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A Preliminary Examination of Negative Affect, Emotion Dysregulation, and Risky Behaviors among Military Veterans in Residential Substance Abuse Treatment

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Abstract

Substance use disorder (SUD) is highly prevalent among military populations and associated with a wide range of negative outcomes. The goal of the present study was to explicate the relations among negative affect, emotion dysregulation, and urges to engage in risky behaviors among military veterans in residential SUD treatment. Emotion dysregulation (overall and three dimensions: access to emotion regulation strategies, impulse control, and emotional awareness) mediated the relation between negative affect and urges to engage in risky behaviors. Findings highlight the potential utility of treatments targeting emotion dysregulation in reducing risky behaviors among military veterans with SUD.

Keywords

military veteran; substance use disorder; emotion dysregulation; negative affect; risky behaviors; urges

Over the past decade, mental health service utilization within the Department of Veteran Health Affairs has increased exponentially (Department of Veterans Affairs, 2012). Notably, among the 404,060 military veterans who received a mental health diagnosis between the years of 2002 and 2012, approximately 25% were diagnosed with a substance use disorder (SUD; Department of Veterans Affairs, 2012). SUD within military veteran populations is associated with a wide range of negative outcomes, including considerable functional impairment (Erbes, Kaler, Schult, Polusny, & Arbisi, 2011), high rates of co-occurring psychiatric disorders (Carter, Capone, & Eaton Short, 2011), and poor treatment outcomes (Ilgen, McKellar, & Tiet, 2005). Importantly, however, a dearth of research has explored

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involvement in risky behaviors (e.g., risky sexual behavior, deliberate self-harm) among military veterans with SUD, despite evidence of heightened risky behaviors among both civilian SUD patients (Gratz & Tull, 2010b; Tull, Weiss, Adams, & Gratz, 2012; Weiss, Tull, Viana, Anestis, & Gratz, 2012) and military veterans without SUD (Borders, McAndrew, Quigley, & Chandler, 2012; Thomsen, Stander, McWhorter, Rabenhorst, & Milner, 2011). Further, no studies to date have explored factors that may underlie risky behaviors within this at-risk population. Given the clinical relevance and public health significance of risky behaviors, research explicating factors that may inform the development of prevention and intervention efforts targeting a reduction in risky behaviors among military veterans with SUD is warranted.

A plethora of literature highlights the role of negative affect in risky behaviors (Cooper, Agocha, & Sheldon, 2000; Cooper, Frone, Russell, & Mudar, 1995; Crepaz & Marks, 2001; Khantzian, 1997; Leith & Baumeister, 1996; Stice, 2002). Specifically, given the potentially aversive nature of negative affective states (Morris & Reilly, 1987), individuals may come to rely on risky behaviors that function to immediately reduce or distract attention away from negative affect (Heatherton & Baumeister, 1991), particularly those individuals who experience heightened or prolonged negative affect (Mennin, Heimberg, Turk, & Fresco, 2005), such as military veterans (Eisen et al., 2004; Kulka, Schlenger, & Fairbank, 1990; Thomas et al., 2010). Indeed, elevated negative affect has been cited as an antecedent to a wide range of risky behaviors (Armey, Crowther, & Miller, 2011; Fortenberry et al., 2005; Shapiro, Jamner, Davydov, & James, 2002; Smyth et al., 2007; Swendsen et al., 2000), and risky behaviors have been found to be associated with a reduction in negative affect in the short-term (Armey et al., 2011; Smyth et al., 2007).

