


The Relationship Between DSM-5 PTSD Symptom Clusters and Alcohol Misuse Among Military Veterans

Jessica L. Walton, PhD ^{1,2,3} Amanda M. Raines, PhD,^{1,3}
Lisa-Ann J. Cuccurullo, PsyD,^{1,2,3} Desirae N. Vidaurri, PhD,¹
Margo C. Villarosa-Hurlocker, MS,¹ C. L. Franklin, PhD^{1,2,3}

¹Southeast Louisiana Veterans Health Care System, PTSD Clinical Team, New Orleans, Louisiana

²Department of Psychiatry and Behavioral Sciences, Tulane University School of Medicine, New Orleans, Louisiana

³South Central VA Healthcare Network Mental Illness Research, Education, and Clinical Center (MIRECC), New Orleans, Louisiana

Background and Objectives: Prior research has revealed a strong relationship between Posttraumatic Stress Disorder (PTSD) and alcohol misuse. However, previous attempts to understand nuanced associations between PTSD symptom clusters and alcohol misuse within military veteran samples have produced mixed results. In an attempt to better understand the associations between PTSD and alcohol misuse, the current study examined the unique relationships between the newly classified *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5)* PTSD symptom clusters and alcohol misuse in an outpatient sample of military veterans seeking treatment for PTSD and Substance Use Disorders.

Methods: Veterans ($N = 100$) were administered a brief battery of self-report questionnaires prior to receiving psychological services to aid in diagnostic assessment and treatment planning.

Results: Hierarchical regression analyses revealed that PTSD intrusions (cluster B), negative alterations in cognition and mood (cluster D), and arousal/reactivity (cluster E) symptoms were associated with alcohol misuse.

Discussion and Conclusions: The positive association between alcohol misuse and PTSD symptom severity is consistent with a broader body of literature demonstrating the co-occurrence of these disorders, particularly in military samples.

Scientific Significance: Increased alcohol consumption may interfere with current front-line treatments for PTSD, which encourages patients to experience a full range of emotions. As such, future research should explore the impact of substance use on the effectiveness of trauma focused treatments in the alleviation of DSM-5 PTSD symptoms. (Am J Addict 2018;27:23–28)

INTRODUCTION

Alcohol use is the fourth leading preventable cause of death in the United States with an estimated 88,000 individuals dying each year from alcohol-related fatalities.¹ According to the National Institute on Alcohol Abuse and Alcoholism,¹ in 2014 57% of adults, 18 years of age and older, reported having consumed alcohol in the last month and 25% reported engaging in binge drinking behaviors. Such problematic patterns of use, coupled with behavioral and physical symptoms including withdrawal, tolerance, cravings, and/or a failure to perform major role obligations, can result in an Alcohol-Related Disorder.² Alcohol use disorders are among the most prevalent and costly category of mental health conditions worldwide affecting approximately 29% of adults and costing an estimated \$249 billion annually in the United States alone.³

Research has found that alcohol related disorders rarely occur in a vacuum and often present with other psychiatric conditions leading to a more chronic and debilitating course.⁴ One psychiatric disorder that often occurs in tandem with alcohol use disorders is Posttraumatic Stress Disorder (PTSD).^{5,6} PTSD, characterized by a constellation of symptoms that occur following exposure to one or more traumatic events, is thought to affect between 7% and 9% of the general population and has been shown to be elevated in individuals, who by virtue of their profession, have increased risk of traumatic exposure.² This includes but is not limited to police officers, military personnel, and military veterans.

Prevalence rates of comorbid alcohol misuse in military veteran populations have been found to range from 12% to 54%^{7,8} depending on age and/or military branch/era and are associated with considerable adverse effects including strained family relationships, vocational impairment, and motor vehicle accidents.^{9,10} Research has shown that individuals presenting

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Address correspondence to Jessica L. Walton, Southeast Louisiana Veterans Health Care System, 2400 Canal St New Orleans, LA 70119. Phone: (504) 507–2000 ext. 65197.
E-mail: jessica.Walton2@va.gov

with both PTSD and alcohol misuse have a poorer quality of life than individual's presenting with either condition alone.^{11,12} In addition, it has been noted from both a research and clinical perspective that symptoms of one condition can mimic those of the other leading to diagnostic and treatment complications.¹³ Thus, there is a need to better understand the specific relations between these two conditions in order to inform prevention and intervention efforts.

