men/women).^{2–5} This style of drinking places students at increased risk for a multitude of negative consequences that range from hangovers to more severe problems; for example, alcohol use among college students is associated with 5,99,000 injuries, 97,000 sexual assaults, and 1,800 deaths on a yearly basis.^{6,7} However, heavy drinking by itself is unlikely to spur college students to seek treatment; in large scale surveys the majority of college students reporting symptoms of alcohol abuse or dependence tend not to view their own alcohol use as a problem⁸ and only 5–13% of students endorsing HED alone report being in treatment.^{9,10}

The years of the typical college career (18–24) are characterized not only by a widespread alcohol use but also by the first onset of lifetime mental health disorders.^{11,12} The prevalence and severity of mental health problems in college students, or at least of help-seeking behaviors, appears to have increased in the past 20 years.¹³ In addition to alcohol and substance use, mood problems (including depressive symptoms) and reactions to traumatic and otherwise stressful events (including posttraumatic stress disorder [PTSD] symptoms) are common among college students and often are the impetus for seeking and receiving mental health treatment.^{9,10,14–19} Depression and PTSD symptoms often cooccur with each other and with substance use disorder (SUD) symptoms,^{20,21} and it has been hypothesized that students may be using substances, including alcohol, to cope with these elevated levels of distress.^{22–24} The cooccurrence of substance use and mental health symptoms results in greater distress and impairment and thus greater need for mental health services.^{10,17,25} In addition, secondhand effects of alcohol (eg sleep disturbance, exposure to potentially threatening situations) have also been associated with worse mental health outcomes.²⁶

Engaging college students in treatment as soon as mental health symptoms manifest is of primary importance, given that longitudinal data indicates that, rather than resolving on their own, these problems tend to persist for prolonged periods of time.¹⁷ Research has indicated that a median of 11 years passes between onset of mental health disorders and engagement in treatment²⁷, and untreated mental health problems can lead to significant social, educational, and academic impairment.^{13,17,28} Unfortunately, despite an increase in help-seeking behavior in recent years,^{29,30} most of the college students tend not to engage in treatment: large scale surveys indicate that less than half of the college students with significant mental health problems have received services in the past year.^{9,10,13,31,32} Longitudinal research indicates that 60% of students with mental health problems at baseline report that they do not need help and almost half of those reporting problems over 2 years continue to report that they do not need help for their symptoms.¹⁷ Particularly, problematic is the low treatment engagement among young adults with SUDs.^{9,10}

Perceiving a need for help appears to be an important first step toward seeking treatment. Of those students who perceive a need for formal mental health treatment,^{33,34} significant predictors of perceived need for help include having disorders related to dysregulated mood (eg major depressive disorder, generalized anxiety disorder) and being female.³⁴ Still, not all

students who perceive a need for help seek and receive treatment, as only approximately 50% of students who report that they need help actually receive treatment.³¹ Attitudes and beliefs regarding mental health and treatment likely contribute to these trends. For example, students often do not seek treatment because they do not perceive their problem to warrant help or intervention, often preferring support from friends or family.^{28,31,34} Students also may not engage in treatment-seeking because they do not believe that their mental health problems can change: One recent study of college students indicated that students who did not believe that it was possible to change their symptoms (eg their level of anxiety) were less likely to seek therapy for these problems.³⁵ Students with untreated mental health problems do not seek services due to beliefs such as the problem will get better by itself, stress is normal in college or graduate school, their problem is not serious enough, they prefer to handle their problems on their own, and/or they do not have the time to seek treatment.³¹ Thus, even when students are aware of their distress on some level, they do not necessarily perceive treatment as urgent, essential, or efficacious.

Most studies that have examined treatment engagement (or lack of thereof) among college students have focused primarily on students with mood or anxiety problems.^{18,31,33,34,36} However, less is known about treatment engagement and barriers to treatment among heavy drinking college students.^{7,37} To our knowledge, prevalence of treatment interest and engagement in heavy drinkers has been scarcely examined.^{9,10,16} In one of the few studies to have been conducted on this topic, Cranford and colleagues¹⁰ examined the perceived need for help among students reporting binge drinking and found that approximately 67% of students reporting frequent binge drinking with mental health problems expressed a perceived need for treatment (and 25% reporting being in therapy) versus 24% (7% in therapy) of those without mental health problems. Treatment engagement (ie whether those who perceived a need for treatment sought or received mental health services) was not examined.

