

# Combat-Related PTSD Nightmares and Imagery Rehearsal: Nightmare Characteristics and Relation to Treatment Outcome

Gerlinde C. Harb,<sup>1</sup> Richard Thompson,<sup>2</sup> Richard J. Ross,<sup>1,3</sup> and Joan M. Cook<sup>4,5</sup>

<sup>1</sup>Philadelphia VA Medical Center, Behavioral Health Service/Research, Philadelphia, Pennsylvania, USA

<sup>2</sup>University of Illinois at Chicago, Department of Psychiatry, Chicago, Illinois, USA

<sup>3</sup>Perelman School of Medicine at the University of Pennsylvania, Philadelphia, Pennsylvania, USA

<sup>4</sup>Yale School of Medicine, Department of Psychiatry, New Haven, Connecticut, USA

<sup>5</sup>National Center for PTSD, Evaluation Division, West Haven, Connecticut, USA

The characteristics of nightmares of 48 male U.S. Vietnam war veterans with combat-related posttraumatic stress disorder (PTSD), as well as revised dream scripts developed in the course of Imagery Rehearsal therapy, were examined in relation to pretreatment symptomatology and treatment outcome. Features, content, and themes of nightmares and rescripted dreams were coded by 2 independent raters. Nightmares were replete with scenes of death and violence and were predominantly replays of actual combat events in which the veteran was under attack and feared for his life. Although addressing or resolving the nightmare theme with rescripting was associated with a reduction in sleep disturbance, references to violence in the rescripted dream were related to poorer treatment outcome in nightmare frequency;  $B = 5.69$  ( $SE = 1.14$ ). The experience of olfactory sensations in nightmares, a possible index of nightmare intensity, was also related to poorer treatment response;  $B = 2.95$  ( $SE = 1.06$ ). Imagery rehearsal for individuals with severe, chronic PTSD and fairly replicative nightmares may be most effective when the rescripted dream incorporates a resolution of the nightmare theme and excludes violent details.

Individuals with posttraumatic stress disorder (PTSD) often suffer from sleep disturbances, with recurrent nightmares present in the vast majority of patients (Fontana & Rosenheck, 2008; Leskin, Woodward, Young, & Sheikh, 2002). Posttraumatic nightmares tend to persist for many years and disturb daytime functioning and well-being (e.g., Blagrove, Farmer, & Williams, 2004). In fact, both sleep disruption and nightmares immediately posttrauma predict the development of PTSD (McLay, Klam & Volkert, 2010; Mellman, Bustamante, Fins, Pigeon, & Nolan, 2002). Gaining a better understanding of these hallmark symptoms of PTSD (Ross, Ball, Sullivan, & Caroff, 1989) is likely a cornerstone for improving the theoretical understanding of and treatment for posttraumatic nightmares (Phelps, Forbes & Craemer, 2008; Wittmann, Schredl, & Kramer, 2007).

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Correspondence concerning this article should be addressed to Joan M. Cook, Yale School of Medicine, NEPEC/182, 950 Campbell Avenue, West Haven, Connecticut 06516. E-mail: [Joan.Cook@yale.edu](mailto:Joan.Cook@yale.edu)

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Posttraumatic nightmares appear to vary in their characteristics and content. They can be classified as replicative/replay, nonreplicative/symbolic, or mixed (Schreuder, Igraja, van Dijk, & Kleijn, 2001). Replicative nightmares are fairly accurate reproductions of traumatic events or parts of events, whereas symbolic nightmares refer to some aspects of the event or to a feeling or idea represented in the traumatic experience. Both types of nightmares are common in posttraumatic populations, with estimates of replicative nightmares between 21% to 60% of all reported nightmares (for a review, see Wittman et al., 2007). In a civilian sample, replicative nightmares, compared to either trauma-similar or completely trauma-dissimilar dreams, were associated with more severe sleep disturbance and PTSD symptoms (Davis, Byrd, Rhudy, & Wright, 2007). Combat veterans compared to other trauma survivors report more replicative nightmares (Schreuder, von Egmond, Kleijn, & Visser, 1998; van der Kolk, Blitz, Burr, Sherry, & Hartmann, 1984).

