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Emotional Dysregulation: Concurrent Relation to Sexual Problems among Trauma-Exposed Adult Cigarette Smokers

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Abstract

Despite the documented association between trauma exposure and sexual problems (sexual dissatisfaction and sexual functioning), only a paucity of studies have investigated possible mechanisms underlying this association. The present study tested the role of emotion dysregulation in regard to levels of sexual dissatisfaction and functioning among a sample of 43 trauma-exposed cigarette smokers (17 women; $M_{\text{age}} = 20.20$, $SD = 10.87$). When controlling for negative affectivity, type of trauma (sexual vs. non-sexual), daily smoking rate, posttraumatic stress symptoms, and anxiety sensitivity, emotion dysregulation provided an independent and unique contribution to sexual dissatisfaction, but not sexual function. These preliminary findings suggest that emotion dysregulation may be more important to understanding certain sexual problems (dissatisfaction) among cigarette smoking trauma survivors than previously recognized, and is therefore, a topic worthy of further investigation.

Clinical observations and empirical studies have suggested an association between sexual problems and trauma exposure, diagnostically defined – in the Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV-TR; American Psychiatric Association [APA], 2000) – as the experience of an event that involved actual or threatened death or serious injury and a subjective sense of fear, helplessness, or horror (Carroll, Rueger, Foy, & Donahoe, 1985; De Silva, 2001; Solomon 1993). The majority of studies have been focused on sexual abuse and sexual problems (see Leonard & Follette, 2002, for a review). Other work has focused on non-sexually oriented trauma. For example, Scholerdt and Heiman (2003) found that women with histories of physical abuse during childhood had more sexual problems, including female orgasmic disorder, female sexual arousal disorder and hypoactive sexual desire, than non-abused women. Similar types of findings have been evident among other populations (e.g., combat veterans; Kotler et al., 2000). Although this corpus of empirical evidence suggests a consistent linkage between sexual problems and various types of trauma exposure, little is known about the possible cognitive-affective processes that may underlie sexual problems among trauma survivors (see Rellini, 2008, for a review).

The sexual problems-trauma exposure relationship sits on the backdrop of a growing psychopathology literature that has suggested that specific cognitive-affective factors may play key roles in better understanding clinical disorders and life impairment, more generally

(Zvolensky & Otto, 2007). One promising construct in this domain has been emotion dysregulation (Mennin, Heimberg, Turk, & Fresco, 2005). Emotion dysregulation reflects difficulties in the self-regulation of affective states and difficulties in self-control over affect-driven behaviors (Carver, Lawrence, & Scheier, 1996; Gross, 1998). Although there has been a long-standing interest in emotional dysregulation and sexual problems in trauma survivors (Rellini, 2008), there has not been a measurement tool available to assess the construct until recently. Here, Gratz and Roemer (2004) developed a self-report scale, entitled the Difficulties in Emotion Regulation Scale (DERS), which measures emotion dysregulation as a higher-order construct involving multiple, internally consistent lower-order dimensions. Emotion dysregulation (higher-order factor), as measured by the DERS, is related to increased levels of negative emotional symptoms (Gratz & Roemer, 2004; Kashdan, Zvolensky, & McLeish, 2008; Vujanovic, Zvolensky, & Bernstein, 2008) and avoidance-oriented coping for life stressors (Bonn-Miller, Vujanovic, & Zvolensky, 2008).