Prior research has attempted to understand nuanced associations between PTSD symptom clusters and alcohol misuse. However, findings within military veteran samples have been somewhat mixed. For example, using a sample of veterans who were involved in combat operations in Vietnam ($N=108$), McFall, Mackay, Donovan¹⁴ found that the *Diagnostic and Statistical Manual of Mental Disorders, 3rd edition-revised (DSM-III-R)* physiological arousal symptoms of PTSD were most associated with alcohol misuse. Similarly, Hellmuth, Stappenbeck, Hoerster, Jakupcak¹⁵ found a direct association between the *DSM-IV-TR* PTSD hyperarousal cluster and alcohol misuse among a large sample of veterans ($N=359$) who were involved in combat operations in Iraq and Afghanistan. On the other hand, Scott, Pietrzak, Mattocks, Southwick, Brandt, Haskell¹⁶ found significant associations between the *DSM-IV* emotional numbing symptoms of PTSD and hazardous drinking among a sample of Iraq and Afghanistan veterans ($N=634$) and Maguen, Stalnaker, McCaslin, Litz¹⁷ found that *DSM-IV-TR* re-experiencing symptoms were most strongly associated with alcohol misuse in a sample of Kosovo peacekeepers ($N=203$). Finally, using non-emergent outpatients at a military medical center ($N=472$) Guina, Nahhas, Goldberg, Farnsworth¹⁸ found associations between all four *DSM-5* PTSD symptom clusters and alcohol related problems.

Whereas these inconsistencies could be due to a host of factors including patient demographics (eg, age/branch of veteran), proximity of trauma, as well as acute versus chronic effects of alcohol use, it is reasonable to assume that the way in which PTSD was conceptualized and measured could also influence the equivocal nature of these findings. Indeed, PTSD was first introduced in the third edition of the *Diagnostic and Statistical Manual of Mental Disorders*.¹⁹ Since its inception, the diagnosis of PTSD has undergone numerous changes at both the nosology and symptom level. Some of the most notable adaptations occurred with the recent release of the *DSM-5*.² Specific changes to symptom clusters included: (1) a new Criterion C comprised only of internal and external avoidance symptoms; (2) a new Criterion D including several former *DSM-IV* Criterion C symptoms as well as three new symptoms reflecting dysphoria; and (3) a new Criterion E that includes one new symptom assessing reckless/self-destructive behavior and slight alterations to other symptoms.²⁰

The purpose of the current study was to examine the unique relationships between specific *DSM-5* PTSD symptom clusters and alcohol use in an outpatient sample of military veterans seeking treatment for PTSD and Substance Use Disorders. PTSD symptoms were measured using the PTSD

Checklist for *DSM-5* (PCL-5), a self-report questionnaire designed to assess each of the 20 *DSM-5* PTSD symptoms and symptom clusters.²¹ Consistent with prior research, it was hypothesized that PTSD intrusion (cluster B) and PTSD arousal/reactivity symptoms (cluster E) would be associated with alcohol misuse, even after controlling for various demographic (eg, gender) and military related variables (eg, branch and number of deployments) as well as depression and anxiety diagnoses, as these constructs often co-occur with increased alcohol use and thus may partially account for the associations noted.²²⁻²⁵ Further, consistent with the self-medication hypothesis which posits that individuals misuse alcohol in an attempt to ameliorate symptoms of depression,^{7,26} it was hypothesized that negative alterations in cognitions and mood (cluster D) would also be associated with increased alcohol consumption. No specific predictions were made however, regarding PTSD avoidance (cluster C) due to the significant modification made to this symptom cluster from *DSM-IV-TR* to *DSM-5* and the limited research available.

METHOD

Participants and Procedures

The sample consisted of 100 Veterans presenting for treatment at a southeastern Veterans Affairs (VA) PTSD and Substance Use Disorder outpatient clinic from July 2015 through May 2016. As a part of the initial intake process, all veterans were administered a brief battery of self-report questionnaires to aid in diagnostic assessment and treatment planning. Only veterans reporting problematic alcohol use and difficulties abstaining from alcohol were included in the current study. The mean age of the sample was 43.03 with ages ranging from 23 to 68 ($SD=11.98$) and comprised of predominantly males (93%). The racial/ethnic configuration of the sample was primarily African American/Black (58%), followed by Caucasian/White (38%), and Other (eg, biracial; 4%). Thirty-six percent of the sample was divorced, with 32% single, 21% married, 9% separated, and 2% widowed. Given that the data were collected as part of routine clinical care, informed consent was not collected. The VA Institutional Review Board in New Orleans, Louisiana, approved use of this data for research purposes.