Nightmares in veterans with combat experience differ from those in noncombat veterans in that they occur earlier in the sleep cycle and are more commonly accompanied by gross body movements (van der Kolk et al., 1984). In a sample of Vietnam veterans with combat-related PTSD, about half of the nightmares contained settings, people, or objects characteristic of combat, whereas 85% featured moderate to high levels of threat. Nightmares also included some degree of reality distortion, which seemed to vary according to how replicative they

were of the actual traumatic event (Esposito, Benitez, Barza, & Mellman, 1999).

Evidence-based treatments for PTSD have shown great promise for daytime symptomatology, yet sleep disturbance and nightmares appear to resolve less readily, often resulting in residual impairment in sleep (Galovski, Monson, Bruce, & Resick, 2009; Spoomaker & Montgomery, 2008). One promising cognitive-behavioral treatment specifically targeting recurrent nightmares is Imagery Rehearsal (Forbes, Phelps, & McHugh, 2001; Krakow et al., 2001). Several variations of Imagery Rehearsal exist and share common elements: identification of a target nightmare, intentional changing of the nightmare story in imagination (i.e., rescripting), and imaginal rehearsal of the changed dream (e.g., Davis & Wright, 2007; Forbes et al., 2001; Krakow et al., 2001). Two randomized clinical trials have demonstrated that Imagery Rehearsal reduces nightmare frequency and/or intensity in civilian trauma survivors as compared to waitlist controls (Davis & Wright, 2007; Krakow et al., 2001). The most recent controlled trial in Vietnam veterans with severe, chronic, combat-related PTSD produced less positive findings when Imagery Rehearsal was compared to an active control intervention (Cook et al., 2010). Veterans who received Imagery Rehearsal overall did not show greater improvement in nightmare frequency or sleep quality than did those who received the active cognitive-behavioral comparison treatment, which included psychoeducation and instruction in sleep hygiene.

The goal of the current study was to investigate the characteristics of targeted nightmares and rescripted dreams of Vietnam veterans receiving Imagery Rehearsal in that clinical trial. More specifically, this study aimed to (a) provide a descriptive analysis of the content, emotions, and themes of targeted nightmares and rescripted dreams; (b) determine whether perpetration of violence, guilt, or lack of mastery/self-efficacy in nightmares were related to pretreatment symptomatology; and (c) examine whether dream characteristics were associated with treatment outcome.

## Method

### Participants

Participants were male U.S. Vietnam veterans with combat-related PTSD, recruited from the mental health clinic of the Philadelphia VA Medical Center and consented to participate in a Philadelphia VA Medical Center Institutional Review Board-approved randomized controlled trial of Imagery Rehearsal (Cook et al., 2010). Veterans were included if they met the following inclusion criteria: recurrent nightmares; PTSD-related sleep disturbance, as indicated by a score of 5 or more on the Pittsburgh Sleep Quality Index (PSQI; Buysse, Reynolds, Monk, Berman, & Kupfer, 1989); no bipolar disorder or psychotic disorder diagnosis; on a stable medication regimen.

Other anxiety disorders and concomitant major depression were allowed.

Of the 124 veterans enrolled in the trial, 61 were assigned to the Imagery Rehearsal treatment; of those, 48 provided detailed nightmare scripts as part of the treatment (of the remaining 13, eight did not start treatment and five did not complete the write-out of the target nightmare). Of the 48, eight did not complete treatment after writing out the target nightmare, leaving 40 veterans who also created a revised dream script as part of treatment. Thus, 48 targeted nightmares and 40 revised dream scripts were analyzed.

### Treatment

All veterans were treated using Imagery Rehearsal according to a manualized protocol (as detailed in Cook et al., 2010). In brief, treatment consisted of six group sessions focusing on psychoeducation about PTSD and related sleep problems and instruction in the techniques of Imagery Rehearsal (Forbes et al., 2001). Specifically, veterans were asked to write out in detail a recurrent nightmare of their choice and were given suggestions on how they might change their nightmare to make it less distressing; they were assisted in writing out a revised dream script and were instructed to practice daily before bed.

