Published in final edited form as:

Addict Behav. 2015 August ; 47: 55–60. doi:10.1016/j.addbeh.2015.03.013.

Emotion Dysregulation Facets as Mediators of the Relationship between PTSD and Alcohol Misuse

Jessica C. Tripp^a and Meghan E. McDevitt-Murphy^{a,*}

^a The University of Memphis, Department of Psychology, 202 Psychology Building, Memphis, TN 38152, United States

Abstract

Introduction—Posttraumatic stress disorder (PTSD) and alcohol misuse, which frequently co-occur among combat veterans, have been linked to emotion dysregulation. Emotion dysregulation may explain the link between PTSD and alcohol misuse, and this investigation tested emotion dysregulation as a mediator of that relationship.

Method—Correlations between PTSD symptoms and cluster symptoms, emotion dysregulation full and subscales, and alcohol misuse were examined in a sample of 139 combat Operation Enduring Freedom/Operation Iraqi Freedom/Operation New Dawn veterans (45% African American; 89% men). Emotion dysregulation full scale and subscales were examined as mediators of the relationship between PTSD symptoms and alcohol misuse for the full sample and men only.

Results—PTSD symptoms and symptom clusters, emotion dysregulation, and alcohol misuse showed positive correlations for the full sample and men only. Neither the full scale of emotion dysregulation nor the facets of emotion dysregulation mediated the relationship between PTSD symptoms and alcohol misuse for the full sample; among men, the Impulse Control Difficulties when Upset and Lack of Emotional Clarity subscales were mediators of that relationship.

Conclusions—Impulse control difficulties and lack of emotional clarity may play an important role in the link between PTSD and alcohol misuse for male veterans and should be an important target in treatment for individuals with both disorders. Addressing impulse control difficulties and lack of emotional clarity in those with PTSD and alcohol misuse may improve outcomes by helping individuals identify and describe upsetting emotions and develop healthy coping alternatives to alcohol misuse.

© 2015 Published by Elsevier Ltd.

* Corresponding author at: 202 Psychology Building, Memphis, TN 38152, United States, Phone: (901) 678-2891, mmcdvttm@memphis.edu.

Publisher's Disclaimer: This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Contributors

J. Tripp conducted the literature searches and the statistical analyses. J. Tripp wrote the first draft of the manuscript and M. McDevitt-Murphy contributed to and has approved the final manuscript. J. Tripp and M. McDevitt-Murphy were involved in the design on the study and the conceptualization of the manuscript.

Conflicts of Interest

None declared.

Keywords

PTSD; emotion dysregulation; alcohol misuse

1. Introduction

Posttraumatic stress disorder (PTSD) and substance misuse are commonly co-occurring disorders, with epidemiological studies showing that about one-third to one-half of individuals with lifetime PTSD also have lifetime substance or alcohol dependence (AD; Blanco et al., 2013; Kessler et al., 1995). Rates of current co-occurring PTSD and alcohol use disorder among Operation Enduring Freedom/Operation Iraqi Freedom/Operation New Dawn (OEF/OIF/OND) veterans range from 15.9% (McDevitt-Murphy et al., 2010) to 24.9% (National Center for PTSD). In comparison, the estimated 10-year incidence of PTSD and alcohol abuse or dependence in the United States general population is 15.8% (Breslau, Davis, & Schultz, 2008). It is important to note though, that this longitudinal study found that neither PTSD nor exposure to trauma in the absence of PTSD predicted subsequent onset of alcohol abuse or dependence. This differs from research done in combat personnel, which has found that combat deployments increase the risk of heavy drinking (Jacobson et al., 2008). Individuals with comorbid PTSD and AD endorse more severe PTSD and AD than those with PTSD or AD only, characterized by higher levels of PTSD symptoms, a higher likelihood of using substances to alleviate PTSD symptoms, a higher number of lifetime psychiatric co-morbidities, more AD symptoms, and higher disability (Blanco et al., 2013).

It is possible that PTSD resulting from combat deployments leads to alcohol misuse. Jacobson et al. (2008) found that veterans with a diagnosis of combat-related PTSD were more likely than those without PTSD to engage in new onset post-deployment problematic alcohol use. This study also found new rates of onset heavy weekly drinking, binge drinking, and other alcohol-related problems post-combat deployment were 8.8%, 25.6%, and 7.1% in Reserve or National Guard personnel and 6.0%, 26.6%, and 4.8% in active duty personnel, respectively. Further, Reserve and National Guard personnel were significantly more likely to experience new onset heavy weekly drinking, binge drinking, and other alcohol-related problems compared to non-deployed personnel (Jacobson et al., 2008). In another study of active-duty personnel aged 18 to 64, 20% reported heavy drinking compared to only 14% of same-aged civilians (Bray et al., 2008). Various causal pathways have been suggested to explain the high rates of co-occurring PTSD and alcohol misuse, and “self-medication” is often noted as an important aspect of the relationship between PTSD and substance misuse (Leeies, Pagura, Sareen, & Bolton, 2010; Simpson, Stappenbeck, Varra, Moore, & Kaysen, 2012). Many studies suggest that alcohol use may function as a coping mechanism for individuals who have difficulty regulating negative emotional states that result from PTSD symptoms such as hypervigilance or numbing (Gil-Rivas, Prause, & Grella, 2009; Ouimette, Coolhart, Funderburk, Wade, & Brown, 2007; Waldrop, Back, Verduin, & Brady, 2007). This explanation does not address why some individuals with PTSD would adopt alcohol misuse as a form of coping while others do not. Recent research on the construct of emotion dysregulation might offer some insight.

