

Emotional Content in PTSD Nightmares and Its Relation to other PTSD Features: An Exploratory Study

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Summary. Nightmares are a cardinal symptom of Post-Traumatic Stress Disorder (PTSD), but little is known about the experiential aspects of PTSD nightmares. The present study is a secondary exploration of baseline data collected in a randomized, controlled trial of prazosin in PTSD patients. This study examined affective attributes of nightmares in 20 PTSD patients using visual analogue scales (VAS) rated from “0” (never) to “100” (always) for anger, fear, and sadness. PTSD diagnosis was confirmed by Clinician-Administered PTSD Scale. Sitting pulse, Disturbing Dreams and Nightmare Severity Index (DDNSI), PTSD Checklist (PCL), and other psychiatric measurements were recorded. Analytic approach included Pearson’s *r*, paired *t*-tests, and multilinear regression modeling. The mean presence of anger, fear, and sadness in dreams was noted to have been: 54.9 ± 32.0 , 76.6 ± 24.3 , and 71.5 ± 26.2 , respectively. Significant positive correlations were found between anger scores and the relation of a dream to: prior trauma ($r = 0.5113$), repetitive nature ($r = 0.4807$), and awakening the dreamer ($r = 0.5781$). Significant correlations were not seen for fearful or sad affects. In multilinear regression, “PCL minus sleep” scores were predicted by DDNSI and anger scores, after covarying for age and gender ($F = 4.5$, $df = 19$, $p < 0.02$). DDNSI scores and resting pulse were significantly positively correlated ($r = 0.5541$). These results confirm that PTSD nightmares are negative-affect laden, and specifically, that anger in dreams is correlated with a greater degree of traumatic themes, repetitiveness, and awakenings. Additionally, anger in dreams best indicated the presence of worse global PTSD symptoms. The correlation between resting daytime pulse and DDNSI scores underlines the unifying features of PTSD across day and night.

Keywords: PTSD, dream experiences, nightmares, emotions, trauma

1. Introduction

Sleep disturbances and nightmares are core features of Post-Traumatic Stress Disorder (PTSD) (American Psychiatric Association, 2013). Bad dreams are often reported in other psychiatric disorders, such as depressive disorders, but they are experienced by the dreamer as qualitatively different from classic nightmares of PTSD (Cartwright, 1996). Nightmares have been defined as both “very disturbing dreams, involving any unpleasant emotion, which are usually vividly recalled” (Belicki, 1992) and as “intensely disturbing dreams that awaken the dreamer to a fully conscious state and generally occur in the latter half of the sleep period” (Hasler & Germain, 2009). Whether the definition of nightmare requires the dreamer to awaken has been left unclear, however, some authors have assigned the word “nightmare” to require a dreamer to awaken while the words “bad dream” refer to an emotionally unpleasant experience that does not cause the dreamer to awaken (Zadra & Donderi, 2000). Regardless of the semantical term used to describe emotionally unpleasant dreams that may or may not cause a dreamer awaken, the nature of emotions in night-

mares and bad dreams has been only partially studied. One study showed that the common emotions in nightmares and bad dreams of persons who are free of psychiatric disorders (i.e., healthy persons) consisted predominantly of fear, anger, sadness, and frustration, with fear being significantly the most dominant (Zadra, Pilon, & Donderi, 2006). Yet to date, little is known about the affective nature of dreams in PTSD patients. In contrast, the emotional content reported in dreams of healthy persons has received more attention.

The present study begins to address the knowledge gap regarding the emotional experience of PTSD nightmares, by reporting a secondary analysis of the baseline dream characteristics of 20 PTSD patients who participated in a randomized clinical trial of bedtime dose of prazosin (McCall et al., 2018). Consistent with the work of Zadra et al.’s work in healthy persons, our work focused on the affects of fear, sadness, and anger. The relationship between the affective aspects of dreams, various psychological standardized scores, and some physiological measurements were investigated. We hypothesized that fear would be the affect most closely related to daytime PTSD symptoms.

