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Improving Treatment Outcomes For Veterans With Ptsd And Sleep Disturbance

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PTSD AND SLEEP DISTURBANCE

IMPROVING TREATMENT OUTCOMES FOR VETERANS WITH PTSD AND SLEEP DISTURBANCE

Submitted to the Faculty
Yale University School of Nursing

In Partial Fulfillment
of the Requirements for the Degree
Doctor of Nursing Practice

Gia Santoro

May 23, 2022
PTSD AND SLEEP DISTURBANCE

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This DNP Project is accepted in partial fulfillment of the requirements for the degree Doctor of Nursing Practice.

________________________________________

M. Lindsay Powell, DNP, APRN, PMHNP-BC

Date: ________________________________
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March 28, 2022
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Dedication

This project is dedicated to the Veterans with PTSD who have trusted me with their care. Thank you for sharing your stories, and thank you for your service.
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Abstract

Evidence-based treatments for post-traumatic stress disorder (PTSD) improve overall symptoms, but sleep disturbance often persists. Insomnia and obstructive sleep apnea (OSA) frequently co-occur with PTSD and contribute to the overall sleep disturbance. Successfully treating the sleep disturbance that occurs in the context of PTSD, including insomnia and OSA when present, will improve sleep, decrease PTSD symptoms, and enhance quality of life. This DNP project adapted an assessment and treatment protocol for Veterans with PTSD and sleep disturbance for use in an outpatient Veterans Affairs (VA) PTSD clinic. The protocol was implemented in a patient education and treatment-planning group for Veterans with PTSD. Screening measures for insomnia and OSA were distributed to group participants. The group curriculum and patient education materials were revised to include information about insomnia, OSA and their treatments. Eight Veterans attended the group during the implementation period and were sent the Insomnia Severity Index and STOP Questionnaire. Two veterans returned the questionnaires: both screened positive for insomnia and one screened positive for OSA. One referral to Cognitive Behavioral Therapy for Insomnia was submitted following the group. Results suggest that screening for insomnia and OSA in an outpatient VA PTSD clinic will uncover high rates of co-morbidity. A longer implementation period and larger sample size are needed to determine if these methods will increase referrals to evidence-based treatments recommended by the protocol. The protocol offers a strategy for treating Veterans with PTSD and sleep disturbance that supports measurement-based care, evidenced-based practice, and drug safety initiatives.
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Glossary of Abbreviations

AA-Auricular Acupuncture
APAP-Advanced Positive Airway Pressure
CBT-I-Cognitive Behavioral Therapy for Insomnia
CPAP-Continuous Positive Airway Pressure
CPT-Cognitive Processing Therapy
DSM-5-Diagnostic and Statistical Manual of Mental Disorders
EBP-Evidenced-Based Psychotherapy
EMR-Electronic Medical Record
ERRT-Exposure, Rescripting, and Relaxation Therapy
ISI-Insomnia Severity Index
IRT-Imagery Rehearsal Therapy
MAD-Mandibular Advancement Device
MBC-Measurement Based Care
MHTC-Mental Health Treatment Coordinator
MRP-Mantram Repetition Program
OEF-Operation Enduring Freedom
OIF-Operation Iraqi Freedom
OSA-Obstructive Sleep Apnea
PE-Prolonged Exposure
PTSD-Post-traumatic stress disorder
SIP-Sleep Intervention for PTSD
TREC-Trauma Recovery and Education Class
VA-Veterans Affairs
Chapter 1: Introduction

Post-traumatic stress disorder (PTSD) is a mental health condition that can develop after an individual experiences a traumatic event. The *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; DSM-5; American Psychiatric Association, 2013) categorizes the symptoms of PTSD in four clusters which include re-experiencing, hyperarousal, avoidance, and changes in thoughts and mood. Although poor sleep is known as a hallmark of the disorder, “sleep disturbance” accounts for just one of the twenty symptoms of PTSD listed in DSM-5. Historically, sleep disturbance in the presence of PTSD was thought to occur as an effect of the development of PTSD and associated symptom profile. More recent studies have suggested that sleep disturbance may play a causal role in the development of PTSD or be an early indicator of PTSD in the aftermath of trauma (Akkinui & Solh, 2019; Koren et al., 2002).

A diagnosis of PTSD alone often does not capture the severity or complexity of sleep disturbance that patients with this condition experience. Often, DSM-5 criteria for insomnia are also met, and this additional diagnosis is warranted. Further, a developing area of research finds that obstructive sleep apnea (OSA), a condition marked by disrupted breathing during sleep, is more common when PTSD is present (Zhang et al., 2017). OSA may play a role in the development and maintenance of sleep disturbance in some patients with PTSD, and account for a significant portion of the sleep problems reported (El-Solh et al., 2018). Several hypotheses regarding this common co-morbidity have been suggested, and this remains an active area of research (Jaoude et al., 2015; Krakow et al., 2000; Kinoshita et al., 2012).

**Problem Statement**

The estimated prevalence of PTSD in the general population is 8% (National Center for PTSD). Among Veterans, rates are higher, and vary based on era of military service. The
estimated prevalence of PTSD among Vietnam era Veterans is 30.9% for men and 26.9% for women (Kulka et al., 1990), while the prevalence of PTSD among Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF) service members is 13.8% (Tanielian & Jaycox, 2008). Sleep complaints are common in individuals with PTSD; sleep disturbance was reported in over 90% of Vietnam era Veterans with PTSD (Neylan et al., 1998; Lewis et al., 2009). Active-duty service members with PTSD report much higher rates of insomnia (92%) than their counterparts without PTSD (28%) (Seelig et al., 2010). Rates of co-occurring PTSD and sleep disturbance vary based on how sleep disturbance is assessed; when the DSM criteria for insomnia is used, the range is 31-65% (Colvonen et al., 2018). The co-occurrence of PTSD and OSA is also common, with one meta-analysis reporting an aggregate prevalence rate of 63% among individuals with PTSD compared with 7% in individuals without PTSD (Zhang et al., 2017). Prevalence data about the multi-morbidity of PTSD, insomnia and OSA is limited, however, in one study of crime victims with nightmares and insomnia, almost half had evidence of OSA (Krakow et al., 2001).

Veterans with PTSD experience a high symptom burden. Evidence-based treatments for PTSD can reduce symptoms and improve functioning, however, sleep disturbance often persists (Belville et al., 2011; Gutner et al., 2013; Pruiksma et al., 2016; Zayfert & DeViva, 2004). Insomnia and OSA, when present, contribute to the overall sleep disturbance and complicate treatment. These co-morbidities can be overlooked, as their symptoms overlap with PTSD. Successfully treating the sleep disturbance that occurs in the context of PTSD, including insomnia and OSA when present, will improve sleep, decrease PTSD symptoms, and enhance overall quality of life. This DNP Quality Improvement project adapted an assessment and treatment protocol for Veterans with PTSD and sleep disturbance for an outpatient Veterans
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Affairs (VA) PTSD clinic, and implemented the protocol in a patient education and treatment-planning group to increase referrals to evidence-based treatments recommended by the protocol.

Significance

Sleep disturbance and insomnia have been associated with a variety of negative consequences including worsening suicidal ideation (Nadorff et al., 2011), increased alcohol use (Nishith et al., 2001), and cognitive deficits (Martindale et al., 2016). In a military cohort, insomnia was associated with poor “self-rated health,” increased healthcare utilization, and lost workdays (Seelig et al., 2016). In the context of PTSD, a night of poor sleep was associated with increased PTSD symptoms and negative affect the following day (Short et al., 2017). Further, evidence suggests that insomnia may interfere with neurobiological mechanisms needed for successful PTSD therapy, rendering the treatments themselves less effective (Colvonen et al., 2019).

Individuals with PTSD and OSA present with more severe PTSD symptoms and sleep disturbance than those with PTSD alone (Krakow et al., 2002). When OSA and PTSD co-occur, quality of life, functioning, and fatigue are worse than in either condition alone (Lettieri et al., 2016). OSA severity has been positively correlated with increased reports of suicidal ideation in civilians with PTSD (Gupta & Jarosz, 2018). Veterans with the multi-morbidity of PTSD, insomnia, and OSA have worse sleep, depression, and overall quality of life than Veterans with PTSD and OSA (El-Solh et al. 2018). Treatment challenges in patients with co-occurring PTSD and OSA are bi-directional. As with insomnia, untreated OSA appears to be associated with decreased effectiveness of PTSD treatment (Mesa et al., 2017; Reist et al., 2017). Conversely, both insomnia and PTSD are associated with lower adherence to continuous positive airway pressure (CPAP), an effective treatment for OSA (El-Solh et al., 2018; Zhang et al., 2017).
Chapter 2: Background

Review of Literature

To identify relevant literature, three databases were searched. First, Ovid MEDLINE(R) ALL was searched for “Stress Disorders, Post-traumatic” AND (“Sleep Initiation and Maintenance Disorders” OR “Sleep Apnea Syndromes”). Next, APA PsycInfo was searched for Posttraumatic Stress Disorder AND (Insomnia OR Sleep Apnea). Last, PubMed was searched for "PTSD" AND ("Sleep Disturbance" OR "Sleep Apnea"). After duplicate records and records published prior to 2001 were removed, 645 remained. Of these, 278 were deemed relevant based on their title, and the abstracts were screened for eligibility. Records were excluded if they were not published in English, did not examine a treatment intervention, if the study’s intervention did not target the sleep disturbance associated with PTSD, or if the sample included subjects with traumatic brain injury. Sixty-eight articles were eligible and analyzed in full for inclusion. Review articles and editorials were excluded, along with those assessing an intervention not available in the United States. Additionally, articles were not included if they did not report a sleep related outcome (see Appendix A). The 37 articles meeting criteria are listed in the evidence matrix (see Appendix B), which outlines each study’s purpose, design, sample size and composition, treatment or intervention, sleep related outcomes, PTSD related outcomes, and level of evidence using the JBI criteria (Joanne Briggs Institute, 2013).

These articles are reviewed below. First, studies examining Cognitive Behavioral Therapy for Insomnia (CBT-I) in subjects with PTSD are reviewed. Next, studies examining CBT-I combined with nightmare focused psychotherapy in subjects with PTSD, followed by studies examining CBT-I combined with trauma-focused psychotherapy in subjects with PTSD are reviewed. Then, studies of CBT-I sequenced with trauma-focused psychotherapy in subjects
with PTSD are reviewed. Next, studies of pharmacological treatment approaches, followed by alternative treatment approaches for the sleep disturbance associated with PTSD are reviewed. Treatments targeting OSA in PTSD are also reviewed. Finally, a proposed screening and treatment protocol for patients with PTSD and sleep disturbance is outlined and conclusions and recommendations based on the review of literature are presented.

**CBT-I for PTSD**

CBT-I is the recommended treatment for insomnia in the setting of PTSD according to the VA/DoD Clinical Practice Guidelines for both for PTSD and *Chronic Insomnia Disorder and Obstructive Sleep Apnea*. This recommendation finds the highest level of support from Talbot et al.’s (2014) randomized trial comparing individual CBT-I to waitlist control in adults with PTSD and insomnia. Participants in the study’s CBT-I arm showed significant improvement in self-report sleep diary and sleep quality measures (P < 0.001), as well as objective measures from polysomnography compared with participants in the waitlist arm (Talbot et al., 2014). These improvements remained six months post-treatment (Talbot et al., 2014). In the CBT-I group, 41% of participants achieved “remission” from insomnia, compared with 0% in the control group (Talbot et al., 2014).

Four smaller studies support CBT-I as safe and effective for patients with PTSD across a variety of treatment settings and modalities. Gellis & Gehrman (2011) found significant subjective improvements in sleep in a pilot study of eight Veterans with long-standing PTSD receiving individual CBT-I, with effect sizes in the moderate to large range (0.6-3.2), but no changes in objective measures. Two studies examined group CBT-I in a PTSD population. DeViva et al. (2018) found significant improvements in several sleep diary measures (p < 0.05) and Insomnia Severity Index (ISI) scores (p < 0.001) in a retrospective chart review of Veterans
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in a residential treatment program for PTSD receiving group CBT-I, and Owen (2002) found a significant time effect of group CBT-I on sleep quality scores of Veterans with PTSD in an inpatient setting. Efficacy of CBT-I for patients with PTSD has also been demonstrated in a tele-health modality (Franklin et al., 2018).

Despite these promising results, CBT-I is not always feasible, accepted by patients, or successful (Akinnusi & El-Solh, 2019). To investigate factors that may predict CBT-I response in a PTSD population, El-Solh et al. (2019) conducted a retrospective chart review of 136 Veterans with PTSD and insomnia. Of the participants who received CBT-I, 77% completed treatment, and 47% were responsive six-months after completion, which is consistent with Talbot et al.’s (2014) remission rate (El-Solh et al., 2019). The CBT-I non-responder group had significantly higher pre-treatment rates of benzodiazepine and non-benzodiazepine GABA receptor agonist prescriptions than the CBT-I responder group ($p = 0.005$) (El-Solh et al., 2019). Further, younger-age and non-white race ($p = 0.001$) were each found to be associated with lack of response to CBT-I (El-Solh et al., 2019).

**CBT-I Combined with Nightmare Focused Psychotherapy**

Given the limitations of EBPs for PTSD and CBT-I in treating the sleep disturbance associated with PTSD, combined, novel, and sequenced psychotherapeutic strategies have been investigated. There are four studies examining combined CBT-I with a therapy targeting PTSD related nightmares (Imagery Rehearsal Therapy (IRT) or Exposure, Rescripting, and Relaxation Therapy (ERRT)). Results of these studies demonstrate that combined approaches improve sleep diary parameters and subjective sleep measures over waitlist or usual care conditions. Ulmer et al. (2011) assessed the feasibility of a “Sleep Intervention for PTSD (SIP),” which combined CBT-I and IRT, and found medium to large effect sizes for sleep diary parameters from baseline
to post-intervention and very large treatment effects for insomnia severity ($F_{3,14} = 9.88, p = 0.006$) and sleep quality ($F_{3,14} = 15.91, p = 0.001$) in the SIP group (Ulmer et al., 2011). Margolies et al. (2013) built upon these results with a larger sample, younger population, and briefer treatment. Like the previous study, large effect sizes were found in the treatment group for several sleep diary parameters, and there was significant improvement in measures of insomnia severity ($F (1,35) = 16.24, p < .001$) and sleep quality ($F (1,35) = 25.28, p < .001$) (Margolies et al., 2013). Mack (2013) combined CBT-I and IRT in a group therapy format and found significant condition by time interactions across sleep diary scores and self-report sleep measures with large effect size, ($F (5, 26) = 3.89, p = .009, \eta^2 = .428$). Similarly, a group treatment combining CBT-I with a modified version of ERRT found medium to large effect sizes for sleep diary measures, insomnia severity and sleep quality (Swanson et al., 2011).

Studies in this category have been included in two meta-analyses. One demonstrated that the CBT-I component of the combined therapy had a significant effect on the degree of improvement in sleep quality from initial assessment to post-treatment ($Q_B (1) = 11.20, p < 0.01$) (Casement & Swanson, 2012). A second meta-analysis evaluating the efficacy of sleep-specific CBT in treating PTSD, sleep, and depressive symptoms found large effect sizes for insomnia severity scores ($g = 1.15$) and sleep quality scores ($g = 0.87$) in the CBT group (Ho et al., 2016).

Limitations of these combined treatment approaches should be considered. In one study, remission rates were lower than expected for both insomnia (11%) and sleep quality (Ulmer et al., 2011). Three of the four studies excluded participants with OSA, limiting generalizability. In studies that included participants taking sleep medications, the medications were not systematically tracked, leaving questions about the role of concurrent medication and psychotherapy.
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Sleep Treatment Combined with Trauma-Focused Psychotherapy

Studies of interventions to improve treatment outcomes for Veterans with PTSD and sleep disturbance include combined Prolonged Exposure (PE), an evidence-based therapy for PTSD, with CBT-I, and combined Cognitive Processing Therapy (CPT), another evidence-based therapy for PTSD with sleep directed hypnosis. Colvonen et al. (2019) piloted the “2NITE protocol,” which consisted of two sessions of CBT-I, then PE integrated with the rest of the CBT-I protocol, for a total of fifteen 90-minute sessions. The authors found significant improvement in subjective and objective measures of sleep, and a significant decrease in insomnia severity scores \(d = 2.38\) from pre- to post-treatment (Colvonen et al., 2019). The lack of control condition and follow-up data limit the findings of this study; a strength was the modification of the treatment manual to screen and treat OSA prior to the start of treatment (Colvonen et al., 2019). A unique study compared the effects CPT with sleep-directed hypnosis to the effects of CPT with symptom monitoring and found modest results, with participants in the hypnosis condition demonstrating improved sleep onset compared with the symptom monitoring condition \((p = 0.4)\) (Arditte Hall et al., 2020).

