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Mary E. Long

Michael E. DeBakey Veterans Affairs Medical Center

Mary E. Hammons

Michael E. DeBakey Veterans Affairs Medical Center

Joanne L. Davis

University of Tulsa

B. Christopher Frueh

Baylor College of Medicine

Myrna M. Khan

Michael E. DeBakey Veterans Affairs Medical Center

See next page for additional authors

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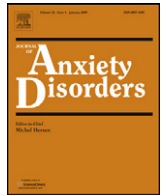
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Authors

Mary E. Long, Mary E. Hammons, Joanne L. Davis, B. Christopher Frueh, Myrna M. Khan, Jon D. Elhai, and Ellen J. Teng



Imagery rescripting and exposure group treatment of posttraumatic nightmares in Veterans with PTSD

Mary E. Long^{a,b,c,*}, Mary E. Hammons^a, Joanne L. Davis^d, B. Christopher Frueh^{b,e}, Myrna M. Khan^{a,b}, Jon D. Elhai^f, Ellen J. Teng^{a,b,c}

^a Michael E. DeBakey Veterans Affairs Medical Center, 2002 Holcombe Blvd (152), Houston, TX, USA

^b Menninger Department of Psychiatry and Behavioral Sciences, Baylor College of Medicine, One Baylor Plaza, Houston, TX, USA

^c Veterans Affairs South Central Mental Illness Research, Education, and Clinical Center, Houston Center for Quality of Care and Utilization Studies, 2450 Holcombe Blvd. Suite 01Y, Houston, TX, USA

^d Department of Psychology, University of Tulsa, 600 South College, 308G Lorton Hall, Tulsa, OK, USA

^e Department of Psychology, University of Hawai'i at Hilo, 200 West Kawili St., Hilo, HI, USA

^f Department of Psychology, University of Toledo, Mail Stop #948, 2801W. Bancroft St., Toledo, OH, USA

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ABSTRACT

This study details results of an open trial of a group psychological treatment for Veterans with posttraumatic stress disorder (PTSD) and chronic posttraumatic nightmares called "Imagery Rescripting and Exposure Therapy" (IRET). IRET is a variant of a successful imagery rescripting treatment for civilian trauma-related nightmares that was modified to address the needs of the Veteran population. Thirty-seven male U.S. Veterans with PTSD and nightmares attended 6 multicomponent group sessions. Findings indicated that the intervention significantly reduced frequency of nightmares and PTSD severity, as well as increased hours of sleep. Unlike the few open trials examining treatment of nightmares in Veterans, effect sizes in this study were similar to those that have been found in the civilian randomized controlled trial. These preliminary findings suggest that a nightmares treatment can be adapted to successfully reduce distress associated with combat Veterans' chronic nightmares. Clinical and research implications are discussed.

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1. Introduction

Posttraumatic nightmares refer to or replicate traumatic experiences and are considered to be an integral feature of posttraumatic stress disorder (PTSD, Phelps, Forbes, & Creamer, 2008). Indeed, trauma-related nightmares have been referred to as the hallmark of PTSD due to the frequency with which traumatized individuals report them (Hartmann, 1996). Despite evidence indicating the efficacy of treatments including an imagery technique called imagery rescripting in reducing nightmares and related distress in the civilian population (Wittman, Schredl, & Kramer, 2006), treatment of nightmares in Veterans has been largely unexamined. The current study investigated the preliminary efficacy of Imagery Rescripting and Exposure Therapy (IRET), a Veteran adaption of a successful civilian imagery rescripting treatment, in reducing symptoms of nightmares and related distress in the Veteran population.

Nightmares in Veterans warrant special attention in the treatment of PTSD because sleep complaints are highly prevalent, have

a generally severe effect on overall functioning, and often persist for decades after the original trauma (Schreuder, Kleeji, & Rooijmns, 2000). Reported prevalence rates of chronic nightmares in the Vietnam Veteran population range from 53 to 88% (Fontana & Rosenheck, 2008), with approximately 70% of Operation Enduring Freedom/Operation Iraqi Freedom (OEF/OIF) Veterans diagnosed with PTSD reporting sleep disturbances (Seal, Bertenthal, Miner, Sen, & Marmar, 2007).

