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The Relationship between Negative Trauma-Related Cognitions and Psychosocial Functioning in Veterans with Posttraumatic Stress Disorder and Alcohol Use Disorder

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Abstract

Background: The comorbidity of posttraumatic stress disorder (PTSD) and alcohol use disorder (AUD) is highly prevalent and associated with especially poor psychosocial functioning. Negative trauma related cognitions are theoretically proposed to be associated with poor psychosocial functioning in PTSD, but few studies have examined the association between negative trauma related cognitions and psychosocial functioning in PTSD/AUD. Evaluating this association may provide evidence of a potential treatment target for improving psychosocial functioning in PTSD/AUD. We hypothesized that negative trauma related cognitions, including cognitions about the self, world, and self-blame, would be independently associated with poor psychosocial functioning in the following domains: vitality, psychosocial well-being, role limitations due to emotional distress, and social functioning.

Methods: We examined the relationship between negative trauma related cognitions and psychosocial functioning in 145 treatment seeking Veterans with PTSD/AUD using multiple linear regression analyses while controlling for PTSD and alcohol abuse and dependence severity.

Results: Our hypotheses were partially supported. We found that negative trauma related cognitions were uniquely associated with greater psychosocial functional impairment, independent of PTSD and alcohol abuse and dependence severity. Specifically, negative trauma related cognitions about the self were associated with greater psychosocial functional impairment across

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Author Contributions: Robert Lyons contributed to the conception and design of the current project idea, ran and interpreted statistical analyses, wrote the initial draft of the manuscript, and addressed edits put forth by other members of the research team. Moira Haller, PhD, assisted with the project design, model specification, and interpretation of statistical analyses. Additionally, Dr. Haller helped substantially with edits of all sections of the manuscript. Dr. Curry contributed substantially to developing the aims and hypotheses of the current project, assisted with the statistical design and interpretation of results, as well as with revisions of the manuscript. Dr. Norman assisted with the conception of the project idea and provided indispensable theoretical wisdom in the framing of the background of this project. Dr. Norman also provided much appreciated edits throughout the preparation of the current manuscript. Drs. Haller and Norman helped immensely in Robert Lyons's professional development as a scientific writer through the course of this project.

all domains, cognitions about the world were associated with worse social functioning and psychological well-being, and self-blame was associated with impaired psychological well-being.

Conclusions: Given that improvements in negative trauma related cognitions are a mechanism of trauma focused treatment, future studies should examine if changes in negative trauma related cognitions through trauma focused treatment are associated with improved psychosocial functioning.

Keywords

PTSD; Alcohol Abuse; Alcohol Dependence; Trauma; Veterans

INTRODUCTION

Posttraumatic stress disorder (PTSD) and alcohol use disorder (AUD) are commonly comorbid in general and Veteran populations^{1,2}. The co-occurrence of PTSD and AUD (PTSD/AUD) presents major challenges to healthcare professionals, as PTSD/AUD is associated with greater symptom severity and complexity when compared to either disorder alone, which can negatively impact the course of treatment. For instance, Blanco et al. found that individuals with PTSD/AUD have more severe PTSD than those with PTSD only, greater AUD severity and poorer mental health functioning than those with AUD only, and more lifetime suicide attempts than those with either disorder alone³. This association holds true for Veterans as well, with poorer quality of life and functioning and more lifetime suicide attempts reported by Veterans with PTSD/AUD when compared to Veterans with a single disorder alone⁴.

Both PTSD and AUD allow for the endorsement of impairment in psychosocial functioning for *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition* (DSM-5) diagnosis⁵. According to Ro & Clark⁶, psychosocial impairment refers to difficulties in functioning across the following domains: subjective (i.e., well-being), routine (i.e., ability to fulfill roles), motivational (i.e., self-direction and energy), and interactional (i.e., social relationships). Specifically, the signs or symptoms of the disorders must produce significant distress, impairment in social, occupational, or other important domains of functioning (e.g., education)⁵. Individuals with PTSD or AUD display greater psychosocial impairment when compared to healthy controls across social domains, mental health, and the ability to function at work or in typical daily activities⁸. PTSD/AUD is associated with even poorer functioning in the aforementioned domains when compared to AUD only^{3,9,10}.