### Measures

The Clinician Administered PTSD Scale (CAPS; Blake et al., 1995), a structured interview that follows the criteria for PTSD according to the *Diagnostic and Statistical Manual for Mental Disorders* (4th ed., text rev.; American Psychiatric Association, 2000), was used to confirm the PTSD diagnosis ( $\alpha = .72$ ). In addition, several widely used and well validated pre- and post-treatment self-report measures were administered. Nightmare frequency was assessed with the 2-item Nightmare Frequency Questionnaire (Krakow et al., 2000), and sleep quality and sleep disturbances were measured with the Pittsburgh Sleep Quality Index (PSQI;  $\alpha = .71$ ). The PTSD Checklist-Military (PCL-M; Weathers, Litz, Herman, Huska, & Keane, 1993) was administered to assess PTSD symptomatology ( $\alpha = .83$ ).

Nightmares and dreams were coded using an iterative process. Two licensed clinical psychologists (GH and JC) reviewed existing tools for rating the phenomenology of nightmares and dreams (e.g., Domhoff, 1999; Esposito, 1999; Germain et al., 2004; Hall & van der Castle, 1966; Hartman, 2008; Revonsuo & Valli, 2000; van der Kolk et al., 1984). Existing scales addressed several important nightmare and dream characteristics, such as aggression, hostility, and emotional content (Hall & van der Castle, 1966), mastery (Germain et al., 2004), and threat (Revonsuo & Valli, 2000). The current study, however, focused on the comprehensive measurement of a broad range of nightmare characteristics (content, emotions, and themes) in combat veterans (rather than dreamers in general); therefore, a new rating tool was developed that assessed the

important variables in a more condensed fashion (please contact the authors in order to obtain a copy of the rating scale). Items assessing setting, life threat/injury to self, serious injury/death to others, general scenes of injury/death, and sensory (auditory, olfactory, tactile/sensation, and visual) details were devised. A rating of perpetration of abusive violence, defined as events that would be considered beyond typical war-related incidents and that might raise questions of engaging in immoral behavior (King, King, Gudanowski, & Vreven, 1995), was also included. Several descriptive words from emotion categories in the existing dream coding literature were used (e.g., Hall & van der Castle 1966; Hartman, 2008; Zadra, Pilon, & Donderi, 2006) and supplemented with descriptors from the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988), a reliable self-report scale of emotion adjectives. The resulting rating scale included both negative and positive emotions (see below).

After reading all nightmare and revised dream scripts independently, the two clinical psychologists compiled a list of applicable nightmare content themes. Items were added to capture the strategies veterans utilized in dream rescripting (i.e., devising alternate dream endings, inserting dream elements that allow the dreamer to view events in a new light or that remind the dreamer that he is dreaming, transforming threatening weapons into harmless objects, distancing techniques). The scale also included questions to capture the degree of threat and/or violence in the dream script, whether the new dream was realistic or fantastic (i.e., not following laws of reality) in nature, and whether it addressed or resolved the content theme identified in the nightmare.

Using this rating tool, independent ratings were made for all nightmare scripts on the presence or absence of specific nightmare and revised dream characteristics (e.g., setting, life threat, etc.), as well as rescripting techniques. Average interrater reliability was  $\kappa = .90$  ( $SD = .15$ ), ranging from .62 to 1.0. Consensus ratings were used for analyses in cases of disagreement (e.g., threat level or whether nightmare themes were resolved in the dream script). The emotions and content themes of all scripts were subsequently categorized by consensus ratings. Primary, secondary, and tertiary dream themes were determined according to affective salience and the amount of text focused on the subject.

Emotion categories that were coded as absent or present with very low frequency were discarded, as were emotion categories that were nondiscriminative or nondistinctive (e.g., irritated, alert, inspired, active). Using intercorrelations as well as classifications of three additional independent raters, summary variables were established for negative and positive emotions. The eight negative emotion categories were fear (scared, nervous, jittery, afraid), guilt (guilty, ashamed), frustration (frustrated), anger (angry, hostile), confusion (confused), sadness (sad), disgust (disgusted), and helplessness (helpless). The five positive emotion categories were joy/exuberance (interested, enthusiastic, happy, excited), strength/pride (proud, strong), relaxation (relaxed), relief (relieved), and hope (hopeful).

## Data Analyses

Initial analyses examined the relationships among the presence of perpetration, guilt, and the lack of self-efficacy and pretreatment sleep, nightmare, and PTSD symptoms. These were explored using Pearson correlations. Next, the target nightmare characteristics and the characteristics of the rescripted dreams were compared using paired  $t$  tests.