In the current study, we considered the intersection of depression, PTSD, and alcohol use in order to provide more sophisticated strategies to engage college students in mental health treatment. Research indicates that students have significant needs for mental health treatment yet are slow to engage in formal psychological treatment, with the lowest rates of engagement in students with SUDs.^{9,16} To date, treatment engagement has tended to be conceptualized in the context of only one type of distress (depression, PTSD, and substance use), rather than multiple, cooccurring types of distress. Furthermore, students know where to access treatment but the majority do not do so; perhaps engagement rates could be enhanced by matching knowledge of available treatments with the symptoms that are causing the most concern or distress to the student. Currently, it is not known how preferences about treatment-seeking would differ between students with heavy drinking and students with comorbid mental health symptoms. Therefore, we first sought to determine systematically whether there are theoretically and meaningful profiles derived from the three most common reasons that students would be appropriate for treatment (symptoms of depression, PTSD, and heavy drinking as indicated by weekly alcohol use). Second, we examined whether these profiles differed on demographic, cognitive (ie drinking motives, drinking expectancies, and readiness to change drinking), and other aspects of alcohol use (eg problems) that could influence treatment engagement. Third, we examined the

differences among these profiles regarding perceived need for engagement in treatment, as well as knowledge of the mental health services that were available on campus. Finally, we provide specific recommendations and strategies for engaging members of these different profiles in treatment.

Methods

Participants

One-hundred and sixty-four participants (53.7% female, $n = 88$) were recruited locally from 4-year public university in the Northeastern United States via introductory psychology courses and advertisements in the community (eg flyers, newspaper ads, Craigslist, etc). All participants were full-time undergraduate students and between the ages of 18–24 ($M_{\text{age}} = 19.29$, $SD = 1.43$). In order to participate, students were required to have reported consuming alcohol at least once in the 3 months prior to recruitment. Approximately 41.5% of participants were in their freshman year of college and 57.3% of participants lived on campus. Ethnicity was reported as follows: 73.8% Caucasian, 7.3% Asian, 7.3% black, 9.7% other/multiracial, and 1.2% Pacific Islander. Additionally, 7.3% of participants identified as Hispanic/Latino.

Procedure

Eligible students were invited to participate in a 2-hour initial assessment session, at which they completed interview and self-report assessments (see below). All students received either course credit through a psychology research subject pool or \$20 for their time. At the completion of this assessment, participants were debriefed and provided with a list of local mental health resources, which they could access in case they felt distressed. Participants were then invited back to the lab approximately 1 week later for the second portion of the study (a two-and-a-half hour session) in which they completed self-report measures assessing alcohol-related behaviors during the previous year. Participants received either course credit or \$30 as compensation for this second portion of the study. All study procedures were approved by the local Human Subjects Institutional Review Board.

Measures

Trauma and PTSD—Participants were interviewed using the *Life Events Checklist* LEC;³⁸ and the *Clinician Administered PostTraumatic Stress Disorder Scale for DSM-IV* CAPS;³⁸ to assess for PTSD as defined by the DSM-IV-TR.³⁹ The LEC comprises a list of 16 potentially traumatic events that may have been personally experienced, witnessed, or learned about happening to someone close. Interviewers probed the three most upsetting events to determine whether any constituted a Criterion A trauma consistent with the DSM-IV-TR (ie event involving actual or threatened death/serious injury/threat to physical integrity accompanied by an emotional response of fear, helplessness, or horror). Past month PTSD symptoms were assessed to determine current PTSD status. The CAPS has excellent psychometric properties,⁴⁰ including concurrent validity with the Structured Clinical Interview for the DSM-IV-TR.^{41,42} All interviews were digitally audio-recorded and inter-rater reliability was conducted both between interviewers and by an outside consultant

psychologist with extensive training on the CAPS. Total number of symptoms endorsed by the participants was used in the cluster analyses.

Depression—To assess current general depression symptoms, participants completed the *Patient Health Questionnaire-8* PHQ-8;⁴³ which asks participants how often in the past 2 weeks (ranging from 0 (*Not at all*) to 3 (*Nearly every day*)) they have experienced the DSM-IV-TR symptoms for major depression (minus suicidality). A cutoff score of 10 is indicative of a depressive disorder.⁴³

Alcohol use—A measure modeled after the *Daily Drinking Questionnaire* DDQ⁴⁴; was used to assess alcohol quantity and frequency over the past 6 months. Respondents were provided with a definition of a standard drink and asked to report the number of standard drinks consumed on a typical Monday, Tuesday, Wednesday, etc, in the past 6 months. From participants' responses on this measure, we calculated number of drinks consumed per week, number of days spent drinking per week, and number of heavy episodic/binge episodes per week.