Randomized controlled trials (RCTs) evaluating the effectiveness of treatments for PTSD/AUD have generally not reported on psychosocial functioning outcomes¹¹. Although psychosocial functioning in PTSD samples does generally improve after trauma focused treatment, research is limited as to what factors may contribute to improved functioning beyond reduction in PTSD and AUD symptoms^{12,13}. Identifying factors that may contribute to poor psychosocial functioning beyond PTSD/AUD symptoms themselves may help elucidate potential PTSD/AUD treatment targets. Negative trauma related cognitions represent a potentially important treatment target, as these cognitions are malleable via intervention¹⁴, are associated with improved PTSD symptoms in trauma focused

treatments¹⁵, and are theoretically implicated in the maintenance of poor psychosocial functioning in PTSD^{16–18}.

Negative trauma related cognitions consist of appraisals related to the self (e.g., “My reactions since the event show that I am a lousy copier”), the world (e.g., “The world is a dangerous place”) and self-blame (e.g., “The event happened because of the way that I acted”)¹⁹. Emotional processing theory suggests that two schemas are reinforced in chronic PTSD: the self as incompetent and world as dangerous¹⁶. These schemas work to maintain one another^{16,20}. Although it has not been empirically studied, Foa & Rothbaum suggest that individuals with views of themselves as incompetent and the world as dangerous will display marked distress as they perceive that they cannot handle their symptoms in an unpredictable world, and as a result they will view themselves as being unable to adequately navigate functional roles (e.g., occupational, relational, social)¹⁶. Thus, beliefs that one is not competent and the world is dangerous are proposed to lead people to have worse functioning. However, to date, there is little research examining the relationship between negative posttraumatic cognitions and functional impairment in PTSD and its comorbidities. Extending Emotional Processing Theory to PTSD/AUD, individuals may potentially use alcohol to cope with these negative trauma related cognitions and accompanying distress in the short-term. Over time, long-term consequences of using alcohol to cope with negative trauma related cognitions and distress may lead to the development of AUD, and corresponding functional impairment. One study that examined the correlation between negative trauma related cognitions and adverse consequences of drinking in individuals with PTSD/AUD found partial support for this model. Specifically, higher negative trauma related cognitions related to self were associated with more functional impairment due to drinking across physical, interpersonal, intrapersonal, and social domains²¹. Understanding how different types of negative cognitions relate to functional impairments among individuals with PTSD/AUD may provide a nuanced view of which types of cognitions may serve as targets for intervention to improve functioning in this comorbidity.

The purpose of the present study was to examine the extent to which negative trauma related cognitions contribute to poor psychosocial functioning among Veterans with PTSD/AUD. Utilizing baseline data from a treatment study of Veterans with PTSD/AUD, we hypothesized that negative trauma related cognitions would be associated with poorer psychosocial functioning across multiple domains, even when controlling for PTSD and AUD symptom severity. These psychosocial functioning domains included the experience of psychological health, role limitations due to emotional distress, social functioning and vitality. A secondary aim of this study was to gain a more nuanced view of how specific types of trauma related cognitions were related to specific domains of psychosocial functioning among Veterans with PTSD/AUD. We hypothesized that negative trauma related cognitions about the self, world, and self-blame would independently be associated with poorer psychosocial functioning across all domains.

METHODS

Participants

Participants were 145 Veterans (41 mean age, $\sigma = 13$ years; 90 % male) from any service era who met DSM-5 criteria for diagnosis of PTSD/AUD⁵, and enrolled in an Institutional Review Board reviewed and approved randomized controlled trial (RCT) comparing two psychosocial interventions for the treatment of PTSD/AUD²². Eligibility criteria included: 1) full or subthreshold (1 symptom missing) PTSD; 2) current alcohol abuse ($n = 18$) or dependence ($n = 127$) with at least 20 days heavy drinking in the past 90 days. Participants were excluded for: 1) acute suicidality; 2) intravenous drug use; 3) unmanaged psychosis or mania. Eligible participants were randomized to receive either Concurrent Treatment of PTSD and Substance Use Disorders Using Prolonged Exposure²³ or Seeking Safety²⁴. Demographic information is displayed in Table 1.