The primary analyses focused on the links between nightmare and dream characteristics and posttreatment sleep disturbance and frequency of nightmares. Because of the small number of participants and the exploratory nature of the analyses, a 2-step process was conducted. In the first step, bivariate regression analyses (linear regression analyses in the case of sleep disturbance and Poisson regression in the case of number of nightmares and number of nights with nightmares) were first conducted linking these three outcomes with both pretreatment (killing/injury, smell, sound, positive emotions, negative emotions) and posttreatment (killing/injury, smell, sound, positive emotions, negative emotions, dream change, similar themes, and nightmare theme addressed/resolved). In the second step, those variables that were significant in bivariate analyses were retained in separate multivariate regression analyses for each of the three outcomes of interest (again, linear regression in the case of sleep disturbance and Poisson regression in the case of nightmare frequency).

## Results

The demographic and clinical characteristics of the entire sample have been reported elsewhere (Cook et al., 2010). The 48 veterans included in the current study had an average age of 59.7 ( $SD = 3.1$ ) and most were either African American (54.2%) or Caucasian (41.7%). Fifty-two percent had completed some college or obtained a college degree; 31% were high school graduates. Most were either married/cohabiting (65%) or separated/divorced (23%). The group had disturbed sleep, as indicated by an average global PSQI score of 13.2 ( $SD = 3.2$ ) and an average of 3.9 nightmares per week ( $SD = 2.3$ ). The mean PCL-M score was 63.0 ( $SD = 10.2$ ).

### Nightmare Characteristics: Content, Emotions, and Themes

As seen in Table 1, veterans chose target nightmares that most often were set in Vietnam and were fairly accurate replays of actual events. Over half of nightmares contained at least one type of sensory detail and the majority contained visual elements depicting scenes of death or injury. References to people killed or severely injured were frequent and usually were of fellow Americans. In addition, most veterans described a threat to their own life. A third of nightmares involved the dreamer killing or injuring someone else, with some perpetrating abusive violence.

Table 1  
*Characteristics of Target Nightmares*

Nightmare content variables	%	n
Nature of nightmare		
Replay	77.1	37
Combined symbolic and replay	16.7	8
Setting		
Vietnam	89.6	43
Other military context	4.2	2
Sensory detail		
Sound	43.8	21
Smell	25.0	12
Color	18.8	9
Sensation	16.7	8
Scenes of death or injury	77.1	37
Someone severely injured or killed	79.2	38
Fellow Americans	68.8	33
Women or children	14.6	7
Life threat to veteran	75.0	36
Veteran actually injured	25.0	12
Veteran killed/seriously injured other person	29.2	14
Perpetrator content	14.6	7
Related guilt	6.2	3
Related anger	2.1	1

Regarding the emotional content of the nightmares, 90% involved feelings of helplessness, 85% contained fear, followed by confusion (42%), sadness (27%), disgust (23%), frustration (21%), anger (21%), and guilt (17%). Of the 15% of nightmares that did not contain fear, the emotions most prevalent in the text or underlying theme were sadness and helplessness (6%), anger or disgust (5%), and confusion or guilt (5%). The nightmares expressed few positive emotions, with none reflecting joy, relaxation, relief, or hope, and only 8% expressing strength/pride.

Table 2 shows the percentage of veterans with specific primary or secondary content themes in the targeted nightmare. The most prevalent theme in veterans' nightmares was fear of death, followed by under attack, lack of self-efficacy, lack of control, and war is disgusting.

**Pretreatment Symptoms and Nightmare Characteristics**

Given previous work with the nightmares of Operation Iraqi Freedom veterans suggesting perpetration as a potentially important content element (Harb et al., 2009) and the significance of mastery over dream content (Germain et al., 2004), it was hypothesized that the presence of perpetration of excessive violence, guilt, and/or a lack of self-efficacy in targeted nightmares would be related to increased pretreatment sleep/nightmare and PTSD symptomatology. Neither guilt nor perpetration of violence was correlated with pretreatment symptomatology. Lack

Table 2  
*Dominant Themes in Nightmares Targeted for Treatment and Percent Primary or Secondary*

