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Examination of the Relationship Between PTSD and Distress Tolerance in a Sample of Male Veterans With Comorbid Substance Use Disorders

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Abstract

Distress tolerance (DT), the perceived or actual ability to tolerate negative emotional or physical states, is inversely related to posttraumatic stress disorder (PTSD) symptoms in civilian, community samples. No studies to date have examined the relationship between DT and PTSD in clinical samples of veterans with a comorbid diagnosis of PTSD and a substance use disorder (SUD). Thus, the present study examined the relationship between DT and PTSD in a sample of predominately African American, male veterans (n = 75) diagnosed with comorbid PTSD and SUD (according to a structured clinical interview). Results of hierarchical linear regression models indicated that DT was inversely related to total PTSD symptom severity score, above and beyond depressive symptoms and SUD severity. Of the 4 symptom clusters, DT was inversely associated with intrusions and hyperarousal. These findings are discussed in light of previous work with civilian samples. Determining whether treatment incorporating DT skills would be useful for veterans undergoing PTSD treatment should be evaluated.

Keywords

PTSD; distress tolerance; substance use disorder; veterans

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Posttraumatic stress disorder (PTSD) has ranged in lifetime prevalence from 6.2%–18.7% among U.S. veterans (Dohrenwend et al., 2006; Hoge et al., 2004; Sundin, Fear, Iversen, Rona, & Wessely, 2010). Veterans diagnosed with PTSD often struggle with a multitude of other problems, including substance use disorders (SUD; Bremner, Southwick, Darnell, & Charney, 1996; Jakupcak et al., 2010; McFall, Mackay, & Donovan, 1992), depression (Campbell et al., 2007), and a diminished overall quality of life (Pittman, Goldsmith, Lemmer, Kilmer, & Baker, 2012). Furthermore, veterans receiving services through the Veterans Health Administration who screened positive for PTSD on the PTSD Checklist (PCL; Weathers, Litz, Herman, Huska, & Keane, 1993) were more likely to endorse risky behaviors such as substance use, aggression, and firearm possession, as well as suicidal ideation, compared with veterans with a negative PTSD screen (Strom et al., 2012).

Recent research has focused on identifying transdiagnostic characteristics that may explain risk for PTSD and related conditions. Distress tolerance (DT), the perceived or actual ability to tolerate negative emotional or physical states (Brown, Lejuez, Kahler, Strong, & Zvolensky, 2005), has been identified as one such potential factor. It has been posited that individuals low in DT may be at particular risk for PTSD due to enhanced motivation to avoid trauma-related stimuli and symptoms (Vujanovic, Bonn-Miller, Potter, Marshall, & Zvolensky, 2011). Preliminary work found associations between lower levels of self-reported DT and greater total PTSD symptom severity and symptom clusters in civilian samples, above and beyond the effects of neuroticism and trauma load (Vujanovic et al., 2011). Further, work in a civilian community sample determined that perceived (i.e., self-report) DT for emotional stimuli, compared with actual, behaviorally observed DT or DT for physical stimuli, appears to be particularly relevant to PTSD symptom severity, after covarying for neuroticism, trauma load, and participant sex (Marshall-Berenz et al., 2010). It is important to note that self-report measures of DT and behavioral measures are generally uncorrelated (Bernstein, Marshall, & Zvolensky, 2011; Marshall-Berenz et al., 2010; McHugh et al., 2011), as they potentially assess different aspects of DT. Furthermore, they have been found to be differentially related to clinical outcomes, with self-report measures of DT often being related to PTSD and anxiety (Bernstein et al., 2011; Marshall-Berenz et al., 2010).

