BRIEF REPORT

A Combined Group Treatment for Nightmares and Insomnia in Combat Veterans: A Pilot Study

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Insomnia and nightmares are hallmarks of posttraumatic stress disorder (PTSD). Sleep disturbances in PTSD negatively impact clinical course and functioning. In this open clinical trial, the preliminary effects of a combined treatment for insomnia and nightmares in combat veterans with PTSD were assessed. Ten combat veterans participated in a 10-session group treatment combining cognitive–behavioral therapy for insomnia with exposure, rescripting, and relaxation therapy. Participants maintained daily sleep and dream diaries and completed self-report measures of sleep quality and PTSD symptoms pre- and posttreatment. Participants reported improvements in sleep and nightmares following treatment. Future research using controlled designs to evaluate this treatment is warranted.

Posttraumatic stress disorder (PTSD) is prevalent and debilitating among combat veterans (Dohrenwend, 2006; Hoge, 2006). Disturbed sleep and recurrent nightmares, hallmarks of the disorder, are common in veterans (Neylan et al., 1998; Ross, Ball, Sullivan, & Caroff, 1989). Recurrent nightmares may represent impairment of the emotional processing or fear extinction functions of dreaming (Nielsen & Levin, 2007; Phelps, Forbes, & Creamer, 2008). Sleep disturbances in PTSD negatively impact functioning (Clum, Nishith, & Resick, 2001; Krakow, 2002).

Psychotherapies for sleep disturbances have not been widely studied in populations with PTSD. The gold standard treatment, cognitive–behavioral therapy for insomnia (CBT-Insomnia), has been used to treat insomnia in veterans with medical and psychiatric comorbidities, including PTSD (Edinger et al., 2009; Perlman, Arnedt, Earnheart, Gorman, & Shirley, 2008). Although CBT-Insomnia shows promise for improving sleep in veterans with comorbidities, its impact on nightmares is unclear.

Psychotherapies for nightmares, including imagery rehearsal therapy (IRT) and exposure, relaxation, and rescripting therapy, improve nightmares and daytime functioning in civilians with PTSD (Davis & Wright, 2007; Krakow et al., 2001). However,

a recent meta-analysis of therapies for nightmares suggests most treatments do not find significant sleep improvements (Lancee, Spoormaker, Krakow, & van den Bout, 2008). Addition of an insomnia treatment component to a therapy for nightmares may provide more complete resolution of all sources of sleep disruption. Indeed, pilot studies of IRT-based treatments that incorporate elements of CBT-Insomnia have shown posttreatment improvements in sleep, dreams, and PTSD symptoms in veteran and civilian samples (Cook, Harb, Ross, Gamble, & Gehrman, 2008; Germain, Shear, Hall, & Buysse, 2007). The goal of the present study was to evaluate the preliminary effects of a 10-session combined insomnia and nightmare-reduction group treatment using CBT-Insomnia and exposure, relaxation, and rescripting therapy in a sample of combat veterans with chronic PTSD, nightmares, and insomnia.

METHOD

Participants

This study was approved by the Ann Arbor Veterans Affairs (VA) Institutional Review Board. Participants were combat veterans

recruited from the Ann Arbor VA's PTSD clinic who met diagnostic criteria for PTSD using the Clinician-Administered PTSD Scale (CAPS; Blake et al., 1995), had Insomnia Severity Index scores in the clinically significant range (Morin, 1993), and reported recurrent nightmares. Participants using antidepressants or hypnotics were included provided these medications were kept stable. Exclusion criteria included current substance/alcohol abuse or dependence, and unstable physical or psychiatric illness. Comorbid diagnoses were established from medical records.

Twenty-three veterans were recruited; five did not meet inclusion criteria and eight declined participation due to scheduling conflicts and illness. Ten male combat veterans (M age = 59 years, SD = 4) were enrolled in three treatment groups of three to four participants. Two participants withdrew halfway through treatment for reasons unrelated to the study.

Nine participants were veterans of the Vietnam War, and one was a Gulf War veteran. Nine were Caucasian, and one was African American. Consistent with the veteran population, participants had heterogeneous medical and psychiatric comorbidities, including major depressive disorder (4), alcohol dependence in remission, hypertension (5), coronary artery disease (2), and diabetes mellitus. Four participants used hypnotic medications during the study, and 6 participants used antidepressants. Participants reported chronic, moderately severe insomnia (M duration = 31 years, SD = 10) and PTSD (M duration = 33 years, SD = 12; M CAPS = 67, SD = 19). Participants were receiving concurrent treatment as usual through the PTSD clinic (8 in pharmacotherapy, 6 in psychotherapy).