Despite the efficacy of cognitive-behavioral trauma-related therapies in treating global PTSD symptoms, sleep disturbances and nightmares are often resistant to front-line psychological (Galovski, Monson, Bruce, & Resick, 2009; Spoomaker & Montgomery, 2008; Zayfert & DeViva, 2004) and pharmacological (van Liempt, Vermetten, Geuze, & Westenberg, 2006) treatments of PTSD. Emerging evidence indicates that therapies targeting nightmares directly have been more successful in producing simultaneous improvement in nightmares and related distress than interventions that treat PTSD symptoms globally (Wittman et al., 2006).

Treatment outcome studies incorporating imagery rescripting have evidenced the greatest efficacy for reducing the frequency of nightmares and associated distress in civilians (Long & Quevillon, 2009; Wittman et al., 2006). During nightmare imagery rescripting treatment, the content of a distressing nightmare is modified to be

* Corresponding author at: 3266 Green Acres Drive, Bethlehem, PA 18014, USA. Tel.: +1 610 248 6674.

E-mail address: melong6@gmail.com (M.E. Long).

less upsetting, with the rescripted nightmare then being read by the patient directly before going to sleep. According to cognitive-behavioral theorists, imagery rescripting techniques may reduce symptoms of PTSD through activation of the fear network, with exposure to the trauma images and related thoughts and feelings resulting in habituation (Long & Quevillon, 2009). It has also been hypothesized that imagery rescripting is therapeutic by identifying and modifying maladaptive beliefs, empowering the client through increased mastery over the images, and improving self-soothing abilities and imagery control.

Variants of imagery rescripting interventions have been examined as a treatment for civilians' idiopathic nightmares since the late 1970s (Long & Quevillon, 2009; Wittman et al., 2006). Davis and Wright (2005) tailored idiopathic imagery rescripting interventions to address the unique characteristics and issues raised by chronic trauma-related nightmares in civilians. In one of the few randomized controlled trials examining the use of imagery rescripting to treat civilian posttraumatic nightmares, the Davis and Wright intervention, Exposure, Relaxation, and Rescripting Therapy (ERRT, 2007), resulted in larger reductions in frequency of nightmares, sleep disturbance, and PTSD frequency at 3-months post-treatment than other imagery rescripting variants (with Cohen's *d* of .96, 1.04, and .83, respectively).

To date, most nightmare treatment outcome trials have been conducted only with civilians, with just one randomized and five non-randomized Veteran nightmare studies being published to date (Cook et al., 2010; Forbes et al., 2003; Harb, Cook, Gehrman, Gamble, & Ross, 2009; Lu, Wagner, Van Male, Whitehead, & Boehnlein, 2009; Moore & Krakow, 2007; Nappi, Drummond, Thorp, & McQuaid, 2010). All studies used imagery rescripting and evidenced reductions in nightmare frequency and related sleep disturbances; however, the studies evidenced smaller effect sizes in these primary outcomes than similar studies with the civilian population (with post-treatment Cohen's *d* effect sizes ranging from .09 to .70 for nightmare frequency and $-.001$ to .57 for sleep quantity, and not all differences resulting in a significant α level). Reduction in overall PTSD symptoms was also smaller than in civilian nightmare studies (ranging from .27 to .74 for PTSD frequency); and, unlike the Davis and Wright civilian study (2007), most Veterans retained their PTSD diagnosis after treatment (Lu et al., 2009).

The current study details the findings of an open trial of Imagery Rescripting and Exposure Therapy (IRET). IRET is the first multi-component group treatment modified from Davis and Wright's (2005) Exposure, Relaxation, and Rescripting Therapy (ERRT) to meet the needs of Veterans with posttraumatic stress disorder (PTSD) and trauma-related nightmares. The hypotheses were that Veteran participation in the IRET treatment would result in a significant improvement in the primary outcome measures (frequency of nightmares and quantity of hours slept), as well as decreases in PTSD frequency, that were similar to the civilian treatment outcome effects.

IRET for Veterans modifies ERRT by increasing the number of sessions, augmenting exposure to the original nightmare, and providing extra practice in nightmare rescripting. These modifications were made in order to address the PTSD treatment-resistance often found in the Veterans (Creamer & Forbes, 2004), as well as to improve on previous nightmare treatment results with this population. Previous imagery rescripting treatments for Veteran nightmares may not have been as effective as with civilians because of many Veterans' resistance to discuss or modify their nightmares and/or sleep behavior (e.g., due to long-standing negative sleep habits and the frequent long-term, chronic, and replicative nature of their nightmares (Phelps et al., 2008)). In order to address this resistance, the number of group treatment sessions was increased from three to six. The lengthier treatment

allowed for enhanced focus on sleep management skills, an augmented nightmare exposure component, and extra description and practice of nightmare rescripting. The exposure component of the civilian treatment was augmented in order to capitalize on the effectiveness of exposure therapy in habituating patients to distressing images and related thoughts/feelings (Bisson et al., 2007), and consequently reducing resistance to subsequent discussing and rescripting their nightmares in proceeding sessions.