Theoretical models highlight the importance of avoidance in the onset and maintenance of PTSD (Foa & Kozak, 1986). Behavioral avoidance may include avoidance of specific people, places, objects, or situations that remind the individual of the trauma, or are associated with it in some way. Experiential avoidance may also occur, with individuals being unwilling to experience various internal experiences, such as unpleasant emotions, thoughts, and bodily sensations (for review, see Chawla & Ostafin, 2007). It is important to note that the use of substances can be viewed as an avoidance coping strategy, aimed at decreasing distress that occurs when experiencing PTSD-related symptoms (i.e., the self-medication hypothesis; Brady, Back, & Coffey, 2004; Ouimette, Finney, & Moos, 1999). Research has found that the endorsement of drinking alcohol to cope mediated the relationship between trauma symptoms and alcohol use, such that increased trauma symptoms was associated with increased endorsement of drinking to cope, resulting in higher alcohol use (Kaysen et al., 2007). SUD are among the most commonly diagnosed disorders for those with PTSD, particularly in veteran populations. For example, among

Operation Enduring Freedom (OEF)/Operation Iraqi Freedom (OIF) veterans diagnosed with PTSD, 76.1% have a comorbid diagnosis of SUD (Seal et al., 2011), and approximately 73% of Vietnam veterans have been found to be diagnosed with PTSD and a lifetime diagnosis of alcohol use disorder (Kulka et al., 1990).

Prior work has examined how individuals diagnosed with comorbid PTSD and SUD manage affective states and distress tolerance. DT has been shown to moderate the relationship between PTSD symptom severity and suicidal behaviors among individuals diagnosed with a SUD, such that the relationship between PTSD symptoms (including overall symptoms, and the specific clusters of reexperiencing and hyperarousal) and suicidal behaviors was stronger for those with higher DT (Anestis, Tull, Bagge, & Gratz, 2012). Waldrop, Back, Verduin, and Brady (2007) found that those diagnosed with either alcohol or cocaine dependence and PTSD were more likely to use substances when experiencing distress than those without PTSD. Following being discharged from SUD treatment, individuals with PTSD have been shown to be more likely to relapse due to negative affect states that those without PTSD (Ouimette, Coolhart, Funderburk, Wade, & Brown, 2007; Tate, Brown, Unrod, & Ramo, 2004). Finally, when examining the role of coping strategies, findings have shown that DT partially mediated the relationship between posttraumatic symptom severity and marijuana coping motives (Potter, Vujanovic, Marshall-Berenz, Bernstein, & Bonn-Miller, 2011). Based on these studies, DT appears to play a central role for those diagnosed with PTSD and SUD, highlighting that DT is generally lower for those diagnosed with PTSD and SUD than those without PTSD.

Treatment retention and completion for patients diagnosed with comorbid PTSD and SUD is also a concern, as treatment outcome studies have consistently reported high rates of attrition (e.g., Back, Dansky, Carroll, Foa, & Brady, 2001; Brady, Dansky, Back, Foa, & Carroll, 2001; Coffey, Stasiewicz, Hughes, & Brimo, 2006). In one of the only studies to examine clinical samples of PTSD and DT, Tull, Gratz, Coffey, Weiss, and McDermott (2013) found that individuals with a PTSD diagnosis and low DT completed fewer sessions of SUD treatment than all other participants. The authors hypothesized that perhaps managing the distress of treatment was more difficult for these individuals, or that they tapped out their cognitive resources and therefore dropped out of treatment. Early identification of such individuals would be useful, in order to tailor treatment to avoid early dropout.

Although the extant findings presented here highlight the importance of DT and PTSD among those with SUDs, there is a lack of research addressing these relationships in veteran populations and clinical samples (i.e., those with a PTSD diagnosis). Furthermore, DT may be especially pronounced in these populations due to the possibility of increased avoidance through self-medication. Finally, given the high rates of comorbidity among individuals with PTSD, studies assessing DT in populations with comorbid conditions are necessary.