Procedures

Data for the current study were collected during the baseline visit of this trial which occurred at an urban VA hospital²². Recruitment methods included referrals from VA providers, flyers, and brochures. Participants provided written informed consent, passed a consent quiz, and completed structured interviews and self-report measures for screening purposes before inclusion into the randomized controlled trial. Participants who, during this baseline visit, completed the Clinician Administered PTSD Scale for DSM-5 (CAPS)²⁵, the Structured Clinical Interview for DSM-IV Axis 1 Disorders (SCID-IV)²⁶, the Posttraumatic Cognitions Inventory (PTCI)¹⁹, and the Medical Outcome Study 36-item Short Form Health Survey (SF-36)²⁷ were included in the current study analyses.

Measures

Clinician Administered PTSD Scale for DSM-5—The CAPS-5 is a semi-structured interview that assesses DSM-5 PTSD symptom severity and diagnostic status through the determination of frequency and intensity of PTSD symptoms²⁵. CAPS-5 scores range from 0 to 80, with higher scores indicating greater PTSD severity. CAPS-5 severity ratings display strong internal consistency ($\alpha = 0.88$) and interrater reliability, as well as convergent validity with CAPS for DSM-IV severity scores ($r = .83$) in military Veteran samples²⁵.

Structured Clinical Interview for DSM-IV Axis 1 Disorders—The SCID-IV alcohol abuse and dependence questions were administered to assess for current alcohol abuse and dependence²⁶. The SCID-5 was not yet available when this study was initiated. The SCID-IV is a semi-structured interview designed to make DSM-IV psychiatric diagnoses. As per previous research, the sum of endorsed alcohol abuse and dependence items was calculated to approximate severity of alcohol use disorder²⁶.

Posttraumatic Cognitions Inventory—The PTCI is a self-report measure that assesses negative trauma related cognitions¹⁹. These trauma related cognitions include cognitive distortions about the self (e.g., “I have no future”) the world (e.g., “people can’t be trusted”), and self-blame (e.g., “the event happened because of the way I acted”). The PTCI includes a total score, as well as three subscales that measure cognitive distortions about the self, the

world, and self-blame. Higher scores indicate the presence of more negative trauma related cognitions. The PTCI showed good internal consistency for total score and subscales ($\alpha_{\text{Total}} = .97$, $\alpha_{\text{Self}} = .97$, $\alpha_{\text{World}} = .88$, and $\alpha_{\text{Blame}} = .86$) in the development sample¹⁹.

Additionally, the PTCI evidenced good convergent validity when compared to other scales that measure trauma-related cognitions, the World Assumptions Scale and the Personal Beliefs and Reactions Scale. In the current sample of Veterans with PTSD/AUD, the PTCI displays strong internal consistency ($\alpha_{\text{Total}} = .93$, $\alpha_{\text{Self}} = .92$, $\alpha_{\text{World}} = .86$, $\alpha_{\text{Blame}} = .82$).

Medical Outcome Study 36-item Short Form Health Survey—The SF-36 is a self-report short-form measure that assesses functioning across physical and mental domains²². These two domains are represented by eight subscales, and all subscales are used in calculating mental and physical domain functioning component scores. The current study utilized the mental component score and the four subscales that contribute the most to the mental functioning component score and map onto Ro and Clark's domains of psychosocial functioning⁶: subjective (i.e., psychological distress and well-being), routine (i.e., role-emotional: role limitations due to emotional distress), interactional (i.e., social functioning), and motivational (i.e., vitality)^{29–31}. Scores on each scale range from 0 to 100; better functioning outcomes are indicated by higher scores. Thus, lower scores are interpreted to indicate greater self-reported psychosocial impairment. The SF-36 displays good psychometric properties across anxiety disorders³². Veterans in the current sample rate lower average subjective psychosocial functioning on all scales reported than at least 75% of respondents in a nationally representative normative sample²⁷, indicating impaired/poor overall functioning in the current sample.