Gratz and Roemer (2004) have identified several dimensions of emotion dysregulation: nonacceptance of emotions; difficulties engaging in goal-direct behavior; impulse control difficulties; lack of emotional awareness; limited access to emotion regulation strategies; and lack of emotional clarity. It is possible that high levels of emotion dysregulation dimensions in the presence of the considerable distress associated with PTSD leads to alcohol misuse.

Several studies have linked trauma, PTSD, and emotion dysregulation. In a study of community trauma survivors, posttraumatic stress symptom severity was correlated with each dimension of emotion dysregulation (Ehring & Quack, 2010). In a study of college students, posttraumatic stress symptom severity was associated with all dimensions of emotion dysregulation other than lack of emotional awareness. Individuals who scored above a cutoff suggestive of meeting PTSD criteria had significantly higher levels of emotion dysregulation than those below the cutoff (Tull, Barrett, McMillan, & Roemer, 2007). Another study of college students found that those with probable PTSD had higher levels of emotion dysregulation than those without a history of trauma and than those with a trauma history but no PTSD (Weiss, Tull, Davis, et al., 2012). Furthermore, students with a history of trauma but no PTSD showed lower scores than students without a trauma history on the facets of difficulties with impulse control when distressed and limited access to emotion regulation strategies relative to individuals with probable PTSD. Emotion dysregulation has been linked to PTSD in a sample of veterans; Kashdan, Breen, and Julian (2010) examined how daily “strivings” (defined as “an objective you are typically trying to accomplish or attain”) that were related to emotion regulation strategies may have been related to PTSD and other negative outcomes. Veterans with PTSD endorsed more strivings related to emotion regulation, described as those “intended to eliminate, reduce, strategically maintain or increase the experience of any emotional experience” than those without PTSD (Kashdan et al., 2010).

Emotion dysregulation has also been linked to alcohol misuse. In a study comparing individuals who recently began substance use treatment to a group of social drinkers who were not in treatment, those with alcohol dependence had worse emotion regulation skills than the social drinkers. After treatment, improvements in awareness and clarity of emotional experience were made while impulse control difficulties persisted (Fox et al., 2008). Another study of individuals seeking substance abuse treatment used a prospective design and found that lower baseline emotion regulation skills were associated with worse treatment response and that worse emotion regulation skills at end of treatment predicted post-treatment alcohol use (Berking et al., 2011). A similar line of research found emotion dysregulation to be related to alcohol-related consequences such as fights and police contact (Magar, Phillips, & Hosie, 2008). Poorer emotion regulation skills may affect both the level of alcohol consumption and the manner in which individuals drink.

One prior study has examined PTSD, emotion regulation, and alcohol misuse in a sample of active-duty Iraq war soldiers with and without PTSD (Klemanski, Mennin, Borelli, Morrissey, & Aikins, 2012). This study found that emotion dysregulation significantly partially mediated the relationship between PTSD and outcomes such as depression but not alcohol misuse. It is important to note that this study used a full scale rather than

dimensional measure of emotion dysregulation. Klemanski and colleagues also excluded any individuals with current substance abuse or dependence from their study, which may have led to null findings.

Given that PTSD and alcohol misuse commonly co-occur among combat veterans (Jacobson et al., 2008) and that both have been positively associated with emotion dysregulation, the present research examined whether emotion dysregulation mediated the relation between PTSD and alcohol misuse in a sample of combat veterans. We used a multidimensional measure of emotion regulation to investigate different facets of this construct, which is something that has not been done previously. We hypothesized that PTSD symptoms, emotion dysregulation, and alcohol misuse would be positively correlated, and PTSD would indirectly affect alcohol misuse through emotion dysregulation (and each of the six facets).

2. Method

2.1 Participants and Procedure

Data were collected from 139 participants recruited from Veterans Affairs Medical Center (VAMC) sites. The sample was predominantly male ($n = 124$; 89%) and ranged in age from 21 to 66 ($M = 35.04$, $SD = 9.96$). The sample was ethnically diverse, with 46% identifying as African American ($n = 64$), 46% Caucasian ($n = 64$), and the remainder identifying as multiethnic (4%, $n = 6$), Asian (1%; $n = 1$), Hispanic (1%; $n = 1$), Native American (1%; $n = 1$), and 2 (1%) individuals not specifying their ethnicity. The average length of deployment was 18.28 months ($SD = 12.36$). Participants reported being home an average of 3.31 years ($SD = 2.45$) since their last deployment. Participants were provided informed consent to complete the study and then completed a set of questionnaires. The Institutional Review Boards approved all procedures.

2.2 Measures

2.2.1. Posttraumatic Stress Disorder Symptoms—The PTSD Checklist-Military (PCL-M; Weathers et al., 1993) was used to assess past month PTSD symptoms. The PCL-M is a brief 17-item measure that screens for PTSD using the DSM-IV criteria (APA, 2001) related to military experience. Items are rated on a scale of 1 to 5, with cumulative scores ranging from 17 to 85 and higher scores indicating more severe PTSD. The PCL has shown excellent internal consistency ($\alpha = .94$) and high convergent validity ($r = .93$) with the Clinician Administered PTSD Scale (CAPS; Blake et al., 1990) in a sample of individuals who experienced a recent trauma (Blanchard, Jones-Alexander, Buckley, & Forneris, 1996). The PCL-M has been validated within different veteran populations (i.e. Vietnam, Gulf War) and showed high internal consistency ($\alpha > .80$) and adequate test-retest reliability after 2 to 3 days ($r > .70$). Internal consistency in the current sample was excellent ($\alpha = .97$).