As such, the aim of the current study was to examine the relationship between perceived emotional DT and PTSD symptom severity within a sample of veterans with comorbid PTSD and SUD. It was hypothesized that lower DT would be associated with greater PTSD symptom severity, above and beyond depressive symptoms and SUD severity. Regarding

specific symptom clusters, it was posited that intrusions, avoidance, and hyperarousal would also be negatively associated with DT (based on findings from Vujanovic et al., 2011).

Method

Participants

Participants were recruited through a PTSD/SUD clinic within a southeastern Veteran Affairs Medical Center upon receiving a referral for consideration of treatment for PTSD and SUD. Veterans typically come to this clinic with a presenting problem of SUD, with additional concerns about anxiety, trauma, depression, and so forth. Veterans are screened for either residential or outpatient treatment, and the decision about what type of treatment to enter is largely based on clinical need (i.e., results of initial intake assessment) and veteran preferences/logistics (e.g., weekly transportation needed for outpatient treatment; childcare needed if veteran chooses residential treatment). After arriving, information about the study was provided to patients, and informed consent was obtained from interested participants. Participants completed a clinical interview and a battery of questionnaires lasting approximately two hours, both pre- and posttreatment, for co-occurring PTSD/SUD. The current study utilizes pretreatment data only. Veterans were included in the study if they had a current diagnosis of PTSD (i.e., they met diagnostic criteria for PTSD within the past month) and a diagnosis of a SUD within the past year. Veterans were excluded if they reported current suicidal, homicidal, self-harming, or psychotic symptoms.

Measures

MINI International Neuropsychiatric Interview (MINI; Sheehan et al., 1998)—The MINI is a brief, structured diagnostic interview for *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; American Psychiatric Association, 1994) disorders. The MINI has demonstrated good reliability and validity properties (Sheehan et al., 1998) and was used in the current study to determine PTSD and SUD diagnoses for eligibility purposes. When being assessed for PTSD, Veterans identified the specific trauma that had been causing the most distressing symptoms during the previous month, and answered the questions on the MINI when thinking about that trauma.

Beck Depression Inventory—II (BDI–II; Beck, Steer, & Brown, 1996)—The BDI–II is a 21-item, self-report measure of depressive symptoms over the past two weeks. Questions are asked on a 0–3 Likert scale, resulting in one total score. The present study utilized the BDI–II to control for level of depression in the current sample. The BDI–II has demonstrated good psychometric properties (Beck et al., 1996), including internal reliability (r = .92), test–retest reliability (r = .93), and concurrent validity (r = .71, with The Hamilton Rating Scale for Depression). Cronbach's alpha in the present study was .91.

Substance use disorder severity—We examined various questions of SUD severity to determine whether these factors related to PTSD symptoms. Items were taken either from the MINI or the Brief Addiction Monitor (BAM; Cacciola et al., 2013). Three specific questions were examined: number of SUD diagnoses (MINI), days spent using substances in the past month (BAM), and past 30 day assessment of craving for a given substance (BAM).

Distress Tolerance Scale (DTS; Simons & Gaher, 2005)—The DTS is a 15-item, self-report measure of an individual's perception of his or her own emotional DT. Items are rated on a 5-point Likert scale (from 1 = *strongly agree* to 5 = *strongly disagree*). Sample items include "Feeling distress or upset is unbearable to me" and "I'll do anything to stop feeling distress or upset." The DTS has demonstrated adequate test-rest reliability (r = .61), as well as convergent (r = .26–.54) and discriminant (r = −.52-−.59) validity (Simons & Gaher, 2005). Cronbach's alpha in the present study was .87.