Analytic Plan

All analyses were conducted using SPSS software Version 24.0³³. Demographic covariates of age and gender were identified via significant zero order correlations and one-way analysis of variance with mental functioning dependent variables, respectively. Therefore, age and gender, as well as PTSD severity and alcohol abuse and dependence severity were included as co-variates in all models. PTSD and AUD severity were controlled for as this allowed us to control for confounding effects of the comorbidity on functioning, while allowing us to view the unique effects of negative trauma related cognitions on functional impairment. A series of multiple linear regression models evaluated the relationship between total negative trauma related cognitions and mental functioning (mental functioning summary score, as well as four mental functioning subscales), while controlling for PTSD symptom severity, alcohol abuse and dependence severity, and demographics. Additionally, separate models tested if three specific types of negative trauma related cognitions (cognitions about the self, world, and self-blame) were associated with the mental functioning summary and subscales while controlling for PTSD symptom severity, alcohol abuse and dependence severity, and demographics. As our sample only included 14 women, we first ran our analyses with males only, and then tested models with the total sample while controlling for gender. Results reported below include the full sample, as interpretation between the male only and full sample models did not substantively differ. Additionally, models without the two items measuring cognitions in the CAPS-5 were tested, and results did not substantively differ from the models with the total CAPS-5 severity score. Therefore,

all models included total CAPS-5 PTSD symptom severity. All continuous variables are mean centered. Semipartial correlations squared are reported as effect sizes, and magnitude is interpreted using Jacob Cohen's recommendations³⁴. Multiple testing was corrected for in specific cognition analyses using a Bonferroni adjustment ($\alpha = .003$).

RESULTS

Descriptive Statistics and Zero Order Correlations

Descriptive statistics for study variables based on the full sample are displayed in Table 2. The three most commonly experienced trauma types were combat (84.1%), physical assault (82.1%), and natural disaster (69.7%). Zero order correlations between the independent variables (negative trauma related cognitions, PTSD severity, and alcohol abuse and dependence severity) and dependent variables (mental functioning) are presented in Table 2. Overall, greater negative trauma related cognitions and PTSD severity were associated with worse functioning across all mental component domains that were examined in these bivariate models.

Regression Models—Total Negative Trauma Related Cognitions

Total negative trauma related cognitions were significantly associated with poorer overall mental component functioning ($\beta = -.42, p < .001$) while controlling for age, gender, PTSD symptom severity, and alcohol abuse and dependence severity. Moreover, total negative trauma related cognitions were significantly related with poorer vitality ($\beta = -.34, p < .001$), social functioning ($\beta = -.50, p < .001$), role limitations due to emotional distress ($\beta = -.27, p = .004$) and psychological well-being ($\beta = -.49, p < .001$). PTSD symptom severity was significantly related to poorer psychological well-being ($\beta_{PTSDseverity} = -.19, p = .029$). Total negative trauma related cognitions displayed medium effects in all models ($sr^2 = .11-.16$) except in the role emotional ($sr^2 = .05$) and vitality models ($sr^2 = .07$). PTSD symptom severity effects were small for psychological well-being ($sr^2 = .02$). Results of total trauma related cognitions regression analyses are displayed in Table 3.

Regression Models—Negative Trauma Related Cognition Subscales

Results of the regression models for trauma related cognitions about the self, world, and self-blame are shown in Table 4. Negative trauma related cognitions about the self were significantly associated with worse functioning outcomes across all psychosocial functioning domains when controlling for age, gender, PTSD severity, and alcohol abuse and dependence severity. Cognitions about the self displayed moderate effects across all functioning outcomes ($sr^2 = .09-.18$). Negative trauma related cognitions about the world were associated with poorer social functioning controlling for the aforementioned covariates at small effects ($sr^2 = .06$). Negative trauma related cognitions related to self-blame were not significantly associated with functioning in any models.

DISCUSSION

This study examined the extent to which negative trauma related cognitions (i.e., thoughts about oneself such as “*My reactions since the event show that I am a lousy copier,*” or

thoughts about the world such as “*The world is a dangerous place*”) were associated with poor psychosocial functioning (e.g., vitality, psychological well-being, role limitations due to emotional distress, and social functioning) among Veterans with PTSD/AUD. Our findings support the hypothesis that negative trauma related cognitions would be associated with poor psychosocial functioning, even when controlling for PTSD symptom severity and alcohol use disorder severity. Several different domains of psychosocial functioning were examined. There were medium effect sizes for the unique associations between negative trauma related cognitions and functioning in the following domains: overall mental component, mental health, and social functioning. The effect sizes were small when examining the unique associations between negative trauma related cognitions and vitality and role limitations due to emotional distress. In regression models, PTSD symptom severity was significantly associated with poorer psychological well-being and overall mental functioning at small effect sizes, whereas alcohol use disorder was not significantly associated with psychosocial functioning.

