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UNIVERSITY OF SAN DIEGO
Hahn School of Nursing and Health Science
DOCTOR OF PHILOSOPHY IN NURSING

**EFFICACY OF MANTRAM REPETITION PROGRAM ON SLEEP IN VETERANS WITH
POSTTRAUMATIC STRESS DISORDER**

by

Lindsay Cosco Holt

**A dissertation presented to the
FACULTY OF THE HAHN SCHOOL OF NURSING AND HEALTH SCIENCE
UNIVERSITY OF SAN DIEGO**

**In partial fulfillment of the
requirements for the degree
DOCTOR OF PHILOSOPHY IN NURSING**

May 2014

Dissertation Committee

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Abstract

Posttraumatic Stress Disorder (PTSD) affects over seven million (3.5%) of the US adult population. In 2011, 476,515 veterans were currently seeking treatment for PTSD. Statistics show that 87% of veterans with PTSD report sleep disturbances and 52% experience frequent nightmares, making sleep the second most common reason why veterans seek mental health care upon return from deployment (Germain et al., 2006). Studies have sought to find a link between PTSD and sleep, and the importance of sleep in the recovery process, but there is a gap in the research on sleep disturbances and interventions for improvement in veterans with PTSD. The Mantram Repetition Program (MRP) teaches a portable method of meditation that has been shown to improve symptoms of PTSD in the Veteran population (Bormann et al., 2012). Qualitative studies have shown that veterans report improvements in sleep by using skills learned in the MRP. However, no quantitative study has been conducted to assess veteran sleep patterns before and after MRP.

This study's aims were to: (1) Evaluate the efficacy of the MRP on sleep habits; (2) Identify the aspects of sleep that are positively influenced by the MRP; and (3) Assess the demographic variables and their relationships to MRP and sleep outcomes.

Methods: The study was a retrospective review of supplemental sleep data collected during a within group pre-post test design. Four primary screening tools were used to evaluate PTSD symptom burden and sleep habits including the Clinical Administered PTSD Scale (CAPS) interview, Insomnia Severity Index (ISI), Glasgow Sleep Effort Scale (GSES), and Pre Sleep Arousal Scale (PSAS).

Results: Results for this study showed significant improvement in sleep after completion of Mantram Repetition Program using valid and reliable tools to measure insomnia, sleep effort, and presleep arousal.

Conclusion: With new cases of PTSD being diagnosed every day, more research is needed for best practices to improve outcomes for current and future veterans. With the present gaps in sleep knowledge and its effect on daytime symptoms, this research will help further identify interventions that are evidence-based with data-grounded results on intervention progression as well as symptom improvement. These studies address the global issues of PTSD, hoping to further expand treatment availability to those coming home from combat, and also looking to discover the best ways to prevent PTSD in the future. Results from this study will lend to the foundation of sleep intervention research on veterans with PTSD, in hopes to aid in symptom relief of veterans who have suffered with the adverse effects of the disorder. Research results will further explore the value of the MRP, aiding in its dissemination for others to learn and practice as a part of their daily routine.

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Efficacy of Mantram Repetition on Sleep in Veterans with PTSD

Chapter One: Introduction to the Topic

Posttraumatic stress disorder (PTSD) affects over seven million (3.5%) of the United States adult population, 36% of whom are categorized with a severe diagnosis. PTSD is defined as a psychiatric disorder that is triggered by a traumatic incident ranging from natural disasters, sexual assaults, and military combat exposure (American Psychiatric Association, 2000). As some survivors are able to heal over time, those with PTSD are unable to cope effectively. From nightmares to flashbacks, these symptoms cause impairments in social and occupational functioning. The most frequently documented symptoms of PTSD include anxiety, restlessness, anger, avoidance, unwanted memories, guilt, and insomnia, all of which interfere with quality of life (American Psychiatric Association, 2000). Recent studies have shown changes on magnetic resonance imaging (MRI) of function and tissue formation changes in the brain (Canive et al. 1997; Jatzko, et al. 2006). Medical and complementary therapies are available for symptom treatment, the latter currently identified as the recommended treatment method by the Department of Defense (DOD) (Shoenfeld, DeViva, & Manber, 2012). Recent reviews of published articles focusing on interventions to improve sleep quality in Veterans have shown these therapies are having a positive impact on sleep, though more research is needed. Examples of modalities used to aid in symptom alleviation include cognitive behavioral therapy for insomnia (CBT-I), imagery rehearsal

(IR), prolonged exposure (PE), meditation, and mindfulness interventions, though researchers are continually seeking improved methods of treatment.