Posttraumatic Stress Disorder Checklist—S (PCL–S; Weathers et al., 1993)—The PCL–S is a 17-item, self-report measure that assesses PTSD symptoms experienced over the past month in response to a previously experienced traumatic event. Veterans identified the specific traumatic event that had been causing them the most distress over the previous month. Symptoms were then assessed on a five point Likert scale, where participants were asked to rate each symptom in reference to their already identified distressing traumatic event (the trauma did not have to be combat-related). Psychometric support for the use of the PCL–S has been previously established (Blanchard, Jones-Alexander, Buckley, & Forneris, 1996). The present study examined the total score and each of four subscale scores (intrusions, avoidance, numbing, and hyperarousal) as primary outcome variables in the regression analyses. Research has indicated that the four factor model of the PCL is the ideal structure for examining PTSD symptoms in various populations (Gauci & MacDonald, 2012; Wilkins, Lang, & Norman, 2011) and corresponds to the most recent changes to the diagnostic criteria for PTSD in the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; American Psychiatric Association, 2013). Cronbach's alpha for this measure in the current study was .85.

Results

Participants included 75 male veterans that were 66.7% African American and 33.3% Caucasian. All veterans were diagnosed with co-morbid PTSD and SUD. Regarding military characteristics, the sample consisted of Army (62.2%), Air Force (6.8%), Navy (10.8%), Marine Corps (9.5%), and National Guard (10.8%). For period of service, 30.7% served during Vietnam, 28% post-Vietnam, 20% Persian Gulf, and 21.3% were OEF/OIF/Operation New Dawn (OND). Veterans reported an average of 7.42 (SD = 6.38) years of active duty service and an average of 1.27 (SD = 1.82) deployment tours.

Descriptive information regarding trauma and substance use history was also collected. With regard to participants' "most distressing" trauma on the PCL, the majority indicated combat-related trauma (53.3%), followed by military sexual trauma (9.3%), trauma during training (8%), and motor vehicle accident (6.7%); examples of other types of traumas endorsed at much lower rates included fire, sexual abuse in childhood or adulthood, and life-threatening accident. Regarding past year SUD diagnosis according to the MINI, 34.7% had an alcohol use disorder only, 20% had an illicit SUD only (which included the following drug categories: stimulants, cocaine, hallucinogens, inhalants, marijuana, tranquilizers, and miscellaneous), and 45.3% had a diagnosis of both an alcohol use and illicit SUD. When asked about substance use in the past 30 days, 27 participants endorsed alcohol use and 18 participants indicated using illicit drugs or the misuse of prescription medication. In total,

42.7% of the sample indicated past 30 day use of substances. See Table 1 for additional information on means and standard deviations for each self-report measure.

Rates of comorbidity that were diagnosed via the MINI included: 69.3% of the sample reported currently (past two weeks) experiencing a major depressive episode (MDE), 17.3% endorsed a current diagnosis (MDE in past two weeks and previously endorsed MDEs) of major depressive disorder, 12% endorsed current (past two years) dysthymia, 21.3% endorsed a current diagnosis (past month) of panic disorder with agoraphobia, 18.7% reported current (past month) social anxiety disorder, 10.7% reported a current (past month) diagnosis of obsessive compulsive disorder, and 17.3% endorsed current (past six months) generalized anxiety disorder.

Because the sample consisted of veterans with SUD, we examined initial bivariate correlations between SUD severity (i.e., days spent using in past month, number of SUD diagnoses, and past 30-day assessment of craving) and PCL–S total score and subscale scores; no significant associations were found. Additional bivariate correlational analyses revealed that demographic information including age and military characteristics (i.e., period of service, years of active service) were not associated with PCL–S total or subscale scores, with the exception of the correlation between PCL–S numbing and age ($r = -.35$, $p = .002$) and PCL–S numbing and period of service ($r = .34$, $p = .003$; coded as higher numbers equaling more recent war). As expected, age and period of service were highly correlated ($r = -.94$, $p = .0001$) and likely targeted similar constructs. Thus, we entered age (as opposed to period of service, for ease of interpretability) in the PCL–S numbing regression model only. Table 1 presents the correlation table with relevant study variables.