2.2.2. Emotion Dysregulation—Emotion dysregulation was measured with the Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004). The subscales of the measure assessed different domains of emotion dysregulation: Nonacceptance of Emotional Responses Difficulties Engaging in Goal-Directed Behavior, Impulse Control Difficulties, Lack of Emotional Awareness, Limited Access to Emotion Regulation

Strategies, and Lack of Emotional Clarity. Items were measured on a scale from 1 to 5, with higher scores indicating higher emotion dysregulation. The DERS has shown good internal consistency ($\alpha = .93$), high test-retest reliability ($p_1 = .88$) as well as adequate construct and predictive validity in past research with college students (Gratz & Roemer, 2004). Internal consistency in this sample was excellent ($\alpha = .96$).

2.2.3. Alcohol Misuse—The Alcohol Use Disorders Identification Test (AUDIT; Saunders, Aasland, Babor, de la Fuente, & Grant, 1993) is a 10-item measure that is used to screen for alcohol use disorders. The measure assesses three domains of alcohol use: hazardous alcohol use, dependence symptoms, and harmful alcohol use. Possible AUDIT scores range from 0 to 40, with higher scores more indicative of alcohol misuse. In a large review of existing studies using the AUDIT among a variety of populations including Veterans Affairs patients at the Veterans Affairs, de Meneses-Gaya, Zuardi, Loureiro, and Crippa (2009) found that the AUDIT yielded strong test-retest reliability as well as excellent sensitivity and specificity values when compared to other instruments that measure alcohol misuse. Internal consistency for the current sample was good ($\alpha = .86$).

2.3. Data Analysis Plan

Prior to conducting analyses outliers were corrected using recommendations outlined by Tabachnick and Fidell (2007). Bivariate relationships were analyzed between PTSD symptoms, emotion dysregulation, and alcohol misuse. Next, we used a mediation model using bootstrapping, which makes no assumptions about the sampling distribution of the indirect effect (Hayes, 2013; Preacher & Hayes, 2004). Bootstrapping has been argued to overcome the issue of power caused by nonnormality in the sampling distribution (Bollen & Stine, 1990), and it also may be used with more confidence in smaller samples as it uses re-sampling. Following procedures outlined by Hayes (2013) using the PROCESS Macro, analyses were conducted to determine whether emotion dysregulation mediated the relationship between PTSD severity and alcohol misuse. A nonparametric bootstrap method of 5,000 samples using a confidence interval of 95% was used to test the indirect effect of PTSD on alcohol misuse through the pathway of emotion dysregulation subscales. Each emotion dysregulation subscale was tested in a separate model.

3. Results

3.1. Descriptive Statistics

Descriptive statistics for the full sample and for men only are shown in Table 1. Participants obtained an average score of 48.70 ($SD = 19.74$) on the PCL-M, with 65 (47%) scoring at or above a score of 50, which is the recommended cut-off score indicating a probable diagnosis of PTSD for combat survivors (Weathers et al., 1993). The AUDIT average score was 5.44 ($SD = 6.80$) and 34 (24.5%) scored at or above the recommended cut-off score of 8 that indicates hazardous alcohol use (Babor, Higgins-Biddle, Saunders, & Montiero, 2001). Participants in this sample endorsed an average score of 87.24 ($SD = 28.89$) on the DERS. This is a higher average score than Gratz and Roemer (2004) reported in their validation study of the DERS using a college sample (77.99 for women and 80.66 for men).

3.2. Correlations between Variables

Table 2 displays correlations between PCL-M (PTSD symptoms), DERS total (emotion dysregulation), and AUDIT (alcohol misuse) scores for both the full sample and men only. For the full sample, all these variables were positively and significantly correlated, with the PCL-M showing a strong association with DERS total ($r = .73, p < .01$). PCL-M and AUDIT were weakly associated ($r = .29, p < .01$), as were AUDIT and DERS total ($r = .24, p < .01$). The PCL-M had significant moderate to high associations with all subscales of DERS. AUDIT score was significantly associated with four subscales of the DERS but was not associated with Nonacceptance of Emotional Responses or Difficulties Engaging in Goal Directed Behavior. Notably, for men AUDIT was significant correlated with all DERS subscales except for Nonacceptance of Emotional Responses.

Correlations between PTSD symptom clusters (re-experiencing, avoidance and numbing, and hypervigilance), DERS subscales, and AUDIT were also examined for the full sample. As shown in Table 3, all PTSD symptom clusters were positively associated with DERS subscales. Some DERS subscales (Nonacceptance of Emotional Responses) were weakly correlated with the PTSD symptom clusters ($r = .31 - .41$) while others were strongly correlated (Limited Access to Emotion Regulation Strategies; $r = .61 - .75$). The AUDIT was significantly positively correlated with each PCL-M cluster score ($r = .25 - .31$).

3.3. Mediation Analyses for Full Sample

Next, the DERS subscales were tested as mediators of the relation between PCL-M and AUDIT with age as a covariate (because age was significantly correlated with both PCL-M and AUDIT). Each of the DERS subscales that had shown significant correlations with both PCL-M and AUDIT was investigated as a potential mediator. As shown in Table 4, PTSD did not indirectly influence alcohol misuse through the pathway of emotion dysregulation. The same is true for all subscales of emotion dysregulation.

3.4. Mediation Analyses for Men Only

We had an insufficient number of women ($n = 15$) to examine the effect of gender as a moderator, but we did analyze men only to determine if specific patterns existed for men. Further analyses were not conducted with women. There was a significant and positive relationship between PCL-M and AUDIT ($r = .35, p < .001$). All emotion dysregulation subscales were significantly correlated with PCL-M ($rs = .40 - .73, p < .001$) and AUDIT ($rs = .23 - .40, p < .001$) except for Nonacceptance of Emotional Responses, and we excluded this subscale from further analyses. We next examined whether emotion dysregulation full scale and subscales mediated the relationship between PCL-M and AUDIT for men ($n = 110$; Table 5) while controlling for age. We ran each emotion dysregulation facet in a separate mediation model. Impulse Control Difficulties significantly mediated between PCL-M and AUDIT ($B = .06, SE = .03, 95\% CI = .004 - .129$). Lack of Emotional Clarity also mediated the relation between PCL-M and AUDIT ($B = .04, SE = .02, 95\% CI = .002 - .088$). No other DERS subscales mediated the relation between PCL-M and AUDIT.