Drinking motives—The 20-item *Drinking Motives Questionnaire* DMQ⁴⁵; was used to assess four domains of drinking motives, Coping, Conformity, Enhancement, and Social Reinforcement (five items per subscale). Respondents rated frequency for each reason for drinking on a scale from 1 (almost never/never) to 5 (almost always/always). Each of the four subscales loads on a higher-order factor, representing stronger motivations to drink alcohol.

Alcohol expectancies—Self-reported expectancies for alcohol's effects were assessed with 35 items from Kushner et al,⁴⁶ which assess a range of relatively static beliefs about positive alcohol effects. These items form four subscales: Tension Reduction, Social Facilitation, Activity Enhancement, and Performance Enhancement. Items are rated dichotomously (yes/no) such that participants responded as to whether they believed each descriptor to be true about the effects of alcohol for them. Higher scores reflect stronger endorsement of positive beliefs about alcohol. A summed score reflects global positive alcohol beliefs.

Readiness to change—The *Readiness to Change Questionnaire* RCQ;⁴⁷ measured participants' motivation or readiness to change their current drinking patterns. The three items for each stage of change (precontemplation, "*I don't think I drink too much*"; contemplation, "*My drinking is a problem sometimes*"; and action, "*I am trying to drink less than I used to*") were measured on a 5-point scale (ranging from -2 to +2) and summed. Each of the stage of change scores range from -6 to +6.

Alcohol-related problems—The *Young Adult Alcohol Consequences Questionnaire* YAACQ;⁴⁸ is a 48-item self-report measure assessing alcohol-related consequences commonly experienced by college students in the past year. Each consequence is rated dichotomously (happened/did not happen) so that the sum score reflects the total number of consequences experienced. This measure has demonstrated good psychometric properties.^{48,49} In this sample, the eight domains of alcohol-related problems demonstrated good

internal consistency: Social/Interpersonal Consequences ($\alpha = .84$), Impaired Control ($\alpha = .78$), Self-Perception ($\alpha = .89$), Self-Care ($\alpha = .87$), Risky Behavior ($\alpha = .86$), Academic/Occupational Consequences ($\alpha = .90$), Physiological Dependence ($\alpha = .65$), and Blackout Drinking ($\alpha = .90$). All domains load onto a single higher-order consequence factor ($\alpha = .95$).

Psychological services questionnaire—Research⁵⁰ has shown that college students would be interested in seeking psychological services if they were more aware of service availability, location, and cost. We developed a 19-item measure to inquire about participants' knowledge of/access to/and utilization of psychological services on campus. Items assessed: (a) participant interest in seeking services for drug/alcohol use or psychological distress; (b) whether they sought treatment services on campus; and (c) familiarity with campus treatment options.

Data analysis

We sorted participants into profiles based on symptom endorsement (LEC; PHQ-8) and weekly drinking quantity (DDQ) using model-based cluster analysis. Model-based clustering is a method of cluster analysis that integrates the benefits of cluster analysis (eg use with modestly sized samples) with the precision of latent variable analyses, such as latent class analysis, see.⁵¹ Model-based cluster analysis yields a single clustering solution based on model fit indices and cluster dispersion through geometric space, for review, see.⁵² We implemented model-based cluster analysis using the “mclust” package in R.⁵³

After establishing group membership using model-based cluster analysis, we tested for differences between profiles using analysis of covariance (ANCOVA) controlling for sex (given differences in sex across profiles; see below) for continuous variables (ie symptoms) and χ^2 for categorical variables (ie answers to questions about psychological services). With the exception of drinking days per week and HED (which were derived from the same scale as weekly drinking quantity, the DDQ), all outcomes variables were measured independently of the variables used in the cluster analysis (depressive symptoms, PTSD symptoms, and weekly drinking quantity). All between-group comparisons following a positive omnibus test were calculated using a Bonferroni correction ($p = .05/3 = .0133$).

Results

Psychometric information (means, *SDs*, and inter-item consistencies) and correlations between the variables are provided in Table 1. Correlations ranged from null to large-sized but were modest on average ($r_M = .17$). Significant symptomatology was evident in the sample: over a quarter of participants (26%, $n = 43$) exhibited a clinical elevation (defined as PHQ-8 score greater than 10) in depressive symptoms, almost a fifth (17%; $n = 28$) met diagnostic criteria for PTSD on the CAPS, and 70% ($n = 114$) reported weekly drinking above the recommended cutoffs of 14 drinks per week for men and 7 drinks per week for women.⁵⁴