Five separate linear regression analyses were then conducted, with criterion variables being: (a) PCL–S total, (b) PCL–S intrusions, (c) PCL–S avoidance, (d) PCL–S numbing, and (e) PCL–S hyperarousal. Predictors were entered into the model in the following order: Step 1, BDI–II depression score to control for level of negative affect (given that prior work has indicated that depression is related to both PTSD and SUD; Brady & Sinha, 2005; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995), and age (in the PCL–S numbing model only); Step 2, SUD severity (number of SUD diagnoses, days spent using substances in the past month, and past 30 day assessment of craving); and Step 3, DTS total score.

Primary Findings

For PCL–S total score, Model 1 was significant, with depression ($\beta = .508$) significantly predicting PCL–S total score. Model 2 was also significant, with depression ($\beta = .515$) remaining as the only significant predictor of PCL–S total score. Model 3 was also significant, with both depression ($\beta = .327$) and the DTS ($\beta = -.356$) predicting PCL–S total score. This final model accounted for about 30% of the variance. Table 2 provides detailed information on these models.

For PCL–S intrusions, Model 1 was significant, with depression ($\beta = .341$) significantly predicting PCL–S intrusions. Model 2 was not significant. Model 3 was significant, with the DTS ($\beta = -.384$) being the only predictor of PCL–S intrusions. The final model accounted for 17% of the variance. Table 3 has additional information on these models.

For PCL–S avoidance, none of the models were significant.

For PCL–S numbing, Model 1 was significant, with both depression (β = .378) and age (β = −.256) significantly predicting PCL–S numbing score. Model 2 was also significant, with depression (β = .398) and age (β = −.291) significantly predicting PCL–S numbing. Model 3 was also significant, with depression score (β = .367) and age (β = −.294) remaining as the only significant predictors in this model. Model 3 accounted for 21% of the variance. See Table 4 for additional information.

For PCL–S hyperarousal, Model 1 was significant, with depression (β = .527) predicting PCL–S hyperarousal score. Model 2 was also significant, with depression (β = .554) remaining as the only significant predictor. Model 3 was also significant, with both depression (β = .377) and the DTS (β = −.335) predicting PCL–S hyperarousal, accounting for about 33% of the variance. Table 5 contains additional information on these models.

Discussion

Understanding how the relationship between DT and PTSD functions in a veteran sample diagnosed with PTSD and SUD could have important implications for the treatment and the ongoing assessment of PTSD symptoms over time. Furthermore, elucidating these associations within the context of SUD has a direct, real-world application. This is the first study, to our knowledge, to examine DT and PTSD symptom severity in a sample of veterans (n = 75) with current PTSD and SUD diagnoses. Further, the current sample consisted largely of African American men, in contrast to the previous samples that were comprised largely of Caucasian individuals (Vujanovic et al., 2011; Marshall-Berenz et al., 2010).

Two primary sets of findings emerged. First, DT (β = −.356) was significantly inversely related to PCL–S total score, with the final model accounting for 30% of variance, above and beyond the effects of depression (β = .327) and SUD severity (all β's = .04). Thus, lower levels of DT were associated with increased PTSD symptom severity. This finding replicates and extends past work in civilian community samples (e.g., Vujanovic et al., 2011) to a sample of veterans diagnosed with comorbid PTSD and SUD. Reasons for this finding may be that a perceived inability to cope with negative emotional distress increases risk for and/or maintenance of PTSD; it is also possible that a diagnosis of PTSD may negatively impact DT. Veterans with PTSD and lower levels of DT may also be at higher risk to develop SUD due to increased motivation to use substances to cope with, or avoid, negative emotional events (e.g., trauma memories). Future studies examining a potential mediating role of DT in the relationship between PTSD and SUD should be explored.