Sequenced CBT-I with Trauma Focused Psychotherapy

There are three studies examining outcomes of sequencing CBT-I both before (Baddeley & Gros, 2013) and after (DeViva et al., 2015, Walters et al., 2020) trauma focused psychotherapy for PTSD. These studies show promising results, however, can’t be directly compared due to the wide variety of treatment intervention and design. Baddeley & Gros (2013) documented a case study of a 70-year-old Veteran with PTSD and insomnia who initially refused PTSD psychotherapy. The treatment approach was shifted to utilize CBT-I infused with psychoeducation about PTSD (Baddeley & Gros, 2013). DeViva et al. (2005) conducted a pilot
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study with five patients who successfully completed CBT for PTSD but continued to report significant sleep difficulties. Treatment included CBT-I tailored to PTSD patients (DeViva et al., 2005). In both studies, participants demonstrated improved sleep outcomes including self-report sleep diary measures, insomnia severity and sleep quality scores (Baddeley & Gros, 2013; DeViva et al., 2005). While these studies are limited by their very small samples (one and five, respectively), Walters et al. (2020) studied the impact of sequencing CBT-I and IRT after PE treatment in a larger sample of 41 subjects. This randomized controlled trial of participants with PTSD, insomnia, and nightmares utilized a treatment consisting of twelve sessions of PE over six weeks, followed by five weekly sessions of IRT, and seven weekly sessions of CBT-I (Walters et al., 2020). Veterans in the control arm received PE followed by supportive care (Walters et al., 2020). PE alone did not improve sleep efficiency or nightmares, further supporting that PTSD psychotherapy is often not adequate to treat associated sleep-disturbance or insomnia. In the treatment arm, there was increased sleep efficiency with large effect size compared with the control condition ($p = 0.68, d = 1.07$). While comprehensive, this treatment design raises feasibility concerns due to the length (18-weeks) and dropout rates (43% from PE; 30% from IRT) (Walters et al., 2020).

**Pharmacologic Approaches**

Medications are frequently prescribed to target sleep disturbance in PTSD, however, there is not enough evidence to recommend a specific pharmacologic approach. The two studies of the non-benzodiazepine sedative-hypnotic eszopiclone demonstrated contradictory results. Pollak et al.’s (2011) placebo controlled randomized trial of eszopiclone in patients with PTSD and insomnia resulted in significant improvements in sleep onset latency ($P = .044$) and sleep quality scores ($P = .011$). This is contrasted with Dowd et al.’s (2020) placebo controlled
randomized trial of eszopiclone in patients with PTSD and “sleep disturbance,” that found no significant differences between groups in sleep outcomes (Dowd et al., 2020). There are no studies of the non-benzodiazepine sedative-hypnotic zolpidem as standalone treatment for PTSD related sleep disturbance, however, a randomized “zolpidem-controlled” trial of patients with PTSD taking an antidepressant that examined the benefits of hypnotherapy added to zolpidem demonstrated similar outcomes in both groups (Abramowitz, 2008).

The atypical antipsychotics risperidone and quetiapine have been studied for their impact on sleep outcomes in Veterans with PTSD (David et al., 2006; Krystal et al., 2016; Robert, 2005). Adjunctive risperidone was found to have a small effect on a self-report sleep quality measure, which in one of the two studies (Krystal et al., 2016) was statistically significant (main effect $F = 4.57, P = 0.34$; drug-by-time $F= 4.32, P =0.14$). The sole study assessing the impact of quetiapine on sleep disturbance in PTSD was a prospective open label trial that found significantly improved sleep duration (1.8 hours per night) and improved sleep quality scores ($p < 0.001$) with quetiapine prescribed at bedtime (Robert, 2005). Given the relatively small impact on sleep, and the significant potential adverse effects, use of atypical antipsychotics for this purpose remains discouraged (Akinnuisi & El-Sohl, 2019).

The alpha-blocker prazosin has received attention for its potential use in PTSD treatment. It has been “recommended” by the American Academy of Sleep Medicine guidelines for PTSD associated nightmares (Brownlow et al., 2015). A reduction in nightmares is hypothesized to indirectly improve sleep in PTSD. Several studies of prazosin have reported sleep outcomes. Two meta-analyses found significantly improved sleep with prazosin over placebo (George et al., 2016; Khachatriyan et al., 2016). However, the meta-analysis by Khachatriyan et al. (2016) reports sleep outcomes using only one PTSD criteria related to sleep, with no other subjective or
objective measures reported. Three randomized controlled trials had mixed results, with one finding no significant effect of prazosin on actigraphy data (Khaziaie et al., 2016), one finding increased total sleep time and REM sleep time over placebo \( (p < 0.01; \text{Taylor et al., 2008}) \), and the last finding significantly improved sleep quality measure scores \( (p = 0.008, \text{Cohen’s } d = 1; \text{Raskind et al., 2007}) \).

There are no controlled trials of trazodone for sleep in a PTSD sample. Warner et al. (2001) surveyed 74 Veterans about their use of trazodone and found that 60 were able to maintain effective doses with most (92%) reporting improved sleep onset, and three-quarters reporting improved sleep maintenance.

**Alternative Treatment Approaches**

Treatment modalities often described as “alternative” have been investigated as potential strategies to improve outcomes in patients with PTSD and sleep disturbance. These include auricular acupuncture (AA), a Mantram Repetition Program (MRP), and exercise (King et al., 2015; beck et al., 2017; Bosch et al., 2017). Of these, the MRP exhibited the most compelling evidence for consideration. The 20 Veterans with PTSD and sleep disturbance participating in an 8-week manualized MRP showed a statistically significant decrease in insomnia severity scores from pre- to post-treatment with moderate effect size \( (P < 0.00, d = 0.61) \) (Beck et al., 2017). However, 60% of the participants continued to meet diagnostic criteria for insomnia following the treatment (Beck et al., 2017). AA did not have promising results, as no significant differences were found in actigraphy results or sleep quality scores from pre- to post-treatment in a Veteran cohort (King et al., 2015). A longitudinal study by Bosh et al. (2017) suggests exercise may improve sleep quality at one-year follow up, controlling for other variables. These studies were limited by study design and small sample sizes.
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Approaches Targeting OSA in PTSD

Evidence suggests that treating co-occurring OSA in individuals with PTSD improves overall treatment outcomes, including sleep outcomes. This is supported by Orr et al.’s (2017) prospective study of Veterans with PTSD and newly diagnosed OSA naïve to CPAP therapy. CPAP use resulted in significant improvement in patient-reported sleep quality and sleepiness measures (p = 0.001) at three- and six-month follow-up (Orr et al., 2017). Despite the benefits of CPAP, patients with PTSD have difficulty with CPAP adherence. For this reason, other treatment options for OSA, such as advanced PAP therapy (APAP) and a mandibular advancement device (MAD) have been considered. In a retrospective chart review of patients with OSA and PTSD who “failed” CPAP and were treated with APAP, Krakow et al. (2019) found that hours of weekly APAP use and insomnia severity were inversely correlated (r = 0.321, p = 0.001) (Krakow et al., 2019). There was significant improvement in insomnia severity scores associated with APAP compliance (P = < 0.001; Krakow et al., 2019). When comparing CPAP to MAD in Veterans with PTSD, El-Sohl et al. (2017) found that both treatment options improved sleep quality significantly. While CPAP demonstrated better results for nocturnal oxygenation and number of apneas and hypopneas than the MAD, adherence to the MAD was significantly higher than to CPAP (P < 0.001). In a prospective cohort study, Veterans with PTSD and OSA with and without insomnia were compared. Findings demonstrated that, in patients with PTSD and OSA, the presence of insomnia worsened sleep and PTSD outcomes as well as CPAP adherence (El-Sohl et al., 2018).

Screening and Treatment Protocol

A review by Colvonen et al. (2018) proposes, but does not implement, a “flow chart for assessment and treatment of sleep disorders in PTSD” based on existing evidence (p. 2). In
individuals with a history of PTSD and sleep problems, the authors recommend beginning with screening and treatment for OSA, with CPAP desensitization to increase compliance if needed (Colvonen et al., 2018). If OSA screening is negative, or once OSA is adequately treated, the flow chart recommends screening for insomnia (Colvonen et al., 2018). If an insomnia diagnosis is made, CBT-I is the next treatment step, followed by an evidence-based psychotherapy (EBP) for PTSD (Colvonen et al., 2018). If insomnia is not diagnosed, direct referral to the PTSD treatment is suggested (Colvonen et al., 2018). In both scenarios, if nightmares persist following the EBP, a targeted nightmare therapy is recommended (Colvonen et al., 2018). A benefit of this approach includes utilization of established treatments supported by existing evidence in which clinicians are often already trained. It also includes prompt screening and diagnosis of both OSA and insomnia, which acknowledges the high rates of both co-morbidities in the PTSD population and recommends addressing them early in treatment to maximize PTSD psychotherapy benefits. Additionally, it limits the length of overall treatment to that which the individual’s symptoms are best matched, a strategy which could reduce treatment drop-out rates.

Conclusions and Recommendations

CBT-I is a safe and moderately effective treatment for insomnia in patients with PTSD across different modalities and settings. However, remission rates average less than 50%. Accessibility to this treatment is an additional concern. Treatment outcomes may be more robust when patients engage in CBT-I before medications such as benzodiazepine and non-benzodiazepine receptor agonists are trialed. Nightmare focused psychotherapy combined with CBT-I has been shown to improve sleep, however, there are no studies comparing these combined treatments to CBT-I alone. Therefore, it remains unclear if the combined treatment is needed for all patients. Similarly, studies combining trauma-focused psychotherapy for PTSD
with sleep interventions show improvement across symptoms compared to waitlist conditions, but there are no comparisons to CBT-I alone. Sequencing CBT-I before or after PTSD psychotherapy is another treatment option. Existing studies are limited by small sample sizes and cannot be directly compared given the variety of treatment interventions employed. There is not yet enough data to determine how to best sequence treatments, however, treating sleep disturbance first may improve response to PTSD psychotherapy and may be preferred by patients (Gutner et al., 2018).

The evidence for medications targeting sleep disturbance in patients with PTSD supports prazosin for the treatment of PTSD related nightmares. While improving nightmares may improve overall sleep, available evidence supporting prazosin’s direct effect on sleep outcomes is mixed. Given the limited evidence and risk of adverse effects of atypical antipsychotics, and the lack of evidence for long-term prescriptions of non-benzodiazepine sedative hypnotics, use of these medications for this purpose is not recommended. Trazodone needs further investigation with a higher level of evidence. Existing data of alternative treatment approaches for Veterans with PTSD and sleep disturbance is not strong enough to support recommendation.

The studies of psychotherapeutic and pharmacological approaches often excluded participants with OSA or did not address if they were screened for this condition. Given the high rates of co-morbidity, and the known impact of OSA on sleep disturbance, this limits generalizability. For those patients with PTSD and co-occurring OSA, evidence suggests that adequate treatment of OSA can improve sleep quality and decrease insomnia severity. Options other than CPAP, such as APAP or MAD, may improve treatment adherence in a PTSD population. Insomnia can worsen sleep in this population regardless of adherence to CPAP therapy. The flow chart proposed by Colvonen et al. (2018) suggests screening and treatment of
OSA as an initial step, and screening and treatment of insomnia via CBT-I prior to PTSD treatment. This offers a potential solution for sequencing existing evidence-based treatments for a complex population.

**Project Model**

The Knowledge-to-Action (KTA) Framework, developed in 2006 by Graham et al., outlines the process of translating and implementing research into practice (Nilsen, 2015). The KTA framework consists of two components: knowledge creation, visually represented as a funnel at the center of a circle, and the action cycle, depicted as a circle surrounding the center funnel (see Appendix C). Each component has several phases. The knowledge creation component comprises knowledge inquiry, knowledge synthesis, and knowledge tools/products. Knowledge inquiry represents a wide array of research, which is reduced to a smaller number of tools or products to facilitate implementation (Sudsawad, 2007). This DNP project reviewed the literature for treatment approaches to improve outcomes for Veterans with PTSD and sleep disturbance. The evidence was appraised, synthesized, and narrowed to several approaches to consider for implementation.

The knowledge creation funnel rotates and feeds into the action cycle, which contains the components needed for knowledge implementation (Crockett, 2017). The knowledge creation funnel can feed into the action cycle at any stage; a suggested starting point is the “Identify Problem/Identify, Review, Select Knowledge” step (Nilsen, 2015). In this step, knowledge is compared to current practice and chosen to appropriately close existing gaps. The protocol selected for adaptation in this DNP project was chosen because the evidence supports it, and because it closes the identified gaps identified in the practice setting where it will be implemented.
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Next in the KTA Framework, knowledge is modified to adapt to the local context, facilitators and barriers to use are identified, and interventions are selected, tailored, and implemented (Graham et al., 2006). The adapted protocol includes the screening measures, treatment approaches, and clinical language used where it was implemented. The action cycle of the KTA Framework and DNP project will continue with monitoring knowledge use, evaluating outcomes, and sustaining knowledge use (Graham et al., 2006).

Organizational Description and Assessment

This DNP project was implemented in an outpatient VA Clinic in southern New England. This clinic is multidisciplinary, comprised of psychiatrists, psychiatric nurse practitioners, clinical social workers, clinical psychologists, and trainees in each discipline, who manage caseloads of various sizes. The clinic’s focus is the treatment of PTSD, anxiety disorders and their co-morbidities in eligible Veterans. Psychiatric evaluation and diagnostic assessments are conducted within the clinic, and Veterans are offered a variety of treatment modalities including psychopharmacology and evidenced-based individual and group psychotherapy. Group therapy options include two CBT-I groups, with new cohorts beginning approximately every six weeks. Veterans with PTSD who are new to treatment, or who wish to learn more about treatment options, are offered a referral to the clinic’s “Trauma Recovery Education Class (TREC),” a four-session patient education and treatment-planning group that has been associated with a higher likelihood of Veterans selecting evidence-based psychotherapies (EBPs) for PTSD (DeViva et al., 2017). Veterans can also be referred, via electronic consult, to other clinics such as the sleep clinic, which conducts sleep evaluations, in-laboratory, and at-home polysomnograms, CPAP prescription and desensitization.
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Decisions about treatments offered in the PTSD clinic are made through discussion in weekly team meetings with final approval given by the clinic director. Available treatments must include, but are not limited to, those required by VHA Handbook 1160.01, *Uniform Mental Health Services in VA Medical Centers and Clinics*. The handbook requires that treatments conform to VA/DoD Clinical Practice Guidelines. The handbook requires VA Medical Centers to provide access to either CPT or PE for PTSD. There are no additional requirements listed for insomnia, sleep disturbance or OSA. According to the *VA/DoD Clinical Practice Guidelines for The Management of Chronic Insomnia Disorder and Obstructive Sleep Apnea*, there are strong recommendations for CPAP therapy when OSA is diagnosed, and CBT-I when insomnia diagnosed, including when there are co-morbid conditions present. Further, the guidelines give strong support for educational, behavioral, and supportive interventions to improve CPAP adherence in Veterans with OSA who are at high-risk for poor adherence, such as those with PTSD or insomnia.

The review of literature supports implementation of a screening and treatment planning protocol for Veterans with PTSD and sleep disturbance in a VA outpatient mental health setting. Of the 37 studies included in the review of literature, 30 had samples comprised of only Veterans, or both Veterans and non-Veterans. The screening and treatment planning protocol selected for adaptation was developed by authors from the VA Healthcare System and the National Center for PTSD (Colvonen et al., 2018). The screening measures and treatments included in the adapted protocol conform with VHA Handbook 1160.0, VA/DoD Clinical Practice Guidelines and are available within the healthcare system where the project was implemented.
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There is consensus among clinicians in the outpatient VA PTSD clinic that the sleep disturbance associated with PTSD is challenging to treat. They report that medications for sleep disturbance often are inadequate and lead to undesirable short and long-term effects. Therefore, they seek non-pharmaceutical options to offer to Veterans. They also find it challenging to encourage Veterans to follow-up with referrals to the sleep clinic and maintain compliance with CPAP when indicated.

The outpatient VA PTSD clinic has several strengths. First, the clinic follows VHA Handbook 1160.01 and the VA/DoD Clinical Practice Guidelines which require and recommend EBPs. Therefore, these therapies are consistently discussed in staff meetings, and clinicians are trained in these modalities through training and consultation programs. Similarly, clinicians are familiar with using standardized assessments and screening tools, which are embedded within the electronic medical record (EMR). Finally, clinicians and Veterans have access to services outside of the PTSD specialty, such as sleep clinic consultation and sleep studies.

Several weaknesses also exist. The high volume of screening tools and EBPs available may lead clinicians to give less focused attention to each one or be unable to complete all measures in the allotted time for evaluation (60-minutes) or follow-up visit (30-minutes). The use of the EMR helps document and track care. However, relying on electronic consults for treatment referrals can create an administrative bottleneck, which can delay treatment due to the low number of administrative staff compared to clinical staff.