Measures

Participants maintained daily sleep and dream diaries throughout treatment. Sleep diaries included time in bed, sleep latency, and time spent awake after sleep onset. Summary measures from sleep diaries included sleep efficiency (time asleep ÷ (time in bed * 100)) and total sleep time. Dream diaries collected information on nightmare frequency and distress level of the worst nightmare using a 0–10 Likert-type scale (0 = *no distress*; 10 = *extreme distress*; range of total weekly scores 0–70). Outcomes from diaries were calculated using weekly averages for baseline and posttreatment weeks (except for nightmare frequency, which was calculated as a weekly total). Other self-reported outcomes, completed at baseline and posttreatment, included the Insomnia Severity Index (Morin, 1993), Pittsburgh Sleep Quality Index (Buysse, 1989), and Posttraumatic Diagnostic Scale (Foa, Cashman, Jaycox, & Perry, 1997). Homework adherence was measured daily by self-report for two of the groups using a yes/no response format.

Treatment

Treatment consisted of ten 90-minute group therapy sessions delivered by doctoral-level clinical psychologists (LMS, TKF). Ex-

posure, relaxation, and rescripting therapy was modified by audio recording rescripted nightmares and providing a recorded relaxation exercise. Core components of CBT-Insomnia, including sleep restriction, stimulus control, sleep hygiene, cognitive restructuring, and relaxation were presented in the first five sessions to increase participants' self-efficacy in managing a chronic problem. Sleep schedule adjustments and restructuring of sleep-focused thoughts continued throughout treatment. Nightmare rescripting began in the sixth session; participants wrote and read aloud a detailed description of their worst nightmare. Thematic processing of nightmare content was facilitated by identifying common nightmare themes (power, safety, intimacy, trust, self-esteem; Davis & Wright, 2007). Consistent with the domains of dysfunction typically observed in veterans with PTSD, these themes are aligned with other evidence-based treatments (i.e., cognitive processing therapy). Participants rewrote the nightmare to address core themes. Participants were audio recorded while reading the rescripted nightmare aloud and instructed to listen to their rescripted nightmare each night (as many times as they wished) prior to bedtime while visualizing the nightmare, followed by a relaxation exercise. Sessions seven and eight were used for discussion of changes and trouble-shooting. The final two sessions focused on relapse prevention.

Data Analysis

To estimate missing data, we compared regression imputation (Little & Rubin, 2002) and multiple imputation strategies using AMOS (Arbuckle, 2007), and retained the more conservative values from regression. AMOS fits regression imputation models using maximum-likelihood (Schafer & Graham, 2002) and then uses linear regression to predict missing values (Arbuckle, 2007). The model included baseline scores for the primary outcome variables as well as age, PTSD duration, and insomnia duration.

Wilcoxon signed-rank tests evaluated baseline to posttreatment changes in sleep, daytime functioning, PTSD, and nightmares. Cohen's d effect sizes (Cohen, 1988) for repeated measures were calculated. Effect sizes of 0.2 were considered small, 0.5 considered medium, and 0.8 considered large. Adherence to homework was calculated by dividing the sum of adherent days for the sample by total number of days homework was assigned for the sample.

RESULTS

Participants reported 86% adherence to relaxation and 74% adherence to dream imagery practice. Wilcoxon signed-rank tests (Table 1) indicated improvement in insomnia severity and sleep quality. Post-treatment, 6 participants reported sleep efficiencies in the subthreshold range ($\geq$85%), 8 reported Insomnia Severity Index scores in the subthreshold range (8–14), and 5 reported a 50% or greater reduction in weekly nightmare frequency. On average, participants experienced a 50% reduction in nightmares per

Table 1. Pre- and Posttreatment Scores

Measure	Pretreatment		Posttreatment		Wilcoxon Z	Cohen's effect size d
	M	SD	M	SD		
Sleep efficiency (%)	68.7	15.6	84.4	15.1	−2.67*	1.01
Sleep onset latency (minutes)	41.7	21.9	22.3	17.0	−2.19*	0.89
Wake after sleep onset (minutes)	75.4	72.3	42.1	47.3	−1.78	0.46
Total sleep time (hours)	5.1	2.2	6.3	2.0	−2.29*	0.52
Weekly nightmare frequency	15.4	15.6	7.8	10.8	−2.31*	0.49
Weekly nightmare distress[a]	39.2	15.5	17.9	18.8	−2.81*	1.14
Pittsburgh Sleep Quality Index	15.1	3.5	11.6	4.8	−2.44*	0.73
Insomnia Severity Index	21.4	3.9	12.5	5.2	−2.67*	1.70
Posttraumatic Diagnostic Scale	36.0	10.2	31.7	9.8	−1.21	0.42