Notably, however, an emerging research suggests that an individual's maladaptive responses to their emotions (i.e., emotion dysregulation) may be more strongly related to their involvement in risky behaviors than the nature or quality of those emotions (Gratz & Roemer, 2004; Gratz & Tull, 2010a; Linehan, 1993). As defined here, emotion dysregulation is a multi-faceted construct, including: (a) a lack of awareness, understanding, and acceptance of emotions; (b) difficulties controlling behaviors when experiencing emotional distress; (c) lack of access to adaptive strategies for modulating the duration and/or intensity of aversive emotional experiences; and (d) an unwillingness to experience emotional distress as part of pursuing meaningful activities in life (Gratz & Roemer, 2004). Emotion dysregulation has been shown to be a significant and unique predictor of risky sexual behavior (Tull et al., 2012), deliberate self-harm (Gratz & Tull, 2010b), and overall risky behaviors (Weiss et al., 2012) among civilian SUD inpatients, above and beyond other well-established risk factors (see Weiss, Sullivan, & Tull, in press for a review). Further, extending these findings, prospective investigations have found that emotion dysregulation predicts substance use following residential substance abuse treatment (Axelrod, Perepletchikova, Holtzman, & Sinha, 2011; Berking et al., 2011), and changes in emotion dysregulation account for reductions in risky behaviors across time (Weiss, Tull, & Gratz, in press). Finally, and of particular relevance to the current study, extant research provides support for an indirect relation between negative affect and risky behaviors through emotion dysregulation in civilian samples, such that maladaptive responses to negative affect confer

the greatest risk for risky behaviors (Bonn-Miller, Vujanovic, Boden, & Gross, 2011; Gratz, 2006; Veilleux, Skinner, Reese, & Shaver, 2014).

Notably, no studies to date have examined the role of emotion dysregulation in urges for or actual involvement in risky behaviors within military veterans with SUD, despite evidence to suggest that this population may be at particular risk for emotion dysregulation. Consistent with diathesis-stress models of emotion dysregulation (Linehan, 1993), Parrish (2007) argued that the presence of emotional vulnerabilities (e.g., greater intensity, reactivity, and duration of aversive emotions) in the context of an invalidating environment (i.e., military subculture) may result in higher levels of emotion dysregulation in military populations. In particular, because military subculture may communicate to members that certain emotional displays or internal experiences are faulty, invalid, or inappropriate, military veterans may feel limited in how they regulate these experiences, believing that if such experiences are not controlled, they will be perceived as weak, insane, incompetent, or undisciplined (Parrish, 2007). As a result, military veterans may be more likely to rely on emotionally-avoidant emotion regulation strategies (e.g., risky behaviors) to avoid or escape negative affective states (Heatherton & Baumeister, 1991). Importantly, however, because involvement in risky behaviors may reduce experiences in which the adaptive modulation of emotions is reinforced (Fischer, Smith, Spillane, & Cyders, 2005), interfere with emotional processing (Foa & Kozak, 1986), and contribute to the experience of more negative emotions (e.g, guilt, shame; Stuewig & Tangney, 2007), emotion dysregulation and risky behaviors may be exacerbated in the long-term.

Therefore, the goal of the current study was to extend extant literature by examining the relations among negative affect, emotion dysregulation, and urges to engage in risky behaviors (a key predictor of actual involvement of risky behaviors; Bordnick & Schmitz, 1998) within a sample of military veterans in residential substance abuse treatment, and explicate the potential mediating role of emotion dysregulation in the relation between negative affect and urges to engage in risky behaviors. Extending past research, the current study explored the role of overall emotion dysregulation, as well as the specific dimensions of emotion dysregulation, in urges to engage in risky behavior to elucidate specific targets for the development of treatments aimed at reducing risky behaviors within this population. We hypothesized that negative affect, emotion dysregulation (overall and the specific dimensions), and urges to engage in risky behaviors would be significantly positively correlated. Further, we hypothesized that overall emotion dysregulation would mediate the relationship between negative affect and urges to engage in risky behaviors. No *a priori* hypotheses were made regarding the effects of the specific dimensions of emotion dysregulation.