2. Method

2.1. Participants

Participants were 37 male Veterans aged between 40 and 72 years who were enrolled in a specialty mental health program for PTSD in a large VA hospital and who completed the IRET group treatment between October 2008 and October 2009. All participants reported a long history of nightmares (i.e., more than 3 decades for the majority of participants), with onset of symptomatology occurring typically during or shortly after returning from deployment. The majority of participants had not participated in PTSD-specific psychosocial interventions prior to entering the group, with PTSD-specific treatment being operationalized as individual or group participation in currently approved front-line psychosocial interventions for Veteran PTSD (e.g., prolonged exposure, cognitive-processing therapy, or anxiety-management skills training). Demographic information for the sample is summarized in Table 1.

Participants were referred to the group treatment by their primary mental health providers and all expressed an interest in participating in psychosocial group treatment for their sleep and nightmare disturbance. All patients received a description and rationale for the treatment by phone by the facilitator and were screened for nightmare frequency, sleep quantity/quality, safety to self and others, active substance dependence or psychosis, and motivation for treatment prior to signing up for the group. Eligible participants were adult Veterans enrolled in the PTSD program reporting at least one combat-related nightmare weekly. Exclusion criteria for the group included patients who were actively suicidal, substance dependent, or psychotic.

2.2. Measures

2.2.1. PTSD Checklist–Military Version (PCL-M) (Weathers, Litz, Huska, & Keane, 1994)

The PCL-M is a 17-item Likert-type self-report measure that corresponds to the PTSD criteria in the *Diagnostic and Statistical Manual of Mental Disorder–Fourth Edition (DSM-IV)* (American Psychiatric and Association, 2000). Participant's completed the PCL-M at the beginning of the first and last sessions in order to assess PTSD frequency at the different time points. The PCL's psychometric properties are compelling, with excellent internal consistency ($\alpha = .94$) (Blanchard, Jones-Alexander, Buckley, & Forneris, 1996; Ruggiero, Del Ben, Scotti, & Rabalais, 2003), and excellent test-retest reliability of .88 for a 1-week interval (Ruggiero et al., 2003). Weathers et al. (1993) found a cutoff score of 50 yielded a sensitivity of .82 and specificity of .83 in a combat Veteran sample.

2.2.2. Daily sleep activities log (DSAL) (Thompson, Hamilton, & West, 1995)

The DSAL is a daily diary of 10-items that assesses quantity of sleep and occurrence of nightmares for the previous night that was adapted for the Veteran IRET open trial. Participants completed the DSAL each morning during the course of the study. Convergent validity of the original DSAL with the Trauma Related Nightmare

Table 1
Baseline demographics.

Categorical variables	n (%)
Gender	
Male	37 (100%)
Ethnicity	
African-American	21 (56.8)
Caucasian	13 (35.1)
Hispanic	3 (8.1)
Other (Asian, Native American, Native Hawaiian, Other Pacific Islander)	0 (0.0)
Relationship status	
Married	27 (73.0)
Single	1 (2.7)
Divorced, separated or widowed	9 (24.3)
Education	
High School	15 (37.8)
Some College	17 (45.9)
College/Post Graduate	5 (13.5)
Combat Era	
Vietnam	35 (94.6)
Gulf War	2 (5.4)
Current psychological treatment	
Medication only	26 (7.03)
Educational group/support group only	1 (2.7)
Medication and group	10 (27.0)
Received PTSD-specific treatment (prior to IRET)	
No previous PTSD-specific treatment	27 (73.0)
Prolonged exposure (PE)	1 (2.7)
Cognitive processing therapy (CPT)	4 (10.8)
Seeking safety	2 (5.4)
Anxiety management	3 (8.1)
Currently prescribed nightmare/sleep medication	
Prazosin	15 (40.5)
Benzodiazepine	7 (18.9)
Service connected for PTSD	
Yes	19 (51.4)
No	18 (48.6)
Continuous variables	M (SD)
Age	62.1 (4.1)
Posttraumatic nightmares (nights/week)	4.8 (1.8)
Sleep quantity (h/night)	4.0 (1.2)
PTSD frequency	68.7 (11.1)

Survey (TRNS, Davis & Wright, 2001) was found to be adequate in a clinical sample: nights with nightmares ($r = .74-.82$) and number of nightmares ($r = .76-.81$) (Davis, Byrd, Rhudy, & Wright, 2007). Weekly frequency of nights with nightmares and average number of hours slept per night over the week, as reported by the participant at the first session and subsequently gathered from the DSAL at the beginning of sessions two through six, are the primary measures of nightmare frequency and sleep hour quantity.