4. Discussion

This study examined relationships between PTSD symptoms, aspects of emotion dysregulation, and alcohol misuse. Individuals with higher levels of PTSD symptoms endorsed higher levels of both emotion dysregulation and alcohol misuse. Individuals with more severe alcohol use endorsed higher emotion dysregulation on all facets except for Nonacceptance of Emotional Responses and Difficulties Engaging in Goal Directed Behavior. The associations between PTSD symptoms and emotion dysregulation were much stronger than the associations between emotion dysregulation and alcohol misuse. These findings related to alcohol misuse and emotion dysregulation differ somewhat from previous findings (Berking et al., 2011; Fox et al., 2008), although many of the existing studies examining these two constructs used samples of treatment seekers or individuals with identified alcohol problems while this sample consisted of a full range of alcohol use, including both alcohol users and abstainers. In addition to looking at PCL-M total score, we also examined the different symptom clusters of PTSD. Our analyses revealed that reexperiencing, avoidance and numbing, and hypervigilance symptoms were moderately to strongly correlated with all dimensions of emotion dysregulation and moderately correlated with alcohol misuse. Nonacceptance of Emotional Responses and Lack of Emotional Awareness showed the weakest correlations with PTSD symptom clusters. All three PTSD symptom clusters showed a wide range of correlation strengths with all emotion dysregulation subscales.

The mediation analyses revealed that after controlling for age, no emotion dysregulation subscales mediated the relation between PTSD symptoms and alcohol misuse in the full sample. However, when we examined patterns among men, both Impulse Control Difficulties and Lack of Emotional Clarity significantly mediated the relationship, while the other subscales did not. These findings suggest that for male combat veterans of the OEF/OIF/OND era, high levels of impulsivity when upset and not having clarity about one's emotions may partially explain the association between PTSD symptoms and alcohol misuse. It is possible that impulse control difficulties when upset and lack of emotional clarity may cause inability to cope with distressful and unwanted PTSD symptoms (e.g. hypervigilance, numbing, avoidance, reexperiencing) in male veterans. This distress coupled with poor emotion regulation may manifest in excess drinking. Impulse control difficulties when upset may interfere with individuals' ability to effectively cope with distressful PTSD symptoms, particularly symptoms that may cause negative affect, such as guilt, depression, or hypervigilance. In this sample, it is plausible that alcohol may be used as a method of dampening one's PTSD related distress. Alcohol misuse may also be a coping strategy for those male veterans with PTSD when they do not understand or lack clarity of their emotions. Because most PTSD symptoms may cause distress for individuals, not understanding why one is upset may interfere with one's ability to effectively cope with the distress. This lack of understanding may cause more distress over time, and alcohol misuse may result as self-medication. We did not have longitudinal data with which to fully examine this causal chain, but this remains a hypothesis for future research.

Previous findings have linked trauma, impulsivity and alcohol misuse (Marshall-Berenz, Vujanovic, & MacPherson, 2011; Weiss, Tull, Anestis, et al., 2013). Much of the past

literature has focused on a definition of impulsivity that includes sensation seeking, lack of perseverance of behaviors, urgency, and lack of premeditation, while the impulsivity variable in the present work was focused on *impulse control while emotionally upset*. Our results parallel research finding that in individuals seeking substance use disorder treatment, those with PTSD showed higher levels of negative urgency, defined as the tendency to engage in impulsive behaviors when upset, as well as overall higher emotion dysregulation (Weiss, Tull, Anestis, et al., 2013).

These findings also speak to the importance of emotional clarity or understanding of one's emotions in those with PTSD and alcohol misuse. Past studies have linked PTSD severity to alexithymia, defined as the inability to identify or describe one's emotions (McCaslin et al., 2006). In a recent study of OEF/OIF veterans, higher emotional intelligence (defined as the ability to understand and regulate emotions) predicted overall fewer symptoms of PTSD, less alcohol use, and alcohol problems (Gaher et al., 2014). Another study of college students found that several emotion dysregulation facets including impulse control difficulties and lack of emotional clarity were associated with the number of negative consequences of alcohol use (Dvorak et al., 2014). It is possible for those experiencing PTSD symptoms, impulse control difficulties and lack of emotional clarity are the most important factors in predicting alcohol misuse.

4.1. Limitations

There were several limitations to the current research that should be considered when interpreting these results. These data are cross-sectional in nature, which limits the ability to draw causal inferences. This is especially important in interpreting the current results, given the potential bi-directionality of the relations among PTSD, emotion regulation, and alcohol misuse. Future research should examine these relationships longitudinally, especially to determine whether individuals with high emotion dysregulation are more likely to develop future PTSD and alcohol misuse. The use of self-report measures also limits the ability to draw conclusions about individuals who meet diagnostic criteria for PTSD. This concern is tempered by the fact that the PCL-M has shown exceptional psychometric characteristics in a broad range of populations (Blanchard, Jones-Alexander, Buckley, & Forneris, 1996; Bollinger, Cuevas, Vielhauer, Morgan, & Keane, 2008; Wilkins, Lang, & Norman, 2011). Eight questions on the AUDIT focused on past year alcohol misuse, while the last two questions asked about lifetime alcohol misuse. Given that majority of veterans in this sample had been home from deployment for longer than one year, it is possible that they had previously experienced alcohol problems after their combat deployment but had since recovered. A study of Vietnam veterans showed that a large proportion of those who reported addiction to heroin while deployed did not continue to use once they returned (Robins, 1974), demonstrating that environment may play an important role in persisting addictive behaviors. In this sample alcohol misuse may be a product of exposure to a combat zone and some veterans may not persist in using once they have returned home. However, there is a large literature suggesting that alcohol misuse may be a lasting problem for veterans after returning home (Milliken, Auchterlonie, & Hoge, 2007), especially for those with PTSD (Bremner, Southwick, Darnell, & Charney, 1996). It is potentially the combination of PTSD and emotion dysregulation that contribute to persistent alcohol

misuse. Future research should examine the trajectory of alcohol misuse over time for veterans who have seen combat versus those who have not to determine the severity and length of lasting alcohol problems.