Materials and Methods

Participants

Participants were 46 SUD patients in a VA Medical Center residential substance abuse treatment facility in Central Mississippi. Participants were male and ranged in age from 27 to 74 (M=50.57, SD=10.09). In terms of racial/ethnic background, 67.4% of the participants self-identified as Black/African American, and 32.6% as White. Almost half of the

participants (46.7%) reported an annual income under $20,000 and 97.8% were unemployed prior to entering substance abuse treatment. Thirty-five (76.1%) of the participants were receiving treatment for alcohol dependence, 37.0% for cocaine dependence, 13.0% for marijuana dependence, and 4.3% for opioid dependence, with 30.4% participants receiving treatment for dual SUD diagnoses. A large number of participants were also diagnosed with a co-occurring mental health disorder, including mood (32.6%), anxiety (6.5%), and/or posttraumatic stress disorders (17.4%).

Measures

Measure of Negative Affect—The *Positive and Negative Affect Schedule* (PANAS; Watson, Clark, & Tellegen, 1988) consists of two 10-item mood scales assessing positive and negative affect. Respondents were asked to rate each item using a 5-point Likert-type scale (1=*very slightly/not at all,* 5=*very much*). Internal consistency was excellent (α=.91).

Measure of emotion dysregulation—The Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) is a 36-item self-report measure that assesses individuals' typical levels of emotion dysregulation across six domains: nonacceptance of negative emotions, difficulties engaging in goal-directed behaviors when distressed, difficulties controlling impulsive behaviors when distressed, limited access to emotion regulation strategies perceived as effective, lack of emotional awareness, and lack of emotional clarity. Participants rate items using a 5-point Likert-type scale (1=*almost never,* 5=*almost always*). Internal consistency was adequate (αs ranging from .78 to .92).

Measure of Risky Behavior—Given that military veterans were in a controlled environment, responses on the Urges Questionnaire (Chapman, Rosenthal, & Leung, 2009), a 12-item self-report measure that assesses urges to engage in twelve types of risky behaviors, served as a proxy for risky behaviors. Past literature suggests that urges to engage in risky behaviors predict actual engagement in risky behaviors (Bordnick & Schmitz, 1998), including during (Flannery, Poole, Gallop, & Volpicelli, 2003) and after (Sinha et al., 2011) substance abuse treatment. Examples of items included the following: binge eat; use drugs; use alcohol; yell/scream; hit someone/throw things; and engage in unprotected/risky sexual activity. Participants rate items using a 5-point Likert-type scale (1=*not at all/very slightly*, 5=*extremely*). Internal consistency was good (α=.73).

Procedure

All procedures were reviewed and approved by the G.V. (Sonny) Montgomery VAMC's Institutional Review Board. Participants were provided with information about study procedures and associated risks, following which written informed consent was obtained. They were asked to complete questionnaires in a small group setting, which occurred an average of 4.30 (*SD*=3.64) days after admission to residential substance use treatment.

Analyses

As recommended by Tabachnick and Fidell (2007), all study variables were assessed for (and were found to meet) assumptions of normality. Preliminary analyses were conducted to

explore the impact of demographic variables and clinical correlates on urges to engage in risky behaviors. Age, income, employment, race/ethnicity, and current substance use and other mental health diagnoses were not significantly correlated with urges to engage in risky behaviors (ps > .05) and, thus, were not controlled for in subsequent analyses. Means, standard deviations, and intercorrelations of all study variables are presented in Table 1. At zero-order, urges to engage in risky behaviors was associated with negative affect and emotion dysregulation (overall and all of the specific dimensions).