2.3. Procedure

2.3.1. Intervention

IRET, the six-week multi-component group intervention assessed in the current study, is an adaptation of ERRT modified by the first author for use with the Veteran population. The IRET group intervention consists of six psychotherapy sessions with weekly assigned homework. Based on experience using ERRT with the Veteran population in a clinical setting, IRET lengthened the treatment from three to six sessions in order to augment discussion of cognitive-behavioral skills for sleep management, exposure to the original nightmare (i.e., reading of the written original nightmare daily for one week), and to provide extra practice in nightmare rescripting (i.e., increased time in the fifth session to practice rescripting a nightmare in session).

Specific techniques across the six sessions included: (1) Psychoeducation related to the treatment rationale and the rela-

tionship between traumatic events and nightmares, as well as learning and practicing a relaxation exercise each of the first 3 sessions; (2) Psychoeducation regarding the impact of insomnia and cognitive-behavioral skills for sleep management; (3) Review of exposure rationale and exposure to the original nightmare (i.e., writing the most distressing and/or frequent nightmare and reading it several times until anxiety decreases); (4) Review of rationale for imagery rescripting and subsequent modification of the original nightmare around the identified traumatic theme; (5) Continued imagery rescripting, either troubleshooting issues that arose with the original nightmare modification or rescripting a second nightmare; and, (6) Review of skills, relapse prevention planning, and application of skills to future possible nightmares, intrusive imagery, or anxiety-provoking situations. The sessions were conducted weekly for 90 minutes over a 6-week period and included a review of homework assignments related to the session module content and weekly behavioral assignments. Behavioral assignments included daily monitoring of sleep/nightmare frequency and content, daily practice of relaxation and sleep management skills, daily reading of the original nightmare content to attain habituation, and reading of the rescripted nightmare directly before going to sleep.

2.3.2. Clinicians

Group facilitators included the first author, who adapted the intervention, and two Master's level intern clinicians (in separate groups) who were oriented, trained, and supervised by the first author in conjunction with co-author, EJT. Clinicians met weekly during the treatment phase of the intervention to discuss progress and/or any issues that had arisen during session.

2.3.3. Analyses

Data was gathered as part of a retrospective chart review, with the study having been approved by the local Institutional and Veteran Affairs Review Boards.

SPSS 17.0 for Windows was used to perform pairwise *t*-test comparisons that were used to compare the sample's pre- to post PCL-M scores. Cohen's *d* effect size statistics were computed for nightmare frequency, sleep quantity, and PTSD frequency to examine the magnitude of clinical change from sessions 1 to 6. Cohen's *d* effect sizes of .2, .5, and .8 are regarded as indicating small, medium, and large clinical changes, respectively (Cohen, 1992).

3. Results

3.1. Pre- to post-treatment comparisons

The univariate analyses revealed that nightmare frequency, sleep quantity, and PCL-M scores all evidenced significant and meaningful improvements over the 6-session IRET group. Of the 33 Veterans present for the last session, 5 Veterans reported no longer having nightmares (15.2%), 10 reported sleeping an average of 6 hours or more (30.3%), and 30 (90.9%) reported at least mild overall improvements in their sleep disturbances (at least 1 less nightmare/week and 1 more hour of sleep/night). Pairwise *t*-test comparisons of the first and last-session PCL-M scores revealed significantly lower scores at the last session ($M = 55.7$, $SD = 14.6$) than at the first session ($M = 68.7$, $SD = 11.1$), $t(32) = 7.1$, $p < .001$, $d = 1.0$ (see Fig. 1 for session-by-session Means). According to the PCL-M Veteran cutoff score of 50, 10 Veterans (27%) also reported no longer meeting the criteria for PTSD after treatment. Effect size analyses demonstrated meaningfully large improvements in nightmare frequency ($n = 29$, $d = 1.37$), sleep quantity ($n = 29$, $d = 1.22$), and PTSD severity ($n = 33$, $d = 1.0$), and over this time period.