The sample was heterogeneous in relation to their war zone service with 56% having served in combat operations in Iraq and Afghanistan, 11% who were involved in combat operations in Vietnam, 9% who were involved in combat operations in Kuwait, 6% who served in multiple combat zones, 1% who served in combat operations in Korea, while 11% did not report war zone service and 6% reported other deployments outside of war zones (eg, peacekeeping missions). In terms of service branch, individuals were dichotomized into two groups based on previous research suggesting higher alcohol consumption among Army and Marine veterans as compared to other branches of the military.²⁵ Sixty-eight percent of the sample served in the

Army or Marines while the remaining 32% served in another branch (eg, Navy, Air Force, and Coast Guard). In terms of primary diagnoses, 34% had a primary diagnosis of PTSD upon completion of diagnostic interview; while 12% were diagnosed with subclinical PTSD (ie, other specified trauma and stressor related disorder), 20% a Substance-Related and Addictive Disorder, 19% a Depressive Disorder, 8% an Anxiety Disorder, with 7% missing data. Further, 67% of veterans met for an Alcohol Use Disorder and 47% of veterans met for a Trauma- and Stressor-Related Disorder, regardless of whether it was the primary diagnosis assigned. Finally, trauma type was as follows: 68% combat, 13% other (eg, military training related accidents), 12% witnessing another person killed or badly hurt, 3% were victims of a serious crime, 2% involved in a serious car accident, and 1% were physically or sexually abused as a child, with 1% missing data.

Measures

Clinician-Administered

Diagnostic Interview. All diagnostic interviews were administered by psychologists who were trained in the administration of the *Structured Clinical Interview for DSM-5* (SCID-5)²⁷ as well as the Clinician Administered PTSD Scale for the *DSM-5* (CAPS-5).²⁸ Whereas PTSD diagnoses were determined using the CAPS-5, depression, anxiety, and substance use disorders were determined using an unstructured clinical interview based on the clinician's knowledge of the SCID-5. Given that these interviews were administered as part of routine clinical care, no inter-rater reliability data were collected.

Self-Report

Alcohol Use Disorders Identification Test (AUDIT). The AUDIT is a 10-item self-report screening instrument developed by the World Health Organization to measure hazardous alcohol use. It has been found to be an accurate measure of harmful or hazardous alcohol use across various ages, genders, and cultures.²⁹ Participants were asked to complete various questions regarding quantity and frequency of alcohol behaviors and problems over the past year. The AUDIT has demonstrated good reliability, validity, and diagnostic sensitivity.^{30,31} Cronbach's α on AUDIT items in the current sample was .91, indicating excellent internal consistency.

Posttraumatic Stress Disorder Checklist for DSM-5 (PCL-5). The PCL-5 is a 20-item self-report measure designed to assess each of the 20 *DSM-5* PTSD symptoms.²¹ Reports suggest that a cut score of 33 can be used to determine probable PTSD.²¹ Veterans were asked to read a list of symptoms and indicate their level of distress as it relates to each symptom within the past month on a five-point Likert scale ranging from zero (Not at all) to four (Extremely). Studies suggest that the PCL-5 is a psychometrically sound instrument to use for the screening of PTSD symptoms and has been shown to be effective within veteran populations.³² Cronbach's α on PCL-5 items in the current sample was .95, indicating excellent internal consistency. Additionally, all

subscales demonstrated good internal consistency: intrusion ($\alpha = .88$), avoidance ($\alpha = .82$), negative alterations in cognition and mood ($\alpha = .85$), and arousal and reactivity ($\alpha = .87$).

Data Analytic Plan

A series of multiple regression analyses were performed to assess the relationships between PTSD symptoms (as measured by the PCL-5), including symptom clusters (ie, intrusion, avoidance, negative alterations in cognitions and mood, and hyperarousal), and alcohol misuse (as measured by the AUDIT). Covariates including demographic (ie, gender) and military related variables (ie, branch of service and number of deployments) were entered in step one of each model. In the second step of each model, psychological covariates were entered including the presence of any co-occurring depression or anxiety diagnoses. Finally, psychological variables, including PCL-5 total score and subscale scores from each PTSD symptom cluster (ie, intrusion, avoidance, negative alterations in cognitions and mood, and hyperarousal) were entered into the third step of each model. Initial examination of each model revealed no violations of normality, multicollinearity, or homoscedasticity.