Following procedures outlined by Preacher and Hayes (2004), analyses were conducted to examine whether emotion dysregulation (overall and the specific dimensions) mediate the relation between negative affect (independent variable) and urges to engage in risky behaviors (dependent variable). The bootstrap method was used for estimating the standard errors of parameter estimates and the bias-corrected confidence intervals of the indirect effects (see MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002; Preacher & Hayes, 2004). The bias-corrected confidence interval is based on a non-parametric re-sampling procedure that has been recommended when estimating confidence intervals of the mediated effect due to the adjustment it applies over a large number of bootstrapped samples (Efron, 1987). The mediated effect is significant if the 95% confidence interval does not contain zero (Preacher & Hayes, 2004). The bias-corrected bootstrapping method is recommended for underpowered samples (Hayes & Scharkow, in press), and has been shown to be an effective analytic strategy for assessing mediation in smaller samples when effect sizes are medium to large (Fritz & MacKinnon, 2007). In this study, 5000 bootstrap samples were used to derive estimates of the indirect effect. All coefficients are reported as unstandardized estimates.

First, mediation analyses were conducted to explicate the role of overall emotion dysregulation in the relationship between negative affect and urges to engage in risky behaviors. As shown in Table 2, negative affect was significantly associated with overall emotion dysregulation (B = 2.58, SE = 0.33; t = 7.90, p < .001), demonstrating a direct effect between negative affect and overall emotion dysregulation. Negative affect was also significantly associated with urges to engage in risky behaviors (B = 0.51; SE = 0.14; t = 3.67 p < .001). Further, emotion dysregulation was significantly associated with urges to engage in risky behaviors (B = 0.16; SE = 0.06; t = 2.68 p = .01). The indirect effect of negative affect on urges to engage in risky behaviors through the pathway of emotion dysregulation (B = 0.42; SE = 0.24; 95% CI = .011 – 1.05) was also significant. Notably, the direct effect linking negative affect with urges to engage in risky behaviors was not significant after controlling for emotion dysregulation (B = .09, SE = .20; t = 0.44, p = .66), suggesting that emotion dysregulation fully mediated the association between negative affect and urges to engage in risky behaviors. The full model accounted for 59% of the variance in urges to engage in risky behaviors, $F(1, 43) = 62.37$, p < .001.

Following this, mediation analyses were conducted to explore the roles of the specific dimensions of emotion dysregulation in the association between negative affect and urges to engage in risky behaviors. As is shown in Table 2, two dimensions of emotion dysregulation, difficulties controlling impulsive behaviors when distressed and lack of access to effective emotion regulation strategies, were found to fully mediate the negative affect-urges to

engage in risky behaviors relation. Specifically, the indirect effect of negative affect on urges to engage in risky behaviors through the pathways of difficulties controlling impulsive behaviors and lack of access to effective emotion regulation strategies was significant, and the direct effect linking negative affect with urges to engage in risky behaviors was not significant after controlling for difficulties controlling impulsive behaviors and lack of access to effective emotion regulation strategies. In addition, one dimension of emotion dysregulation, lack of emotional awareness, was found to partially mediate the relation between negative affect and urges to engage in risky behaviors. Specifically, while the indirect effect of negative affect on urges to engage in risky behaviors through the pathway of lack of emotional awareness was significant, the direct effect linking negative affect with urges to engage in risky behaviors was still significant (but reduced in strength) after controlling for lack of emotional awareness.

Discussion

Military veterans report heightened engagement risky behaviors (Borders et al., 2012; Thomsen et al., 2011); however, a dearth of literature has examined factors that may contribute to risky behaviors within this at-risk population. Consistent with our hypotheses, negative affect, emotion dysregulation (overall and all of the specific dimensions), and urges to engage in risky behaviors were significantly positively correlated at zero-order. Further, overall emotion dysregulation, as well as the specific dimensions of difficulties controlling impulsive behaviors when distressed and lack of access to emotion regulation strategies perceived as effective, fully mediated the relation between negative affect and urges to engage in risky behaviors, whereas lack of emotional awareness partially mediated this association. Our findings are consistent with a growing body of research that underscores the role of emotion dysregulation in risky behaviors among SUD patients (Gratz & Roemer, 2008; Tull et al., 2012; Weiss et al., 2012).