There has not been direct empirical study of emotion dysregulation in the sexual function literature using a measure designed to assess the construct. Indirect work has found that adult female twins ($n = 2,632$) self-described as 'anxious and emotionally unstable' or 'anxious, easily upset' (Ten-Item Personality Index: emotional stability scale; Gosling, Rentfrow, & Swann, 2003) were less likely to reach orgasm regularly, as compared to a comparison group of twin counterparts self-describing as more emotionally stable (Harris, Cherkas, Kato, Heiman, & Spector, 2008). To the extent 'anxiety and emotional lability' are related to emotion dysregulation, and given the evidence that affect can impede sexual arousal by distracting the individual from sexually-relevant stimuli (Barlow, 2002), the findings of Harris and colleagues (2008) suggest that it is possible that emotion dysregulation may be related to sexual functioning. However, it remains unclear whether emotion dysregulation *per se* is related to (1) greater sexual functioning problems among trauma-exposed females and males, and (2) whether such effects offer explanatory utility above and beyond other established factors related to sexual problems. Beyond sexual functioning *per se*, emotion dysregulation may be related to sexual dissatisfaction, defined as a lack of contentment with one's sexual life. For example, some work suggests emotion dysregulation may theoretically have a negative impact on interpersonal connection with partners (Fruzzetti & Iverson, 2004; Linehan, 1993), or the ability to regulate intense sexually-based interoceptive cues (e.g., bodily arousal, physical sensations, affect intensity; Polusny & Follette, 1995). In either case, greater levels of emotional dysregulation may be related to higher degrees of sexual dissatisfaction. In total, to the extent trauma-exposed persons have greater difficulties in regulating affective states and affect-driven behaviors (e.g., sexual engagement), they may experience more sexual dissatisfaction, and perhaps, sexual functioning problems; these effects should not theoretically be applicable to only one gender (gender invariant).

The aim of the present investigation was to examine whether emotional dysregulation is independently related to sexual problems among trauma-exposed adults. Consistent with past work (Hayes, Dennerstein, Bennett, & Fairley, 2008), sexual problems were operationally defined as increased sexual dissatisfaction and problems with sexual functioning. Participants were trauma-exposed adult daily smokers. Daily smokers were studied for two key reasons: (1) smoking rate has been found to be related to impairments in vasculogenic sexual responses in men (Shabsigh, Fishman, Schum, & Dunn, 1991), and more recently, women (Harte & Meston, 2008); and (2) daily smoking is related to traumatic stress symptoms and psychopathology (Feldner, Babson, & Zvolensky, 2007). Thus, trauma-exposed daily smokers represent an understudied population who is ostensibly at high-risk for experiencing sexual dissatisfaction and sexual functioning problems. It was hypothesized that emotional dysregulation (higher-order construct), as measured by the DERS, would explain unique (concurrent) variance, relative to the tendency to experience negative affect (negative affectivity; Watson, 2000), trauma type (sexual vs. non-sexual trauma), daily smoking rate,

posttraumatic stress symptom severity, and sensitivity to internal stimuli (anxiety sensitivity; McNally, 2002), in sexual dissatisfaction and functioning among trauma-exposed smokers.

Method

Participants

Forty-three participants (17 women; $M_{\text{age}} = 20.20$, $SD = 10.87$), ranging in age from 18 to 57 years, who endorsed exposure to traumatic life events, were included in the present investigation, a subset of a larger study (see Procedure section for details). The ethnic/racial background of participants was generally consistent with that of the Vermont population (State of Vermont Department of Health, 2007): 93.0% of participants identified as white/Caucasian, 4.7% identified as black/African-American, and 2.3% identified as “other.” In terms of current marital status, 72.1% of participants reported being single, 11.6% reported being separated, 9.3% reported being married, 4.7% reported being divorced, and 2.3% reported being widowed.