Another limitation of the current research was small number of women in the sample. Although the number of female veterans is rapidly increasing (National Center for Veterans Analysis and Statistics, 2011), this sample did not have a large enough number to permit a fully powered test of our hypotheses within women. Future research should examine these same constructs with a larger female sample to determine whether there are differences in the relations among PTSD symptom severity, emotion dysregulation, and alcohol misuse. Because the co-occurrence of alcohol dependence is lower in women than men with PTSD (Kessler et al., 1995), it is possible that these relationships may not exist.

4.2. Clinical Implications

The current findings speak to the importance of addressing both impulse control difficulties and lack of emotional clarity when treating individuals with co-occurring PTSD and alcohol misuse. Both of these facets of emotion dysregulation may act as contributing factors to higher negative consequences of alcohol use in these individuals. PTSD symptoms such as hypervigilance, avoidance, numbing, or reexperiencing may lead to negative affect states that motivate individuals to drink, and increasing emotion regulation skills may decrease that motivation. Emotion dysregulation is a main target of Dialectical Behavioral Therapy (DBT; Linehan & Dexter-Mazza, 2008) and supplementing emotion regulation skills on top of traditional PTSD treatments such as Prolonged Exposure Therapy may inhibit the need to drink in a manner that may lead to problems. Specifically addressing impulses when upset and clarifying emotions would improve treatments for PTSD, as these emotion dysregulation domains are highly correlated with PTSD severity and may put individuals at danger for risky drinking. Individuals with PTSD may benefit from developing resistance to impulsivity, as they may be at risk for engaging in dangerous behaviors (James, Strom, & Leskela, 2014) even outside of alcohol misuse. As past literature has linked PTSD to alexithymia, a construct similar to lack of emotional clarity, helping individuals identify, describe, and understand their emotions would strengthen existing PTSD treatments. These additions to existing treatments may also contribute to positive outcomes in treating alcohol misuse, as both impulse control difficulties and lack of emotional clarity may both precede risky drinking. Individuals who are able to understand their emotions may be less likely to misuse alcohol as they may be better able to address their distress and use healthy coping strategies.

4.3. Conclusions

The current study provided evidence that in OEF/OIF/OND veterans emotion dysregulation is significantly associated with PTSD symptoms and alcohol misuse. Two facets of emotion dysregulation mediate the relation between PTSD symptoms and alcohol misuse. Future longitudinal research should clarify this relationship using more precise measurement approaches. The present findings suggest that individuals with PTSD symptoms and alcohol misuse may benefit from learning emotion regulation skills, especially those that may decrease impulse control difficulties and increase emotional clarity.

Acknowledgements

Funding for this study was provided by NIAAA Grant K23AA016120.

Role of Funding Sources

NIAAA had no role in the study design, collection, analysis, or interpretation of the data, writing the manuscript, or the decision to submit the paper for publication.

References

- Babor, TF.; Higgins-Biddle, JC.; Saunders, JB.; Monteiro, MG. The Alcohol Use Disorders Identification Test (AUDIT): Guidelines for Use in Primary Care. second ed.. World Health Organization; Geneva, Switzerland: 2001. Available at <http://www.who.int/substanceabuse/publications/alcohol/en/index.html> [July 2, 2013]
- Berking M, Margraf M, Ebert D, Wupperman P, Hofmann SG, Junghanns K. Deficits in emotion-regulation skills predict alcohol use during and after cognitive-behavioral therapy for alcohol dependence. *Journal of Consulting and Clinical Psychology*. 2011; 79(3):307–318. doi:10.1037/a0023421. [PubMed: 21534653]
- Blake DD, Weathers FW, Nagy LM, Katoupek DG, Gusman FD, Charney DS, Keane TM. The development of a Clinician-Administered PTSD Scale. *Journal of Traumatic Stress*. 1995; 8(1):75–90. [PubMed: 7712061]
- Blanco C, Xu Y, Brady K, Pérez-Fuentes G, Okuda M, Wang S. Comorbidity of posttraumatic stress disorder with alcohol dependence among us adults: Results from national epidemiological survey on alcohol and related conditions. *Drug and Alcohol Dependence*. 2013 doi:10.1016/j.drugalcdep.2013.04.016.
- Blanchard EB, Jones-Alexander J, Buckley TC, Forneris CA. Psychometric properties of the PTSD Checklist (PCL). *Behaviour Research and Therapy*. 1996; 34(8):669–673. doi:10.1016/0005-7967(96)00033-2. [PubMed: 8870294]
- Bollen KA, Stine R. Direct and indirect effects: Classical and bootstrap estimates of variability. *Sociological Methodology*. 1990; 20:115–140. doi:10.1177/004912419201002004.
- Bollinger AR, Cuevas CA, Vielhauer MJ, Morgan EE, Keane TM. The operating characteristics of the PTSD Checklist in detecting PTSD in HIV+ substance abusers. *Journal of Psychological Trauma*. 2008; 7(4):213–234. doi:10.1080/19322880802384251.
- Bray, RM.; Pemberton, MR.; Hourani, LL.; Witt, M.; Olmsted, KLR.; Brown, JM., et al. Department of Defense survey of health related behaviors among active duty military personnel: Final report (prepared for the Assistant Secretary of Defense [Health Affairs]. U.S. Department of Defense, task order number for DoD NO. W81XWH-07-F-0538 and task order number for Coast Guard HSCG23-07-F-PMD047). Research Triangle Institute; Research Triangle Park, NC: 2008. 2009.
- Bremner JD, Southwick SM, Darnell A, Charney DS. Chronic PTSD in Vietnam combat veterans: Course of illness and substance abuse. *The American Journal of Psychiatry*. 1996; 153(3):369–375. [PubMed: 8610824]
- Breslau N, Davis GC, Schultz LR. Posttraumatic stress disorder and the incidence of nicotine, alcohol, and other drug disorders in persons who have experienced trauma. *Archives Of General Psychiatry*. 2003; 60(3):289–294. doi:10.1001/archpsyc.60.3.289. [PubMed: 12622662]
- de Meneses-Gaya C, Zuairi A, Loureiro S, Crippa JS. Alcohol Use Disorders Identification Test (AUDIT): An updated systematic review of psychometric properties. *Psychology & Neuroscience*. 2009; 2(1):83–97. doi:10.3922/j.psns.2009.1.12.
- Dvorak RD, Sargent EM, Kilwein TM, Stevenson BL, Kuvaas NJ, Williams TJ. Alcohol use and alcohol-related consequences: Associations with emotion regulation difficulties. *The American Journal of Drug and Alcohol Abuse*. 2014; 40(2):125–130. doi:10.3109/00952990.2013.877920. [PubMed: 24588419]
- Ehring T, Quack D. Emotion regulation difficulties in trauma survivors: The role of trauma type and PTSD symptom severity. *Behavior Therapy*. 2010; 41(4):587–598. doi:10.1016/j.beth.2010.04.004. [PubMed: 21035621]