While preliminary, results of the present study highlight the utility of interventions targeting specific dimensions of emotion dysregulation in reducing risky behaviors among military veterans with SUD. For example, distress tolerance skills, which focus on decreasing risky behaviors in the context of heightened emotional arousal, may be useful in promoting behavioral control in the context of distress (Linehan, 1993). Likewise, mindfulness skills focused on observing and describing emotions in the present moment may facilitate awareness of emotions (Segal, Williams, & Teasdale, 2002). Finally, military veterans with SUD may benefit from learning alternative strategies for modulating the intensity and/or duration of their emotions, such as emotional approach and distraction (Gratz & Gunderson, 2006; Gratz & Tull, 2011; Gratz et al., 2013). Indeed, treatments that directly target emotion dysregulation, such as Dialectical Behavior Therapy and Emotion Regulation Group Therapy, have been found to result in significant reductions in risky behaviors (Axelrod et al., 2011; Gratz & Tull, 2011).

In evaluating the implications of our findings, it is important to take into account several limitations. First and foremost, given the preliminary nature of this study, the sample size was small; however, the bias-corrected bootstrapping method has been found to be an acceptable statistical method for assessing mediation in small samples (Hayes & Scharkow,

in press), particularly when effect sizes are medium to large (Fritz & MacKinnon, 2007). Further, given the cross-sectional and correlational nature of our data, prospective studies are needed to examine the precise nature and direction of the relationships between the primary study variables. Additionally, this study relied exclusively on self-report measures, which may have been influenced by participant's willingness and/or ability to report accurately. Future studies should consider other assessment methods that may improve data validity (e.g., multi-modal assessment of emotion dysregulation). Further, although results are consistent with investigations of actual involvement in risky behaviors among non-military veteran SUD patients (Tull et al., 2012; Weiss et al., 2012, in press), future research would benefit from examining whether our findings generalize to real-world behaviors within this population. Likewise, as the present study focused exclusively on difficulties regulating negative emotions, future investigations would benefit from examining the role of difficulties regulating positive emotions in risky behaviors among military SUD patients (Weiss, Lavender, & Gratz, in press). Finally, although our focus on military veterans with SUD may be considered a strength of this study, our findings cannot be assumed to generalize to military or non-military populations without SUD. Further, replication across larger, more diverse samples of military veterans with SUD is needed.

Despite these limitations, results of the present study provide initial support for the underlying role of overall emotion dysregulation (and the specific dimensions of difficulties controlling impulsive behaviors when distressed, lack of access to emotion regulation strategies perceived as effective, and lack of emotional awareness) in the association between negative affect and urges to engage in risky behaviors. As such, our findings highlight the potential utility of strategies for modulating the intensity and/or duration of emotions, promoting behavioral control, and increasing emotional awareness in reducing risky behaviors among military veterans with SUD. Although treatments that target emotion dysregulation have been found to reduce risky behaviors (Gratz & Tull, 2011; Linehan, 1993), few studies have examined the effects of these treatments within non-borderline personality disorder clinical populations, such as SUD patients. Therefore, future investigations are needed that examine the utility of these treatments in reducing risky behaviors among military veterans with SUD. Finally, research is needed to better understand the relationship between emotion dysregulation and risky behaviors in military populations, such as identifying factors that heighten the risk for emotion dysregulation (e.g., posttraumatic stress disorder; Tull, Barrett, McMillan, & Roemer, 2007; Weiss, Tull, Anestis, & Gratz, 2013) and the temporal sequencing of emotion dysregulation and risky behaviors.