Results of model-based cluster analysis of symptoms indicated that the best-fitting solution was a three-profile model (BIC = -1169.73 ; diagonal dispersion with varying volume and

shape). Average likelihood of profile membership was 90% (range: 48–100%) with 99% of individual cases having a group membership likelihood of > 50%. Preliminary examination of symptoms across profiles suggested that they could be classified as (a) Low Risk, (b) Concomitant, and (c) Heavy Drinking (see Figure 1). Comparison of these three profiles did not differ significantly according to age or race, but there was a significant difference across profiles in terms of sex ($\phi_C = .25, p < .05$), with more women than men in the Concomitant profile ($n_{\text{women}} = 27, 77\%$) than in the Low Risk ($n_{\text{women}} = 31, 47\%$) and Heavy Drinking ($n_{\text{women}} = 30, 48\%$) profiles. To address these gender differences, we examined differences across profiles using ANCOVA controlling for sex. Results indicated generally large differences between profiles in terms of symptoms (see Table 2). As expected, the Concomitant profile exhibited significantly more depressive symptoms and PTSD symptoms than both the Heavy Drinking and Low Risk groups. The Heavy Drinking profile endorsed consuming more drinks per week and bingeing more often than the Low Risk group, but did not drink or binge more than the Concomitant group. Results also revealed medium-sized differences between profiles in 4 of 8 negative alcohol consequence domains, with the Concomitant group endorsing significantly more consequences than the Low Risk group. Last, a few differences between profiles were found in drinking motives, expectancies, and readiness to change.

We next compared the three profiles in terms of members' endorsement of 19 questions about treatment services. Profiles differed on 10 of 19 questions, and these statistically significant comparisons are listed in Table 3. Overall, the Concomitant and Heavy Drinking profiles reported similar responses. However, a lower percentage of the Concomitant group responded "no" to being in psychological distress over the past 4 weeks and that they have been more likely to know exactly where to locate campus resources for distress. Size of differences in question endorsement ranged from modest to large, indicated by Cramer's V (ϕ_C).

Discussion

To our knowledge, this is the first study to identify profiles of college students based on psychological distress (depression, PTSD) in combination with alcohol involvement – two significant mental health issues in college students that commonly cooccur. This is in contrast to prior work that has examined treatment attitudes and beliefs among students with only one type of distress.³³ The Low Risk, Concomitant, and Heavy Drinking profiles that emerged in this study differed significantly in sex, cognitive, and alcohol-related variables as well as perceived and received treatment services, suggesting distinct treatment and intervention implications. The focus on personal insight into distress from psychological symptoms or substance use was also novel, as other studies have examined only perceived need for treatment or actual engagement.¹⁰ Findings have significant clinical and research implications.

Females were more likely to be in the Concomitant profile. This is consistent with previous research finding greater symptoms of depression, anxiety, and/or PTSD in females than males,^{15,55,56} and suggests that female students may present with more complex profiles of psychological symptoms. We also observed expected differences in heavy drinking between

the Low Risk, Concomitant, and Heavy Drinking profiles. The Concomitant and Heavy Drinking profiles reported greater use of alcohol for social lubrication than the Low Risk profile, and also reported significantly more alcohol-related consequences involving self-care, engaging in more risk behaviors, worse academic/occupational functioning, and more symptoms of dependence. However, there were no differences between the Concomitant and Heavy Drinking profiles on coping motives and tension reduction expectancies. As such, these profiles do not appear to be at increased risk for drinking to cope with their distress (ie self-medication).

Regarding drug/alcohol treatment, both perceived need for and previous engagement in substance treatment were markedly low among the Concomitant and Heavy Drinking profiles. These data are consistent with previous research: Blanco and colleagues⁹ reported that 5% of college students had received treatment for alcohol or drug disorder in the past year and Cranford and colleagues¹⁰ found that only 13% of frequent binge drinkers were taking medications or were receiving counseling. Another study⁵⁷ showed that the *heavier* the alcohol use, the more likely students were to report that mental health services were not needed due to problems being minor or transient. In the current sample, the overall low levels of alcohol-related consequences, and lack of differences between the Concomitant and Heavy Drinking groups on several of the subscales, may have limited the salience of the need to engage in treatment.