Participants were daily smokers who reported smoking an average of 14.63 cigarettes per day ($SD = 8.0$). They endorsed a mean age of onset of daily smoking of 17 years ($SD = 5.6$) and smoking for an average of 11.14 years ($SD = 11.0$) to date. Smoking status was verified using carbon monoxide (CO) analysis of breath samples, and participants evidenced a mean rating greater than CO ppm >10. On average, participants reported experiencing 3.16 ($SD = 2.20$) traumatic life events. Traumatic events were defined according to the DSM-IV-TR definition as an event that involved actual or threatened death or serious injury and a subjective sense of fear, helplessness, or horror (APA, 1994, 2000; De Silva, 2001). The types of traumatic events reported, as per responses on the Posttraumatic Diagnostic Scale (PDS; Foa, 1995), included: serious accident, fire, or explosion (44.0%), non-sexual assault by a stranger (40.0%), natural disaster (38.0%), non-sexual assault by a family member or someone known (36.0%), sexual assault by a family member or someone known (34.0%), sexual contact when younger than 18 years with someone 5 or more years older (28.0%), imprisonment (26.0%), life-threatening illness (14.0%), sexual assault by a stranger (10.0%), military combat or war zone (10.0%), torture (4.0%), and “other” trauma (32.0%). Of the 32.0% of participants who endorsed an “other trauma type,” the most commonly endorsed traumas included: witnessing death or violence ($n = 7$), deaths of family members or friends ($n = 2$), and suicide attempts by family members or friends ($n = 2$).

Trauma type was divided into two groups – sexual trauma ($n = 23$) and other trauma ($n = 20$) – since theories have suggested that the nature of the abuse is an important variable in the prediction of adult sexual functioning (Leonard & Follette, 2002). Sexual trauma was defined as sexual assault by a family member or someone known, sexual contact when younger than 18 years with someone 5 or more years older, and sexual assault by a stranger (see Posttraumatic Diagnostic Scale, Foa, 1995, described in Measures section).

Overall, 35.0% of participants met current diagnostic criteria for an axis I disorder, as assessed with the Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I); a total of 6 participants met criteria for one axis I disorder, 5 participants met criteria for two axis disorders, and 4 participants met criteria for three axis I disorders. Specifically, participants met current diagnostic criteria for the following axis I disorders: major depressive disorder ($n = 9$), generalized anxiety disorder ($n = 6$), specific phobia ($n = 4$), panic disorder with agoraphobia ($n = 4$), social phobia ($n = 4$), and agoraphobia ($n = 1$).

Participants were excluded from the study based on evidence of: (1) limited mental competency and the inability to give informed, voluntary, written consent to participate; (2) current or past psychotic-spectrum symptoms, as determined by structured diagnostic interview (see Measures section for details); (3) current (past week) suicidal intent; (4) for women, the

possibility of being pregnant (by self-report); and (5) current or past chronic illness (e.g., heart disease, chronic obstructive pulmonary disease).

Measures

Structured Clinical Interview for Diagnostic and Statistical Manual of Mental Disorders – 4th Edition (DSM-IV) Axis I Diagnoses/Non-Patient Version (SCID-I/NP)—Assessment of axis I diagnoses was determined using the SCID-I/NP (First, Spitzer, Gibbon, & Williams, 1995). The *DSM-IV* version of the SCID-I/NP has been shown to have good reliability (inter-rater Kappa = .63 – 1.0, Zanarini et al., 2000; test-retest Kappa = .44 – .78, Zanarini et al., 2000) and good to excellent validity (Basco et al., 2000).

Smoking History Questionnaire (SHQ)—Daily smoking rate was assessed with the well-established SHQ, which includes items pertaining to smoking rate, age of onset, and years of regular smoking. The SHQ has been successfully used in previous studies as a descriptive measure of smoking history (Brown, Lejuez, Kahler, & Strong, 2002; Zvolensky, Lejuez, Kahler, & Brown, 2004).

Carbon Monoxide (CO) Analysis—A noninvasive biochemical verification of smoking history was completed by CO analysis of breath samples (10 ppm cutoff; Cocomor, 1993). Expired air CO levels were assessed using a CMD/CO Carbon Monoxide Monitor (Model 3110; Spirometrics, Inc.).