2. Method

2.1. Overview

The primary aim of the parent study behind this report was to examine whether treatment of nightmares would reduce suicidal ideation in suicidal PTSD patients (McCall et al., 2018).

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Nightmares are a risk factor for suicide (McCall et al., 2013), and the α -adrenergic-blocking blood pressure medication prazosin has been proposed as a treatment of nightmares (Raskind et al., 2013). Therefore, we hypothesized that bedtime doses of prazosin would reduce nightmares in PTSD patients and thereby reduce suicidal ideation. As a result, we recruited patients who were suicidal and who could safely receive prazosin versus placebo. Ethical and safety concerns led us to require that all the participants at baseline be taking a medication for mood disorder, and with age between 18-65 years of age to reduce age-associated risks of giving blood pressure medication to persons who did not have hypertension.

2.2. Participants

Study participants were recruited around Augusta, Georgia and included men and women. All participants were drawn from the stream of patients seeking routine outpatient care in the psychiatric clinics of the Medical College of Georgia. Written informed consent was obtained for all included subjects, and the study was approved by the local IRB.

Inclusion criteria required that the subject: was between the ages of 18-65 years, had a diagnosis of PTSD according to the Clinician Administered PTSD Scale (CAPS) (Weathers, Keane, & Davidson, 2001), had a Disturbing Dreams and Nightmares Severity Index (DDNSI) score of greater than 10 (Krakow et al., 2002a; Krakow et al., 2002b), had a Scale for Suicide Ideation (SSI) score of greater than 3 (Beck, Kovacs, & Weissman, 1979; Beck, Brown, & Steer, 1997; Beck, Brown, Steer, Dahlsgaard, & Grisham, 1999), and had a Columbia-Suicide Severity Rating Scale (C-SSRS) suicidal ideation score of less than 4 (Oquendo & Mann, 2003). In addition, participants must have been on a constant dose of selective serotonin reuptake inhibitor (SSRI) for at least 4 weeks before the baseline assessment, in a dose equal or greater than fluoxetine 20mg (Marshall et al., 2007; Brady et al., 2000). Alternatively, if the patient had been diagnosed with bipolar disorder, he or she was required to have been on a constant dose of FDA-approved bipolar medication for 4 weeks at the minimum. Other psychotropics, such as mood stabilizers and other antidepressants, were allowed insofar as the dose was stable for 4 weeks or more before baseline assessment. Additionally, participants who had PTSD co-occurring with diagnoses of other specific psychiatric illnesses, such as depression, social phobia, panic disorder, obsessive compulsive disorder, and generalized anxiety, were included in the study. Other psychiatric illnesses were determined using the Structured Clinical Interview for DSM-IV (SCID) (First, Spitzer, Gibbon, & Williams, 1996).

Exclusion criteria included: a diagnosis of alcohol or drug abuse within the past 90 days, an active bipolar manic or hypomanic episode, or diagnosis of schizophrenia as determined by the SCID. In addition, patients with a diagnosis of a major neurocognitive disorder or with a Mini Mental State Exam (MMSE) of less than 24 were disqualified from the study (Folstein, Folstein, & McHugh, 1975). Additional exclusion criteria consisted of: history of sensitivity or reaction to prazosin or quinazolines, history of fainting in the past 6 months, history of low blood pressure, intended use of sildenafil, tadalafil, or similar medications for erectile dysfunction. Blood pressure and pulse were measured with a Philips™ "Sure Signs VS4" automatic blood pressure device, and participants were excluded for blood pressure

reading with values of systolic < 90 or diastolic < 50 in either sitting or standing positions. The present report focuses on the baseline characteristics prior to randomization to prazosin versus placebo.