Specific recommendations for enhancing treatment engagement

Enhance screening and assessment efforts—Compared to the Low risk profiles, the Concomitant and Heavy Drinking profiles exhibited a greater endorsement of psychological distress, whether they should get therapy for their distress and whether it would help, and working on getting therapy. The equivalence across the two profiles suggests that screening for psychological distress may engage and interest individuals in treatment, even those that are primarily reporting heavy alcohol use. That said, many students do not see mental health distress or alcohol use as urgent enough to compete with other demands on their time and attention.^{31,57} Students may want to cope with stress on their own, or simply, view stress as a normal part of the college experience and/or do not have time to seek and engage in therapy.^{31,33} This is a concern, as normalization of personal distress can lead to a cycle of avoidance²⁵ in which stress gradually increases (and is explained away as normative) until a crisis is reached. Here are many different types of outreach and screenings that have been developed, such as a phone-based triage system that is available for distressed students or the QPR (Question, Persuade, Refer) system, which provides guidance to campus faculty and staff on how to connect students with mental health services.¹³ Such efforts can put students' psychological distress and/or drinking in the proper context, dispelling the belief that "everyone else is dealing with the same thing." The importance of the timing of screenings is highlighted by research indicating that alcohol-related consequences are prevalent in students with PTSD symptoms early, rather than later, in the academic year.¹⁵ Universal screenings in college, especially during matriculation, may identify students who could benefit from treatment. In addition, although there have been several screening and referral programs implemented,¹³ there is little empirical research demonstrating the impact of screening and outreach efforts on mental health treatment engagement. New technologies,

such as smartphones, are ubiquitous among college students and may offer a more efficient and cost-effective means of screening college students for psychological distress and/or heavy alcohol use.^{58,59}

Enhance knowledge and awareness of treatment options—Fortunately, access to mental health treatment does not seem like a major hurdle, given that college students tend either to have health coverage or have access to free counseling services on campus and providers are most commonly located on campus, in the students' hometown, or in the community near campus.³¹ Several reasons may explain why these students choose not to engage in treatment and each of them can be addressed with specific strategies. First, approximately 30% of the students in the Concomitant and Heavy Drinking profiles reported distress but chose not to seek help. Students often report that they do not seek treatment because they believe stress, and maybe distress, is normal in college or that their problems are not "serious."^{33,34,57} Educating students about "normal" and "not normal" stress may encourage students to seek help. Second, students may think treatment will not be helpful. For these individuals, education about the efficacy of evidence-based treatments, as well as realistic changes to be expected from treatment, may help to dispel misperceptions about the utility of engaging in treatment.³³ In this sample, more people were willing to consider treatment for psychological distress than for drinking/drug use, regardless of profile type. Stigma is not a very common barrier to mental health treatment among untreated college students,³³ but there may be stigma surrounding SUD treatment or an underlying perception that substance use treatment has to be separated from psychological therapy. These perceptions could be challenged by treatment providers educating students about integrated therapy and how addressing substance use does not necessarily mean rehabilitation, 12-step meetings or abstinence-based approaches. Third, time commitment is often cited as a reason for not engaging in treatment. Thus, educating students about length of treatment or promoting brief interventions may encourage individuals to more readily seek services. Finally, lack of knowledge regarding where to receive services may be an issue. That said, over half of the students in our sample reported that they did not know where to go to receive counseling services on campus. This is consistent with previous research,³⁴ and underscores that universities can do more to educate students about where to find mental health treatment.

Provide flexible, multimodal interventions—Students who drink heavily, who do not currently engage in treatment, may find interventions that focus on improving aspects of their life that they consider of importance (eg stress, sleep, weight, and health) valuable. Findings from the literature on brief motivational interventions are, particularly, relevant as reductions in alcohol use and/or problems have been reported in students with cooccurring depressed mood⁶⁰ and posttraumatic stress symptoms.⁶¹ Therefore, psychological distress may spur interest in treatment for alcohol use, especially if delivered in a face-to-face format and detailing the link between alcohol use and psychological symptoms. Flexibility in the format used to deliver the treatment could also be appealing to students who cite time as a concern regarding treatment engagement.⁵⁷ Consideration can also be taken to optimally match institutions with the type and modality of treatment. For example, higher mental health symptoms and lower treatment utilization were evident on campuses that were public,

large,³¹ and nonresidential.⁶² For these sites, mailed or mobile delivery (or enhancement) of treatments may be particularly appropriate.