Second, for the specific symptom clusters, the final models for both intrusions and hyperarousal symptoms explained more variance than the previous models (total model variance explained was 16.8% and 32.8% respectively), indicating that DT significantly adds to the prediction of these symptom clusters, above and beyond depression and SUD severity. DT (β = −.384 and β = −.335) was inversely associated with intrusions and hyperarousal symptoms respectively, but not numbing or avoidance symptoms. Thus, although DT is

significantly related to both intrusions and hyperarousal symptoms, the effect size for DT predicting intrusions was slightly larger than that of hyperarousal symptoms in our sample. This finding is partially consistent with that of Vujanovic et al. (2011) who found the greatest effect for DT on hyperarousal symptoms, followed by reexperiencing and avoidance symptoms. Veterans low in DT may experience trauma memories and physiological arousal as being particularly unbearable due to a perceived inability to cope with such stimuli. It may be the case that veterans with elevations in these symptom clusters may benefit from specific interventions targeting increasing DT (e.g., prior to beginning PTSD treatment among those reluctant to recount their trauma memories). Upon interpreting the results that DT was inversely associated with hyperarousal symptoms, the reader should keep in mind that this sample consisted of veterans diagnosed with comorbid PTSD and SUD, with approximately 43% reporting some form of active use. Thus, although veterans were asked to complete the PCL–S when thinking about their trauma experience, it is possible that symptoms related to active use may have influenced their responses (e.g., problems sleeping, difficulty concentrating). Additionally, although both depression and hyperarousal remained significant predictors in the final model, depression ($\beta = .377$) was slightly more associated with PCL–S hyperarousal than DT ($\beta = -.335$).

A brief discussion on the lack of findings for the numbing and avoidance symptoms is warranted. When considering that DT was not related to numbing symptom severity, it could be hypothesized that individuals who report increased numbing symptoms might actually be shutting out any DT before they can even experience it. Second, any variance attributed to numbing might have been accounted for when controlling for depressive symptoms, given the overlap in these constructs. For instance, the numbing subscale of the PCL–S assesses constructs such as anhedonia and a foreshortened future, which are also symptoms of depression. DT was also not associated with avoidance symptoms. Although Vujanovic and colleagues (2011) did find DT to be related to avoidance, the relationship showed a smaller effect when compared with that of DT and reexperiencing and DT and hyperarousal. Among our sample of comorbidly diagnosed PTSD and SUD veterans, it is possible that if they are avoiding stimuli associated with their trauma consistently and frequently, the opportunity to experience distress (and to subsequently know how they are managing the distress) does not happen. Thus, DT and avoidance would not be associated with one another.

Among individuals diagnosed with comorbid PTSD and SUD, the use of substances when experiencing distress (Waldrop et al., 2007) and relapse rates (due to difficulty managing distress; Ouimette et al., 2007; Tate et al., 2004) is higher among those diagnosed with PTSD than those without PTSD. Further, treatment dropout for individuals diagnosed with PTSD and SUD are high (Back et al., 2001; Coffey et al., 2006). Thus, these findings have potential clinical implications. In light of recent evidence from Tull et al. (2013) showing that those with PTSD and low DT had higher rates of treatment dropout, consideration of how to better tailor treatment for individuals with low DT to prevent dropout is warranted. Based on the current findings, it would seem that patients entering treatment reporting high levels of intrusions and hyperarousal may be at particularly high risk and should be assessed for DT skills. If needed, providing adjunct treatment for developing DT skills (e.g., the DT skills section from dialectical behavior therapy; Linehan, 1993) would likely be useful for these individuals.