Theme	Definition/example	%	n
Fear of death	Expression of fear for life: "I hear shots behind me and in front of me. I fear that I'll get a direct hit."	41.7	20
Under attack	Combat scenes of danger to self: "Incoming rockets light up the sky, wounded soldiers are taking cover."	29.2	14
Lack of self-efficacy	Cannot do what is needed or has been trained to do: "I couldn't save him, there was nothing I can do."	27.1	13
Lack of control	Events in nightmare are out of veteran's control: "I can't get away; I'm being buried alive."	27.1	13
War is disgusting and horrible	Focus on horrible and gruesome details of war: "The smell of death is all around."	22.9	11
Guilt	Explicit or implicit expression of guilt about actions or inactions: "I start shooting and see an old Momma falling down. I can't believe I shot her."	12.5	6
Responsible for others' well-being	Worries about comrades/others' well-being: "They are in pain and asking for help."	10.4	5
Loss of comrade	Veteran witnesses the death of fellow soldier: "We bring him down the hill, he said to let him die."	10.4	5
Disbelief	Surreal experiences that do not fit picture of reality: "This shouldn't be happening."	8.4	4
Retribution or aggression	Actual retribution or veteran's wish for retribution: "We had about 10 dead so that night we went out and killed every living thing in the village."	6.3	3
Self-blame	Taking the blame for negative and distressing events: "I should have been able to help; it was my fault."	4.2	2

Table 3  
Dominant Themes of Revised Dream Scripts and Percent Primary or Secondary

Theme	Definition/example	%	<i>n</i>
Life is good	Positive feelings and optimistic happiness: "The sky is blue and birds are singing."	37.5	15
Safety	Veteran and others are safe or safely escaped a dangerous situation: "There is help if I need it; we are safe"	27.5	11
At peace	Veteran experiences relaxation and peaceful thoughts/feelings: "I have no worries in the world."	27.5	11
Self-efficacy	Feelings of empowerment and ability to control events in a positive way: "My surroundings are familiar and I know exactly what to do."	25	10
Hope	Hope for the future: "Everything will work out."	12.5	5
Danger is past	Realization that the danger is not real right now: "I am only an observer watching events of the past."	12.5	5
Moving on	Putting trauma in past and focus on future: "I get on a plane and take off for my life at home."	7.5	3
It's not all bad	Positive memories of Vietnam: "We did some good things in Vietnam."	5	2
Appreciation by others	Others appreciate veteran and his service: "The people come out and wave to us. I feel good about what we are doing in this war torn country."	2.5	1

of self-efficacy in the target nightmare, however, was related to more nightmares (NFQ weekly number:  $r = .39, p = .02$ ; NFQ weekly nights:  $r = .41, p = .02$ ). Perpetration was significantly related to the presence of guilt ( $r = .74$ ) in the nightmares.

### Dream Rescripting: Content, Emotions, Themes, and Changes

The content of the revised dreams included a similar amount of sensory detail, but significantly more positive emotions,  $t(44) = 10.62, p < .001$ , and fewer negative emotions,  $t(44) = -10.10, p < .001$ , than the targeted nightmares. Of the 40 rescripted dreams, 92.5% included no negative emotions (5% reported one and 2.5% reported three). In contrast, only 7.5% reported no positive emotions. The mean number of positive emotions was 2.75 ( $SD = 1.54$ ). In addition, there was a significant decrease in the level of threat to the dreamer in the revised dreams,  $t(44) = -11.89, p < .001$ . Nevertheless, 17.5% of these dreams included violence, 15% included scenes of blood or injury, and 12% were coded as the veteran remaining in danger.

Dream changes were predominantly realistic (87%), rather than fantastical in content, and 57% remained set in Vietnam or a military context. Almost all (98%) dreams ended on a positive note, whereby the veteran demonstrated mastery, confidence, or optimism. Although 38% of the dreams did not appear to focus directly on the theme of the targeted nightmare, 35% directly addressed it, and 28% appeared to actually resolve the target nightmare theme.

Regarding the particular types of changes made during rescripting, most veterans (58%) created alternate endings for their new dream. Veterans also sometimes used positive imagery (23%) and transformed threatening aspects of the nightmare into less distressing images (13%). Fewer veterans in-

serted reminders into the dream (10%) or used distancing techniques (8%). The predominant primary and secondary content themes of the new dreams are presented in Table 3, and the most prevalent were life is good, safety, at peace, self-efficacy, and hope.