Limitations/Future directions

Findings should be considered in the context of some limitations. First, though many local-area colleges were represented in this sample, data were collected in one geographical region. As multisite research has revealed that there is also considerable variation by campus regarding mental health symptom severity and treatment engagement,^{31,62} it is difficult to determine how these findings will generalize to other campuses. This sample of students was primarily white and nonHispanic, and white students are more likely to receive mental health treatment than those of Asian, black, or Hispanic race/ethnicity.³¹ Second, only campus options for treatment were assessed. As students may also receive treatment in the community or in their hometowns,³¹ estimates of treatment engagement may have been low. Regarding actual self-reported past treatment, the rates of previous treatment engagement (13% of the sample was lower than previous research in which the proportion who received any services ranged from 16 to 63%, depending on the disorder.^{31,34} Third, although our use of cluster analysis allowed us to classify participants into empirically derived symptom profiles (eg as opposed to creating groups via symptom cut-offs or median-splits), these profiles were limited by the kinds of problems we assessed (alcohol use, symptoms of PTSD, and depression). We focused on some of the most common symptoms of distress in college populations but did not assess other psychological problems that are also common among college students (eg disordered eating, social anxiety, and generalized anxiety). Similarly, we focused on alcohol use (at least once in past 3 months) and not on hazardous use of other substances.^{10,17,31} These will be important areas for future investigation. Fourth, the cross-sectional nature of the data limits our ability to examine the interaction of mental health and alcohol use over time. Recent research has demonstrated that negative coping strategies mediate the association between PTSD symptoms and alcohol-related consequences,²⁴ a relationship with clear implications for perceptions of psychological distress and treatment engagement. Finally, with the exception of PTSD, all constructs were assessed via self-report. Thus, rates of depression symptoms may be either over- or underestimated in the present study. Although there has been little evidence that college students intentionally bias their responses assessing alcohol use,⁶³ structured clinical interviews, and collateral collaboration would enhance confidence in the validity of the data.

In sum, concurrent examination of depressive and PTSD symptoms and weekly alcohol use in a college sample resulted in three unique profiles that inform current treatment on college campuses. Overall, students in the Concomitant and Heavy Drinking profiles demonstrated low levels of interest and engagement in any type of treatment. Therefore, enhanced screening and flexible interventions may increase the number of students who choose to engage in treatment that can reduce their psychological distress and alcohol use.

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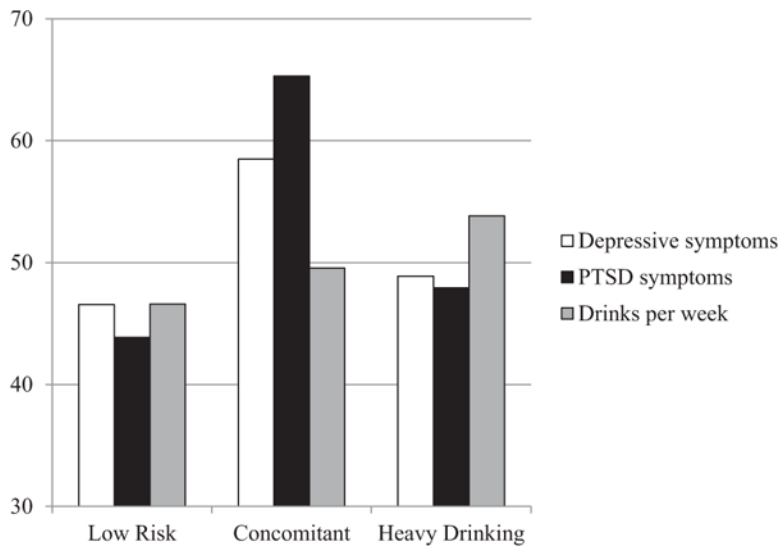


Figure 1.
Symptom severity profiles (T-scores).

Table 1

Psychometric information and correlations between variables.

	1	2	3	4	5	6	7	8	9	10	11	12	
1. Depressive symptoms	(.84)												
2. PTSD symptoms	.39	(.89)											
3. Drinks per week	.02	-.04	(.76)										
4. Drinking days per week	.07	.03	.67	—									
5. HED per week	-.01	-.07	.84	.41	—								
6. Social	.12	-.03	-.13	-.12	-.05	(.87)							
7. Coping	.12	.09	.20	.19	.15	-.65	(.83)						
8. Enhancement	-.02	.03	.01	.04	.01	-.46	.48	(.83)					
9. Social pressure/conformity	.00	-.10	.39	.15	.41	-.01	.11	-.15	(.84)				
10. Tension reduction	.33	.16	.12	.10	.10	-.03	.21	-.04	.29	(.71)			
11. Social lubrication	-.02	.01	.34	.19	.34	-.04	.13	-.19	.70	.42	(.66)		
12. Activity enhancement	.04	.05	-.07	-.14	-.05	-.12	.02	.01	.27	.20	.13	(.63)	
13. Performance enhancement	.19	.17	.15	.10	.12	-.07	.19	.03	.16	.59	.32	.00	
14. Precontemplation	.09	.08	.15	.04	.06	-.09	.14	-.02	.41	.43	.50	.28	
15. Contemplation	-.01	-.05	.30	.29	.18	-.14	.24	-.01	.30	.27	.45	-.06	
16. Action	.15	.22	.03	.06	-.04	-.02	.08	-.02	.11	.36	.22	.08	
17. Social/interpersonal	.14	.12	.04	.07	-.05	-.25	.39	.28	.12	.21	.21	.06	
18. Impaired control	.08	.24	.19	.17	.12	-.34	.45	.32	.12	.27	.13	.23	
19. Self-perception	.23	.15	-.05	.04	-.02	-.26	.28	.37	-.03	.30	.04	.17	
20. Self-care	.34	.22	.16	.18	.12	-.16	.31	.33	.05	.23	.14	.04	
21. Risky behavior	.25	.17	.27	.22	.15	-.16	.34	.18	.23	.33	.32	.11	
22. Academic occupational	.22	.17	.41	.38	.35	-.20	.26	.09	.16	.20	.21	.02	
23. Dependence	.02	.18	.22	.20	.18	-.12	.35	.13	.16	.19	.25	.01	
24. Blackout	.01	.09	.33	.19	.31	-.16	.36	.12	.35	.21	.40	-.04	
25. Total drinking consequences	.26	.25	.30	.27	.22	.23	.37	.33	.11	.35	.32	.28	
Mean	6.74	5.40	14.73	3.15	1.58	12.59	10.72	10.57	17.85	11.43	15.37	8.32	
SD	5.01	8.36	10.22	1.50	1.23	2.88	3.51	3.85	4.46	4.65	4.60	3.77	
	13	14	15	16	17	18	19	20	21	22	23	24	25