The present study is novel as it is the first to our knowledge to examine the relationship between negative trauma related cognitions and psychosocial functioning in Veterans with PTSD/AUD, a population that commonly experiences significantly poor quality of life and attenuated treatment response compared to non-veterans^{4,35}. Examining the association between negative trauma related cognitions and functioning in Veterans is especially important to understand and potentially remedy these disparities. Findings suggest that negative trauma related cognitions have a unique association with the poor functioning that is often exhibited in Veterans with PTSD/AUD, providing a potential intervention target for the improvement of psychosocial functioning. It is particularly noteworthy that these associations were significant because, historically, the DSM-IV included three symptom clusters for PTSD: re-experiencing, avoidance and numbing, and increased arousal. The DSM-5 includes a fourth symptom cluster, negative alterations in cognitions⁵. This is in line with our findings, which show that trauma-related cognitions impact functioning even when accounting for severity of PTSD and AUD. All clinical diagnoses require a significant impact on important areas of functioning. Thus, cognitions contributing uniquely to impairment, beyond what is already explained by severity of PTSD and symptoms of AUD, underscore the importance of including this symptom cluster in the diagnosis, as well as addressing it in treatment.

We found partial support for our hypotheses that negative trauma related cognitions about the self, world and self-blame would be associated with psychosocial functioning. Specifically, we found that negative trauma related cognitions about the self were associated with poor psychosocial functioning across all domains at moderate effect sizes (except for small effects in role limitations due to emotional distress) when controlling for PTSD and alcohol use disorder severity, whereas negative trauma related cognitions about the world were only associated with poor social functioning at small effect sizes, and trauma related cognitions of self-blame were not significantly associated with psychosocial functioning. Similarly, previous literature examining the bivariate association between specific negative trauma related cognitions and adverse consequences of drinking among individuals with PTSD/AUD found negative trauma related cognitions about the self to be associated with adverse consequences of drinking across all domains examined (e.g., physical, interpersonal,

intrapersonal, impulsive, and social domains)²¹. It is unclear why effect sizes were smaller for vitality (total cognitions and self models) and role limitations due to emotional distress (total cognitions), however it may be that the experience of negative emotions have a more prominent effect in functional impairment across these domains in comparison to social functioning and psychological well-being. Taken together, these findings suggest that thoughts related to seeing oneself as incompetent, and unable to manage distress, may be especially salient to functioning, and may be a critical target for interventions aiming to improve psychosocial functioning in PTSD/AUD. These findings provide additional support for Emotional Processing Theory, suggesting that individuals who see themselves as unable to handle the distress associated with PTSD may potentially also view themselves as incompetent in their abilities to fulfill roles and duties (e.g., relationships, occupations, education).

The findings that negative cognitions about the world and self-blame were not as strongly associated with functioning may be a product of the psychometric properties of the PTCI. In the initial development sample the factor interpreted as negative trauma cognitions related to the self accounted for 48.5% of the variance, whereas the factors interpreted as negative trauma cognitions related to the world and self-blame accounted for an additional 4% and 3.4% of the remaining variance, respectively¹⁹. Negative trauma related cognitions about the self may relate to a broad view of oneself as incompetent and unable to adequately function regardless of the domain in question, making this subset of cognitions the most prominent in how it relates to overall functional impairment. We would expect to see negative trauma related cognitions about the world relate to poor social functioning, as Veterans with these views may avoid social interactions due to inflated perceptions of danger, which would support the modest association between these types of cognitions and impaired social functioning. However, even in this example, Veterans may have additional cognitions of how the dangers of the world and their isolation from others are related to inadequacies about the self. Similarly, cognitions of self-blame related to trauma may contribute to avoidance of certain reminders or triggers of the trauma, and in turn, impact psychosocial functioning. But in this scenario also, self-blame could be followed by negative trauma cognitions about the self (e.g., catastrophizing about being triggered, being upset about their avoidance). Researchers should consider utilizing additional measures that assess cognitions related to the world and self-blame to further understand how these cognitions impact psychosocial functioning in PTSD/AUD (e.g., World Assumptions Scale and Cognitive Distortions Scale)^{36,37}.