RESULTS

First, means, standard deviations, and zero-order correlations for all variables included in the analyses were examined (see Table 1). The mean AUDIT total score was considerably higher than the recommended cut score and higher than that found in other veteran samples.^{29,33,34} Likewise, the mean PCL-5 total score was well above the recommended cut score set forth by Weathers, Litz, Keane, Palmieri, Marx, Schnurr²¹ and that found in other veteran samples.³² Regarding correlations, as expected, there was significant positive correlation between overall PTSD symptom severity and alcohol misuse. Further, there were significant correlations between alcohol misuse and all four PTSD symptom clusters.

Demographic and military related variables accounted for 1% of the variance in alcohol misuse ($F(3, 91) = .29, p = .83$).¹ Psychological variables, including the presence of any co-occurring depression or anxiety diagnoses, accounted for an additional 2% of the variance in alcohol misuse (F Change = .52, $p = .60$). PCL-5 total score accounted for an additional 8% of the variance (F Change = 8.26, $p = .005$) and was significantly associated with alcohol misuse ($\beta = .31, t = 2.87, p = .005, sr^2 = .08$). As expected, negative alterations in cognition and mood and hyperarousal also accounted for additional variance in alcohol misuse, respectively 7% (F Change = 6.93, $p = .010$) and 7% (F Change = 7.10, $p = .009$), and both subscales were associated with alcohol misuse ($\beta = .28, t = 2.63, p = .010, sr^2 = .07$; $\beta = .28, t = 2.67,$

¹Of note, regression models were also computed controlling for other potentially relevant demographic variables including participant age and ethnicity. Findings remained the unchanged.

TABLE 1. Means, standard deviations, and zero-order correlations for all self-report variables used in the current analyses

	1	2	3	4	5	6	7	8	9	10	11
1. Gender	–										
2. Branch	–.23*	–									
3. Number of deployments	.09	.12	–								
4. Anxiety diagnosis	–.11	–.18	–.14	–							
5. Depression diagnosis	.06	–.07	.07	.11	–						
6. PCL-5 total	.07	.04	.09	–.23*	.18	–					
7. PCL-5 intrusion	.13	–.03	.05	–.15	.24*	.90***	–				
8. PCL-5 avoidance	.10	.05	.12	–.14	.15	.77***	.67***	–			
9. PCL-5 NACM	–.01	.04	.09	–.27**	.13	.93***	.73***	.65***	–		
10. PCL-arousal	.08	.08	.08	–.21*	.13	.93***	.77***	.63***	.81***	–	
11. AUDIT	–.06	.00	.07	–.08	.06	.31**	.27**	.22*	.29**	.28**	–
M	–	–	1.42	–	–	56.80	14.19	5.94	19.17	17.47	16.83
SD	–	–	.97	–	–	16.12	4.61	2.02	6.10	5.10	11.79

PCL-5, PTSD checklist for DSM-5; AUDIT, alcohol use disorder identification test. * $p < .05$, ** $p < .01$, *** $p < .001$.

$p = .009$, $sr^2 = .07$, respectively). Additionally, intrusions also accounted for an additional 7% of the variance in alcohol misuse and were significantly associated with alcohol misuse ($\beta = .27$, $t = 2.58$, $p = .012$, $sr^2 = .07$) whereas avoidance was trending toward significance ($\beta = .21$, $t = 1.97$, $p = .052$, $sr^2 = .04$).

DISCUSSION

The purpose of the current study was to examine the relationships between PTSD symptom clusters and alcohol misuse among a sample of military veterans seeking treatment for PTSD. Based on prior research,^{14–16,35} it was hypothesized that PTSD intrusion (cluster B), arousal/reactivity symptoms (cluster E), and negative alterations in cognition and mood symptoms (cluster D) would be associated with alcohol misuse. To our knowledge, this is the first study to examine the relationships between alcohol misuse and *DSM-5* PTSD symptom clusters using a military veteran population.

In line with our initial hypothesis, results revealed a significant association between *DSM-5* PTSD intrusion symptoms (formerly known as re-experiencing) and alcohol misuse. This finding is consistent with previous research using both non-veteran^{36,37} and veteran samples.¹⁷ It has been hypothesized that individuals with co-occurring PTSD and substance use may be using substances in an attempt to forget or block out trauma related recollections.³⁸ Indeed, several substances including alcohol have been found to impair cognitive capacities such as memory³⁹ and thus may serve as a viable means of suppression.