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Table 1

Descriptive data and intercorrelations for the DERS, PANAS NA, and Urges to Engage in Risky Behaviors

	1	2	3	4	5	6	7	8	9
1. DERS Overall	--	.75***	.93***	.88***	.95***	.58*	.86***	.38*	.59***
2. DERS Accept	--	--	.65***	.57***	.61***	.30*	.59***	.58***	.39**
3. DERS Goals	--	--	--	.81***	.88***	.46**	.75***	.62***	.49**
4. DERS Impulse	--	--	--	--	.86***	.33*	.67***	.76***	.55***
5. DERS Strategies	--	--	--	--	--	.44*	.80***	.55***	.56***
6. DERS Aware	--	--	--	--	--	--	.51***	.37*	.49**
7. DERS Clarity	--	--	--	--	--	--	--	.45**	.46**
8. PANAS NA	--	--	--	--	--	--	--	--	.49**
9. Urges to Engage in Risky Behaviors	--	--	--	--	--	--	--	--	--
M	91.78	13.80	15.15	15.52	19.65	15.80	11.83	19.42	23.86
SD	27.83	5.56	5.05	5.97	8.05	4.36	4.21	8.36	8.75

Note. DERS=Difficulties in Emotion Regulation Scale; Overall DERS=Overall Difficulties in Emotion Regulation Scale; DERS Accept=DERS Emotional Nonacceptance Subscale; DERS Goals=DERS Difficulties Engaging in Goal-Directed Behavior When Distressed Subscale; DERS Impulse=DERS Difficulties Controlling Impulsive Behaviors When Distressed Subscale; DERS Strategies=DERS Lack of Access to Effective Emotion Regulation Strategies Subscale; DERS Aware=DERS Lack of Emotional Awareness Subscale; DERS Clarity=DERS Lack of Emotional Clarity Subscale; PANAS=Positive and Negative Affect Schedule; PANAS NA=PANAS Negative Affect;

* $p<.05$.

** $p<.01$.

*** $p<.001$.

Table 2

Summary of analyses (5000 bootstrap samples) exploring the mediating role of emotion dysregulation (overall and the specific dimensions) in the relationship between negative affect (IV) and urges to engage in risky behaviors (DV)

Mediating variable	Effect of IV on M	Effect of M on DV	Direct Effect	Indirect Effect		Total Effect
(M)	(*a*)	(*b*)	(*c′*)	(*a* x *b*)	99% CI	(*c*)
Overall DERS	2.58***(0.33)	0.16**(0.06)	0.09(0.20)	0.42*(0.24)	0.11–1.05	0.51***(0.14)
DERS Accept	0.39***(0.08)	0.28(0.26)	0.40*(0.17)	0.11(0.12)	−0.05–0.46	0.51***(0.14)
DERS Goals	0.38***(0.07)	0.53^{+}(0.28)	0.32^{+}(0.17)	0.20(0.14)	−0.001–0.54	0.51***(0.14)
DERS Impulse	0.54***(0.07)	0.58*(0.29)	0.20(0.21)	0.32*(0.17)	0.04–0.71	0.51***(0.14)
DERS Strategies	0.70***(0.10)	0.46*(0.20)	0.19(0.19)	0.32*(0.18)	0.07–0.82	0.51***(0.14)
DERS Awareness	0.25***(0.07)	0.65*(0.29)	0.35*(0.15)	0.16*(0.09)	0.02–0.37	0.51***(0.14)
DERS Clarity	0.33***(0.06)	0.52(0.36)	0.34^{+}(0.18)	0.17*(0.11)	0.03–0.46	0.51***(0.14)

Note. DERS=Difficulties in Emotion Regulation Scale; Overall DERS=Overall Difficulties in Emotion Regulation Scale; DERS Accept=DERS Emotional Nonacceptance Subscale; DERS Goals=DERS Difficulties Engaging in Goal-Directed Behavior When Distressed Subscale; DERS Impulse=DERS Difficulties Controlling Impulsive Behaviors When Distressed Subscale; DERS Strategies=DERS Lack of Access to Effective Emotion Regulation Strategies Subscale; DERS Awareness=DERS Lack of Emotional Awareness Subscale; DERS Clarity=DERS Lack of Emotional Clarity Subscale. All coefficients are reported as unstandardized estimates.

$^{+}$ $p \leq .10$.

* $p \leq .05$.

** $p \leq .01$.

*** $p \leq .001$.