Improvement in negative trauma related cognitions is a mechanism of PTSD symptom reduction in trauma focused therapies (i.e., Prolonged Exposure Therapy and Cognitive Processing Therapy)^{14,15,18}. For example, Foa and Rauch found that reductions of negative trauma related cognitions in Prolonged Exposure therapy predicted decreased PTSD severity¹⁴. Furthermore, Klein and colleagues found that reductions in negative trauma focused cognitions through trauma focused cognitive behavioral therapy were associated with reduced PTSD severity, but reductions in PTSD severity did not predict changes in negative trauma focused cognitions¹⁵. Future research should examine if changes in negative trauma related cognitions via trauma focused therapy also corresponds with psychosocial functioning improvement. Authors of Department of Veterans Affairs and Department of

Defense PTSD Clinical Practice Guidelines recommend concurrent interventions (i.e., treatments with trauma focused components delivered alongside substance use treatment) for the treatment of comorbid PTSD and substance use disorders³⁸. It is unclear how concurrent interventions impact psychosocial functioning, as the authors of a recent meta-analysis and systematic review were unable to report on functional status after treatment, as these outcomes were not reported in the majority of studies¹¹. Therefore, future research evaluating potential mechanisms of functional change in integrated treatments via mediation models will provide a novel avenue for evaluating these interventions in the treatment of PTSD/AUD.

Limitations of this study include its cross-sectional design; we were unable to evaluate the causal relationship between negative trauma related cognitions and psychosocial functioning. All measures utilized in the current study were self-report. Assessing functioning via objective measures (e.g., employment status) or collateral reports through friends, family, or partners would strengthen our findings. Additionally, the measure used to evaluate negative trauma related cognitions may not capture cognitions about the world as adequately as other established scales (e.g., World Assumptions Scale). We did not have information regarding other diagnoses that may also have an impact on functioning such as Bipolar Disorder, and therefore, we could not control for potentially confounding effects related to other psychopathology. Finally, the study sample was composed of Veterans who were mostly white and male. Veterans with PTSD/AUD face unique challenges in psychosocial functioning that extend years after their service ends, making it unclear how the results would generalize to others, including women and racial minorities.

In summary, this study indicates that negative trauma related cognitions, particularly negative cognitions about the self, are associated with poor psychosocial functioning in PTSD/AUD. Future studies should address whether reduction of negative trauma related cognitions via trauma focused interventions leads to improvement in psychosocial functioning in PTSD/AUD.

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Table 1

Cohort characteristics (n = 145).

Cohort characteristics (n = 145)	
Age in years, mean (<i>SD</i>)	41.2 (12.8)
Women, <i>n</i> (%)	14 (9.7)
Race	
White, <i>n</i> (%)	92 (63.4)
Black, <i>n</i> (%)	20 (13.8)
Other or unknown, <i>n</i> (%)	33 (22.7)
Hispanic ethnicity, <i>n</i> (%)	40 (27.6)
Marital Status	
Married or remarried, <i>n</i> (%)	37 (25.5)
Separated or divorced, <i>n</i> (%)	68 (46.9)
Widowed, <i>n</i> (%)	4 (2.8)
Never married, <i>n</i> (%)	36 (24.1)
Education	
Completed high school or less, <i>n</i> (%)	17 (11.7)
Employment Status	
Fulltime employed, <i>n</i> (%)	41 (28.3)
Unemployed (seeking and not seeking work), <i>n</i> (%)	13 (9.0)
Military history	
Regular armed services, <i>n</i> (%)	144 (99.3)
National Guard/Reserve, <i>n</i> (%)	12 (8.3)
Deployed to a combat zone more than once, <i>n</i> (%)	65 (44.8)

Table 2
Descriptive statistics and bivariate correlations between psychosocial functioning, negative trauma-related cognitions, PTSD severity, and AUD severity