2.3. Psychiatric Measurement Scales

The following measurements were assessed by a blinded rater: SCID, CAPS Baseline, Hamilton Rating Scale for Depression (HRSD) (Hamilton, 1960; Beck, Steer, & Garbin, 1988), C-SSRS, clinical global impression-severity (CGI-S) (Busner & Targum, 2007), and MMSE scores. Self-report measures included: all visual-analogue scale (VAS) measurements, Insomnia Severity Index (ISI) (Bastien, Vallieres, & Morin, 2001), PTSD checklist-specific version (PCL-S) (Wilkins, Lang, & Norman, 2011), DDNSI, and SSI scores. PCL scores were recorded as a total score and also as "PCL minus sleep" scores that consisted of the value obtained from the PCL scores when ignoring the sleep related questions. Additional measurements included systolic and diastolic blood pressure as well as sitting pulse measurements that were determined using a machine.

The VAS measurements were taken to quantify the frequency of various aspects of the patient's dreams and were rated from "0" (never) to "100" (always). The VAS measurements tapped how often the patients experienced sadness, anger, or fear in their dreams. Additionally, VAS scales inquired how often the patient's dreams were related to prior trauma, were similar to their other dreams, and caused the patient to awaken from their dreams.

2.4. Analytic Approach

Statistical analysis included Pearson's *r*, paired *t*-tests, and multilinear regression modeling. Pearson's *r* was employed for VAS measurements, psychiatric assessments (both self-report and blind rater conducted), and some physiological measurements. Paired *t*-tests compared the frequency of sadness, fear, and anger. Multilinear regression modeling was employed to discern the dependency of "PCL minus sleep" scores on DDNSI scores, age, gender, and the presence of anger in dreams. Statistical significance was considered to be met if $p < 0.05$. For the purposes of this exploratory study, no corrections were made for multiple comparisons.

3. Results

The main hypothesis that daytime PTSD symptoms would be most closely related to the experience of fear during nightmares was not supported. Instead, we found a stronger relationship between daytime PTSD symptoms and anger during nightmares

Sixty-four persons were screened for the study and 20 participants were selected for this study. The sample consisted of 3 men and 17 women. Two participants experienced military trauma while the other 18 experienced trauma as civilians. The mean age of the sample was 39.8 ± 14.5 years with 16 participants with concurrent major depressive disorder and 4 with concurrent bipolar depression. Participants with comorbid major depressive disorder were taking selective serotonin reuptake inhibitors, while patients with bipolar disorder were taking lamotrigine or risperidone. Additional, 6 patients were taking benzodiazepines and 6 were using trazodone at bedtime.

Table 1. Baseline psychometric data

Measurement (N = 20)	Mean ± Standard Deviation
CAPS score	46.1 ± 8.4
HRSD score	27.5 ± 6.2
PCL total score	61.6 ± 9.8
PCL minus sleep score	57.9 ± 9.2
SSI score (inclusion score must be >3)	14.3 ± 7.0
DDNSI score (inclusion score must be >10)	22.2 ± 5.2
ISI score	20.4 ± 4.2
Dreams: Sameness	47.2 ± 27.2
Dreams: Related to Prior Trauma	71.3 ± 25.4
Dreams: Awaken from	67.2 ± 27.3
Dreams: Scared	76.6 ± 24.3
Dreams: Sad	71.5 ± 26.2
Dreams: Angry	54.9 ± 32.0

CAPS: Clinician Administered PTSD Scale; HRSD: Hamilton Rating Scale for Depression; PCL: PTSD Checklist; SSI: Scale for Suicide Ideation; DDNSI: Disturbing Dreams and Nightmare Severity Index; ISI: Insomnia Severity Index

The intensity of depression, PTSD, and insomnia symptoms was high, as shown in Table 1. Dreams were reported to be frequently frightening or sad. Less often, dreams were described as containing angry affect. Indeed, the emotion of anger was reported to be less frequent than fear (paired $t = -2.7$, $df = 19$, $p < 0.05$) for all participants, and reports of anger were less frequent than sadness in women ($t = -2.2$, $df=16$, $p<0.05$). Dreams were noted to be often related to prior trauma, but were not uniformly related to trauma, and the individuals would often awaken from their dreams. Less often, participants reported their dreams contained elements that were present from night to night (see Table 1).