Evaluation of these strengths and weaknesses uncovers opportunities for this DNP project to improve clinical outcomes. Clinicians are familiar with screening measures and EBPs, but do not consistently use all of them. Presenting them in a screening and treatment protocol could increase EBP referral and completion, fulfilling the requirements of the VHA Handbook 1160.01
and the VA/DoD Clinical Practice Guidelines, and improving performance on local and national EBP benchmarks. A program relevant to this project is the VA Psychotropic Drug Safety Initiative (National Center for PTSD), which discourages the use of benzodiazepines and other controlled substances that are often prescribed for sleep disturbances related to PTSD. A screening and treatment protocol that does not involve medication provides clinicians an approach to help their patients that is in line with the drug safety initiative.

External threats to this DNP project must be considered. The ongoing COVID-19 pandemic put a stop to in-person treatment groups. The clinic transitioned groups to virtual platforms; however, some Veterans are unwilling or unable to participate in this format. The distribution of screening tools has also been impacted, with many clinicians and Veterans preferring written vs. electronic administration, which is not as easily accomplished in the virtual format. Successful implementation of the treatment and screening protocol includes adequate treatment of OSA when present. Issuing and monitoring of CPAP for OSA relies on an outside company, over which VA clinicians have minimal control. Delays in delivery or poor customer service could hinder successful clinical outcomes.

**Aims**

This DNP Quality Improvement project adapted an assessment and treatment protocol for Veterans with PTSD and sleep disturbance for an outpatient VA PTSD clinic, and implemented the protocol in a patient education and treatment-planning group to increase referrals to evidence-based treatments recommended by the protocol. The aims of the project were as follows:

1. To adapt an assessment and treatment protocol for Veterans with PTSD and sleep disturbance for an outpatient VA PTSD clinic.
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2. To implement and evaluate the protocol in a patient education and treatment-planning group to increase referrals to the evidence-based treatments recommended by the protocol.

3. To make recommendations for scaling and sustainability.
Chapter 3: Methods

This DNP Quality Improvement project adapted an assessment and treatment protocol for Veterans with PTSD and sleep disturbance for an outpatient VA PTSD clinic and implemented the protocol in a patient education and treatment-planning group to increase referrals to evidence-based treatments recommended by the protocol. The aims of the project were as follows:

Aim 1: To adapt an assessment and treatment protocol for Veterans with PTSD and sleep disturbance for an outpatient VA PTSD clinic.

- Development of protocol:
  - An assessment and treatment protocol for Veterans with PTSD and sleep disturbance was adapted from the “flow chart for assessment and treatment of sleep disorders in PTSD” published in 2018 by Colvonen et al. (pg. 48, see Appendix E). The adapted protocol was named “Evidence-Based Protocol for Veterans with PTSD and Sleep Disturbance” (see Appendix F).
  - The protocol was adapted through expert consultation with Dr. Colvonen. Dr. Colvonen provided input on the incorporation of relevant research findings from 2018 to 2021 into the adapted protocol. He also provided input regarding the implementation of the protocol in an outpatient PTSD clinic.
  - Clinicians working in the outpatient VA PTSD clinic provided feedback about the adapted protocol through email communication. This included feedback regarding the protocol’s visual design, ease of use, and potential for integration into the clinic’s procedures and standard practices.
A team was formed to implement the adapted protocol in the outpatient VA PTSD clinic’s patient education and treatment planning group (TREC).

The implementation team was led by this author, a psychiatric nurse practitioner specializing in PTSD. Other team members included a clinical psychologist who specializes in PTSD, and a psychology intern assigned to the outpatient PTSD clinic.

The implementation team modified the procedures and curriculum of TREC:

- A screening measure for OSA, the STOP Questionnaire (see Appendix G) and a screening measure for insomnia (Insomnia Severity Index, see Appendix H) were added to the existing PTSD screening measures provided to Veterans attending the group.
- The team modified the TREC curriculum (see Appendix I) and included patient education material (see Appendix J) about the sleep disturbance associated with PTSD, the common co-morbidities of OSA and insomnia, and the recommended treatments for both co-morbidities.

Aim 2: To implement and evaluate the protocol in a patient education and treatment-planning group to increase referrals to the evidence-based treatments recommended by the protocol.

- Implementation in TREC:
  - TREC is an established treatment group in the PTSD clinic which focuses on patient education and treatment planning for Veterans with PTSD. It is a four-session group that runs once per calendar month. Veterans attending TREC must have a confirmed diagnosis of PTSD and express interest in education about
PTSD symptoms and treatments. Veterans are referred to the group by their individual mental health treatment coordinator (MHTC).

- Each Veteran attending TREC during the implementation period was sent a STOP questionnaire and an ISI:
  
  - The STOP questionnaire is a validated screening tool for OSA (Chung et al., 2008). A variation of the STOP questionnaire, the STOP-BANG questionnaire, is thought to have superior predictive value compared with other OSA screening tools, including the STOP questionnaire (Chiu et al., 2017). The STOP is available in the VA EMR, while the STOP-BANG is not. Therefore, the STOP was chosen for implementation.
  
  - The ISI is a validated and recommended screening measure for insomnia (Bastien et al., 2001).

- The revised TREC curriculum was delivered by members of the implementation team.

- The implementation team held weekly meetings throughout the implementation period. The “Patient Tracking and Protocol Fidelity Form” (see Appendix K) was used to ensure that fidelity to the new TREC procedure and curriculum components were followed.

- Veteran attendance, pertinent information gathered from chart review, screening measure results, and relevant electronic referrals were also tracked using this form.
Results from the returned STOP questionnaires with accompanying treatment recommendations were communicated to the Veteran’s MHTC via formal documentation in the EMR by the implementation team:

- If the Veteran had a “positive” STOP Questionnaire (answered “yes” to two or more questions), the recommendation was that a consult to the sleep clinic be entered.

Results from the returned ISI’s with accompanying treatment recommendations were communicated to the Veteran’s MHTC via formal documentation in the EMR by the implementation team:

- If the Veteran scored “positive” on the ISI (score of “8” or above), the recommendation was that a sleep assessment be completed by the MHTC or the sleep clinic and a referral to CBT-I be made, if appropriate.

Evaluation:

- Descriptive statistics were used to report the following:
  - Number of Veterans who attended each TREC session during the implementation period.
  - Number of TREC participants who had an existing diagnosis of OSA (per chart review).
  - Number of TREC participants with an existing diagnosis of OSA who were compliant with treatment (per chart review).
  - Number of TREC participants who were sent a STOP questionnaire.
  - Number of TREC participants who completed and returned the STOP questionnaire.
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- Number of TREC participants with a “positive” STOP questionnaire.
- Number of TREC participants who were sent an ISI.
- Number of TREC participants who completed and returned the ISI.
- Number of TREC participants with a “positive” ISI.
- Number of TREC participants receiving referrals to the sleep clinic within 60-days of their attendance in TREC.
- Number of TREC participants receiving referrals to CBT-I within 60-days of their attendance in TREC.
- Trends in referrals to the sleep clinic and CBT-I during the implementation period were compared to trends in referrals to these services prior to the implementation period.

**Aim 3: To make recommendations for scaling and sustainability.**

- **Scaling**
  - Outcomes will be reported to the VA outpatient PTSD clinic.
  - Clinicians will be coached to utilize the adapted assessment and treatment protocol for Veterans with PTSD and sleep disturbance with Veterans who do not attend TREC.
  - The Evidence-Based Protocol for Veterans with PTSD and Sleep Disturbance will be shared with two PTSD clinical teams within the regional healthcare system.

- **Sustainability**
  - Permanently implement the added screening measures and revised curriculum in TREC.
  - Train new TREC facilitators on the updated curriculum and procedures.
Dissemination

- An abstract will be submitted to the 36th Annual American Psychiatric Nurses Association (APNA) Conference.
- Results will be submitted for publication; the following peer reviewed journals will be considered: Psychological Trauma: Theory, Research, Practice, and Policy, Traumatology, and the Journal of the American Psychiatric Nurses Association.

**Human Subjects Considerations**

This project was designated as a Quality Improvement project by the Yale University Institutional Review Board (IRB). The VA Connecticut Healthcare System (VACHS) Research Office determined that this project was not research and therefore did not require review by the VACHS IRB or Research and Development Committee. Publication or presentation describing the study is permitted (see Appendix L).

**Project Timeline**

See Appendix M for project timeline.

**Systems Considerations and Implications**

**Leadership and Stakeholder Engagement**

This author is a psychiatric nurse [practitioner working in the outpatient VA PTSD clinic where this DNP Project was implemented and served as the project sponsor. The project was approved by a clinical psychologist also working in the clinic who is responsible for the facilitation of the patient education and treatment planning group. Other stakeholders included the clinicians working in the outpatient VA PTSD clinic as well as the Veterans seeking care in the clinic. Leadership involved included the PTSD clinic director.
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Business and Financial Considerations

This DNP Project is cost effective. It was implemented using a modest budget of $280.80 (see Appendix N for full expense budget) and has the potential to provide short- and long-term cost avoidance, clinician time savings and satisfaction, enhanced quality and safety of care, more efficient clinic flow, and improved patient outcomes. Aim 1, the development of the adapted protocol for Veterans with PTSD and sleep disturbance, was accomplished utilizing existing resources, incurring no additional cost. Aim 2, the implementation of the adapted protocol in TREC required limited additional costs ($30.80; see Appendix N). These start-up costs supported the addition and distribution of screening measures for OSA and insomnia, and the addition and distribution of patient education materials about PTSD and sleep. Scaling, sustaining, and disseminating the project, will require a small start-up cost to prepare poster presentations for local and national conferences.

The adapted protocol for PTSD and sleep disturbance will enhance clinician satisfaction. It synthesizes a large body of evidence by ordering screening measures and treatments in a stepwise manner. This will save clinician time and improve collaborative treatment planning between clinician and Veteran. The protocol contains only non-pharmacological methods for treating the sleep disturbance associated with PTSD. This avoids costs associated with the short and long-term prescription of sleep medications including cost per pill, cost and time associated with follow-up medication management visits, and potential cost of complications related to medication adverse effects including additional clinic visits and medications prescribed to alleviate adverse effects.

Providing patient education and treatment planning for PTSD related sleep disturbance in a group format over four 60-minutes sessions will save clinicians time and improve clinic flow.
Providing six to eight Veterans the information via two co-leaders (eight total clinician hours) is more efficient than providing it individually (24-32 total clinician hours). Groups have the added value of increased patient engagement via shared treatment planning and peer support. Of note, TREC has been associated with a higher likelihood of Veterans selecting EBPs for PTSD (DeViva et al., 2017).

Outcomes of this project include the identification of, and referral to, evidence-based treatment for OSA and insomnia in Veterans with PTSD and sleep disturbance. Identifying and treating OSA in Veterans with PTSD will improve patient safety, overall health, and quality of life as untreated OSA is linked to automobile accidents, hypertension, cardiovascular disease, stroke, and depression. It has the potential to decrease healthcare costs associated with these comorbidities. It will limit the prescription of sleep medications contraindicated with OSA, further decreasing cost and risk. Similarly, identifying and treating insomnia in veterans with PTSD will decrease healthcare costs associated with long-term treatment of insomnia such as office visits and medications, and will increase quality of life for Veterans and their families. Finally, treating OSA and insomnia prior to engagement in psychotherapy for PTSD will maximize benefits of the therapy, leading to shorter episodes of care and further improving clinic flow.
Chapter 4: Results

Development of Adapted Protocol

The interventions outlined in Aim 1 were completed between June 2020 and January 2021. A meeting with content expert Dr. Peter Colvonen took place on June 3, 2020. Results from this meeting included Dr. Colvonen’s permission to adapt the “flow chart for assessment and treatment of sleep disorders in PTSD” for this DNP project. The importance of using an algorithm for PTSD and sleep disturbance, especially in a PTSD clinic, and of screening all individuals with PTSD for OSA was established. The potential advantages and disadvantages of utilizing various screening measures for OSA as part of the algorithm were discussed. The evidence for treating OSA prior to both insomnia and PTSD was confirmed. The lack of current evidence for sequencing CBT-I before or after an EBP for PTSD was discussed, with the recommendation being for this to remain a collaborative decision between Veteran and provider. This information was integrated into the adapted protocol.

Feedback regarding the adapted protocol was requested from six clinicians working in the outpatient VA PTSD clinic where the project was implemented. Two medical doctors, two psychologists, two licensed clinical social workers and two psychiatric nurse practitioners were asked to provide feedback regarding protocol’s visual presentation, content and feasibility of integration into the clinic. Formatting and consult title adjustments were made based on the feedback.

Implementation in TREC

The interventions outlined in Aim 2 were implemented in the outpatient VA PTSD clinic from October 1, 2021, through November 30, 2021. This period included two four-session cohorts of TREC. Eight Veterans attended at least one session of TREC during the
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implementation period. Four Veterans attended all four TREC sessions. TREC Session 1 included the curriculum components added to educate Veterans with PTSD about the common co-morbidities of OSA and insomnia, and the impact of these on overall sleep disturbance and functioning. Corresponding patient education material along with the two added screening measures (STOP Questionnaire and ISI) were mailed to each veteran following Session 1. TREC Session 2 included a review of this information and answered any questions Veterans had about the patent education material. TREC Session 3 included a description of the evidence-based treatment recommendations for Veterans with PTSD and sleep disturbance outlined in the protocol. TREC Session 4 included a review of these recommendations and collaborative treatment planning. Table 1 summarizes TREC attendance during the implementation period.

Table 1

<table>
<thead>
<tr>
<th>TREC Session</th>
<th>October</th>
<th>November</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Session 1</td>
<td>6</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Session 2</td>
<td>5</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Session 3</td>
<td>4</td>
<td>1(^1)</td>
<td>5</td>
</tr>
<tr>
<td>Session 4</td>
<td>4</td>
<td>1(^1)</td>
<td>5</td>
</tr>
<tr>
<td>All Sessions</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
</tbody>
</table>

\(^1\)Sessions combined

Protocol Fidelity and Evaluation of Results

Fidelity to the adapted protocol was tracked. All Veterans who attended at least one TREC session during the implementation period (n=8) were screened by the implementation
team for an existing diagnosis of OSA and compliance with OSA treatment via chart review. All eight Veterans were sent the ISI and STOP Questionnaires via US Mail. Two Veterans (25%) returned the questionnaires to the clinic. All questionnaire results were documented in the EMR, and MHTCs were alerted to these results and corresponding treatment recommendation. Of the two Veterans who returned STOP questionnaires, one (50%) screened positive (indicative of “high risk of OSA”) and one (50%) screened negative. The Veteran who screened positive was not referred to the sleep clinic for polysomnography in the 60-day period following participation in TREC; the reason for this is unclear. Both Veterans (100%) who returned the ISI scored in the range indicating clinical insomnia (moderate or severe). One of the two veterans (50%) was referred to CBT-I in the 60-day period following participation in TREC via electronic referral.

The number of sleep clinic and CBT-I referrals from these two TREC cohorts was compared to the number of sleep clinic and CBT-I referrals from the two TREC cohort prior to the implementation period (August and September 2021). A total of nine Veterans attended TREC across those two cohorts. In the 60-days following each cohort, there were no electronic referrals to the sleep clinic and no electronic referrals to CBT-I. Table 2 summarizes protocol fidelity during implementation, and Table 3 summarizes questionnaire results and referrals.
Table 2

*Protocol Fidelity During TREC Implementation*

<table>
<thead>
<tr>
<th></th>
<th>TREC Cohort</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>October</td>
</tr>
<tr>
<td>Screened for OSA</td>
<td>7</td>
</tr>
<tr>
<td>With existing OSA diagnosis</td>
<td>31</td>
</tr>
<tr>
<td>With OSA diagnosis and treatment</td>
<td>2</td>
</tr>
<tr>
<td>Sent STOP Questionnaire</td>
<td>7</td>
</tr>
<tr>
<td>Returned STOP Questionnaire</td>
<td>1</td>
</tr>
<tr>
<td>With positive STOP result</td>
<td>0</td>
</tr>
<tr>
<td>Sent ISI</td>
<td>7</td>
</tr>
<tr>
<td>Returned ISI</td>
<td>1</td>
</tr>
<tr>
<td>With positive ISI</td>
<td>1</td>
</tr>
</tbody>
</table>

1One Veteran received OSA diagnosis during the implementation period

Table 3

*Questionnaire Results and Corresponding Referrals*

<table>
<thead>
<tr>
<th>Veterans with Returned Questionnaires</th>
<th>STOP Result (+/-)</th>
<th>Referral to Sleep Clinic (Y/N)</th>
<th>ISI Result (score)</th>
<th>Referral to CBT-I (Y/N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Veteran 1</td>
<td>-</td>
<td>N</td>
<td>18</td>
<td>Y</td>
</tr>
<tr>
<td>Veteran 2</td>
<td>+</td>
<td>N</td>
<td>25</td>
<td>N</td>
</tr>
</tbody>
</table>

*Note.* A score of 15 or above on the ISI is indicative of clinical insomnia
Chapter 5: Discussion and Conclusion

Despite the small sample size and limited response rate, results of this DNP project suggest that increased screening for OSA and insomnia in an outpatient VA PTSD clinic will uncover rates of these conditions consistent with reported prevalence rates among individuals with PTSD. Of the two Veterans who returned STOP Questionnaires during the implementation period, 50% screened positive for OSA. While a sleep study will be needed to confirm an OSA diagnosis, this rate is comparable to the aggregate prevalence rate of 63% found by Zhang et al. (2017). Both Veterans who returned the ISI scored above the cutoff for insomnia (100%); 31-65% of patients with PTSD have co-morbid insomnia when the DSM diagnostic criteria are used (Colvonen et al., 2018).