Golombok Rust Inventory of Sexual Satisfaction (GRISS)—The GRISS is comprised of 28-items, designed to assess sexual problems, scored on a Likert-type scale from 0 to 4 (“never” to “always”) and then transformed into a 1-9 weighted scale with scores above 5 indicating a sexual problem (Rust & Golombok, 1986). Weighted scores are used to compare men and women on overall sexual functioning problems (GRISS-total) and levels of sexual dissatisfaction (GRISS-dissatisfaction), and they have been found to discriminate between individuals with and without sexual dysfunction, and to correlate with therapists' ratings of severity of sexual dysfunction (Rust & Golombok, 1986). The GRISS subscales include: avoidance, dissatisfaction, infrequency, non-communication, and non-sensuality within sexual relationships. Gender-specific subscales are: male erectile dysfunction, male premature ejaculation, female anorgasmia (i.e., inability to achieve orgasm), and female vaginismus (i.e., difficulty with vaginal penetration). In the present study, the GRISS-total Cronbach's α was .89 and .91 for men and women, respectively.

Difficulties in Emotion Regulation Scale (DERS)—The DERS is a 36-item self-report measure on which respondents indicate, on a 5-point Likert-style scale (1 = *almost never* to 5 = *almost always*), how often each item applies to them (Gratz & Roemer, 2004). The DERS is multidimensional in that it is comprised of 6 factors in addition to a total score. These factors include: (1) Non-acceptance of Emotional Responses, (2) Difficulties Engaging in Goal-Directed Behavior, (3) Impulse Control Difficulties, (4) Lack of Emotional Awareness, (5) Limited Access to Emotion Regulation Strategies, and (6) Lack of Emotional Clarity. The DERS has high levels of internal inconsistency (α = .93; Gratz & Roemer, 2004) and adequate test-retest reliability over a 4-8 week period (r = .88; Gratz & Roemer, 2004). Similar to past work (Tull, 2006; Vujanovic et al., 2008), in the present investigation, we utilized the DERS – Total Score, a sum of all the items, as this represents a global composite index of affect regulatory difficulties (Gratz & Roemer, 2004). In this study, the Cronbach's α for the DERS was .95.

Anxiety Sensitivity Index (ASI)—To assess sensitivity to, and discomfort with, anxious arousal, the 16-item ASI (Reiss, Peterson, Gursky, & McNally, 1986) was employed. The ASI

is a self-report measure on which respondents indicate, on a 5-point Likert-style scale (0 = *very little* to 4 = *very much*), the degree to which they fear the potential negative consequences of anxiety-related symptoms and sensations. The ASI has demonstrated good test-retest reliability ($\kappa = .75$), as well. The ASI has demonstrated excellent convergent validity ($r > .70$) with other established anxiety-relevant measures (Peterson & Reiss, 1992; Zinbarg, Mohlman, & Hong, 1999); and it is unique from, and demonstrates incremental predictive validity to, trait anxiety (McNally, 1996). Cronbach's α for the ASI in the current study was .96.

Posttraumatic Diagnostic Scale (PDS)—The PDS (Foa, 1995) is a 49-item self-report instrument designed to assess the presence of posttraumatic stress symptoms, based on *DSM-IV* criteria (APA, 1994, 2000). Respondents report if they have experienced any of 12 traumatic events, including an “other” category, and then indicate which event was most disturbing. Respondents also rate the frequency (0 = *not at all or only one time* to 3 = *five or more times a week/almost always*) of 17 PTSD symptoms experienced in the past month in relation to the most-disturbing event endorsed. The PDS is a measure of trauma-related symptoms with generally excellent psychometric properties (Foa, Cashman, Jaycox, & Perry, 1997). The PDS has demonstrated high internal consistency ($\alpha = .92$) and high test-retest reliability ($\kappa = .74$). In terms of convergent validity, when PDS scores were compared to those of the SCID-PTSD module, the PDS correctly identified the PTSD status of 86% of participants; with positive predictive power of 100% and negative predictive power of 82% (Foa, Riggs, Dancu, & Rothbaum, 1993). Inter-item reliability for the PDS in the current study was $\alpha = .96$. In the present study, the PDS was utilized to index traumatic event exposure type and to assess posttraumatic stress symptom severity.