### Relationships Between Nightmares, Changed Dreams, and Treatment Outcome

The multivariate analyses predicting posttreatment sleep disturbance and frequency of nightmares are presented in Table 4. Because no bivariate associations were found between any of the outcomes and the following potential predictors, they were not retained in any multivariate analyses: number of positive or negative emotions (pretreatment and posttreatment) and dream change. The presence of olfactory experiences in the targeted nightmare was predictive of a smaller reduction in sleep disturbance. References to violence such as killing or injury in the revised dream script were also related to a reduced treatment response for nightmare frequency. Resolving or addressing the nightmare theme in the revised script predicted a greater improvement in overall sleep disturbance.

### Discussion

The current investigation examined characteristics of posttraumatic nightmares and rescripted dreams of treatment-seeking Vietnam combat veterans with severe, chronic PTSD and their relation to outcome of Imagery Rehearsal treatment. The study constitutes the first systematic description of the content, emotions, and themes of recurrent nightmares targeted in Imagery Rehearsal of which we are aware. Most target nightmares were fairly accurate replays of traumatic events, set in the warzone

Table 4  
 Multivariate Relationships Between Pretreatment and Treatment Variables and Outcome

Variable	Sleep disturbance			Nightmare freq			Freq nights w/nightmares		
	<i>B</i>	<i>SE B</i>	$\beta$	<i>B</i>	<i>SE B</i>	Wald	<i>B</i>	<i>SE B</i>	Wald
Block 1:	$F(1, 36) = 40.51,$ $\Delta R^2 = .53^*$			$\chi^2 = 0.81, ns$			$\chi^2 = 4.55^{**}$		
Baseline level	1.00	0.16	.73*	0.13	0.15	0.76	0.43	0.21	4.43**
Block 2:	$F(4, 32) = 5.17,$ $\Delta R^2 = .19^*$			$\chi^2 = 14.08^*$			$F(3, 34) = 3.78,$ $\Delta R^2 = .20^*$		
Prekilling/injury	–	–	–	–	–	–	0.06	0.79	0.16
Presmell	2.95	1.06	.30*	–	–	–	0.60	0.64	0.86
Postviolence	1.32	1.26	.11	5.69	1.14	24.91*	1.29	0.59	4.87**
Similar theme	–	–	–	1.16	0.81	2.03	–	–	–
Addressed/resolved	1.79	0.98	-.20**	–	–	–	–	–	–
Postsound	0.61	0.92	.07	1.46	0.76	3.71	–	–	–

Note.  $N = 48$ . For a given relationship between predictor and outcome, “–” indicates a relationship that was not significant in a bivariate analysis, and so was not included in a multivariate analysis. *ns* = not significant.

\*  $p < .05$ . \*\*  $p < .01$ .

and replete with scenes of death, injury, and killing. Feelings of helplessness and fear, and themes of fear of death and being under attack predominated. In addition, as previously shown in nontrauma-related nightmares (Zadra et al., 2006), a portion of nightmares centered on nonfear-based emotions such as sadness, anger, or disgust.

Consistent with previous literature demonstrating the importance of a lack of mastery in posttraumatic nightmares (Germain et al., 2004), this study found that a lack of self-efficacy as a primary theme was related to more frequent nightmares prior to treatment. Fifteen percent of nightmares also included abusive violence (King et al., 1995) perpetrated by the dreamer and exceeding typical combat violence, crossing the moral divide of necessary combat actions. Given the suggestion by Harb et al. (2009) of the possible importance of perpetration of violence in nightmares, it was surprising that while abusive violence was related to guilt in the nightmares, it was not related to the severity of pre- or posttreatment symptoms. Interestingly, with the exception of amount of sensory detail, neither target nightmare content nor themes were related to treatment outcome. Olfactory detail in the nightmare predicted reduced treatment response, whereas auditory detail (present in approximately half of the nightmare scripts) did not. Olfactory compared to other forms of sensory memory is more closely related to affect, and there is a strong functional relationship between odor perception and neural systems involved in memory and emotion (Vermetten & Bremner, 2003). Because the processing of smells is mediated by primitive brain systems involved in fear and survival (Vermetten, Schmahl, Southwick, & Bremner, 2007), the experience of smells in nightmares may represent an index of nightmare intensity and/or the nightmare’s resistance to change with Imagery Rehearsal.