Patient education and treatment planning about evidence-based treatments for PTSD and sleep disturbance, including co-morbid OSA and insomnia, may lead to increased referrals for such treatments. There were no electronic referrals to the sleep clinic placed in the 60-days following the implementation period. Several factors may have contributed to this. One Veteran was referred to the sleep clinic just prior to his attendance in TREC and received a diagnosis of OSA, though had not yet started OSA treatment (after meeting with the sleep clinic, the Veteran declined CPAP and requested a referral to the dental clinic for consideration of a MAD). This referral was not counted as it occurred prior to the implementation period. This Veteran did not return questionnaires to the clinic; it is possible that his concurrent engagement with the sleep clinic impacted his decision not to complete and return the screening measures. There were two Veterans who had existing diagnoses of OSA and based on chart review, appeared to be complaint with their OSA treatment. It is possible that having adequately treated OSA impacted their decision not to complete or return the screening measures.
There was one electronic referral to CBT-I in the 60-days following the implementation period. Low numbers of CBT-I referrals may not be unique to this project or clinic. Despite evidence recommending CBT-I as a first-line treatment for insomnia, including for insomnia that co-occurs with other mental health conditions such as PTSD, few Veterans receive it. Across the VA, only 0.4% of patients receive CBT-I each year (Ulmer & Hermes, 2020). It is also possible that, despite having poor sleep, these Veterans experienced other PTSD symptoms as more disabling and selected treatments targeting these. Aim 3 of this project includes making recommendations for scaling and sustainability. These are outlined on the next sections.

**Sustainability Modifications**

Only 25% of the screening measures that were distributed to TREC participants during the implementation period were returned to the clinic. While this limits what can be understood from the results, it informs next steps and modifications for sustainability. Veterans attending TREC during the implementation period were offered the option of electronic or mailed screening measures. All eight Veterans chose mail, suggesting that this population may have a low preference for electronic communication within their treatment. Recent studies comparing response rates for electronic vs. mailed questionnaires have found lower rates for the electronic method, so this preference may not be unique to Veterans with PTSD (Blumenberg & Barros, 2018).

The next step is to implement the project over a six-month period to obtain a larger sample size and further evaluate if referrals to evidence-based treatments recommended by the protocol are increased by the interventions. Whether or not Veterans engage in these treatments and have improved symptoms after completing them can also be measured utilizing a longer implementation period. Additional modifications will be made to increase screening measure
response rates. If TREC remains virtual, Veterans will continue to be offered electronic and mail options for distribution and collection of screening measures. Reminder calls after each group session will be added. If TREC returns to an in-person format, screening measures will be handed out and collected during the first session. This “paper and pencil” method is both cost- and time-efficient and may produce higher response rates. An application that can send screening measures directly to a Veteran’s phone called BHL Touch was recently introduced at the VA. The current version of BHL Touch includes the ISI but does not include the STOP or alternate screening measure for OSA. Once included, screening measures can be administered through this platform.

The clinical psychologist responsible for facilitation of TREC has granted permission to permanently adopt the added screening measures, curriculum components, and patient education materials into the group procedures. Any new facilitator of TREC will be trained to follow this procedure and utilize the revised curriculum. Sustainability of this project is supported by the VA’s requirement for PTSD clinics to use measurement-based care (MBC), which includes screening measures such as the STOP Questionnaire and the ISI. VHA Handbook 1160.01 and the VA/DoD Clinical Practice Guidelines require and recommend utilization of EBPs, which this project is designed to encourage. Additionally, it will help prescribing clinicians comply with the ongoing “VA Psychotropic Drug Safety Initiative,” which discourages the use of benzodiazepines and other controlled substances often prescribed for sleep disturbances related to PTSD. The adapted protocol does not involve medication and provides clinicians an approach to helping their patients that is in line with the initiative.
Recommendations for Scaling

The results of this project will be presented to the staff of the outpatient VA PTSD Clinic on May 2, 2022. Clinicians will be asked to utilize the adapted assessment and treatment protocol for Veterans with PTSD and sleep disturbance with Veterans who do not attend TREC to expand the number of Veterans who can benefit. The adapted protocol will also be shared with two PTSD clinical teams within the healthcare system. The protocol may need minor adjustments or adaptations based on the services available to each individual PTSD clinic. PTSD clinical teams may have different strategies for implementing the adapted protocol with their patients based on their clinic’s structure and flow. PTSD clinics that have psychoeducation and/or treatment planning groups like TREC may choose to implement the protocol in these groups and can use the curriculum and patient education materials as a guide. Clinics who don’t have an existing group could adopt the entire TREC curriculum. Clinics may also utilize these materials during individual sessions with patients.

Dissemination

Considering the low response rate and limited results, the dissemination plan has been revised. An abstract for a poster presentation was submitted to the 2022 American Psychiatric Nurses Association Conference for review. The proposed poster, “PTSD and Sleep Disturbance: A Comprehensive Treatment Approach for Veterans,” will focus on the complexities involved in treating Veterans with PTSD and sleep disturbance, including the high rates of co-occurring insomnia and obstructive sleep apnea, and introduce the adapted protocol as a potential approach to evaluation and treatment. A literature review of treatments options for Veterans with PTSD and sleep disturbance will be submitted to the Journal of the American Psychiatric Nurses Association for potential publication. The existing literature is fragmented, with many studies
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focusing on either pharmacologic or non-pharmacologic treatments and/or excluding patients with OSA. Nurses can benefit from a wholistic approach to this complex clinical presentation which includes consideration of the common comorbidities of OSA and insomnia, and using an assessment and treatment protocol like the one adapted for this project.

Conclusion

Treating the sleep disturbance associated with PTSD is a complex problem that requires a systematic yet flexible treatment approach. The protocol adapted for this DNP project offers a potential solution for VA clinics treating Veterans with PTSD. It provides a structured method for screening and referring for evidence-based treatments based on the Veteran’s co-morbidities. It supports MBC, evidenced-based practice, and drug safety initiatives. This DNP project implemented the protocol in a patient education and treatment planning group. Given the short implementation period and virtual group modality, the sample size was small and response rate was limited. However, results suggest that increased screening for insomnia and OSA will uncover high rates of co-morbidity among Veterans with PTSD. Implementation over a longer period to obtain a larger sample is needed to assess if this method will increase referrals to the evidence-based treatments recommended by the protocol. VA PTSD clinics will benefit from this protocol but may need to adjust it to match the available treatment options. Similarly, each clinic can adopt an implementation approach that fits their clinic’s unique procedures and resources.
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References


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https://www.healthquality.va.gov/guidelines/MH/ptsd/


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https://doi.org/10.1016/S0010-440X(00)90131-7

https://doi.org/10.1186/s40779-019-0204-y

https://doi.org/10.1097/00005053-200207000-00004

https://doi.org/10.1016/S0006-3223(00)01087-8

https://doi.org/10.4088/JCP.14m09585
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Appendix A

Prisma Flow of Studies

Records identified through PubMed database searching (n = 359)
Records identified through PsycInfo database searching (n = 188)
Records identified through Ovid MEDLINE(R) ALL database searching (n = 352)

Records after duplicates removed (n = 685)

Records after filtering published within last 20 years (n = 645)
Records excluded (n = 40)
- Prior to 2001

Records after titles screened for relevance (n = 278)
Records excluded (n = 367)
- No PTSD (n = 243)
- No sleep disturbance, insomnia or OSA (n = 107)
- Not adult (n = 17)

Records after abstracts screened for eligibility (n = 68)
Records excluded (n = 210)
- No treatment intervention (n = 157)
- Intervention not targeting sleep disturbance (n = 48)
- Sample included TBI (n = 5)

Records after articles analyzed for inclusion in final review (n = 37)
Records excluded (n = 31)
- Reviews/editorials (n = 5)
- Intervention not available in US (n = 4)
- Results did not include sleep outcome (n = 22)

Studies included in ROL (n = 37)
Studies included in matrix (n = 37)

# Appendix B

## Evidence Matrix: Studies of Treatments for Veterans with PTSD and Sleep Disturbance

<table>
<thead>
<tr>
<th>Author(s), Year</th>
<th>Study Purpose</th>
<th>Study Design</th>
<th>Sample</th>
<th>Treatment/Intervention</th>
<th>Sleep Related Outcomes</th>
<th>PTSD Related Outcomes</th>
<th>Additional Outcomes</th>
<th>Level of Evidence (JBI)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Talbot et al., 2014</td>
<td>Investigate whether CBT-I improves sleep, nightmares, non-sleep PTSD symptoms, depression symptoms and psychosocial functioning in patients with PTSD and insomnia</td>
<td>RCT</td>
<td>45 adults (Veteran and non-Veteran) with PTSD and insomnia</td>
<td>CBT-I</td>
<td>CBT-I group had statistically significant sleep x time improvement in sleep diary measures: SOL ($F(1, 2697) = 20.59, P &lt; 0.001, d = 0.82$), WASO ($F(1, 2695) = 22.75, P &lt; 0.001, d = 0.93$), SE ($F(1, 2710) = 35.89, P &lt; 0.001, d = 1.06$), TST ($F(1, 2711) = 5.25, P = 0.022, d = 0.30$), energy level ($F(1, 2606) = 68.15, P &lt; 0.001, d = 0.67$) and PSG measures compared to control group; improvement remained 6-months post-treatment</td>
<td>Participants in both groups showed improvement in non-sleep PTSD symptoms from baseline to posttreatment</td>
<td>CBT-I was superior for disruptive nocturnal behaviors</td>
<td>No significant differences between groups for nightmares</td>
<td>Psychosocial impairment dropped significantly from baseline to posttreatment and follow-up in CBT-I group; control group’s scores did not decrease</td>
</tr>
<tr>
<td>El-Solh et al., 2019</td>
<td>Identify factors that may predict response to CBT-I in Veterans with PTSD</td>
<td>Retrospective chart review</td>
<td>136 Veterans with PTSD-related insomnia</td>
<td>CBT-I</td>
<td>77% of subjects completed CBT-I</td>
<td>Not reported</td>
<td>Statistically significant decrease in antidepressant usage ( (p = 0.001) ) in those who improved from CBT-I; hypnotic use did not decrease Younger age, non-white race ( (p = 0.001) ), and use of benzodiazepine and non-benzodiazepine receptor agonist prior to CBT-I ( (p = 0.005) ) were independently associated with lack of CBT-I response</td>
<td>3.c</td>
<td></td>
</tr>
<tr>
<td>Study</td>
<td>Aim</td>
<td>Methodology</td>
<td>Participants</td>
<td>Results</td>
<td>Follow-up</td>
<td>Notes</td>
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<tr>
<td>DeViva et al., 2018</td>
<td>Examined effects of group CBT-I in Veterans diagnosed with PTSD in residential PTSD treatment</td>
<td>Retrospective chart review</td>
<td>47 Veterans with PTSD in residential treatment</td>
<td>Group CBT-I Significant improvements in WASO, $F(1, 46) = 4.17, p &lt; .05$, TIB, $F(1, 46) = 4.06, p &lt; .05$, SE, $F(1, 46) = 4.71, p &lt; .05$, and ISI score, $F(1, 46) = 38.8, p &lt; .001$</td>
<td>No follow-up</td>
<td>Sleep medications tracked</td>
<td></td>
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</tr>
<tr>
<td>Franklin et al., 2018</td>
<td>Explore feasibility and effectiveness of CBT-I in rural Veterans with PTSD</td>
<td>Pilot study</td>
<td>18 Veterans with insomnia and PTSD or sub-threshold PTSD</td>
<td>In-person CBT-I vs. telephone CBT-I PSQI scores in both groups significantly changed over time Between groups: large effect sizes favoring CBT-I in-person at post-treatment ($d = 0.77$) and 1-month f/u ($d = 0.10$); difference diminished at 3 months f/u ($d = 0.10$) Within groups: large effect sizes for CBT-I in-person at each time point ($d = 1.00-1.61$); medium to large for CBT-I via telephone ($d = 0.55-1.33$)</td>
<td>Not reported</td>
<td>No differences found in “usefulness” or satisfaction between in person and telephone CBT-I delivery</td>
<td></td>
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<tr>
<td>Gellis &amp; Gehrman, 2011</td>
<td>Examine effects of CBT-I in Veterans with long-standing PTSD</td>
<td>Pilot study</td>
<td>8 male Veterans with PTSD</td>
<td>CBT-I Statistically significant improvements in sleep diary: WASO ($t = 2.9, p = 0.02$), TST ($t = 3.3, p = 0.03$), SE ($t = 3.4, p = 0.01$) and ISI ($t = 4.4, p = 0.01$) Effect sizes in the moderate to large range (0.6-3.2) No pre-to-post differences in actigraphic sleep</td>
<td>Not reported</td>
<td>No differences found on PTSD severity</td>
<td></td>
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<tr>
<td>Owen, 2002</td>
<td>Investigate effectiveness of group CBT-I in Quasi-experimental design</td>
<td>22 inpatient Veterans with PTSD</td>
<td>Group CBT-I Significant time effect in treatment group on PSQI Wilks’ A = .308, $F(2,19)$</td>
<td>Not reported</td>
<td>Improved sleep quality was not found to be associated with lower</td>
<td>OSA excluded</td>
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</tbody>
</table>
### PTSD AND SLEEP DISTURBANCE

<table>
<thead>
<tr>
<th>Casement &amp; Swanson, 2012</th>
<th>Evaluate efficacy of IR on nightmares, sleep disturbance, and symptoms PTSD</th>
<th>Meta-analysis</th>
<th>13 studies</th>
<th>Studies including IR and reporting on sleep outcomes</th>
<th>At post-treatment: Mean treatment group effect size large for sleep quality (ESWG=0.68)</th>
<th>Mean between group effect size moderate for sleep quality (ESBG=0.64)</th>
<th>At follow-up: Mean treatment group effect size moderate for sleep quality (ESWG=0.62)</th>
<th>At post-treatment: Mean treatment group effect size large for PTSD (ESWG=0.72)</th>
<th>Mean between group effect size large for PTSD (ESBG=0.67)</th>
<th>At follow-up: Mean treatment group effect size large for PTSD (ESWG=0.93)</th>
<th>At post-treatment: Mean treatment group effect size large for nightmares (ESWG=0.69)</th>
<th>Mean between group effect size moderate for nightmare frequency (ESBG=0.59)</th>
<th>At follow-up: Mean treatment group effect size large for nightmare frequency (ESWG=0.72)</th>
<th>CBT-I significantly improved sleep quality from initial assessment to post-treatment, ( Q_a(1)=11.20, \ p &lt; 0.01 ) Samples who underwent CBT-I+IR demonstrated more improvement in sleep quality at post-test than samples who underwent IR alone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ho et al., 2016</td>
<td>Evaluated effectiveness of sleep related CBT on PTSD, sleep and depression</td>
<td>Meta-analysis</td>
<td>11 RCTs</td>
<td>Studies comparing sleep-specific CBT to waitlist controls</td>
<td>Effect size for ISI in CBT group was ( g = 1.15 ) and PSQI ( g = 0.87 )</td>
<td>CBT for sleep was superior to WL/psychoeducation in reducing PTSD symptoms ( g = 0.60 ) and</td>
<td>Average study attrition rate 12.8%</td>
<td>1.a</td>
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</table>
### PTSD AND SLEEP DISTURBANCE