Positive and Negative Affect Scale (PANAS)—The PANAS is a mood measure that assesses two global dimensions of affect: negative and positive (Watson, Clark, & Tellegen, 1988). The negative affectivity subscale was used as an index of the broad-based disposition to experience negative affective states (e.g., anger, anxiety, depression, guilt). A large body of literature supports the psychometric properties of the PANAS (see Watson, 2000). Inter-item reliability for the negative affectivity subscale of the PANAS in the current study was good ($\alpha = .92$).

Procedure

The present study was approved by the Institutional Review Board at XXXXX. Participants were recruited from the greater XXXX, Vermont, community for the study via placement of flyers throughout local universities and colleges, marketplaces, and well-traveled locations and posting of printed advertisements in local newspapers. Data for the current study was derived from a larger investigation examining emotional processes among daily smokers. Participation consisted of two appointments. At the first appointment, participants (1) provided verbal and written informed consent, (2) completed a medical screen (to assess for self-reported medical conditions and/or pregnancy), (3) underwent a diagnostic evaluation (SCID-I/NP) in order to determine if any exclusion criteria were met, and (4) completed a battery of self-report assessments, including those used in the present investigation. The second appointment consisted of a laboratory procedure. Participants were compensated a total of \$35 for attending both appointments (i.e., \$10 for the first appointment; \$25 for the second appointment). The present investigation is based on data collected only at the first appointment.

Data Analytic Plan

Two independent 3-step hierarchical linear regression analyses were employed. Negative affectivity (PANAS-NA), type of trauma (sexual vs. non-sexual), daily smoking rate (SHQ-number of cigarettes smoked per day) were entered as covariates at step 1, posttraumatic stress

symptom severity (PDS-total) was entered at step 2, and emotional dysregulation (DERS-total) and anxiety sensitivity (ASI-total) were entered at step 3 (see Tables 1 and 2). The criterion variables included the GRISS-dissatisfaction subscale and GRISS-total score (sexual functioning problems index); these sexual problem variables were studied separately because the literature has established a distinction between sexual dissatisfaction and overall sexual function in that an individual experiencing difficulties reaching an orgasm may not necessarily experience sexual dissatisfaction (Basson, 2006). An additional reason to include sexual dissatisfaction as a primary dependent variable, in addition to the GRISS-total score, is that women and men vary in the types of sexual dysfunction experienced. For example, GRISS-total scores for men include problems with premature ejaculation while scores for women include female anorgasmia, vaginismus, and dyspareunia, sexual problems that cannot be compared between genders. Conversely, sexual dissatisfaction is a construct that taps into the subjective experience of the effect of sexual problems on quality of life, a construct that has been found to be present in both men and women (Laumann et al., 1999). Given gender differences in sexual problems (Laumann et al., 1999), exploratory analyses were planned to assess potential differences between men and women in sexual problems.

Results

Emotional dysregulation in the prediction of sexual variables

Please see Table 1 for a summary of zero-order (or bivariate) and partial correlations among all variables and Table 2 for a summary of all regression analyses. As can be seen in Table 1, all predictor variables, except daily smoking rate and trauma type, showed significant zero-order correlations with GRISS-dissatisfaction, yielding moderate to large effects (r 's = .26 - .60).

In the hierarchical regression analysis relevant to GRISS-dissatisfaction, step 1 contributed a significant 18.8 % of variance (Adj. R^2) to the model ($p = .018$); PANAS-NA was the only significant predictor at step 1 ($Beta = .460$, $p = .006$). Step 2 did not contribute any unique variance to the model ($p > .05$). Step 3 was marginally significant in predicting GRISS-dissatisfaction, $\Delta F(2,31)=3.02$, $p = .068$, $\Delta R^2 = .112$. The overall model entered in step 3 was significant, $F(6,31)=3.547$, $p = .009$, and predicted 29.2% of variance in GRISS-dissatisfaction (Adj. R^2). DERS-total was the only significant predictor at step 3 ($Beta = .581$, $p = .030$).