- Fox HC, Hong KA, Sinha RR. Difficulties in emotion regulation and impulse control in recently abstinent alcoholics compared with social drinkers. *Addictive Behaviors*. 2008; 33(2):388–394. doi:10.1016/j.addbeh.2007.10.002. [PubMed: 18023295]
- Gaher RM, Simons JS, Hahn AM, Hofman NL, Hansen J, Buchkoski J. An Experience Sampling Study of PTSD and Alcohol-Related Problems. *Psychology of Addictive Behaviors*. 2014 doi: 10.1037/a0037257.
- Gil-Rivas V, Prause J, Grella CE. Substance use after residential treatment among individuals with co-occurring disorders: The role of anxiety/depressive symptoms and trauma exposure. *Psychology of Addictive Behaviors*. 2009; 23(2):303–314. doi:10.1037/a0015355. [PubMed: 19586147]
- Gratz KL, Roemer L. Multidimensional assessment of emotion regulation and dysregulation: Development, factor structure, and initial validation of the difficulties in emotion regulation scale. *Journal of Psychopathology and Behavioral Assessment*. 2004; 26(1):41–54. doi:10.1023/B:JOBA.0000007455.08539.94.
- Hayes, AF. *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. Guilford Press; New York, NY US: 2013.
- Jacobson IG, Ryan MK, Hooper TJ, Smith TC, Amoroso PJ, Boyko EJ, Bell NS. Alcohol use and alcohol-related problems before and after military combat deployment. *JAMA: Journal of the American Medical Association*. 2008; 300(6):663–675. doi:10.1001/jama.300.6.663.
- James LM, Strom TQ, Leskela J. Risk-taking behaviors and impulsivity among veterans with and without PTSD and mild TBI. *Military Medicine*. 2014; 179(4):357–363. doi:10.7205/MILMED-D-13-00241. [PubMed: 24690958]
- Kashdan TB, Breen WE, Julian T. Everyday strivings in war veterans with posttraumatic stress disorder: Suffering from a hyper-focus on avoidance and emotion regulation. *Behavior Therapy*. 2010; 41(3):350–363. doi:10.1016/j.beth.2009.09.003. [PubMed: 20569784]
- Kessler RC, Sonnega A, Bromet E, Hughes M, Nelson CB. Posttraumatic stress disorder in the National Comorbidity Survey. *Archives of General Psychiatry*. 1995; 52(12):1048–1060. [PubMed: 7492257]
- Klemanski DH, Mennin DS, Borelli JL, Morrissey PM, Aikins DE. Emotion related regulatory difficulties contribute to negative psychological outcomes in active duty Iraq war soldiers with and without posttraumatic stress disorder. *Depression and Anxiety*. 2012; 29(7):621–628. doi: 10.1002/da.21914. [PubMed: 22461455]
- Leeies M, Pagura J, Sareen J, Bolton JM. The use of alcohol and drugs to self-medicate symptoms of posttraumatic stress disorder. *Depression and Anxiety*. 2010; 27(8):731–736. [PubMed: 20186981]
- Linehan, MM.; Dexter-Mazza, ET. Dialectical behavior therapy for borderline personality disorder.. In: Barlow, DH., editor. *Clinical handbook of psychological disorders: A step-by-step treatment manual*. 4th ed.. Guilford Press; New York, NY, US: 2008. p. 365-420.
- Magar EE, Phillips LH, Hosie JA. Self-regulation and risk-taking. *Personality and Individual Differences*. 2008; 45(2):153–159. doi:10.1016/j.paid.2008.03.014.
- Marshall-Berenz EC, Vujanovic AA, MacPherson L. Impulsivity and alcohol use coping motives in a trauma-exposed sample: The mediating role of distress tolerance. *Personality and Individual Differences*. 2011; 50(5):588–592. doi:10.1016/j.paid.2010.11.033. [PubMed: 21483650]
- McCaslin SE, Metzler TJ, Best SR, Liberman A, Weiss DS, Fagan J, Marmar CR. Alexithymia and PTSD Symptoms in Urban Police Officers: Cross-Sectional and Prospective Findings. *Journal Of Traumatic Stress*. 2006; 19(3):361–373. doi:10.1002/jts.20133. [PubMed: 16788996]
- McDevitt-Murphy ME, Williams JL, Bracken KL, Fields JA, Monahan CJ, Murphy JG. PTSD symptoms, hazardous drinking, and health functioning among U.S. OEF and OIF veterans presenting to primary care. *Journal of Traumatic Stress*. 2010; 23(1):108–111. [PubMed: 20104586]
- Milliken CS, Auchterlonie JL, Hoge CW. Longitudinal assessment of mental health problems among active and reserve component soldiers returning from the Iraq war. *JAMA: Journal of the American Medical Association*. 2007; 298(18):2141–2148. doi:10.1001/jama.298.18.2141.
- National Center for PTSD (Producer). *Managing PTSD and co-occurring substance use disorder [DVD]*. 2012. Available from <http://www.ptsd.va.gov/professional/ptsd101/course-modules/SUD.asp>