Tables 2 and 3 show a complete representation of the Pearson's r values for all variables. The most salient findings included: the presence of anger was positively correlated with PCL scores and dreams featuring repetitiveness, themes related to prior trauma, and awakenings, in both the entire sample and in just the women. Additionally, DDNSI scores were noted to be significantly positively related to sitting pulse values in both the entire sample and in just the women.

Table 2. Correlations (Pearson's r) between selected psychometric and physiologic variables

Component Analyzed	CAPS Baseline Total Score	PCL Total	PCL Minus Sleep	DDNSI	Sitting Systolic	Sitting Diastolic	Sitting Pulse
CAPS Score	1.0000						
PCL Total	0.4910 ^a	1.0000					
PCL Minus Sleep	0.4728 ^a	0.9951 ^b	1.0000				
DDNSI	0.1995	0.4057	0.3616	1.0000			
Sitting Systolic	-0.3375	-0.1747	-0.1689	0.0344	1.0000		
Sitting Diastolic	-0.4790 ^a	-0.3855	-0.3821	-0.0697	0.6331 ^b	1.0000	
Sitting Pulse	-0.0429	0.1952	0.1998	0.5541 ^a	0.0234	0.0689	1.0000

^a $p < 0.05$, ^b $p < 0.01$; CAPS: Clinician Administered PTSD Scale, PCL: PTSD Checklist, DDNSI: Disturbing Dreams and Nightmare Severity Index

A multilinear regression model examined the dependency of "PCL minus sleep" scores on DDNSI scores and the presence of anger in dreams, after covarying for age and gender ($F = 4.5$, $df = 19$, $p < 0.02$). The results of the model found that the presence of anger in dreams ($p = 0.0275$) and DDNSI scores ($p = 0.0304$) were significant in predicting the "PCL minus sleep" scores. Similar results were found when restricting the analysis to just the women.

These results confirm that PTSD nightmares are negative-affect laden, and specifically, that anger in dreams is correlated with a greater degree of traumatic themes, repetitiveness, and awakenings. Additionally, anger in dreams best indicated the presence of worse global PTSD symptoms. The correlation between resting daytime pulse and DDNSI scores underlines the unifying features of PTSD across day and night.

4. Discussion

This report generated several hypotheses that warrant further exploration, including the hypothesis that certain emotional and content features of nightmares are specific to the components of PTSD that are expressed during wakefulness. Borrowing from the work of Zadra et al. in healthy controls, we had hypothesized that fear would be the affect during nightmares that was most emblematic of the PTSD syndrome. However, we found that although the emotion of anger was underrepresented in PTSD nightmares, as contrasted with the emotions of fear and sadness, anger was more closely correlated with the daytime symptoms of PTSD. The reason for this finding is not clear at this point. In the future, it would be useful to examine whether the intensity of anger in nightmares mirrors the intensity of anger experienced during the daytime in PTSD patients. Notably, PTSD nightmares were not uniformly representative of the patient's historical trauma, a feature previously noted by Wittmann et al. (Wittmann, Schredl, & Kramer, 2007). The experience of anger in nightmares, coupled with a measure of the frequency of nightmares, was a potent indicator of global PTSD symptom severity. The premise that certain nighttime symptoms (i.e., emotion of anger in nightmares, frequency of nightmares) are linked to daytime expression of PTSD symptoms was further supported in the finding of a positive correlation between sitting pulse and DDNSI scores, complementing what has been reported by others (van Liempt, 2012). This is consistent with the premise that