<table>
<thead>
<tr>
<th>Study</th>
<th>Design</th>
<th>Participants</th>
<th>Intervention</th>
<th>Findings</th>
<th>1.c/1.d Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mack, 2013</td>
<td>Randomized trial</td>
<td>34 combat Veterans with PTSD and chronic insomnia</td>
<td>Combined CBT-I and IRT</td>
<td>Significant condition by time interaction across WASO, SOL, SE, ST, ISI, PSQI with large effect size. $F(5, 26) = 3.89, p = .009, \eta^2 = .428$</td>
<td>Sleep disorders excluded; medications included and monitored</td>
</tr>
<tr>
<td>Ulmer et al., 2011</td>
<td>Randomized parallel group experimental design</td>
<td>22 Veterans with PTSD and insomnia</td>
<td>SIP (combined CBT-I/IRT)</td>
<td>Slight group had significantly larger improvements in sleep diary measures of TST from baseline to post-intervention ($F_{1, 21} = 6.33, p = 0.02$), WASO ($F_{1, 21} = 5.91, p = 0.02$), SOL ($F_{1, 21} = 10.17, p = 0.004$), SE ($F_{1, 21} = 14.61, p = 0.001$); medium to large effect sizes</td>
<td>OSA excluded</td>
</tr>
<tr>
<td>Margolies et al., 2013</td>
<td>RCT</td>
<td>40 OEF/OIF combat Veterans</td>
<td>Combined CBT-I/IRT compared to waitlist control</td>
<td>Significant condition by time interaction across sleep variables with large effect size. $F(4, 29) = 5.4, p = .002, \eta^2 = .43$</td>
<td>Medications not systematically tracked</td>
</tr>
<tr>
<td>Swanson et al., 2009</td>
<td>Investigate outcomes of a treatment for nightmares and insomnia in veterans with PTSD</td>
<td>Open clinical trial</td>
<td>10 combat Veterans with PTSD, clinically significant ISI scores, and recurrent nightmares</td>
<td>10 session group treatment combining CBT-I with ERRT</td>
<td>Medium to large effect sizes for: SE (d = 1.01), SOL (d = 0.89), WASO (d = 0.46), TST (d = 0.52), ISI (d = 1.70), PSQI (d = 0.42)</td>
</tr>
<tr>
<td>Colvonen et al., 2019</td>
<td>Describe a protocol integrating CBT-I and PE and present pilot data</td>
<td>Pilot study</td>
<td>12 veterans with PTSD &amp; insomnia</td>
<td>2NITE protocol: 2 sessions CBT-I, then PE and CBT-I integrated for 15 sessions</td>
<td>Clinically significant decrease in ISI of 11.75 points on average (d = 2.38), increase in SE by 14.97% on average (d = -3.15), increase in TST by 57.24 minutes on average (d = 1.34), decrease in SL (d = 1.22) and</td>
</tr>
</tbody>
</table>
### PTSD AND SLEEP DISTURBANCE

#### Sleep Treatment Combined with Trauma-Focused Psychotherapy

<table>
<thead>
<tr>
<th>Study</th>
<th>Methodology</th>
<th>Participants</th>
<th>Findings</th>
</tr>
</thead>
</table>
| Arditte Hall et al., 2020    | Quasi-experimental           | 45 women with PTSD and “PTSD related sleep impairment” | Decrease in WASO ($d = 1.48$)  
Actigraphy results showed increase in SE by 10.86% on average ($d = -1.56$) and TST by 51.29 minutes on average ($d = -1.40$)  
Sleep-directed hypnosis + CPT (hypCPT) or symptom monitoring + CPT (ssmCPT)  
Those in the hypCPT condition had significantly less SOL than those in the ssmCPT condition at post-treatment ($p = 0.4$)  
No significant effects on WASO or TST |
| Germain et al., 2007         | Pilot study                  | 10 participants with PTSD and sleep disturbance (>5 on PSQI) | Small→moderate improvements in sleep diary measures; none statistically significant  
Improvement in PSQI ($Z = -1.87$, $d = 0.66$, $p < 0.1$)  
Daytime PTSD symptom severity was reduced (some CAPS measures statistically significant with $p = <0.1$; some with $p = <0.05$) |

#### Sequenced CBT-I with Trauma Focused Psychotherapy

<table>
<thead>
<tr>
<th>Study</th>
<th>Methodology</th>
<th>Participants</th>
<th>Findings</th>
</tr>
</thead>
</table>
| Baddeley & Gros, 2013        | Case study                   | 70 y/o male Veteran with PTSD and insomnia | Increased SE (70%-97% form pre-treatment to follow-up), TST (3.5 hours to 7.5 hours from pre-treatment to follow-up), decreased ISI score  
Decreased PCL score from 41 to 26 from pre-treatment to follow-up  
CBT-I may help motivate patients for PTSD treatment |

60
<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Title</th>
<th>Study Design</th>
<th>Participants</th>
<th>Intervention Details</th>
<th>Outcomes</th>
<th>Findings/Conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>DeViva et al., 2005</td>
<td>Examine effects of a tailored CBT-I treatment on PTSD treatment responders who reported ongoing insomnia</td>
<td>Pilot study</td>
<td>5 veterans who successfully completed CBT for PTSD</td>
<td>CBT-I tailored to PTSD patients</td>
<td>PSQI and ISI scores improved from pre- to post-treatment</td>
<td>Sleep diary measures improved pre- to post-treatment (Cohen’s d from 0.12-1.7)</td>
</tr>
<tr>
<td>Walters et al., 2020</td>
<td>Examine impact of PE on sleep assessments; assess impact of sequencing evidence-based sleep interventions after PTSD treatment on sleep and PTSD symptoms</td>
<td>Parallel groups RCT</td>
<td>41 Veterans and active-duty service members</td>
<td>PE followed by combined CBT-I &amp; IRT compared to PE followed by supportive care</td>
<td>PE did not improve sleep efficiency</td>
<td>IRT/CBT-I group had more improvement in insomnia (SE) with large effect size, relative to SCT ($p = .068, d = 1.07$) At treatment end, subjects who underwent CBT-I did not meet insomnia threshold; subjects who underwent supportive care did</td>
</tr>
<tr>
<td>Abramowitz, 2008</td>
<td>Examined benefit of hypnotherapy added to zolpidem in patients with chronic PTSD</td>
<td>Randomized, zolpidem-controlled trial</td>
<td>32 patients with PTSD, on SSRI and supportive therapy</td>
<td>Zolpidem 10mg qHS x14 nights vs. symptom-oriented hypnotherapy 2x/week x 2 weeks</td>
<td>TST identical for both treatment groups; a significant main effect was found for assessment time ($F(2, 60) = 23.4; p &lt; .0005$); treatment efficacy was similar in both groups for quality of sleep; quality of sleep was higher in the hypnotherapy group compared to the zolpidem group ($F(1, 30) = 10.7; p = .003$) and was improved from the first to the second assessment ($F(2, 60) = 24.2; p &lt; .0005$); sleep quality was significantly</td>
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### Pharmacologic Approaches

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### Summary

- **DeViva et al., 2005**: Examined the effects of tailored CBT-I treatment on PTSD treatment responders who reported ongoing insomnia. PSQI and ISI scores improved from pre- to post-treatment, with sleep diary measures also improving (Cohen’s d from 0.12-1.7).

- **Walters et al., 2020**: Investigated the impact of PE on sleep assessments and the impact of sequencing evidence-based sleep interventions after PTSD treatment. The IRT/CBT-I group showed more improvement in insomnia compared to supportive care ($p = .068, d = 1.07$), with subjects who underwent CBT-I not meeting the insomnia threshold.

- **Abramowitz, 2008**: Examined the benefit of adding hypnotherapy to zolpidem in treating chronic PTSD. Significant improvements were found in both TST and sleep quality between the groups, with the hypnotherapy group showing better outcomes compared to the zolpidem group ($F(1, 30) = 10.7; p = .003$).
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<table>
<thead>
<tr>
<th>Reference</th>
<th>Study Title</th>
<th>Study Design</th>
<th>Participants</th>
<th>Intervention</th>
<th>Key Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Krystal et al., 2016</td>
<td>Impact of risperidone on sleep impairment in Veterans with PTSD</td>
<td>Multicenter RCT</td>
<td>267 Veterans with PTSD who were symptomatic despite treatment with other medications</td>
<td>Adjunctive risperidone</td>
<td>Reductions in PTSD symptom severity were correlated with improvements in sleep quality</td>
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<td>Adjunctive risperidone group had a small statistically significant effect on PSQI scores (main effect $F = 4.57, P = 0.34$; drug-by-time $F = 4.32, P = 0.14$)</td>
<td></td>
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<tr>
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<td>David et al., 2006</td>
<td>Open-label, flexible dose trial</td>
<td>20 male combat Veterans with PTSD and partial response to current medications</td>
<td>Risperidone 1-3mg at bedtime</td>
<td>Total CAPS score, <strong>recurrent distressing dreams of the event,</strong> and <strong>difficulty falling or staying asleep</strong> were improved at 6 weeks ($P = 0.04, 0.04, 0.01$ respectively)</td>
</tr>
</tbody>
</table>

*Note: PTSD = Post-Traumatic Stress Disorder, RCT = Randomized Controlled Trial, PSQI = Pittsburgh Sleep Quality Index, CAPS = Clinician-Administered PTSD Scale.*
<table>
<thead>
<tr>
<th>Study Authors</th>
<th>Study Title</th>
<th>Study Design</th>
<th>Participants</th>
<th>Intervention</th>
<th>Main Findings</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Robert, 2005</td>
<td>Assess impact of quetiapine on sleep disturbance related to PTSD</td>
<td>Prospective open-label trial</td>
<td>20 combat Veterans with PTSD</td>
<td>Quetiapine at nighttime</td>
<td>Significantly improved sleep (PSQI) $p &lt; 0.001$ Sleep length increased from $4.0 \pm 1.0$ to $6.0 \pm 1.8$ hours per night</td>
<td></td>
</tr>
<tr>
<td>Pollack et al., 2011</td>
<td>Examine efficacy and tolerability of short-term use of eszopiclone in PTSD w/ co-morbid insomnia</td>
<td>Placebo controlled RCT</td>
<td>24 patients with PTSD and sleep disturbance</td>
<td>Eszopiclone 3mg x3 weeks, placebo x3 weeks, 1 week “wash-out” between</td>
<td>SL ($P = .044$) and PSQI ($P = .011$) scores significantly improved in eszopiclone group compared to placebo; there was a non-significant increase in TST</td>
<td>CAPS ($P = .003$) and SPRINT ($P = .032$) scores were significantly improved in eszopiclone group compared to placebo</td>
</tr>
<tr>
<td>Dowd et al., 2020</td>
<td>Evaluate efficacy of eszopiclone vs. placebo for patients with insomnia and PTSD</td>
<td>Placebo controlled RCT</td>
<td>25 patients with PTSD and sleep disturbance</td>
<td>Eszopiclone 3mg at bedtime x 12 weeks</td>
<td>No significant difference between groups on PSQI, self-report or actigraphy data of SL and TST</td>
<td>No significant difference between groups on CAPS or SPRINT, even when sleep items removed post-hoc</td>
</tr>
<tr>
<td>Warner et al., 2001</td>
<td>Assess effectiveness and tolerability of trazodone for sleep in a PTSD population</td>
<td>Survey/ questionnaire</td>
<td>74 Veterans in an inpatient treatment program for PTSD</td>
<td>Trazodone 50-200mg at bedtime</td>
<td>60 patients maintained an effective dose of trazodone 92% reported it helped with sleep onset, 78% reported improved sleep maintenance</td>
<td>72% found trazodone helpful in decreasing nightmares (average 3.3 to 1.3 nights per week) 9 patients reported priapism</td>
</tr>
<tr>
<td>George et al., 2016</td>
<td>Examine impact of prazosin on nightmares, sleep disturbance, and symptom severity in adults with PTSD</td>
<td>Meta-analysis</td>
<td>6 RCTs</td>
<td>Prazosin</td>
<td>Prazosin better than placebo in improving sleep quality CAPS Item 13 (SMD = 0.93, 95% CI [-0.02, 1.88], $p = 0.054$) PSQI (SMD = 1.14, 95% CI [0.24, 2.03], $p = 0.01$)</td>
<td>Prazosin was better than placebo at improving symptom severity (SMD = 1.20, 95% CI)</td>
</tr>
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</table>
### PTSD AND SLEEP DISTURBANCE

<table>
<thead>
<tr>
<th>Study</th>
<th>Methodology</th>
<th>Participants</th>
<th>Intervention</th>
<th>Outcome Measures</th>
<th>Effect Size and Confidence Interval</th>
<th>Significance</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Khachatryan et al., 2016</td>
<td>Meta-analysis</td>
<td>6 RCTs</td>
<td>Prazosin</td>
<td>Prazosin was more effective than placebo in improving sleep quality (g = 0.987, 95% CI: [0.324–1.651])</td>
<td>[0.79, 1.61], p = .001</td>
<td></td>
<td>1.a</td>
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<tr>
<td>Khaziaie et al., 2016</td>
<td>RCT</td>
<td>32 Veterans with combat related PTSD and distressing nightmares</td>
<td>Prazosin for 8 weeks</td>
<td>Prazosin had no significant effect on sleep quality measured by actigraphy compared to placebo</td>
<td></td>
<td></td>
<td>1.c</td>
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<tr>
<td>Raskind et al., 2007</td>
<td>RCT</td>
<td>40 Veterans with PTSD and trauma-related nightmares and sleep disturbance</td>
<td>Prazosin for 8 weeks</td>
<td>Prazosin group improved significantly over placebo p = .008, Cohen’s d = 1</td>
<td></td>
<td></td>
<td>1.c</td>
</tr>
<tr>
<td>Taylor et al., 2008</td>
<td>Randomized placebo-controlled crossover trial</td>
<td>13 civilians with chronic PTSD</td>
<td>Prazosin</td>
<td>TST was greater in the prazosin condition than placebo (374 +/- 86 min vs. 280 +/- 105 min, p &lt; .01, Cohen’s d = .98) REM sleep time was greater in the prazosin condition than placebo (138 +/- 63 min vs. 97 +/- 70 min, p &lt; .01, Cohen’s d = .62) SOL did not differ between conditions</td>
<td>PCL-C scores decreased from baseline more in prazosin than placebo group (all p &lt; .05) CAPS distressing dreams scores decreased from baseline more in prazosin than placebo group (all p &lt; .05)</td>
<td></td>
<td>1.c</td>
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<tr>
<td>King et al., 2015</td>
<td>Pilot study</td>
<td>20 OEF/OIF Veterans with PTSD and self-Auricular Acupuncture</td>
<td>No significant differences in actigraphy results or PSQI pre- to post-treatment</td>
<td>Excluded sleep apnea; Veterans were in a residential</td>
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**Alternative Treatment Approaches**

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<th>Intervention</th>
<th>Outcome Measures</th>
<th>Effect Size and Confidence Interval</th>
<th>Significance</th>
<th>Notes</th>
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<tr>
<td>King et al., 2015</td>
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<td>Design</td>
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<td>Intervention</td>
<td>Outcomes</td>
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<tr>
<td>Beck et al., 2017</td>
<td>Quasi-experimental</td>
<td>20 Veterans with PTSD and sleep disturbance</td>
<td>Mantram repetition program</td>
<td>There was a statistically significant decrease in ISI scores pre- to posttreatment with moderate effect size ($P &lt; .00, d = 0.61$)</td>
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<tr>
<td>Bosch et al., 2017</td>
<td>Longitudinal</td>
<td>76 OEF/OIF/OND Veterans with PTSD</td>
<td>Exercise</td>
<td>Engagement in exercise was significantly associated with better sleep quality (measured by PSQI) at one-year follow-up controlling for other factors ($\beta = -0.128, p &lt; 0.05$)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Krakow et al., 2019</td>
<td>Retrospective chart review</td>
<td>96 patients with OSA and PTSD who failed CPAP and were prescribed APAP</td>
<td>Advanced PAP therapy such as ABPAP or ASV</td>
<td>Hours of PAP use and insomnia severity were inversely correlated ($P=0.001, r=-0.321$). Significant main effect ($P&lt;0.001$) for decreased ISI scores as well as a group by time interaction ($P = 0.039$)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Orr et al., 2017</td>
<td>Prospective study</td>
<td>59 Veterans with PTSD and new diagnosis of OSA naive to PAP therapy</td>
<td>CPAP</td>
<td>Self-reported sleep duration did not change</td>
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**Approaches Targeting OSA in PTSD**

<table>
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**PTSD AND SLEEP DISTURBANCE**

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<td>CPAP</td>
<td>Self-reported sleep duration did not change</td>
</tr>
<tr>
<td>El-Sohl et al., 2018</td>
<td>Determine impact of insomnia on outcomes in Veterans with PTSD and OSA before and after CPAP therapy</td>
<td>Prospective cohort study</td>
<td>72 Veterans with PTSD and OSA with and without insomnia</td>
<td>CPAP</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>El-Sohl et al., 2017</td>
<td>Compare efficacy, adherence, and preference for CPAP versus MAD, compare effect of CPAP and MAD on outcomes in veterans with PTSD</td>
<td>Randomized crossover trial</td>
<td>42 Veterans with PTSD and newly diagnosed OSA</td>
<td>12 weeks with CPAP and 12 weeks with MAD with 2-week wash-out</td>
</tr>
</tbody>
</table>