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	1	2	3	4	5	6	7	8	9	10	11	12
1. Depressive symptoms												
2. PTSD symptoms												
3. Drinks per week												
4. Drinking days per week												
5. HED per week												
6. Social												
7. Coping												
8. Enhancement												
9. Social pressure/conformity												
10. Tension reduction												
11. Social lubrication												
12. Activity enhancement												
13. Performance enhancement												
14. Precontemplation		.43										
15. Contemplation		.43	.32									
16. Action		.31	.36	.22								
17. Social/interpersonal		.10	.20	.12	-.05							
18. Impaired control		.33	.19	.26	.18	.34						
19. Self-perception		.26	.19	.08	.09	.44	.41					
20. Self-care		.24	.22	.15	.12	.43	.38	.55				
21. Risky behavior		.26	.34	.21	.17	.53	.33	.31	.41			
22. Academic occupational		.20	.11	.13	.11	.34	.31	.19	.45	.43		
23. Dependence		.30	.24	.30	.15	.23	.39	.09	.25	.23	.19	
24. Blackout		.22	.21	.24	-.02	.36	.28	.20	.27	.50	.29	.15
25. Total drinking consequences		.13	-.31	.52	.35	.72	.64	.62	.74	.75	.62	.41
<i>Mean</i>	14.13	11.29	13.98	9.70	2.88	2.36	1.34	2.12	2.38	1.26	.73	3.85
<i>SD</i>	2.26	1.97	2.08	1.14	1.71	1.56	1.42	1.99	1.86	1.53	.78	2.09
												8.57

Note. All $r > |.15|$ significant at $p < .05$.

Cronbach's alpha listed on diagonal.

HED = Heavy Episodic Drinking.

Table 2
Comparisons of profiles on alcohol-related behaviors and cognitions, controlling for gender.

Symptoms	<i>F</i>	1. Low risk (<i>n</i> = 66)	2. Concomitant (<i>n</i> = 35)	3. Heavy drinking (<i>n</i> = 63)	Group comparisons (Cohen's <i>d</i>)	
					1 vs. 2	1 vs. 3
Depressive symptoms	14.09*	5.02 ^a	11.00 ^b	6.19 ^a	1.12	.92
PTSD symptoms	110.52*	.27 ^a	18.20 ^b	3.67 ^c	2.55	1.98
Drinks per week	10.07*	11.24 ^a	14.26 ^{a,b}	18.65 ^b		.78
Alcohol use						
Drinking days per week	2.15	2.88	3.23	3.38		
HED per week	3.78*	1.26 ^a	1.51 ^{a,b}	1.95 ^b		.62
Drinking motives						
Social	1.78	17.55	17.17	18.54		
Coping	1.60	10.64	12.31	11.78		
Enhancement	1.54	15.02	15.20	15.84		
Social pressure/conformity	1.53	8.12	8.91	8.19		
Drinking expectancies						
Tension reduction	2.68*	13.85	14.66	14.13		
Social lubrication	8.95*	10.83 ^a	11.43 ^b	11.70 ^b	.30	.45
Activity enhancement	3.10*	13.92	13.80	14.13		
Performance enhancement	2.17	9.55	9.86	9.78		
Readiness to change						
Precontemplation	1.71	13.14	12.63	12.00		
Contemplation	.85	10.27	10.77	11.16		
Action	.71	10.29	10.17	11.10		
Consequences of drinking						
Social/interpersonal	1.99	2.58	2.91	3.19		
Impaired control	2.54	1.98	2.69	2.57		
Self-perception	1.32	1.21	1.71	1.27		
Self-care	3.83*	1.64 ^a	2.97 ^b	2.14 ^{a,b}		.65