- National Center for Veterans Analysis and Statistics. America's Women Veterans: Military Service History and VA Benefit Utilization Statistics. National Center for Veterans Analysis and Statics, Department of Veterans Affairs; Washington, DC: Nov. 2011
- Ouimette P, Coolhart D, Funderburk J, Wade M, Brown PJ. Precipitants of first substance use in recently abstinent substance use disorder patients with PTSD. *Addictive Behaviors*. 2007; 32(8): 1719–1727. doi:10.1016/j.addbeh.2006.11.020. [PubMed: 17188816]
- Preacher KJ, Hayes AF. SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments & Computers*. 2004; 36(4):717–731. doi: 10.3758/BF03206553.
- Robins LN. A follow-up study of Vietnam veterans' drug use. *Journal Of Drug Issues*. 1974; 4(1):61–63.
- Saunders JB, Aasland OG, Babor TF, de la Fuente JR, Grant M. Development of the Alcohol Use Disorders Identification Test (AUDIT): WHO collaborative project on early detection of persons with harmful alcohol consumption: II. *Addiction*. 1993; 88:791–804. doi:10.1111/j.1360-0443.1993.tb02093.x. [PubMed: 8329970]
- Simpson TL, Stappenbeck CA, Varra AA, Moore SA, Kaysen D. Symptoms of posttraumatic stress predict craving among alcohol treatment seekers: Results of a daily monitoring study. *Psychology of Addictive Behaviors*. 2012; 26(4):724–733. doi:10.1037/a0027169. [PubMed: 22369221]
- Tabachnick, BG.; Fidell, LS. Using multivariate statistics. 5th ed.. Allyn & Bacon/Pearson Education; Boston, MA: 2007.
- Tull MT, Barrett HM, McMillan ES, Roemer L. A preliminary investigation of the relationship between emotion regulation difficulties and posttraumatic stress symptoms. *Behavior Therapy*. 2007; 38(3):303–313. doi:10.1016/j.beth.2006.10.001. [PubMed: 17697854]
- Waldrop AE, Back SE, Verduin ML, Brady KT. Triggers for cocaine and alcohol use in the presence and absence of posttraumatic stress disorder. *Addictive Behaviors*. 2007; 32(3):634–639. doi: 10.1016/j.addbeh.2006.06.001. [PubMed: 16863682]
- Weathers, FW.; Litz, BT.; Herman, DS.; Huska, JA.; Keane, TM. The PTSD Checklist (PCL): Reliability, validity, and diagnostic utility. Paper presented at the annual meeting of the International Society for Traumatic Stress Studies. San Antonio, TX.: Oct. 1993
- Weiss NH, Tull MT, Anestis MD, Gratz KL. The relative and unique contributions of emotion dysregulation and impulsivity to posttraumatic stress disorder among substance dependent inpatients. *Drug and Alcohol Dependence*. 2013; 128(1-2):45–51. doi:10.1016/j.drugalcdep.2012.07.017. [PubMed: 22917752]
- Weiss NH, Tull MT, Davis LT, Dehon EE, Fulton JJ, Gratz KJ. Examining the association between emotion regulation difficulties and probable posttraumatic stress disorder within a sample of African Americans. *Cognitive Behaviour Therapy*. 2012; 41(1):5–14. doi: 10.1080/16506073.2011.621970. [PubMed: 22074329]
- Wilkins KC, Lang AJ, Norman SB. Synthesis of the psychometric properties of the PTSD checklist (PCL) military, civilian, and specific versions. *Depression and Anxiety*. 2011; 28(7):596–606. doi: 10.1002/da.20837. [PubMed: 21681864]

Highlights

- PTSD, emotion dysregulation, and alcohol misuse were correlated in an OEF/OIF/OND veteran sample
- For men, Impulse Control Difficulties when Upset and Lack of Emotional Clarity were mediators
- Emotion dysregulation did not mediate the relation between PTSD and alcohol misuse for the full sample

Table 1

Descriptive Statistics on PTSD Severity, Emotion Dysregulation, and Alcohol Misuse for Full Sample and Men Only

	Full Sample (<i>n</i> = 132 [*])		Men Only (<i>n</i> = 116 [*])		Maximum Possible
	Mean	Standard Deviation	Mean	Standard Deviation	
PCL-M	48.70	19.74	47.81	19.66	85
AUDIT	5.44	6.80	5.82	7.06	40
DERS TOTAL	87.24	28.88	84.92	27.23	180
AWARE	17.56	5.69	17.45	5.67	30
IMPULSE	13.15	6.37	12.74	6.08	30
GOALS	14.46	5.50	14.16	5.24	25
ACCEPT	12.74	6.21	12.20	5.69	30
CLARITY	11.50	4.66	11.23	4.59	25
STRATEGIES	17.99	8.00	17.35	7.44	40

Note. PCL-M = PTSD Checklist Military Version; AUDIT = Alcohol Use Disorder Identification Test; DERS TOTAL = Difficulties in Emotion Regulation Total; ACCEPT = Nonacceptance of Emotional Responses; GOALS = Difficulties Engaging in Goal-Directed Behavior; IMPULSE = Impulse Control Difficulties; AWARE = Lack of Emotional Awareness; STRATEGIES = Limited Access to Emotion Regulation Strategies; CLARITY = Lack of Emotional Clarity.