Until 1980, PTSD was not considered a diagnosable disorder. It was first believed to be present only in Veterans unable to cope with the experiences of war. Tanielian and Jaycox (2008) found a sample of Veterans of the Afghanistan and Iraq conflicts (N=1,938) reported a PTSD prevalence rate of 13.8%. Research has also reported a 10.1% presence of PTSD in Gulf War Veterans (Kang, Natelson, Mahan, Lee, & Murphy, 2003), and a 30.9% prevalence of PTSD in Veterans of Vietnam (Kulka, et al. 1990). The gold standard for diagnosing PTSD is the Clinician Administered PTSD Scale (CAPS). Weathers, Keane, and Davidson (2001) define the CAPS severity scoring as remission (0-19), partial (20-39), PTSD (40-59), severe (60-79), and very severe (≥ 80) with a cutoff of ≥ 50 to diagnose PTSD. Other studies have reported using a different range of cutoff thresholds (P. Shnurr, personal communication, March 10, 2011). A decrease in overall score by ten points considered an improvement in symptom burden.

PTSD management and treatment costs the United States billions of dollars each year. The profile of those diagnosed with PTSD includes younger males with lower levels of education, having grown up in lower income households, with a history of multiple traumatic life events prior to service (Seal, Bertenthal, Miner, Sen, & Marmar, 2007). Research has found that 87% of Veterans with PTSD report sleep disturbances and 52% report nightmares, these complaints being the second most common reason for Veterans to seek mental health care upon return from deployment (Germain, Shear, Hall, & Buysee, 2006). The effect of PTSD on sleep quality is an essential component of Veteran treatment. Poor sleep quality compounds daytime impairment, leading to an increased

reaction to stimuli, and an inability to focus, concentrate, and achieve goals. Impaired sleep has also been associated with an increased risk of suicide (Nishith, Resick, & Mueser, 2001). Research shows a significant relationship between sleep deprivation and continued exposure to high amounts of stress leading to decreased health outcomes (Clum, Pallavi Nishith, & Resick, 2001). Research on pharmacologic and nonpharmacologic interventions to improve daytime effects of PTSD have been published (Nappi, Drummond, & Hall, 2011), but more research is needed to evaluate interventions on sleep quality in this population.

Bormann and colleagues (2012) conducted a prospective, single blind, randomized trial to compare usual treatment with the Mantram Program (MP) in Veterans with PTSD. A mantram, when translated from Sanskrit, means to cross the mind. It is a short phrase or word repeated in silence anytime, anywhere, to center and find focus (Easwaran, 2008). MP is an eight-week program teaching a portable, meditation-like practice, which provides tools to help the Veteran become one-pointed and slow down. This research reported MP to be statistically significant ($p < .05$) in reducing PTSD Checklist (PCL) and CAPS scores at posttreatment, and these improvements continued after the intervention had completed. Significant results ($p < .001$) were also seen on the Brief Symptom Inventory-18 (BSI) depression subscale (Bormann, Thorp, Wetherell, Golshan, & Lang, 2012). Mindfulness based therapies have been linked to decreased stress levels and a reduction in reported depressive symptoms (Vago and Silbersweig, 2012). Results of significant symptom improvement in PTSD scores collected using the CAPS supports previous studies with family caregivers of Veterans with dementia (Bormann, et al. 2009), and patients with Human

Immunodeficiency Virus (HIV) (Bormann, Gifford, Shively, Smith, Redwine, Kelly, ... & Belding, 2006). Based on the significant results indicating overall improvement of PTSD symptoms using the MP, this efficacy study was conducted to assess its effects on sleep in Veterans with PTSD.