Limitations of the current study should be noted. First, the sample was limited to men only, given the very low number of female veterans ($n = 4$) for which data was collected in the current study. Future work would benefit from examining the relationship between these variables in other samples diagnosed with PTSD, such as women and nonveteran samples. Second, the data are cross-sectional; therefore, causal inferences cannot be made, and temporal relationships among the constructs are not known. Prospective data examining the relationship between PTSD and anxiety sensitivity (the fear of anxiety and anxiety symptoms), a construct closely related to DT, has found that anxiety sensitivity and PTSD symptoms exert a bidirectional influence on one another (Marshall, Miles, & Stewart, 2010). However, studies examining DT and PTSD symptoms over time are needed. Third, although previous research has indicated that self-report measures of DT are useful when examining PTSD (Bernstein et al., 2011; Marshall-Berenz et al., 2010), future research may want to consider incorporating behavioral measures of DT into their studies. Fourth, the current study had limited data on SUD variables including details on the types of substances used by participants, severity of SUD, and whether participants met criteria for substance abuse versus dependence. Not having these data limited our ability to examine the role of SUD characteristics (e.g., severity level) in the relationship between DT and PTSD. Finally, we did not have data on the total number of traumas experienced over participants' lifetime, and therefore could not account for the role of trauma load in the present analyses. We also did not assess tobacco use among our sample, which should be examined in future studies.

This study extends prior findings to show that within a sample of predominately African American, male veterans diagnosed with PTSD and SUD, DT was inversely associated with PTSD symptom severity, even while controlling for other relevant factors. Of the PTSD symptom clusters, intrusions and hyperarousal demonstrated large effect sizes regarding their relationship with DT. Considering whether including DT training as part of treatment (either prior to treatment entry or parallel to treatment) would increase individuals' ability to tolerate distress and whether this would subsequently impact PTSD symptoms is a potential avenue for future research.

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Table 1

Correlation Table With Study Variables

Variable	*M* (*SD*)	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Age	44.71 (12.04)													
2. Years of active service	7.42 (6.38)	.01												
3. Period of service		−.94**	.09											
4. Days spent using[a]		.13	−.01	−.07										
5. No. of SUD diagnoses[b]	1.81 (1.00)	−.27*	−.12	.18	−.07									
6. Past 30 day craving[c]		−.20	.05	.26*	.32**	.27*								
7. DTS	34.88 (11.37)	.08	−.17	−.13	.03	−.10	−.24*							
8. BDI–II	31.93 (11.36)	−.30*	.06	.26*	−.17	.16	.09	−.53**						
9. PCL–S Total	66.29 (9.72)	−.15	.08	.16	−.04	.03	.09	−.54**	.49**					
10. PCL–S Intrusions	19.64 (3.58)	−.05	.10	.09	−.1	.02	.12	−.46**	.33**	.80**				
11. PCL–S Avoidance	11.12 (2.11)	−.05	.05	.02	−.14	−.01	.03	−.25*	.08	.62**	.39**			
12. PCL–S Numbing	11.68 (2.56)	−.35**	−.01	.34**	−.03	.07	.03	−.27*	.45**	.69**	.27*	.38**		
13. PCL–S Hyperarousal	20.33 (3.59)	−.14	.10	.16	.05	.04	.09	−.51**	.51**	.88**	.66**	.37**	.54**	

Note. SUD = substance use disorder; DTS = Distress Tolerance Scale; BDI–II = Beck Depression Inventory—II; PCL–S = PTSD Checklist.

[a]Number of days spent using substances in the past month.

[b]Number of SUD diagnoses.

[c]Past 30 days assessment of craving.

*$p < .05$.

**$p < .01$.

Table 2

Hierarchical Linear Regression Predicting PCL-S Total

	Model 1			Model 2			Model 3		
Variable	***t***	**β**	***sr*²**	***t***	**β**	***sr*²**	***t***	**β**	***sr*²**
BDI–II	4.938**	.508	.26	4.762**	.515	.25	2.698**	.327	.07
Days spent using[a]				.196	.022	.01	.341	.037	.01
No. of SUD diagnoses[b]				−.486	−.054	−.01	−.373	−.039	−.01
Past 30 day craving[c]				.535	.062	.01	−.117	−.013	−.01
DTS							−2.921**	−.356	−.08
Adj. R^2		.248			.221			.300	
F		24.38**			6.03**			7.08**	

Note. SUD = substance use disorder; BDI–II = Beck Depression Inventory—II; DTS = Distress Tolerance Scale; PCL–S = PTSD Checklist; β = standardized beta; sr^2 = squared semi-partial correlation.