* *n*'s varied from 110-132 due to missing data

Table 2
Correlations Between PTSD Severity, Emotion Dysregulation, and Alcohol Misuse

	Full sample		Men only	
	AUDIT <i>n</i> = 124	PCL-M <i>n</i> = 125	AUDIT <i>n</i> = 108	PCL-M <i>n</i> = 110
DEERS TOTAL	.24**	.73**	.34**	.72*
AWARE	.20*	.43**	.23*	.40**
IMPULSE	.30*	.65**	.40**	.63**
GOALS	.16	.61**	.22*	.61**
ACCEPT	.01	.40**	.08	.40**
CLARITY	.26**	.63**	.34**	.60**
STRATEGIES	.22*	.72**	.32**	.73**
AUDIT	--	.29**	--	.35**

Note. DEERS TOTAL = Difficulties in Emotion Regulation Scale Total Score; ACCEPT = Nonacceptance of Emotional Responses; GOALS = Difficulties Engaging in Goal-Directed Behavior; IMPULSE = Impulse Control Difficulties; AWARE = Lack of Emotional Awareness; STRATEGIES = Limited Access to Emotion Regulation Strategies; CLARITY = Lack of Emotional Clarity; AUDIT = Alcohol Use Disorder Identification Test; PCL-M = PTSD Checklist Military Version

* $p < .01$.

** $p < .05$

Table 3

Correlations Between PTSD Symptom Clusters, Emotion Dysregulation, and Alcohol Misuse for the Full Sample

	AUDIT	PCL-B	PCL-C	PCL-AVOID	PCL-NUMB	PCL-D
AWARE	.20*	.39**	.42**	.38**	.40**	.42**
IMPULSE	.30*	.58**	.66**	.59**	.64**	.60**
GOALS	.16	.48**	.63**	.55**	.61**	.62**
ACCEPT	.01	.31**	.41**	.30**	.44**	.39**
STRATEGIES	.22*	.61**	.75**	.64**	.75**	.66**
CLARITY	.26**	.53**	.64**	.52**	.67**	.61**
AUDIT	--	.31**	.27**	.30**	.23**	.26**

Note. AWARE = Lack of Emotional Awareness; IMPULSE = Impulse Control Difficulties When Upset; GOALS = Difficulties Engaging in Goal-Directed Behavior; ACCEPT = Nonacceptance of Emotional Responses; CLARITY = Lack of Emotional Clarity; STRATEGIES = Limited Access to Emotion Regulation Strategies; AUDIT = Alcohol Use Disorder Identification Test; PCL-B = PTSD Re-experiencing Symptoms; PCL-C = PTSD Avoidance and Numbing Symptoms; PCL-AVOID = PTSD Avoidance Symptoms; PCL-NUMB = PCL Numbing Symptoms; PCL-D = PTSD Hypervigilance Symptoms

*
p < .01.

**
p < .001.

Table 4

Summary of Mediation Analysis for the Full Sample (5,000 bootstrap samples; n = 123).

Independent Variable (IV)	Mediating variable (M)	Dependent variable (DV)	Coefficient	SE	95% CI
PCL-M	DEERS TOTAL	AUDIT	.01	.03	[−.05, .08]
PCL-M	AWARE	AUDIT	.01	.01	[−.01, .04]
PCL-M	IMPULSE	AUDIT	.04	.03	[−.02, .10]
PCL-M	CLARITY	AUDIT	.03	.02	[−.01, .07]
PCL-M	STRATEGIES	AUDIT	−.001	.03	[−.07, .06]

Note. PCL-M = PTSD Checklist Military Version; AUDIT = Alcohol Use Disorder Identification Test; AWARE = Lack of Emotional Awareness; IMPULSE = Impulse Control Difficulties; ACCEPT = Nonacceptance of Emotional Responses; CLARITY = Lack of Emotional Clarity; STRATEGIES = Limited Access to Emotion Regulation Strategies.

Table 5

Summary of Mediation Analysis for Men (5,000 bootstrap samples; n = 108). Each mediator run separately.

Independent Variable (IV)	Mediating variable (M)	Dependent variable (DV)	Coefficient	SE	95% CI
PCL-M	DEERS TOTAL	AUDIT	.04	.03	[−.02, .11]
PCL-M	AWARE	AUDIT	.01	.01	[−.01, .04]
PCL-M	IMPULSE	AUDIT	.06	.03	[.004, .13]
PCL-M	GOALS	AUDIT	.01	.02	[−.04, .05]
PCL-M	CLARITY	AUDIT	.04	.02	[.001, .09]
PCL-M	STRATEGIES	AUDIT	.02	.04	[−.05, .10]

Note. PCL-M = PTSD Checklist Military Version; AUDIT = Alcohol Use Disorder Identification Test; AWARE = Lack of Emotional Awareness; IMPULSE = Impulse Control Difficulties; GOALS = Difficulties Engaging in Goal-Directed Behavior; CLARITY = Lack of Emotional Clarity; STRATEGIES = Limited Access to Emotion Regulation Strategies.