Veterans were as likely to improve regardless of the particular types of changes made in their rescript. Devising an alternate ending to the dream, using distancing techniques, and transforming weapons into harmless objects were equally effective. Whether or not the distressing theme of the nightmare is addressed by the rescripting, however, may hold clinical significance. Sixty-three percent of new dream scripts addressed or resolved the nightmare theme (e.g., a fear of death theme could be transmuted into a safety theme) and such rescripting predicted a reduction in overall sleep disturbance. Consistent with the literature on the cognitive-behavioral treatment of PTSD, Imagery Rehearsal may constitute a form of cognitive restructuring of the meaning of the traumatic memory replayed in the nightmare as well as veterans’ negative evaluations of themselves. Focus on the theme and on resolving it may also increase the cohesion of the nightmare through attempts to understand it (Foa, Molnar, & Cashman, 1995). Similarly, in a pilot study of Imagery Rehearsal for female sexual assault survivors, an increase in mastery over negative elements of the dream was found important (Germain et al., 2004). Furthermore, these findings support the focus on identification of themes as practiced in a variant of Imagery Rehearsal (Davis & Wright, 2007) and suggest the importance of assessing for themes applicable to replicative nightmares of combat veterans.

Violent imagery present in the rescripted dream was related to a smaller reduction in nightmare frequency. Violence in the rescript may affect treatment outcome in two ways. First, if the new dream content was incorporated into the storyline of veterans’ dreams, it could result in different yet still distressing content, which likely results in sudden waking. Second, rehearsal of such imagery before sleep may act as a trigger for trauma-related memories, thus increasing the likelihood of

trauma-related nightmares. These findings suggest that, for at least some trauma survivors, instructions for rescripting a nightmare may need to be highly specific. Although negative dream elements were acceptable in the rescripts composed by female sexual assault survivors (Germain et al., 2004), combat veterans may need to exclude violent elements from their new dream scripts.

Documenting the characteristics of recurrent nightmares in veterans with severe chronic PTSD adds to a theoretical understanding of nightmares following trauma and suggests ways to improve their treatment. Our participants' nightmares likely differed from the dreams targeted in some previous trials of Imagery Rehearsal. Other investigations included civilian survivors, who reportedly have less replicative dreams (e.g., only 21% of civilians in Davis et al., 2007); participants with subsyndromal PTSD; and some with dreams unrelated to a trauma (Davis & Wright, 2007; Krakow et al., 2001). In addition, in some variations of Imagery Rehearsal, patients are instructed to select a nonreplicative and less severe target dream, whereas we left the choice of nightmare to the veteran. It is possible that the different types of nightmares participants present with may be one variable explaining divergent treatment outcomes.

This investigation has several limitations. First, the study population was a treatment-seeking sample of male Vietnam combat veterans with severe, chronic PTSD. The findings may not generalize to women, other traumatized populations, nontreatment-seeking trauma survivors, or those with subthreshold or acute symptomatology. Second, veterans were allowed to choose the nightmare to be targeted in treatment. Therefore, this was not a comprehensive analysis of veterans' nightmare experiences, rather an evaluation of one recurrent, not necessarily representative, nightmare of the participant's choice. Third, veterans were not queried in detail about the characteristics of their nightmares as this could have added an exposure component to the Imagery Rehearsal therapy. In the future, our rating scale might be used to assess salient nightmare characteristics prior to treatment.

Future directions for advancing the field of posttraumatic nightmares include studying nightmare characteristics in a variety of posttraumatic populations. For example, future studies may examine the importance of gender effects in the phenomenology of nightmares (e.g., Germain et al., 2004). Because this study utilized a new rating scale, it will be important that this measure be refined over time through use in various populations. Upcoming investigations might also examine whether emotional engagement with the nightmare content (i.e., emotional intensity) may be an important moderator of how well the nightmare theme is addressed during rescripting (Jaycox, Foa, & Morral, 1998). Finally, future studies may gain a different image of nightmare phenomenology if patient self-ratings of dream content are used instead of independent raters. A better understanding of why some individuals benefit from Imagery Rehearsal while others do not will allow for more informed treatment recommendations. Further, it will allow for evidence-

based modifications to treatment protocols used with different posttraumatic populations to maximize treatment success for each individual.

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