Table 3. Correlations (Pearson's r) between all psychometric data

Component Analyzed	Age	CAPS Score	HRS D	ISI	Dreams: Same-ness	Dreams: Related to Prior Trauma	Dreams: Awaken from	Dreams: Feel sad	Dreams: Scared	Dreams: Angry	DDNSI	PCL Total	PCL minus Sleep	SSI Score
Age	1.0000													
CAPS Score	-0.1584	1.0000												
HRS D	0.3376	0.3024	1.0000											
ISI	0.1530	0.5286 ^a	0.4746 ^a	1.0000										
Dreams: Sameness	-0.1147	0.4450	0.1535	0.5602 ^a	1.0000									
Dreams: Related to Prior Trauma	0.1018	0.2904	0.1314	0.5010 ^a	0.5666 ^a	1.0000								
Dreams: Awaken from	0.4339	0.3279	0.2927	0.6344 ^b	0.4278	0.6550 ^b	1.0000							
Dreams: Feel sad	-0.3500	0.2698	0.1092	0.1600	-0.0224	-0.1278	0.0859	1.0000						
Dreams: Scared	-0.0676	0.2722	0.2494	0.3436	0.1594	0.2613	0.2695	0.0292	1.0000					
Dreams: Angry	0.1978	0.2590	0.3378	0.4489	0.4807 ^a	0.5113 ^a	0.5781 ^b	0.0980	0.2373	1.0000				
DDNSI	-0.0374	0.2262	-0.2430	0.3350	0.2041	0.5668 ^a	0.1959	-0.1712	0.2087	0.0058	1.0000			
PCL Total	0.3511	0.4960 ^a	0.4855 ^a	0.5581 ^a	0.4964 ^a	0.6535 ^b	0.5312 ^a	-0.0678	0.1611	0.5032 ^a	0.4057	1.0000		
PCL minus Sleep	0.3786	0.4771 ^a	0.5100 ^a	0.5287 ^a	0.4783 ^a	0.6195 ^b	0.5072 ^a	-0.0861	0.1645	0.5061 ^a	0.3616	0.9951 ^b	1.0000	
SSI Score	-0.0224	0.0698	0.1046	0.2117	0.0209	0.2674	0.1621	-0.0571	-0.2266	0.2959	0.2902	0.1873	0.1535	1.0000

^a $p < 0.05$; ^b $p < 0.01$; CAPS: Clinician Administered PTSD Scale; HRS D: Hamilton Rating Scale for Depression; ISI: Insomnia Severity Index; DDNSI: Disturbing Dreams and Nightmare Severity Index; PCL: PTSD Checklist; SSI: Scale for Suicide Ideation

individuals with PTSD are in a state of hyper-arousal during both wake and sleep.

5. Limitations and Future Directions

The present study had a sample size of only 20 individuals, and as a result, the interpretation of the findings has limited generalizability. Moreover, all the participants were collected from one site and may not be representative of PTSD patients from other locations. Additionally, because the selected participants for the study had severe symptoms, the findings may not be reflective of PTSD patients with milder symptoms. Another limitation was that patients were on multiple psychotropic drugs, and the influence of these medications was not assessed. However, selective serotonin reuptake inhibitors are reported to have somewhat unpredictable effects on dreaming, but with a preponderance of the evidence that they can intensify dreaming and potentially cause nightmares (Schredl, Berger, & Riemann, 2009; Tribl, Wetter, & Schredl, 2013). In spite of these limitations, a strength of this study is that the participants' clinical state is likely representative of real-world conditions.

Additional research concerning the emotional experience of PTSD nightmares is warranted. Specifically, the correlations identified in this work should be reproduced with larger sample sizes. The role of anger in nightmares should be correlated with daytime experiences of anger. Our methods did not specify the time period over which participants should consider their responses to what affects they experience during nightmares. Most prior publications on the topic of dream affects have focused on a time period of less than 14 days. Replication of our study should consider the relative merits of a short time frame versus a longer time frame of measurement (i.e., a week versus a month). Contemporary research has led to identification of the dissociative subtype of PTSD (Hansen, Ross, & Armour, 2017). A comparison of the dream features found in the dissociative subtype of PTSD and non-dissociative PTSD should be performed.

The discovery that certain affects (anger) are associated with the intensity of daytime PTSD symptoms suggests a unitary process driving both the daytime and nighttime experiences of PTSD patients. Future studies which examine the relationship of nightmare affects and daytime symptoms should consider adding explanatory mediator variable that measure physiologic arousal.

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