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	<i>M(SD)</i>
1. Mental Component (SF-36)	-											26.72(10.73)
2. Psychological Well-Being (SF-36)	.87**	-										39.82(18.66)
3. Role-Emotional (SF-36)	.65**	.47**	-									18.92(30.87)
4. Social Functioning (SF-36)	.76**	.62**	.50**	-								36.83(23.38)
5. Vitality (SF-36)	.66**	.63**	.39**	.55**	-							31.21(20.39)
6. Total Trauma-Related Cognitions (PTCI)	-.55**	-.60**	-.36**	-.61**	-.40**	-						139.34(36.26)
7. Cognitions Related to Self (PTCI)	-.59**	-.62**	-.42**	-.63**	-.45**	.97**	-					4.0(1.23)
8. Cognitions Related to the World (PTCI)	-.29**	-.34**	-.16	-.42**	-.24**	.65**	.54**	-				5.54(1.06)
9. Self-Blame (PTCI)	-.28**	-.34**	-.12	-.27**	-.09	.66**	.47**	.20*	-			3.20(1.65)
10. PTSD Severity (CAPS-5)	-.50**	-.48**	-.30**	-.47**	-.31**	.58**	.57**	.36**	.37**	-		40.83(11.42)
11. Alcohol Abuse & Dependence (SCID-IV)	-.33**	-.25**	-.26**	-.26**	-.06	.33**	.31**	.22**	.20*	.42**	-	6.01(2.0)

Note.

**
p < .001;

*
p < .01.

Table 3
Multiple Linear Regression Analysis for Total Trauma Related Cognitions and Covariates Associated with Psychosocial Functioning

Variable	Psychosocial Functioning Outcomes											
	Vitality		Psychological Well-Being		Role-Emotional		Social Functioning		Mental Component			
	β	95% CI	β	95% CI	β	95% CI	β	95% CI	β	95% CI		
Total Trauma Related Cognitions	-0.34**	[-0.30, -0.09]	-0.49**	[-0.34, -1.17]	-0.27**	[-0.39, -0.06]	-0.50**	[-0.43, -0.22]	-0.42**	[-0.18, -0.07]		
PTSD Severity	-0.14	[-0.59, 0.12]	-0.19*	[-0.59, -0.37]	-0.07	[-0.71, 0.35]	-0.15	[-0.66, 0.03]	-0.18	[-0.32, 0.01]		
AUD Severity	0.15	[-0.12, 1.43]	0.05	[-0.41, 0.82]	-0.09	[-1.77, 0.58]	-0.03	[-0.95, 0.61]	-0.07	[-0.54, 0.19]		
Age	0.17*	[0.02, 0.54]	0.14*	[0.003, 0.41]	0.13	[-0.08, 0.70]	-0.01	[-0.27, 0.24]	0.22**	[0.07, 0.33]		
Gender	0.08	[-5.70, 16.50]	0.06	[-4.79, 12.77]	0.11	[-5.90, 27.87]	0.15*	[1.12, 22.70]	0.10	[-1.76, 8.06]		
R-Squared	0.21		0.41		0.18		0.43		0.43			

Note.

* $p < .05$.

** $p < .01$.

Table 4
Multiple Linear Regression Analyses for Specific Trauma Related Cognitions and Covariates Associated with Psychosocial Functioning

Cognition Subtype in Model	Psychosocial Functioning Outcomes											
	Vitality		Psychological Well-Being		Role-Emotional		Social Functioning		Mental Component			
	β	95% CI	β	95% CI	β	95% CI	β	95% CI	β	95% CI	β	95% CI
Cognitions Related to Self	-0.42*	[-9.50, -3.73]	-0.50*	[-9.38, -4.93]	-0.36*	[-12.85, -4.27]	-0.53*	[-12.52, -6.75]	-0.46*	[-5.23, -2.49]		
R-Squared		0.25		0.43		0.22		0.44		0.46		
Cognitions Related to the World	-0.15	[-6.16, 0.37]	-0.19	[-6.08, -0.69]	-0.42	[-6.07, 3.63]	-0.27*	[-10.23, -2.80]	-0.11	[-2.96, 0.54]		
R-Squared		0.15		0.30		0.14		0.32		0.33		
Self-Blame	0.02	[-1.85, 2.46]	-0.19	[-3.90, -0.43]	0.01	[-3.06, 3.32]	-0.09	[-3.62, 0.96]	-0.13	[-1.89, 0.20]		
R-Squared		0.14		0.30		0.13		0.26		0.34		

Note.

* p < .003. All models included PTSD severity, alcohol abuse and dependence severity, gender, and age as covariates.