These results were not consistent for GRISS-total. Although significant bivariate/zero-order correlations were found between PANAS-NA and GRISS-total, $r(37)=.31$, $p < .05$, between DERS-total and GRISS-total, $r(37)=.35$, $p < .05$, and GRISS-total and ASI-total, $r(37) = .31$, $p < .05$ (Table 2), GRISS-total was not significantly predicted by any variables in the regression model, and no steps of the model were significant.

Gender differences

No significant gender differences were found in terms of type of trauma experienced (sexual vs. non-sexual), $\chi^2(1,43)=0.003$, $p = .954$ (for all cells, expected count > 5). Men and women also did not significantly differ in GRISS-dissatisfaction, $t(41)=-0.181$, $p = .857$, or GRISS-total, $t(41)=1.647$, $p = .107$. No significant gender differences were observed for DERS-total, $t(41)=-1.118$, $p = 0.270$, ASI-total, $t(40)=0.440$, $p = .662$, PDS-total, $t(37)=-.166$, $p = .869$, daily smoking rate $t(41)=.081$, $p = .428$, or PANAS-NA, $t(41)=-1.095$, $p = .280$.

Discussion

Although trauma-exposed smokers may represent a population at an increased risk of sexual problems, little is known about the role of emotion dysregulation in the prediction of sexual

functioning and dissatisfaction among this population. To address this gap in the existing literature, the present investigation sought to explore the role of emotional dysregulation in the prediction of sexual problems (sexual dissatisfaction and functioning) among trauma-exposed daily smokers.

Consistent with prediction, emotional dysregulation provided a statistically significant independent and unique contribution to the explanation of sexual dissatisfaction even when controlling for negative affectivity, trauma type, daily smoking rate, posttraumatic stress symptom severity, and anxiety sensitivity. The size of the observed effect was theoretically and practically meaningful at approximately 9.9% of unique variance (see Table 2; Cohen, 1988). Moreover, 21% of total variance in the regression model was accounted for by the covariates at the first two levels in the hierarchical model. Thus, these data suggest that emotion dysregulation offers unique explanatory value in regard to sexual dissatisfaction among a heterogeneous, trauma-exposed smoking sample comprised of men and women. Given the magnitude of variance accounted for at levels one and two in the model, in conjunction with the significant relationship between emotional dysregulation and the affect-based covariates (negative affectivity, posttraumatic stress symptoms, and anxiety sensitivity), it is indeed noteworthy that emotional dysregulation enhanced the model's predictive power at all (Abelson, 1985). Indeed, this is a potentially clinically important finding because sexual dissatisfaction is theoretically (Rosen & Althof, 2008) and empirically (Fugl-Meyer, Lodnert, Branholm & Fugl-Meyer, 1997; Lemieux, Kaiser, Pereira, & Meadows, 2004; Nasiri, Assari, Maleki, & Einollahi, 2007; Rosen, & Althof, 2008; Tavallaii, Fathi-Ashtiani) associated with quality of life and ongoing sexual behavior. That is, emotional dysregulation may influence sexual satisfaction and thereby sex-related quality of life and behavior among trauma-exposed smokers. For example, emotional dysregulation may have a negative impact on interpersonal connection with partners (Fruzzetti & Iverson, 2004; Linehan, 1993) or the ability to regulate intense sexually-based interoceptive cues (e.g., bodily arousal, physical sensations, affect intensity; Polusny & Follette, 1995).

In contrast to expectation, there was no significant incremental effect for emotional dysregulation in regard to sexual functioning. Thus, emotional dysregulation appears to be related to satisfaction with sexual behavior but not necessarily with sexual function. This finding is somewhat in contrast to that reported by Harris et al. (2008) among a large sample of women. Although the results of the present study and that of Harris et al. (2008) should not be directly compared due to differences in study design, measurement approach, and type of population, they do urge researchers to further examine the putative linkage between emotional dysregulation and sexual functioning. It is possible that emotional dysregulation is more strongly related to perceived satisfaction than actual sexual functioning capacity. This type of finding underscores the complex nature of sexual behavior and the factors that underlie it.