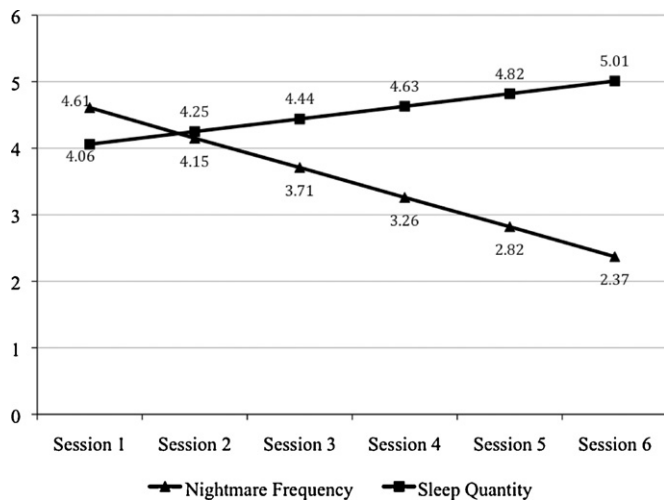


Fig. 1. Estimated nightmare frequency and sleep quantity means across treatment sessions. Nightmare frequency = number of nights with nightmares per week; sleep quantity = average number of nightly hours slept per week.

4. Discussion

This study details results of an open trial of Imagery Rescripting and Exposure Therapy (IRET), a multi-component treatment for Veterans with PTSD and trauma-related nightmares. Findings indicated that the intervention reduced frequency of nightmares (from 4.8/week to 2.4/week), improved quantity of sleep (4.0 h/night to 5.4 h/night), and decreased PTSD frequency to a degree that is both statistically significant and clinically meaningful. Unlike previous studies examining imagery rescripting variants in the treatment of Veteran' trauma-related nightmares, the treatment investigated in this study resulted in consistently large effect sizes for all outcome variables that were similar to those that have been found in an RCT with civilian PTSD samples (Davis & Wright, 2007).

These findings are particularly meaningful given the status of PTSD and nightmare intervention research with the population examined in this study. Previous research has suggested that frontline, trauma-focused cognitive-behavioral interventions have been less clinically effective in reducing global PTSD in Vietnam Veterans than with civilians (Bisson et al., 2007; Creamer & Forbes, 2004). Given that research indicates that nightmares and other sleep disturbances are particularly resistant to these other-wise successful global PTSD treatments (Galovski et al., 2009; Spoomaker & Montgomery, 2008; Zayfert & DeViva, 2004), the implications of significantly and clinically meaningful findings across these domains in a sample comprised primarily of Vietnam Veterans are considerable. These findings are especially note-worthy given that this Vietnam Veteran sample reported to have experienced, like most Veterans of this generation, their posttraumatic stress disorder symptoms and trauma-related nightmares for decades. Also, due to the sample's average age (62.1 years), they also may be susceptible to age-related declines in sleep quantity/quality in a way the younger civilian samples previously studied have not.

The modifications made to Davis and Wright's ERRT in the study's IRET protocol may have accounted for the improved treatment effects over previous nightmare studies with Veterans. IRET modified the civilian ERRT to address many Veterans' resistance to modifying their nightmares and sleep behaviors by lengthening the treatment, which allowed for augmented discussion of cognitive-behavioral skills for sleep management, exposure to the original nightmare, and practice in nightmare rescripting. These modifications capitalize on the effectiveness of exposure therapy in treating symptoms of PTSD through the process of habituation,

subsequently reducing the amount of distress caused by the nightmares and increasing the Veterans' willingness and belief that their nightmare images can be modified.

The current study is limited by being an open trial design with no comparison group, moderate sample size with only adequate power for some of the analyses, and may be limited in generalizability because the sample consisted primarily of Vietnam Veterans. Furthermore, despite the sample evidencing meaningfully large degrees of improvements on important nightmare, sleep, and PTSD variables, it was not the full clinical recovery we often seek.

5. Conclusions

The current study is timely and relevant because it addresses a gap in the literature regarding the mental health needs of Veterans experiencing the debilitating and potentially treatment-resistant effects of both PTSD and associated nightmares. Based on the positive outcomes from the current study, future research of IRET, via randomized controlled trials with long-term follow-up, in a broader range of outcome domains and Veteran war eras is needed and warranted.

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