AA-Auricular Acupuncture, ABPAP-Autobilevel Positive Airway Pressure, AHI-Average Hypopnea Index, ASV-Adaptive Servo-Ventilation, CAPS-Clinically Administered PTSD Scale, CBT-I-Cognitive Behavioral Therapy for Insomnia, CGI-Clinical Global Impression, ERRT-Exposure Relaxation and Rescripting Therapy, IRT-Imagery Rehearsal Therapy, ISI-Insomnia Severity Index, MADRS-Montgomery and Åsberg Depression Rating Scale, OSA-Obstructive Sleep Apnea, PAP-Positive Airway Pressure, PCL-5-PTSD Checklist for DSM-5, PCL-C-PTSD Checklist-Civilian, PCL-M-PTSD Checklist-Military, PE-Prolonged Exposure, PHQ-9-Patient Health Questionnaire, PSG-Polysomnogram, PSQI-Pittsburgh Sleep Quality Index, PTSD-Post-traumatic Stress Disorder, PSS-PTSD and Suicide Screener, RCT-Randomized Controlled Trial, SE-Sleep Efficiency, SIP-Sleep Intervention for PTSD, SOL-Sleep Onset Latency, ST-Sleep Time, TIB-Time in Bed, TST-Total Sleep Time, WASO-Wake After Sleep Onset, WL-Waitlist
Appendix C

Project Model: Knowledge to Action Framework

SWOT Analysis: Outpatient VA PTSD Clinic

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Clinic follows VHA Handbook 1160.01, <em>Uniform Mental Health Services in VA Medical Centers and Clinics</em> which requires EBPs for PTSD and following VA/DoD Clinical Practice Guidelines</td>
<td>• High number of EBPs can lead to less focus on specific EBP (“EBP fatigue”)</td>
</tr>
<tr>
<td>• Clinic follows VA/DoD which recommends EBPs listed in screening and treatment planning protocol</td>
<td>• Large clinic, can lead to smaller/divided workgroups with different focuses</td>
</tr>
<tr>
<td>• Clinic promotes implementation of EBPs, trainings/consultations offered to clinicians</td>
<td>• Low number of administrative staff manages scheduling electronic referrals which can lead to delay</td>
</tr>
<tr>
<td>• Screening measures available in EMR</td>
<td>• PTSD clinic and sleep clinic operate independently</td>
</tr>
<tr>
<td>• Clinicians/Veterans have access to sleep clinic services</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Opportunities</th>
<th>Threats</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Presenting screening measures and EBPs in comprehensive protocol may increase utilization, thus supporting the VHA Handbook requirements and adherence to VA/DoD Clinical Practice Guidelines</td>
<td>• Ongoing COVID-19 pandemic means treatment groups now virtual</td>
</tr>
<tr>
<td>• Project supports VA Psychotropic Drug Safety Initiative, encouraging non-pharmacologic interventions</td>
<td>-Some decline participation virtually</td>
</tr>
<tr>
<td></td>
<td>-Technical difficulties arise</td>
</tr>
<tr>
<td></td>
<td>-Difficulty obtaining completed screening measures remotely</td>
</tr>
<tr>
<td></td>
<td>• Issuing Monitoring CPAP done by outside company; limits VA oversight</td>
</tr>
</tbody>
</table>
Appendix F

Adapted Protocol

Evidence-Based Protocol for Veterans with PTSD and Sleep Disturbance

START

Assess: does Veteran have sleep apnea? YES NO

Screen: for sleep apnea
Use: STOP Questionnaire

Refer: to sleep clinic
Use: “Sleep Testing” Consult

Treatment determined by sleep clinic

Assess: is veteran compliant with sleep apnea treatment? YES NO

Refer: for CPAP desensitization
Use: “CPAP Clinic” Consult

Refer/Provide: EBP for PTSD
Use: “MH PTSD Anx Psychotherapy Ind Output” consult

Screen: for insomnia
Use: Insomnia Severity Index (ISI)

Assess: for other sleep disorders, determine if appropriate for CBT-I

NOTE: collaborative treatment planning can be used to determine order of CBT-I and EBP for PTSD

Assess: for residual nightmares

Refer: for ERT
Use: “MH PTSD Anx Psychotherapy Ind Output” consult

Refer: for CBT-I
Use: “CBTI Consult Output”

IF NEGATIVE

IF POSITIVE

IF NEGETIVE

IF NEGATIVE

70
Appendix G

STOP Questionnaire

1. Snoring
   Do you snore loudly (louder than talking or loud enough to be heard through closed doors)?
   Yes No

2. Tired
   Do you often feel tired, fatigued, or sleepy during daytime?
   Yes No

3. Observed
   Has anyone observed you stop breathing during your sleep?
   Yes No

4. Blood pressure
   Do you have or are you being treated for high blood pressure?
   Yes No

*High risk of OSA:* answering yes to two or more questions
*Low risk of OSA:* answering yes to less than two questions

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Appendix H

Insomnia Severity Index

For each question, please CIRCLE the number that best describes your answer.

Please rate the CURRENT (i.e. LAST 2 WEEKS) SEVERITY of your insomnia problem(s).

<table>
<thead>
<tr>
<th>Insomnia problem</th>
<th>None</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
<th>Very severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Difficulty falling asleep</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2. Difficulty staying asleep</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>3. Problem waking up too early</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

4. How SATISFIED/DISSATISFIED are you with your CURRENT sleep pattern?

<table>
<thead>
<tr>
<th>Very Satisfied</th>
<th>Satisfied</th>
<th>Moderately Satisfied</th>
<th>Dissatisfied</th>
<th>Very Dissatisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td></td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

5. How NOTICEABLE to others do you think your sleep problem is in terms of impairing the quality of your life?

<table>
<thead>
<tr>
<th>Not at all Noticeable</th>
<th>A Little</th>
<th>Somewhat</th>
<th>Much</th>
<th>Very Much Noticeable</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

6. How WORRIED/DISTRESSED are you about your current sleep problem?

<table>
<thead>
<tr>
<th>Not at all Worried</th>
<th>A Little</th>
<th>Somewhat</th>
<th>Much</th>
<th>Very Much Worried</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

7. To what extent do you consider your sleep problem to INTERFERE with your daily functioning (e.g. daytime fatigue, mood, ability to function at work/daily chores, concentration, memory, mood, etc.) CURRENTLY?

<table>
<thead>
<tr>
<th>Not at all Interfering</th>
<th>A Little</th>
<th>Somewhat</th>
<th>Much</th>
<th>Very Much Interfering</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

Guidelines for Scoring/Interpretation:

Add the scores for all seven items (questions 1 + 2 + 3 + 4 + 5 + 6 + 7) = _______ your total score

Total score categories:
0-7 = No clinically significant insomnia
8-14 = Subthreshold insomnia
15-21 = Clinical insomnia (moderate severity)
22-28 = Clinical insomnia (severe)

(Copyright, Charles M. Morin, 1993).

Appendix I

Revised TREC Manual

Trauma Recovery Education Class Manual

Jason C. DeViva, Ph.D., Gwendolyn A. Bassett, MSW, Gia M. Santoro, APRN, Lisa Fenton, Psy.D., Lashauna Cutts, MSW, & Andrea Williams, MSW

Updated July 30, 2021, by Gia Santoro, MSN, APRN, PMHNP-BC & Jason C. DeViva, Ph.D.
PTSD AND SLEEP DISTURBANCE

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Overview

The Trauma Recovery Education Class (TREC) is a four-session education and treatment-planning group for veterans diagnosed with posttraumatic stress disorder (PTSD) that was developed at an outpatient VA PTSD Clinic in 2011. The primary purpose of TREC is to help veterans make educated choices while developing their plans for PTSD treatment. The group includes the following components:

1) Education: Veterans are educated about the definition and frequency of trauma and the diagnostic criteria and associated features of PTSD. Specific treatment options are also discussed in detail, including their general demands and likely effectiveness.

2) Problem identification: Veterans are encouraged to identify PTSD-related problems they are currently experiencing. Veterans then use cost/benefit analysis to determine whether other aspects of their lives are potentially problematic and therefore targets for change.

3) Identification of barriers to care: Veterans receive information on common barriers to care and discusses ways to circumvent them. Veterans are encouraged to identify which barriers are most relevant to them.

4) Treatment-planning: Group members select their next step in treatment from the available clinic options.

The TREC group is appropriate for veterans diagnosed with PTSD who are ambivalent about treatment or who have not developed specific treatment plans and who wish to hear a comprehensive list of treatment options. Veterans who are well-informed about PTSD and express clear motivation for clinically indicated treatment (e.g., a veteran diagnosed with PTSD requests prolonged exposure) may not need TREC.

Group format

TREC is a four-session group that meets weekly for 60 minutes. We recommend that the group’s schedule be synchronized with some other aspect of the calendar (e.g., group starts the first Tuesday of each calendar month) so that program clinicians can reliably predict group start dates and can easily refer veterans. One or two staff can facilitate the group. We recommend it be provided in a room with a place where material can be written for the group to see (e.g., a dry-erase board). It is also helpful to provide group members with folders to encourage them to keep the educational handouts provided during the course of the group.

Because of the educational nature of the group, it can be run with up to 10 members. Homework is assigned at the end of the first, second, and third sessions. Because each session begins with a review of the previous session, veterans can miss sessions 1, 2, or 3 and still complete the group. We recommend that veterans missing more than one session of the group repeat the entire group the next time it is offered. If the fourth session is missed, the veteran can either attend the next cycle of the group or develop a treatment plan individually with another provider, depending on the organization of the clinic.
Trainees

Staff can co-facilitate the group with trainees. The experience of co-facilitating the group can orient trainees to a clinic’s conceptualization of PTSD and its treatment options. Co-facilitating also provides staff an opportunity for in vivo observation of trainees providing basic psychoeducational information on trauma and its effects.

Assessment

Because the TREC group results in a treatment plan that can be implemented as soon as circumstances allow, it serves as an excellent opportunity to implement assessment instruments measuring PTSD symptoms and other relevant constructs (e.g., depression symptoms, substance use, sleep, quality of life). The goals of the group are to maximize motivation for change and change maladaptive beliefs about PTSD treatment, so it is unlikely that PTSD symptoms would change over the four sessions. However, motivation and beliefs might be expected to change, so clinicians may choose to measure these constructs before and after the group.

Subthreshold PTSD

Depending on a clinic’s purpose and situation with a larger mental health service, it may be useful to be able to provide the TREC group to veterans with sub-threshold PTSD symptoms. Given that there is evidence supporting the use of trauma-focused treatment with sub-threshold PTSD and that most non-trauma-focused treatments offered to veterans with PTSD are not necessarily PTSD-specific (e.g., anger management, stress management/relaxation), the TREC protocol can be easily modified to work for a group of veterans with posttraumatic symptoms who do not all necessarily have PTSD.
I. Group structure and rationale

Facilitators explain that the group will meet four consecutive weeks at the same time in the same place. Attendance at all four groups is strongly recommended, as the content of later sessions builds on that of previous sessions. Facilitators also emphasize that the purpose of the group is learning about the effects of trauma, identifying problems to target, identifying and when necessary, breaking through barriers, learning about treatment options, and selecting a treatment plan. It is helpful to remind group members that the purpose of the group is not to decrease PTSD symptoms, but instead for them to identify how they would like to accomplish that.

II. Introductions

At this point, the facilitators may choose to note that this group is sometimes called a “class” because it emphasizes the provision of information more than some other groups might. The group is designed for veterans who are diagnosed with PTSD, so everyone in the group will have that diagnosis. As such, veterans do not need to disclose the traumatic events they have experienced or even their era of service if they do not want to. We recommend that group facilitators suggest that veterans do not share details of past traumatic events as this can be distressing to other group members. Group facilitators then introduce themselves.

Group members are asked to provide their names (how they would like to be addressed in the group) and one thing about themselves they would like to change. Generally, veterans provide specific and predictable targets for change (e.g., sleep, nightmares, anger, interactions with others). Sometimes, veterans will state that they want to change “everything.” Other veterans might refer to “my PTSD” broadly. We recommend that facilitators encourage group members who respond in these ways to identify more specific targets (“If you had to pick one thing today, it can be different tomorrow or next week…”). It can be helpful for facilitators to record the targets for change so that they can be referred back to when discussing the diagnostic criteria for PTSD.
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III. Group rules

Experienced facilitators may have their own preferred methods of explaining rules for group attendance and participation. They may use those preferred methods. We tend to focus on two specific rules: treating everyone in the room with respect (not interrupting others, accepting that everyone can have different experiences and opinions, not judging, etc.) and confidentiality (not repeating what other veterans say in group, facilitators ask group members whether they would like to add any rules to the list.

IV. Definition of trauma and diagnostic criteria

Facilitators provide the definition of what trauma is, according to the *DSM5*, and describe the four symptom clusters of diagnostic criteria for PTSD. We recommend that facilitators make this process interactive and involve group members in the discussion (e.g., “What makes something traumatic?” “The first group of diagnostic criteria is re-experiencing symptoms; how do you think people might re-experience trauma?”). It is helpful for facilitators to emphasize the broad range of events that can be classified as trauma and to present the high proportion of the general population that experiences at least one traumatic event (70-90%) as well as the lifetime prevalence of PTSD (8-10%). Facilitators will also note that depression and maladaptive substance use commonly co-occur with PTSD.

Facilitators discuss the high number of veterans with PTSD who have sleep disturbance (90%). Veterans should be informed that the sleep disturbance associated with PTSD can be multifactorial and include one or both common comorbidities of insomnia obstructive sleep apnea (OSA). The rate of insomnia among veterans with PTSD is 30-60%, and the rate of co-occurring OSA may be as high as 63%. A basic definition of insomnia can be provided: “Insomnia disorder involves persistent (occurring for at least three nights per week for at least three months) difficulty with sleep initiation, duration, consolidation, or quality that occurs despite adequate opportunity and circumstances for sleep, and results in some form of daytime impairment.” A basic definition of obstructive sleep apnea can also be provided: “Sleep apnea is a breathing problem that disrupts normal sleep.” People with sleep apnea may wake up not feeling rested and struggle with feeling tired or needing to sleep during the daytime.

Facilitators may refer to group members’ targets for change and discuss how they correspond to diagnostic criteria and associated features of PTSD.

V. Why symptoms persist

The discussion of why symptoms persist can be difficult because veterans may blame PTSD on negative aspects of their personality or make-up (e.g., “I still have this because I’m weak”; “this means I can’t deal with it”). We recommend focusing on the more common cognitive-behavioral models of the development and maintenance of PTSD.

1) The trauma and the emotions it evoked in the moment (primarily fear/anxiety) become associated with stimuli that were present at the time, including aspects of the traumatic event that were objectively threatening as well as other elements that were not dangerous. These non-threatening stimuli may then elicit anxiety in the future. The stimuli are avoided because of this anxiety, so the brain never has a chance to learn that the stimuli are not dangerous.
PTSD AND SLEEP DISTURBANCE

This can be illustrated with any examples the facilitators want to use. For example, the facilitator may describe an individual who is bitten by a large brown dog while walking along a street. The individual was bitten by that specific dog, but the anxiety felt in the moment may also become associated with the location (e.g., that street corner), what the individual was wearing (e.g., red jacket), or the time of day (e.g., evening). These stimuli will then elicit anxiety in the future, and if the individual avoids them, he or she will never have the opportunity to learn that they are safe.

2) Veterans may judge how they acted or reacted during the trauma and may also blame themselves for how the traumatic event transpired. These judgments can generate unpleasant emotions and distress and can prevent the veteran from understanding how the trauma fits into the context of the rest of their experiences.

As with the previous example, facilitators may illustrate this in any way they wish. They may describe examples where veterans may have had the fight/flight/freeze response and then judged themselves for this without appreciating the automatic nature of these emergency responses. They may also provide examples of veterans who think that if they had acted differently, negative outcomes would not occur (e.g., a soldier who sees a friend die and thinks she could or should have done something to prevent it). Facilitators can discuss how these judgments can interfere with the processing of other emotions related to the trauma.

Facilitators should emphasize that at this time research has not yet determined why some individuals experience trauma and develop PTSD while others experience trauma and return to baseline functioning.

VI. Avoidance

We recommend that facilitators discuss the role of avoidance in maintaining PTSD symptoms. It is important to have the group discuss the wide range of avoidant behaviors and how avoidance relates to PTSD to prevent members from avoiding group and help members make a more thorough assessment of current problems in session 2. Facilitators should attempt to solicit examples of avoidance from the group (e.g., crowds, trauma reminders) and should provide them themselves if the group does not. It is helpful for facilitators to note that though avoidance is part of the diagnostic criteria of PTSD and one of the possible means by which posttraumatic symptoms persist, individuals with PTSD often think of avoidance as a “coping mechanism” because it decreases anxiety and brings some symptom relief in the short-term.

VII. Homework

Homework at the end of session 1 includes reading on trauma, PTSD, avoidance, and PTSD related sleep disturbance. The materials provided by the VA’s National Center for PTSD (www.ptsd.va.gov) can be used, though facilitators can use any materials with which they are comfortable. It is recommended that facilitators discuss the importance of homework with the group when it is assigned in session 1. Facilitators should emphasize the role that homework plays in specific treatments available in the clinic and should inform the group that each subsequent group will begin with review of the homework.
Session 2 Contents

I. **Homework review**

   Facilitators begin the session by reviewing the homework. Facilitators can ask veterans whether they completed the homework. For veterans who did not, facilitators can ask about what got in the way. For veterans who did, facilitators can ask whether they had any questions about the material and how consistent the description of PTSD symptoms was with their own experiences.