Consistent with our second hypothesis, findings also indicated that PTSD arousal/reactivity symptoms (formerly classified as arousal) were associated with alcohol misuse. This finding is consistent with previous empirical work establishing a relationship between arousal based PTSD symptoms and the abuse of and dependence on alcohol.^{5,14} Further, these results are consistent with the notion that

PTSD-diagnosed patients experiencing increased arousal symptoms may use alcohol, a depressant, as a means to reduce and/or control their symptoms of physiological arousal.⁴⁰

Consistent with our third hypothesis and previous research examining the association between PTSD and alcohol misuse,¹⁶ findings also suggested that PTSD negative alterations in cognition and mood symptoms (formerly classified as avoidance/numbing symptoms in *DSM-IV-TR*) were related to an increase in alcohol misuse. This finding is consistent with the work of Jakupcak, Tull, McDermott, Kaysen, Hunt, Simpson³⁵ who found a relationship between the emotional numbing symptoms of PTSD and increased alcohol misuse, even after controlling for depression diagnoses, among a large, outpatient sample of military veterans ($N = 287$).

Taken together, these findings support the longstanding self-medication hypothesis, which proposes the use of substances and/or alcohol as a means of reducing distressing psychological symptoms and/or increasing positive affect among individuals with various psychological disorders.⁴¹ This is particularly relevant among individuals diagnosed with PTSD where the diagnostic criteria consist of a significant number of both dysphoric and anxious arousal symptoms.² On one hand, alcohol may serve as a buffer for anxious arousal symptoms in situations that would otherwise cause discomfort (eg, going to crowded public places); whereas, on the other hand, alcohol may be used as a means to improve mood, increase interpersonal interactions, and/or initiate sleep.

Somewhat contrary to previous research,¹⁶ we did not find a relationship between PTSD avoidance symptoms and alcohol misuse, which could be a result of the recent reclassification of symptoms of PTSD within the *DSM-5*. Indeed, previous studies examining the relationship between alcohol use and PTSD utilized earlier versions of the *DSM* where both avoidance and numbing symptoms were classified within the same symptom cluster. Therefore, it may be that these earlier findings are more representative of a relationship between

PTSD numbing symptoms and alcohol misuse, as opposed to PTSD avoidance symptoms and alcohol misuse. It is also reasonable to assume that individuals who use alcohol as a coping mechanism may not use it as a means of avoiding; rather, it may be used as a means of confronting trauma-related interpersonal and/or situational triggers.

Several implications exist that should be highlighted here. One, with a substantial number of military veterans meeting criteria for comorbid diagnosis of a Substance Use Disorder at some point in time,⁴² it is important to continue to explore the complexities of this relationship in an attempt to better inform the assessment and treatment of both disorders. This is particularly true among military veteran populations where the rates of PTSD are higher as compared to their civilian counterparts.² For example, Concurrent Treatment of PTSD and Substance Use Disorders Using Prolonged Exposure (COPE) is a cognitive behavioral treatment designed for patients with comorbid substance use and PTSD.⁴³ While there is growing evidence demonstrating the efficacy of this treatment⁴⁴ more research is needed examining the utility of such interventions in military veteran populations. Second, learning more about the function of alcohol as it relates to the alleviation of negative emotions and increased positive affect may assist in the development of preventative treatments and/or interventions targeting alcohol as a “self-medication” mechanism.

Results should be interpreted in light of the current study limitations. First, all constructs of interest were measured using self-report. Future research should attempt to replicate these findings using multi-method approaches, as the relations between these variables might be artificially inflated due to method variance. Second, there were no standardized assessments available to detect the presence of other mental health diagnoses, including depression, anxiety, or personality variables, which could have influenced the relationships noted. Nevertheless, we controlled for the presence of any anxiety or depression diagnoses in all analyses. Third, the sample consisted solely of military veterans seeking treatment for PTSD. As such, findings may not generalize to other non-veteran, non-treatment seeking samples. Fourth, due to the cross-sectional nature of the current study, inferences regarding causality cannot be made. Whereas it seems far more likely that PTSD symptoms would lead to increased alcohol use, we cannot conclusively rule out the alternative. Fifth, the sample size was relatively small. Thus, we may have been underpowered to detect associations between some PTSD clusters (eg, avoidance symptoms) and alcohol misuse. Last, there are likely additional psychological and personal variables that may have influenced the relationships noted that were not controlled for in the current study. Future research would benefit from including these variables to further elucidate these relationships.

Despite these limitations, the current investigation adds to a growing body of literature highlighting the relationship between PTSD and alcohol misuse. Given increased rates of PTSD and alcohol misuse, particularly among veterans who

were involved in combat operations in Iraq and Afghanistan, more work is needed to modify and improve dual diagnosis treatment designs and implementation. Additionally, determining which interventions are the most effective at various time points in the recovery process could be helpful in the amelioration of symptoms across both disorders.

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Declaration of Interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of this paper.

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