[a]Range of nightmare distress = 0–70.
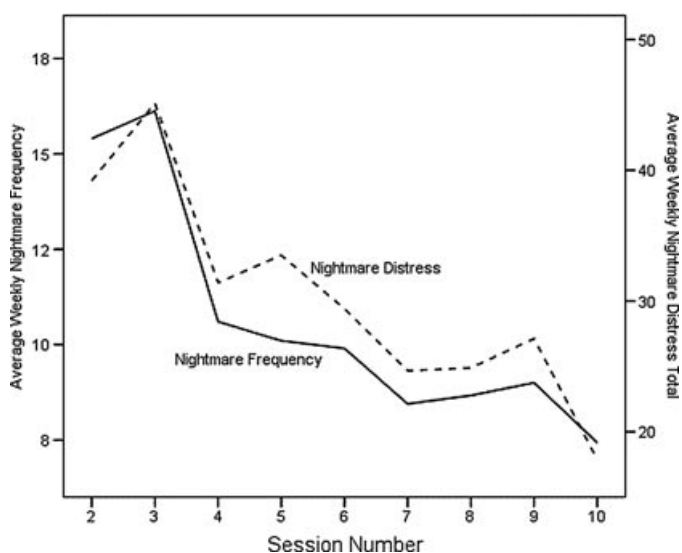* $p < .05$.

Figure 1. Average weekly nightmare frequency and distress by session.

week, and a 46% reduction in total nightmare distress per week (see Figure 1).

There were large effect sizes for sleep efficiency, sleep onset latency, the Insomnia Severity Index, and weekly nightmare distress (Table 1). There were medium effects for weekly nightmare frequency, the Pittsburgh Sleep Quality Index, wake after sleep onset, total sleep time, and the Posttraumatic Diagnostic Scale.

DISCUSSION

These preliminary findings suggest that combining CBT-Insomnia with exposure, relaxation, and rescripting therapy has promise for improving sleep and nightmares in combat veterans with chronic PTSD. Retention and adherence rates were reasonable. Major treatment targets (sleep and nightmares) improved. Average insomnia severity was in the subthreshold range following treatment, which corresponds with improvements in sleep diary measures. Although the sleep quality measure showed statistically significant improvement posttreatment, the mean score remained in the clinically significant range. Nightmare distress and frequency decreased by approximately half. Reductions in PTSD symptoms were nonsignificant. Effect sizes for changes in nightmare frequency, sleep quality, and PSTD symptoms were comparable to those found in a pilot study of IRT plus elements of CBT-Insomnia with veterans (Cook et al., 2008).

Of the potential explanations for the small reductions in PTSD symptoms, the most parsimonious is that the treatment did not directly impact PTSD symptoms. Other explanations include problems with our measure of PTSD symptoms (the Posttraumatic Diagnostic Scale; Foa et al., 1997), which has not been specifically validated in veterans, and the possibility that new learning, behavioral change, and symptom improvement may not have an immediate impact on the long-standing sick-role identification associated with the chronic clinical profile of our participants. In support of the latter, although no immediate posttreatment improvements were seen in a pilot study of IRT in veterans, significant changes were observed at 3- and 6-month follow-up (Lu, Wagner, Van Male, Whitehead, & Boehnlein, 2009).

Sleep quality also remained above the clinically significant cutoff. There is evidence that individuals with PTSD have high rates of sleep-disordered breathing, but atypical symptom profiles (Krakow et al., 2006). Thus, it is plausible that undetected sleep-disordered breathing partially accounts for why sleep quality remained poor.

Several limitations warrant discussion. The uncontrolled design precludes the conclusion that the treatment produced the observed

effects. Small sample size and use of self-report data should be considered when interpreting the results. The absence of follow-up assessments leaves questions as to the durability of symptom reduction. Finally, the sample was heterogeneous with respect to comorbidities, which increases generalizability but may hinder observation of treatment effects.

In sum, results from this small, uncontrolled pilot study of a combined group treatment for chronic insomnia and nightmares in combat veterans with PSTD and multiple comorbidities are promising and warrant further investigation. Areas for future research include ways to enhance treatment effects (e.g., multiple, sequential exposure trials to nightmares), development of shorter versions of the treatment, and randomized, controlled comparison to pharmacological and nonpharmacological treatments.

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