II. **Problem identification**

   Facilitators then remind the group that the purpose of the TREC group is education and treatment-planning, and that before treatment can be planned, goals for change must be identified. Facilitators then remind the group that each of them identified one thing they would like to change in session 1 and begin the discussion of problem identification by asking the group how they knew that those things needed to be changed. This discussion can be guided into the broader topic of how a person knows something is a problem. Facilitators should focus the discussion on interference in important aspects of functioning (e.g., job, social activities, recreational activities, family/intimate relationships, health) and distress as factors that indicate that a particular behavior is problematic.

   Facilitators can note that people often engage in behaviors that cause difficulties because those behaviors also bring about some desirable result. Any avoidance-related problem identified by the group (e.g., isolation, drinking) can be used as an example of this. Facilitators can then ask veterans whether there are any aspects of their lives that they are not sure are problematic. If veterans have difficulty understanding this concept, facilitators can use as examples behaviors that others think are problematic but with which the veteran is content, or behaviors that sometimes yield good results and sometimes do not. The goal of this discussion is to guide the group toward thinking of the positive aspects and costs of specific behaviors.

III. **Pro/con analysis**

   Facilitators then introduce the concept of pro/con or cost-benefit analysis to the group and discuss its applicability to identify when a certain behavior is problematic. Facilitators emphasize considering both the positive and negative consequences of the behavior to determine whether, overall, the behavior is a problem and therefore whether the individual might benefit from changing it. We use fear of snakes to illustrate this. An individual living in an old farmhouse in New England may find that a fear of snakes causes significant distress and may be associated with avoidance, while
PTSD AND SLEEP DISTURBANCE

bringing no positive consequences. Therefore, the individual may determine that the fear of snakes as a problem that may be worth changing. An individual living in Hawai‘i would not have any difficulties associated with anxiety or avoidance because there are no snakes in Hawai‘i, so for that person the fear of snakes would not be problematic.

Facilitators should then demonstrate a pro/con analysis in the room, either by using an example identified earlier by the group of something that might or might not be a problem or soliciting the group for another example. Group members are invited to participate by discussing the pros and cons of this example. Any avoidance-based behavior (e.g., social isolation, avoiding confrontations, substance abuse) tends to work well because it allows facilitators to help the group recognize that most of the positive aspects of avoidance (e.g., prevention or relief of distress) occur in the short-term and most of the negative aspects are longer-term considerations.

IV. Homework

Homework at the end of session 2 includes a worksheet to assist with identifying problems one definitely has, problems one definitely does not have, problems that one is not sure one has, and problems others say one has. Homework also includes a basic form for identifying pros and cons of a potential problem. Both forms are taken from the Problem Area Review Group manual described by Murphy et al. (2008). In addition, homework also includes a short-term and long-term pro/con analysis form. Veterans are encouraged to spend time identifying aspects of their lives that they are sure they want to change, aspects of their lives that they are sure they do not want to change, and aspects of their lives about which they are ambivalent. For the aspects about which they are ambivalent, they are encouraged to use pro/con analyses to try to determine whether that area is problematic.
PTSD AND SLEEP DISTURBANCE

Session 3 Contents

I. Homework review

II. Barriers to care

III. Treatment options

IV. Homework

I. Homework review

As with session 2, facilitators begin session 3 by reviewing the homework and, for veterans who did not complete the homework, asking what got in the way. For veterans who did the homework, facilitators can ask whether they were able to resolve any aspects of their lives as definitely or definitely not problems. Facilitators can ask the group whether anyone who did the homework whether they would like to share it and can spend a few minutes discussing a specific pro/con analysis. Alternately, facilitators can ask whether anyone had any difficulty determining whether an aspect of their lives was a problem, and a pro/con analysis on that aspect can be conducted as a group exercise.

II. Barriers to care

Facilitators then open the discussion of barriers to care by asking veterans whether it was easy or difficult to come into the VA at all, talk to a mental health provider, or come to the group. If veterans report any degree of difficulty, facilitators can ask them why to draw out potential barriers to care. We recommend listing these barriers on a board, and sorting them into categories (e.g., internal/external, logistical/emotional). We recommend that facilitators make sure that the prospects of thinking about past events and/or experiencing unwanted emotions, stigma associated with psychiatric diagnoses and treatment, beliefs about treatment and its efficacy, and logistical barriers are discussed specifically.

We recommend that providers spend time expanding on the notion of stigma in two areas. First, facilitators can ask the group what happened in the military if they disclosed or discussed pain or distress. The discussion should be guided to the conclusion that though the military’s emphasis on “soldiering on” despite pain or discomfort and maintaining focus on the mission is functional in dangerous situations, it is very hard to sustain in the long-term and may be counter-productive when dealing with mental health concerns.

Second, it is helpful for facilitators to note gender-specific norms in general American culture for expressing distress or the need for help as a potential barrier to care. Examples can be used from throughout the developmental trajectory to illustrate how others react when men experience emotion (for example, how adults react when a four-year-old girl falls, skins a knee, and cries versus when a four-year-old boy falls, skins a knee, and cries; athletes being praised for playing through pain). If there are women in the group, we also recommend discussing the pressure on women while they serve (if a male service member makes a mistake or cannot complete a task, he is belittled, often with feminine labels, and if a female service member does the same thing, her and other women’s abilities and right to serve are questioned) as an obstacle to disclosing distress.
PTSD AND SLEEP DISTURBANCE

As mental health providers, we often forget how little the non-clinical population knows about psychotherapy. We recommend that facilitators discuss different beliefs the group may have about treatment. Veterans often have beliefs about negative things that therapy will do (e.g., “the therapist will get inside my head,” “therapy will change my personality,” “I’ll start thinking about it/feeling emotions and won’t stop”) or things that therapy will not change (e.g., “PTSD can’t be treated,” “you’ll never make me forget it, so why bother?”).

Facilitators should then discuss ways to eliminate or get through the barriers. They can initiate this discussion by asking group members how they have made it to three group sessions thus far. For stigma-related concerns, facilitators can highlight the increased awareness of PTSD in American culture. It can help to note that even though accounts of combatants returning from war and suffering have been around for thousands of years, PTSD was not an actual diagnosis until 1980, and both scientific and lay understanding of PTSD has increased since then. Facilitators can provide education to address beliefs about the potential effects, positive or negative, of treatment. We recommend that facilitators address beliefs that diagnosis or treatment would result in loss of government benefits, lower chances of employment, or restriction of access to firearms, regardless of whether group members report them. Problem-solving can be used to address logistical difficulties. Facilitators can ask the group how well it works to try to “soldier on” while symptoms of PTSD are present. Overall, the focus should be on helping veterans decide whether the potential gains of treatment can make the potential barriers worth dealing with.

III. Treatment options

At this point, facilitators can summarize the group and note that the group has been educated about PTSD, problems have been identified, and ways to address barriers have been discussed. The next step is to talk about treatment options. How facilitators do this will depend greatly on what options exist in the clinic at that time, and how those options are organized. Currently, our clinic breaks options down into psychotherapy, pharmacotherapy, and research treatments. The pros, cons, and evidence base for research treatments and pharmacotherapy are described. Psychotherapy is broken down into four categories: supportive therapy, symptom-focused therapy, trauma-focused therapy, and complementary therapies. For each category, specific options, structure (e.g., group or individual, duration), requirements (e.g., weekly attendance, homework), potential outcomes (e.g., anger management group can help with responses when angry but is unlikely to decrease re-experiencing symptoms), and evidence base are described. After treatment options are presented, group members are given the opportunity to ask questions about any of the material they have heard.

Our clinic has added specific education related to sleep treatments in the context of PTSD, due to the high rates of insomnia and OSA in this population, and the risk of both untreated OSA and insomnia rendering evidence-based PTSD treatments less effective. Again, what is provided in this section may be determined by the available treatment options in your clinic or hospital. We have chosen to strongly recommend that veterans with a positive score on the STOP Questionnaire be referred to the sleep clinic to rule out OSA, and those with previously diagnosed OSA who are not adequately compliant with OSA treatment (i.e., CPAP) be referred to the sleep clinic for CPAP desensitization, or other methods of increasing compliance. For veterans with a diagnosis of insomnia who do not have OSA, and those with a diagnosis of OSA who are compliant with treatment, we recommend a referral to Cognitive Behavioral Therapy for Insomnia (CBT-I). We engage in collaborative decision making with the veteran so that they can choose CBT-I or an EBP for PTSD in either order or undertake both concurrently.
It is helpful to emphasize during the discussion of treatment options that veterans may add to or subtract from their treatment plan over time depending on the outcome of initial stages. For example, a veteran who chooses to start with an anger management group because his anger causes significant difficulty in interpersonal relationships may find that the group is helpful with anger but does not change his self-blame or his sleep. At this point, the veteran may choose to try a course of cognitive processing therapy or cognitive-behavioral therapy for insomnia.

IV. Homework assignment

Homework at the end of session 3 includes a form on identifying barriers to care, which is taken from the Problem Area Review Group manual described by Murphy et al. (2008). In addition, group members are given materials on PTSD treatment in general (our clinic uses the document on treatment found on the website of the National Center for PTSD, www.ptsd.va.gov) as well as specific treatments available in the treatment program. Our clinic provides a schematic of research, medication, and therapy options as well as our brochure of group therapy offerings. Group members are instructed to read the materials over and identify options that they think might be best for them at this time. They may also be given a form to write down their ideas.
Session 4 Contents

I. Homework review

II. Treatment planning

III. Wrap-up

I. Homework review

As with sessions 2 and 3, facilitators begin session 4 by reviewing the homework and, for veterans who did not complete the homework, asking what got in the way. For veterans who did, facilitators can ask whether they discovered any barriers to care that affect them more than others. Ways to move past these barriers should be identified. Facilitators should also solicit and respond to any questions about treatment or specific treatment options.

II. Treatment planning

Facilitators should provide a complete review of the options discussed in session 3 and provide group members with ample time to ask questions or express concerns. At this point in the group, members choose their next steps in treatment. Facilitators should emphasize that there is no right or wrong place to begin the treatment process, and the initial plan may be all the group member needs or may be the first step in a progression of care. Facilitators then ask group members whether they have decided what they might like to do as their next step in treatment. Any group members who have decided what they would like can report their treatment options. Facilitators will write these choices down on the treatment-plan form.

Group members who are not certain are given the opportunity to discuss any concerns they might have about treatment options they are considering. Typically, group members ask whether they can engage in more than one treatment at the same time, or whether there is an optimal order of treatment. Group members may also ask which treatments are best for specific symptoms (e.g., nightmares). Responses to these questions will depend on the specific treatment options being offered in the clinic at that time as well as the clinic’s philosophy on engaging in more than one treatment at once.

The disposition of group members who are unable to select a treatment plan, or who do not want to engage in any of the treatments offered, will vary according to the organization of the clinic. In our clinic at this time, group members who do not select a treatment plan are referred back to the referring provider in order to complete the treatment-planning process.

Though treatment-planning is completed in the group, we recommend that facilitators familiarize themselves with the basic backgrounds and trauma histories of group members. If there are group members whose histories may make it difficult for them to talk about treatment concerns in front of others (e.g., veterans with history of military sexual trauma who might want to join an MST support group), facilitators may consider giving group members the option of talking over options with them after the session is over.

Each group member is provided with a written summary of his or her plan. This summary also contains the contact information for the group facilitators, who function as points of contact until the group member begins his or her next step in treatment.
III. Wrap-up

Once treatment plans are developed for each group member, the group curriculum is complete. Group members are congratulated for completing the group. At this time, facilitators summarize the progress of the group, and provide general encouragement about the prospects of treatment for PTSD and related symptoms. Facilitators also solicit feedback from group members about what aspects of the group were helpful and which ones were not as helpful. If appropriate, facilitators may also note that though some group members may have had concerns about participating in a group, they were able to tolerate the treatment and complete all the requirements.
GUIDE TO FORMS

The following forms are provided to group members. The source for forms not appearing in this manual is given.

Session 1

What is PTSD?
(taken from www.ptsd.va.gov)
Avoidance
(taken from www.ptsd.va.gov)
Sleep Problems and PTSD
(taken from www.ptsd.va.gov/understand/related/sleep_problems.asp)

Session 2

Problem identification worksheet
Pros and cons worksheet
Short-term and long-term pros and cons worksheet

Session 3

Roadblocks to change worksheet
Clinic treatment options (“do something/do nothing”)
Clinic group therapy brochure
PTSD Treatment
(taken from www.ptsd.va.gov)

Session 4

Treatment plan
# PROBLEM IDENTIFICATION

<table>
<thead>
<tr>
<th>MIGHT HAVES</th>
<th>Problems You DEFINITELY HAVE</th>
<th>Problems you might have: You have wondered if you have</th>
<th>Problems you might have: Problems other people say you have but you disagree</th>
<th>Problems You DEFINITELY DON'T HAVE</th>
</tr>
</thead>
</table>

From *Problem Area Group patient workbook* (Murphy et al., 2009).
### PROs & CONs

<table>
<thead>
<tr>
<th>Behavior: __________________________</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pros (Benefits) to ________</td>
</tr>
<tr>
<td>Cons (Disadvantages) to ________</td>
</tr>
</tbody>
</table>

From *Problem Area Group patient workbook* (Murphy et al., 2009).
### PTSD AND SLEEP DISTURBANCE

<table>
<thead>
<tr>
<th></th>
<th>Short-Term</th>
<th>Long-Term</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Positive</td>
<td>Negative</td>
</tr>
<tr>
<td>If I continue to…</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If I stop and change and start to…</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
When you think of your personal roadblocks, ask yourself what the roadblocks to change would be for a veteran or any other person. We all can think of many reasons why we shouldn’t change. But now we want you to think about what’s behind the fear of change.

**LIST OF ROADBLOCKS**

This is a list of thoughts, feelings, and beliefs that might prevent someone from taking an honest look at themselves. Some may apply to you, and some may not.

<table>
<thead>
<tr>
<th>Fears</th>
<th>Feelings</th>
<th>Beliefs</th>
<th>Internal Stereotypes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fear of rejection</td>
<td>Guilt</td>
<td>Admitting a problem equals weakness</td>
<td>Belief that alcohol problem = “skid row”</td>
</tr>
<tr>
<td>Fear of change</td>
<td>Shame</td>
<td>Shameful to tell other people your problems</td>
<td>type of alcoholic, homeless</td>
</tr>
<tr>
<td>Fear of embarrassment</td>
<td></td>
<td>Don’t deserve help</td>
<td>Belief that drug problem = dirty “addict”</td>
</tr>
<tr>
<td>Fear of feeling “weak”</td>
<td></td>
<td>Shame about past events</td>
<td>Belief that needing help for psychological</td>
</tr>
<tr>
<td>Fear of being seen as weak</td>
<td></td>
<td>Don’t want to think about past events</td>
<td>problems = “crazy mental patient”</td>
</tr>
<tr>
<td>Fear of feeling overwhelmed</td>
<td></td>
<td>Don’t want to have feelings of failure</td>
<td></td>
</tr>
<tr>
<td>Fear of emotions coming up</td>
<td></td>
<td>Don’t want to fail</td>
<td></td>
</tr>
<tr>
<td>Fear of facing truth</td>
<td></td>
<td>Have to take care of problems yourself</td>
<td></td>
</tr>
<tr>
<td>Fear of crying</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fear of not being able to stop crying</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fear of “I told you so”</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fear of finding out I’m “crazy”</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fear that others will think I’m crazy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fear of being “locked up”</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fear of being judged</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fear of being seen as “damaged”</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fear of feeling “stupid”</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fear that others will see me as “stupid”</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fear of losing control</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

From *Problem Area Group patient workbook* (Murphy et al., 2009).
MY ROADBLOCKS

List Your Own "Roadblocks" to Accepting That You May Have Additional Problems:

• Fears:
  ____________________________________________
  ____________________________________________
  ____________________________________________
  ____________________________________________
  ____________________________________________
  ____________________________________________

• Distortions:
  ____________________________________________
  ____________________________________________
  ____________________________________________
  ____________________________________________
  ____________________________________________
  ____________________________________________

• Stereotypes:
  ____________________________________________
  ____________________________________________
  ____________________________________________
  ____________________________________________
  ____________________________________________
  ____________________________________________

• Other:
  ____________________________________________
  ____________________________________________
  ____________________________________________
  ____________________________________________
  ____________________________________________
  ____________________________________________

From Problem Area Group patient workbook (Murphy et al., 2009).
OUTPATIENT PTSD CLINIC TREATMENT OPTIONS

The PTSD program at this VA offers a variety of treatments to help veterans with PTSD improve their lives. Each veteran works with treatment providers to determine his or her treatment plan, based on what he or she wants to change and is willing to do. We offer the following options:

**Medication**
- Can be effective at reducing overall PTSD symptoms and/or targeting specific aspects of PTSD (e.g., insomnia or depression).
- Work with provider to identify target symptoms and medication options.
- Potential side effects.
- May need adjustments to find most effective medication(s) with least side effects.
- Can be done in conjunction with therapy.