[a]Number of days spent using substances in the past month.

[b]Number of SUD diagnoses.

[c]Past 30 days assessment of craving.

**$p < .01$.

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Mil Psychol. Author manuscript; available in PMC 2017 June 23.

Table 3

Hierarchical Linear Regression Predicting PCL-S Intrusions

	Model 1			Model 2			Model 3		
Variable	***t***	**β**	***sr*²**	***t***	**β**	***sr*²**	***t***	**β**	***sr*²**
BDI–II	3.032**	.341	.12	2.907**	.342	.11	1.057	.139	.01
Days spent using[a]				.076	.009	.01	.213	.025	.01
# of SUD diagnoses[b]				−.512	−.062	−.01	−.401	−.046	−.01
Past 30 day craving[c]				.884	.112	.01	.248	.031	.01
DTS							−2.885**	−.384	−.10
Adj. R^2		.103			.078			.168	
F		9.20**			2.49			3.88**	

Note. BDI–II = Beck Depression Inventory—II; DTS = Distress Tolerance Scale; PCL–S = PTSD Checklist; SUD = substance use disorder; β = standardized beta; sr^2 = squared semi-partial correlation.

[a]Number of days spent using substances in the past month.

[b]Number of SUD diagnoses.

[c]Past 30 days assessment of craving.

**$p < .01$.

Table 4

Hierarchical Linear Regression Predicting PCL-S Numbing

	Model 1			Model 2			Model 3		
Variable	***t***	**β**	***sr*²**	***t***	**β**	***sr*²**	***t***	**β**	***sr*²**
BDI–II	3.506**	.378	.13	3.584**	.398	.14	2.781**	.367	.09
Age	−2.375*	−.256	−.06	−2.549*	−.291	−.07	−2.557*	−.294	−.07
Days spent using[a]				.729	.084	.01	.748	.086	.01
No. of SUD diagnoses[b]				−.450	−.051	−.01	−.432	−.049	−.01
Past 30 day craving[c]				−.730	−.086	−.01	−.809	−.099	−.01
DTS							−.443	−.057	−.01
Adj. R^2		.244			.224			.214	
F		12.43**			5.09**			4.22**	

Note. BDI–II = Beck Depression Inventory—II; DTS = Distress Tolerance Scale; SUD = substance use disorder; PCL–S = PTSD Checklist; β = standardized beta; sr^2 = squared semi-partial correlation.

[a]Number of days spent using substances in the past month.

[b]Number of SUD diagnoses.

[c]Past 30 days assessment of craving.

*$p < .05$.

**$p < .01$.

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Table 5

Hierarchical Linear Regression Predicting PCL-S Hyperarousal

	Model 1			Model 2			Model 3		
Variable	***t***	**β**	***sr*²**	***t***	**β**	***sr*²**	***t***	**β**	***sr*²**
BDI–II	5.195**	.527	.28	5.255**	.554	.29	3.179**	.377	.10
Days spent using[a]				1.247	.139	.02	1.437	.152	.02
No. of SUD diagnoses[b]				−.312	−.034	−.01	−.193	−.020	−.01
Past 30 day craving[c]				.225	.026	.01	−.410	−.046	−.01
DTS							−2.804**	−.335	−.07
Adj. R^2		.268			.259			.328	
F		26.98**			7.21**			7.93**	

Note. BDI–II = Beck Depression Inventory—II; SUD = substance use disorder; DTS = Distress Tolerance Scale; PCL–S = PTSD Checklist; β = standardized beta; sr^2 = squared semi-partial correlation.

[a]Number of days spent using substances in the past month.

[b]Number of SUD diagnoses.

[c]Past 30 days assessment of craving.

**$p < .01$.

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