	<i>F</i>	1. Low risk (<i>n</i> = 66)	2. Concomitant (<i>n</i> = 35)	3. Heavy drinking (<i>n</i> = 63)	Group comparisons (Cohen's <i>d</i>)	
					1 vs. 2	2 vs. 3
Risky behavior	5.17*	1.91 ^a	2.86 ^b	2.60 ^{ab}	.51	
Academic occupational	3.27*	.97 ^a	1.91 ^b	1.21 ^{ab}	.62	
Dependence	2.97*	.58 ^a	.91 ^b	.79 ^{ab}	.40	
Blackout	0.71	3.61	3.86	4.10		
Total consequences	3.61*	14.47 ^a	19.83 ^b	17.87 ^{ab}	.61	

Note.

* Indicates *F*-test is statistically significant ($p < .05$) with Bonferroni correction; different superscripts indicate statistically significant comparisons between groups (eg values with the superscript "a" are significantly different from values with the superscript "b" and values with the superscript "a, b" are not significantly different from values with superscripts "a" or "b").

Cohen's *d* listed only for statistically significant comparisons.

HED = Heavy Episodic Drinking; PTSD = Posttraumatic Stress Disorder.

Table 3

Treatment seeking across profiles (percentages).

Question	Answer	Total %	Profile			Φ.
			Low risk	Concomitant	Heavy drinking	
Drinking and/or drug use						
	Yes	10	2 ^a	4 ^a	4 ^a	.18
	No	83	38 ^a	15 ^b	30 ^b	
My drinking and/or drug use has been a problem for me in the past 4 weeks.	Not sure/maybe	7	1 ^a	2 ^a	4 ^a	
	Yes	1	0 ^a	0 ^a	1 ^a	.19
	No	92	39 ^a	17 ^b	36 ^{ab}	
I think I should get therapy/counseling for my drinking and/or drug use.	Not sure/maybe	7	1 ^a	4 ^b	2 ^{ab}	
Psychological distress						
	Yes	30	8 ^a	11 ^b	11 ^{ab}	.31
	No	47	27 ^a	2 ^b	18 ^a	
Psychological distress has been a problem for me in the past 4 weeks.	Not sure/maybe	23	6 ^a	9 ^b	9 ^{ab}	
	Yes	24	5 ^a	9 ^b	10 ^{ab}	.19
	No	63	30 ^a	9 ^b	23 ^{ab}	
I am thinking about whether or not therapy/counseling would help with my psychological distress.	Not sure/maybe	13	4 ^a	4 ^a	5 ^a	.23
	Yes	8	1 ^a	4 ^b	3 ^{ab}	
	No	57	29 ^a	7 ^b	21 ^{ab}	
I think I should get therapy/counseling for my psychological distress.	Not sure/maybe	27	8 ^a	8 ^a	11 ^a	
	I am already in therapy	8	2 ^a	2 ^a	4 ^a	.20
	Yes	10	2 ^a	4 ^b	4 ^{ab}	
	No	90	38 ^a	17 ^b	35 ^{ab}	
I am working on getting therapy/counseling for my psychological distress.						
Prior treatment						
	Yes	13	3 ^a	6 ^b	4 ^{ab}	.24
	No	87	37 ^a	15 ^b	34 ^{ab}	
Have you ever sought psychological/counseling resources on campus? If not, why not?	No significant distress	57	32 ^a	4 ^b	21 ^{ab}	.32
	Significant distress but chose not to seek help	43	13 ^a	11 ^b	19 ^{ab}	
Knowledge						

Question	Profile					Φ_c
	Answer	Total %	Low risk	Concomitant	Heavy drinking	
How would you describe your familiarity with psychological/counseling resources on campus?	Not at all familiar	29	10 ^a	7 ^a	13 ^a	.23
	Not sure where resources are located	34	13 ^{a,b}	4 ^b	17 ^a	
	Think I know where and how to access resources	24	13 ^a	5 ^a	6 ^a	
	Know exactly where and how to access resources	13	4 ^{a,b}	6 ^b	3 ^a	

Note. Different superscripts indicate statistically significant comparisons ($p < .05$ with Bonferroni correction) between groups (eg values with the superscript “a” are significantly different from values with the superscript “b”, and values with the superscript “a, b” are not significantly different from values with superscripts “a” or “b”).