It is noteworthy that emotional dysregulation was significantly correlated with negative affectivity (62% shared variance), posttraumatic stress symptoms (39% shared variance see Table 1), and anxiety sensitivity (38% shared variance). Such findings are noteworthy, in conjunction with the observed differential associations with the dependent sexual problem measures. Indeed, these data suggest that although related, emotional dysregulation also may be distinct in terms of its nomological relations with certain cognitive-affective variables. This pattern of results highlights the potential complexity involved in the study of emotional dysregulation, and the early stage of this area of study. Future work is needed to continue to evaluate the emotional dysregulation construct and its measurement as well as to evaluate its nomological network. This work is to be particularly informative when it incorporates a multi-method approach in the evaluation of construct validity.

In our sample, daily smoking rate was not significantly correlated with sexual dissatisfaction or sexual function. In light of established associations between smoking and sexual function problems (Condra, Morales, Owen, Surridge, & Fenemore 1986; Juenemann, Lue, Luo, Benowitz, Abozeid, & Tanagho, 1987; Oksuz & Malhan, 2006; Shabsigh, Fishman, Schum, & Dunn, 1991), these findings might indicate that smoking-relevant variables other than daily smoking rate might be worthy of examination. For example, it is feasible that number of daily smoking years, ratio between nicotine metabolism and number of cigarettes smoked per day, and latency between smoking and sexual activities may be variables more relevant to sexual problems than daily smoking rate (Harte & Meston, 2008b; Oksuz & Malhan, 2006). Future studies might continue to explore this line of inquiry to better understand the documented associations between smoking and sexual problems.

This study has several limitations that should be considered when interpreting findings. First, the sample was comprised of a relatively small, homogenous group of individuals in terms of race/ethnicity, thus limiting the generalizability of the interpretations. Because of the small sample utilized in this study, these results can only be considered a suggestion of a significant relationship between emotion dysregulation and sexual satisfaction. Replication from studies utilizing larger and more diverse samples are needed before clear inferences can be made regarding the effect of emotion dysregulation on sexual satisfaction, in the larger population. Second, due to the diverse trauma experiences reported by participants, conclusions about the effects of certain types of trauma cannot be deduced; and future work might recruit samples based on trauma type to more rigorously discern trauma-relevant effects. Third, participants in this study reported only mild to moderate levels of posttraumatic stress symptom severity, and therefore, it is unclear whether these results might be generalized to individuals with more severe symptoms. Fourth, the study was based exclusively on self-report methods of indexing the variables of interest, and therefore, issues of method variance might have affected findings; future work in this line of inquiry therefore might utilize interview-based assessments of symptoms as well as physiological indices of sexual problems. Fifth, the present cross-sectional correlational design does not permit causal-oriented hypothesis testing. Although an attempt to strengthen confidence in the observed findings was achieved by controlling for theoretically-relevant factors, causal directions of the observed relations cannot be fully determined. Finally, this study lacked a non-traumatized comparison group, and therefore, it is unclear whether the documented effects between emotional dysregulation and sexual dissatisfaction are specific to traumatized populations or might be generalized to the greater population, underscoring the need for further extension of this work.

In conclusion, the present study found an incremental association between emotional dysregulation and sexual dissatisfaction among trauma survivors who are current cigarette smokers. Using this type of basic research to guide our understanding of clinically-relevant processes will continue to be an important task for translational research efforts focused on understanding sexual problems among traumatized populations.