**Psychotherapy**
- Can be effective at decreasing symptoms and targeting specific aspects of PTSD (like sleep or depression).
- Significant time commitment
- The more trauma-focused and intensive the therapy, the more effective it is likely to be.
- There are several different types of therapy available...

**Research**
- Participation in research is completely voluntary.
- The VA Healthcare System and the National Center for PTSD conduct research to learn more about PTSD.
- Some of the research involves medications or therapies.
- Times are flexible and some studies pay you to participate.
- You can stop participating

**Trauma-focused therapy**
Trauma-focused therapies are the most effective PTSD treatments. They target the traumatic event or events directly. These therapies focus on engaging with the trauma memory and examining emotions and beliefs related to trauma. They are very structured and intense with frequent homework.
- Prolonged exposure (PE)
- Cognitive processing therapy (CPT)

**Symptom-focused therapy**
Treatments targeting specific PTSD symptoms or problems. These are more structured and often include homework. We offer symptom-focused groups and some individual services in the following areas:
- Anger management
- Sleep (CBT-Insomnia)
- Substance use problems
- Parenting skills
- Emotion regulation
- Anxiety skills group
- Relaxation/stress management

**Supportive therapy**
Groups of veterans with similar histories or concerns meet to support each other. Supportive therapy involves a lower intensity level and less work outside of session. Research indicates it may not decrease symptoms, but many veterans find it helpful and meaningful.
- OEF/OIF Readjustment Group
- Military sexual trauma groups
- Substance use groups

**Complementary Therapies**
Focus on increasing positive aspects of a person's life by mobilizing strengths, initiative, and creativity through expressive and mindfulness-related therapies. They can provide support, reduce stress, improve mood and focus, access and express thoughts and feelings, foster insight, increase self-awareness, and decrease isolation. These therapies offer a means to cope, enhance resilience, and provide a sense of accomplishment, fulfillment, and meaning.
- Art therapy
- Music therapy
- Mindful yoga
- Adapted sports
- Transcendental meditation
CONGRATULATIONS!

You have completed the PTSD/Anxiety Clinic’s Trauma Recovery Education Class.

Your next step is:

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

If you have any questions about this plan, please contact ENTER FACILITATOR NAMES HERE.
Appendix J

Patient Tracking and Protocol Fidelity Form for TREC Implementation

Veteran ID: _______________________________  TREC Cohort: _______________________________

1. Does the veteran have an existing diagnosis of sleep apnea (based on chart review)?
   Yes   No

2. Is the veteran compliant with sleep apnea treatment (based on veteran self-report or chart review)?
   Yes   No

3. Was the Veteran sent a STOP Questionnaire?
   Yes   No

4. Did the veteran return the STOP Questionnaire?
   Yes   No   If YES, score:

5. Did the veteran score positive on the STOP (answered “YES” to 2 or more questions)?
   Yes   No

6. If the answer to #5 is “YES,” was the following recommendation provided to the MHTC within TREC progress note or addendum?
   “This Veteran completed a STOP Questionnaire for sleep apnea and answered “YES” to 2 or more questions, indicating that the veteran has a high risk of Obstructive Sleep Apnea. It is recommended that a consult for a sleep study be placed (“Sleep Testing”).”
   Yes   No

7. Was the veteran sent an ISI?
   Yes   No

8. Did the veteran return the ISI?
   Yes   No   If YES, score:

9. Did the veteran score positive on the ISI (score of “8” or above)?
   Yes   No

10. If the answer to #9 is “YES,” was the following recommendation provided to the MHTC within TREC progress note or addendum?
This Veteran completed an Insomnia Severity Index and scored in the positive range, indicating subthreshold or clinical insomnia. It is recommended that a sleep assessment be performed by the MHTC or the sleep clinic and, if appropriate, a referral to CBT for Insomnia be placed ("CBTI Consult Outpt").

Yes
No

11. Veteran attended the following sessions of TREC and received the following education:

12.

a. Session 1
   Attended: _____________
   Educated about the co-morbidities of insomnia and OSA, with basic definitions provided: _____________
   Received patient education material about PTSD and sleep: _____________

b. Session 2
   Attended: _____________
   Session 1 Information reviewed: _____________

c. Session 3
   Attended: _____________
   Received education about recommended treatments for OSA: _____________
   Received education about recommended treatments for insomnia: _____________

d. Session 4
   Attended: _____________
   Treatment plan is in line with recommendations: _____________

13. Did the Veteran receive an electronic referral to the Sleep Clinic within 60 days following the TREC Cohort?

   Yes
   No

14. Did the Veteran receive an electronic referral to CBT-I within 60 days following the TREC Cohort?

   Yes
   No
Appendix K
Patient Education Material for TREC

Sleep Problems & PTSD

Taken from: https://www.ptsd.va.gov/understand/related/sleep_problems.asp
*please see website for helpful patient videos

Almost everyone with PTSD reports sleep problems. In fact, trouble sleeping is the main reason that people first go to a doctor to get help for PTSD. Both insomnia—trouble falling or staying asleep—and nightmares are PTSD symptoms. The good news is there are evidence-based treatments that can help with PTSD and sleep problems. And, these treatments help whether your sleep problems began before a traumatic event or only came about after the trauma.

Why Is Sleep Important?

Both how well (quality) and how much (quantity) a person sleeps are important.

Poor sleep may lead to:
- Slow reaction time
- Trouble with learning and memory
- Feeling irritable and mood problems
- Trouble with thinking and concentration
- Thinking about suicide or acting in ways that self-harm
- Also, sleep problems that last a long time are related to medical problems such as heart disease, depression, kidney disease, high blood pressure, diabetes, obesity and stroke.

How Does PTSD Affect Sleep?

Both nightmares and insomnia are symptoms of PTSD. Nightmares are often a replay of the traumatic event; and, if the dreams cause kicking and screaming, bed partners can be affected too. Nightmares can also make it difficult to fall back asleep. Insomnia is when a person has trouble falling or staying asleep at least three nights a week. This lack of sleep continues for a few months or more and is severe enough to cause problems at work and at home.

Because people with PTSD may try to push away trauma memories during the day, it may cause worries to get worse at night and disrupt sleep. Here are some examples:

Avoidance. People with PTSD may avoid going to sleep. Nightmares and flashbacks—feeling like the trauma is happening again—can create fear or feeling as if going to bed is unsafe.

Loss of sleep time. Whether or not insomnia is diagnosed, people with PTSD often report less sleep due to problems falling asleep, being restless during the night and waking up earlier than wanted. Even brief periods of sleep loss can affect daily life.

Increased arm and leg movement. After a trauma, people may have more arm and leg movements during sleep. This can make someone feel restless.

Talking during sleep. After a trauma, people may talk more in their sleep. Talking during sleep can affect bed partners. Feeling "on alert." People with PTSD may feel the need to be on guard, to protect themselves from danger. It is difficult to have restful sleep when you feel the need to be always alert or are startled easily by noise.
Not liking silence. Some may be uneasy with silence after a trauma. When this happens, a person may keep a television on all night. Changes in light and sound can disrupt the deepest and most needed level of sleep.

What Is the Relationship Between PTSD, Sleep Problems and Substance Use?

Sleep problems may become their own disorders that cause distress. As a result, some will use substances such as alcohol, marijuana, or other drugs to fall asleep. Over time, drug and alcohol use can also have negative effects on sleep quality and on overall health and functioning.

What Is the Best Treatment for Sleep Problems?

The best treatment for insomnia is Cognitive Behavioral Therapy for Insomnia, or CBT-I. This talk therapy is recommended over medication because it is more effective—CBT-I has been shown to work in multiple research studies—and has fewer side effects than medication. CBT-I improves sleep in 7 out of 10 people who complete it. Research also shows that CBT-I reduces how many nightmares people have and the distress related to upsetting dreams.

How does CBT-I work?

CBT-I focuses on a person’s beliefs, feelings, and behaviors that affect sleep. A trained CBT-I therapist may offer the treatment in one-on-one appointments or to a group of people with insomnia. It usually lasts six sessions. CBT-I can be delivered in person or through video medical appointments. There are also online programs and a smartphone app—CBT-I Coach—designed to help with the treatment.

What is “sleep hygiene” Is it the same as CBT-I?

Sleep hygiene includes various practices and habits that are important for good sleep. It includes tips to change behaviors that may interfere with sleep. For example, you may limit beverages with caffeine before bedtime to fall asleep more easily. Or, you may find that you need to adjust your sleep environment—such as limiting smartphone use or television viewing in bed—to be more comfortable. CBT-I, on the other hand, is a more focused treatment for chronic insomnia. Sleep hygiene is not the same as CBT-I treatment, but it is often included as a part of CBT-I.

What are the pros and cons of using sleep medication?

Sleep medication is easy to take and usually provides quick, temporary relief. There are many different types of medications used for sleep, from herbal supplements and over-the-counter sleep aids to prescription medications. If you choose to take medication, you should be familiar with the side effects and risks before you take it.

Sleep medication side effects usually include daytime drowsiness, dizziness and confusion. Sleep medication is often recommended for short-term use only (2 to 4 weeks). These medications usually become less helpful over time and don’t get to the core cause of sleep problems.

Certain prescription sleep medication can cause serious side effects with long-term use. Examples include:

Benzodiazepines: such as Xanax, Klonopin, Valium or Ativan
Nonbenzodiazepines (or "Z-drugs"): such as Ambien, Lunesta and Sonata

Although benzodiazepines—or "benzos"—can make people feel calm, relaxed or sleepy, they can become a problem in the long run and are not recommended for the treatment of PTSD.
Compare Your Treatment Options:

<table>
<thead>
<tr>
<th></th>
<th>CBT for Insomnia (CBT-I)</th>
<th>Sleep Medication</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>How It Works</strong></td>
<td>• Talk therapy addresses thoughts and behaviors that affect sleep</td>
<td>• Chemicals bind to receptors in the brain and make people feel calm or sleepy</td>
</tr>
<tr>
<td><strong>Side Effects</strong></td>
<td>• Time and practice to learn skills (sleep efficiency training)</td>
<td>• Some get less effective over time (tolerance)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Some are linked to dependence, withdrawal, accidental overdose, addiction, accidents, falls, confusion and memory problems</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Next-day sleepiness</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Pregnancy risks</td>
</tr>
<tr>
<td><strong>Things to Consider</strong></td>
<td>• Making time for weekly visits for therapy</td>
<td>• Don’t address the underlying problem (PTSD, worry, pain, or poor sleep habits)</td>
</tr>
<tr>
<td></td>
<td>• Requires being open to making changes in sleep behaviors</td>
<td>• May not be recommended for people 65 and older or for people with substance use issues</td>
</tr>
<tr>
<td></td>
<td>• Taking time to track your sleep (sleep diary)</td>
<td>• Dangerous interactions with alcohol and opioids</td>
</tr>
<tr>
<td><strong>Cost</strong></td>
<td>• Transportation and office co-pays</td>
<td>• Medication co-pay</td>
</tr>
<tr>
<td><strong>Benefit</strong></td>
<td>• Skills learned can be used for a lifetime</td>
<td>• Helps for one night</td>
</tr>
</tbody>
</table>

What Other Sleep Problems Affect People with PTSD?

Sleep apnea is common among people with PTSD, particularly in Veterans. Sleep apnea is a breathing problem that disrupts normal sleep. People with sleep apnea may wake up not feeling rested and struggle with feeling tired or needing to sleep during the daytime.

Being aware of sleep apnea can be difficult. There are many causes of fatigue or feeling tired during the day. Also, with sleep apnea, breathing pauses (or disruptions) happen during sleep, so a person may be unaware of those symptoms. Often a bed partner notices those breathing changes or snoring first.

To diagnose sleep apnea, a provider may recommend a sleep study. Treatment can include lifestyle changes and use of a breathing device—continuous positive airway pressure, or CPAP machine—at night. Research suggests that for those with PTSD and sleep apnea, using a CPAP device may benefit PTSD treatment.
Final Points About PTSD and Sleep

With PTSD, it can take some time and effort to get good sleep. Using marijuana, alcohol and street drugs to manage PTSD or sleep problems is related to a higher risk of thoughts about suicide and suicide attempts. There are effective treatments available for sleep problems and PTSD. Work with your provider to learn about your treatment options and decide on the best fit for your needs.
Appendix L

VACHS IRB Exemption

DEPARTMENT OF VETERANS AFFAIRS
VA Connecticut Healthcare System Research Office

Date: August 4, 2021
To: Gia Santoro, MSN, APRN
From: VACHS Research Office
Protocol Title: [1844423-1] Improving Treatment Outcomes for Veterans with PTSD and Sleep Disturbance
Review Type: Not Research/Quality Improvement
Action: Approved
Determination Date: August 4, 2021

The objective of this project is to adapt an existing assessment and treatment protocol for Veterans with PTSD and sleep disturbance for an outpatient VA PTSD clinic. The protocol will then be implemented in a patient education and treatment-planning group to increase referrals to evidence-based treatments that are recommended by the protocol. Veterans in this group will receive the STOP questionnaire for obstructive sleep apnea and the Insomnia Severity Index alongside the existing measures provided to Veterans attending the group. Educational components will be added to the existing curriculum to educate Veterans about sleep disturbance associated with PTSD and the common co-morbidities of OSA and insomnia. Results from this project will be used to bring the clinics in line with the latest research findings related to PTSD and sleep, and to improve overall patient care.

It appears that the project is designed to support the delivery of healthcare rather than to contribute to generalizable knowledge. It is not designed to expand the knowledge base of a scientific discipline or other scholarly field of study. The data collected will be used for quality improvement purposes rather than to test a hypothesis or answer a specific research question. It is not funded as a research study.

In view of these characteristics, the Research Office has made the determination that this project is not research. It does not require review by the VACHS IRB or R&D Committee. Publication or presentation describing the study is permitted.

Fred S Wright 363490
(Date 2021.08.04 14:58:48 -04'00')

Fred Wright, M.D. (Associate Chief of Staff for Research)
### Appendix M

#### Timeline

<table>
<thead>
<tr>
<th>Milestone</th>
<th>Projected Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adapt evidenced-based protocol for veterans with PTSD and sleep disturbance</td>
<td>8/1/2021-9/30/2021</td>
</tr>
<tr>
<td>Establish implementation team</td>
<td>9/1/2021-9/15/2021</td>
</tr>
<tr>
<td>Finalize implementation team meeting schedule and communication plan</td>
<td>9/15/2021-9/30/2021</td>
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<tr>
<td>Revise TREC curriculum and procedures</td>
<td>8/1/2021-9/15/2021</td>
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<tr>
<td>Train TREC facilitators in new manual process</td>
<td>9/15/2021-9/30/2021</td>
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<tr>
<td>Implement adapted protocol in TREC</td>
<td>10/1/2021-11/30/2021</td>
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<tr>
<td>Data collection/analysis</td>
<td>11/20/2021-12/31/2021</td>
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<tr>
<td>Permanently adapt new TREC procedure and curriculum</td>
<td>1/2/2022-1/31/2022</td>
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<tr>
<td>Report outcomes to PTSD Clinic</td>
<td>4/1/2022-4/30/2022</td>
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<tr>
<td>Submit abstracts to APNA Conference, and a peer reviewed journal for dissemination and potential publication</td>
<td>4/1/2022-4/30/22</td>
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<tr>
<td>Expand protocol to individual evaluations and treatment planning in West Haven VA PTSD Clinic and other PTSD clinics</td>
<td>5/1/2022-8/1/2022</td>
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## Appendix N

### Project Expense Budget

<table>
<thead>
<tr>
<th>Program Expense</th>
<th>Projected Cost</th>
<th>Actual Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Salaries/wages (Admin support, practitioners, statistics consultant)</strong></td>
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<td>$0</td>
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<tr>
<td>No additional costs</td>
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<tr>
<td><strong>Start-up costs (copies, charts, displays, etc.)</strong></td>
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<tr>
<td>Hard copy of screening measures (STOP &amp; ISI) for each TREC group attendee</td>
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<td>Hard copy of patient education material for each TREC attendee</td>
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<td>Postage &amp; return postage for each TREC group attendee</td>
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<td>Tracking sheet for each TREC group attendee</td>
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<td>Poster purchase/printing for conferences</td>
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<td><strong>Capital costs (hardware, equipment)</strong></td>
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<td>No additional costs</td>
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<tr>
<td><strong>Operational costs (heat/electricity)</strong></td>
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<tr>
<td>No additional costs</td>
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<td>$0</td>
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<tr>
<td><strong>Other</strong></td>
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<tr>
<td>Thank you breakfast for implementation team, PTSD clinicians and director</td>
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<tr>
<td><strong>Total Project Expenses</strong></td>
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<td>$280.80</td>
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