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Table 1
Measures of Biavariate, Partial Correlations and Central Tendency for GRISS-Dissatisfaction, GRISS-Total, and Predictors

	GRISS-DISS	GRISS-total	PANAS-NA ^a	Trauma type ^b	Daily smoking ^c	PDS ^d	ASI ^e	DERs ^f	M (SD)
GRISS-DISS ^a	-		0.47**	0.26	0.12	0.45**	0.26	0.55**	3.40 (2.2)
GRISS-total		-	0.26	0.02	0.22	0.25	0.23	0.29	3.56 (2.4)
PANAS-NA ^b	0.49**	0.31*	-	0.25	0.17	0.52**	0.64**	0.79***	21.07 (8.8)
Trauma type ^c	0.26	-0.03	0.32*	-	0.29	0.33*	0.15	0.14	<i>h</i>
Daily smoking ^d	0.11	0.23	0.23	0.24	-	0.08	0.16	0.07	14.63 (8.0)
PDS ^e	0.45**	0.26	0.53***	0.34*	0.08	-	0.54***	0.63***	12.67 (14.2)
ASI ^f	0.29*	0.31*	0.66***	0.19	0.17	0.54***	-	0.64***	18.71 (10.7)
DERs ^g	0.60***	0.35*	0.79***	0.19	0.12	0.64***	0.63***	-	83.47 (26.3)

Note: coefficients above the diagonal (in *italics*) are partial correlations. Coefficients below the diagonal are Pearson's *r* from zero order bivariate correlations.

^a Golombok Rust Inventory of Sexual Satisfaction - dissatisfaction subscale.

^b PANAS-NA: Positive Affect Negative Affect Scale – Negative Affectivity subscale.

^c Trauma type: Sexual trauma = 1, Non-sexual trauma = 0.

^d Daily smoking: number of cigarettes smoked per day.

^e PDS: Posttraumatic Diagnostic Scale – total score.

^f ASI: Anxiety Sensitivity Index – total score.

^g DERs: Difficulties in Emotion Regulation Scale – total score.

^h Categorical variable.

* $p < .05$,

** $p < .01$,

*** $p < .001$.

Table 2
Results for the hierarchical regressions with GRISS-dissatisfaction and GRISS-total

	Adj. R ²	R ² _Δ	B	t	p	r ²
Outcome: GRISS-dissatisfaction						
Step I	.188*					
PANAS-NA			.460	2.906	.006	.185
Trauma type			.118	.742	.463	.020
Daily smoking			-.025	-.161	.873	.001
Step II	.209*	.041				
PANAS-NA			.342	1.918	.064	.079
Trauma type			.068	.419	.678	.004
Daily smoking			-.005	-.034	.973	.000
PDS			.245	1.384	.176	.041
Step III	.292**	.112				
PANAS-NA			.076	.304	.763	.002
Trauma type			.120	.772	.446	.011
Daily smoking			.021	.143	.887	.000
PDS			.106	.543	.591	.006
ASI			-.211	-1.080	.288	.022
DERS			.581	2.272	.030	.099
Outcome: GRISS-total						
Step I	.079					
PANAS-NA ^a			.326	1.932	.062	.093
Trauma type ^b			-.185	-1.094	.282	.030
Daily smoking ^c			.201	1.220	.062	.037
Step II	.080	.025				
PANAS-NA			.233	1.212	.231	.037
Trauma type			-.225	-1.294	.205	.042
Daily smoking			.216	1.309	.200	.043
PDS ^d			.192	1.006	.322	.025
Step III	.040	.016				

	Adj. R ²	R ² Δ	B	t	p	r ²
PANAS-NA			.064	.218	.829	.001
Trauma type			-.195	-1.071	.293	.030
Daily smoking			.216	1.274	.212	.042
PDS			.101	.446	.659	.005
ASI ^e			.104	.457	.651	.005
DERSS ^f			.177	.596	.556	.009

^aPANAS-NA: Positive Affect Negative Affect Scale – Negative Affectivity subscale.

^bTrauma type: Sexual trauma = 1, Non-sexual trauma = 0.

^cDaily smoking: number of cigarettes smoked per day;

^dPDS: Posttraumatic Diagnostic Scale – total score.

^eASI: Anxiety Sensitivity Index – total score.

^fDERSS: Difficulties in Emotion Regulation Scale – total score. r^2 = squared semi-partial correlations.