Purpose and Specific Aims

The purpose of this study was to examine the effects of the Mantram Program on sleep in Veterans with PTSD. Specific aims were to:

1. Evaluate the efficacy of Mantram Program on sleep in Veterans with PTSD.
2. Examine demographics in a sample of Veterans with PTSD who have completed MP.
3. Describe the relationship between previous/current meditation practices and assessment scores.

Hypotheses

1. MP will aid in the improvement of sleep quality.
2. Demographic data will not be different for Veterans who completed the MP and those who did not.
3. Veterans with previous use of meditation will show a more significant improvement in sleep quality after the introduction of MP.

Theoretical Perspective

The theoretical framework Improving Sleep Quality with the MP was developed to depict the introduction of MP to Veterans with PTSD, and the journey towards improving sleep quality (Figure 1). This was adapted from three previously published frameworks (Prochaska, Norcross, & DiClemente, 1995; Vago & Silbersweig, 2012; Veteran Affairs San Diego Healthcare System, 2014).

First, Prochaska's parent theory of readiness to change begins the process of recognizing a bad habit and the mental preparation and action required for successful behavior change. Prochaska began exploring the stages of change in the 1970s, and with years of work, Prochaska, DiClemente, and Norcross (1992) published their theory on the transtheoretical model of Health Behavior Change. These steps begin with pre-contemplation, where the thought for a need to change may not be present. This is followed by the contemplation stage, where the idea of change has come, first as a passing thought and then as a decision with a unspecified timeframe to initiate change. The next stage is preparation, where the person decides to make a change and puts plans in place to begin working towards change. The final steps to successful change are taking action and maintaining the changed habits. In the action stage, the behavioral change is being made, but still requires effort to maintain it. Maintaining lifestyle changes requires effort to continue the change along with the knowledge that it is possible to revert back to previous habits and behaviors (Prochaska, et al. 1995).

Building on this, Vago and Silbersweig (2012) published a framework to display the process of a mindfulness intervention and the steps it takes to habitually use mechanisms such as working memory and executive monitoring to focus and obtain

emotional regulation. This framework illustrates how through intention and motivation, a mindfulness intervention can be initiated. It describes the manner in which distraction and disengagement can disrupt the process and further interrupts positive behavior change. The framework is applicable to the MP in that it requires effort, engagement, habit, and executive monitoring in order for mantram repetition to become automatic responses (Vago & Silbersweig, 2012).

Within this article, Buddhist origin of the word “sadness” signified the inability to avoid unwanted thoughts. As in Buddhist practice, breaking free of the negative thoughts requires balance and mental clarity. Equanimity, or the ability to openly acknowledge the passing of thoughts and experiences, allows one to separate from the thoughts of avoidance (Vago & Silbersweig, 2012). If unable to separate from the unwanted thoughts and feelings, there remains a cyclical reinforcement of negative symptoms. The intent of mindfulness interventions is to bring a sense of calm, the ability to recognize thoughts and feelings, without attachment to them and to continue with minimal reaction.

As previously discussed, sleep disturbances of Veterans with PTSD affect daytime symptom burden, which in turn continues to impact nighttime PTSD symptoms. Further examining the Mindfulness Process Model, it is found that mantram repetition can be comfortably expressed within a portion of this framework. In order to participate in MP, intention and motivation must be present to initiate involvement. Stuck in a cycle of impaired sleep, the choice is made to participate in changing behaviors with the goal to improve sleep quality. Individually, each framework was able to identify a portion of the adapted framework needed to exemplify the process of improving sleep quality in Veterans through MP. Prochaska and DiClemente highlight the steps needed to create

and maintain change. Vago and Silbersweig (2012) illustrate the mechanism in which intention and practice initiate participation in a practice, while also highlighting the distractions and disengagement that takes place while instituting change.

In the case of MP as the intervention, the framework describes the process of change, as it does not always have a linear progression. After recognizing the need/want to change, and initiating the participation in change behaviors, practice is mechanical. Intent must be present to start utilizing your mantram. Mental cues are given to initiate using the mantram, when it is needed and not. At this stage the first tools are available to help improve sleep, but the opportunity to revert to previous sleep habits is a constant. Practiced repetition in times where distress is not present leads to easier access of mantram repetition in stressful situations. Named the experiential stage, the mantram use at bedtime is necessary to improve sleep quality. The last stage of this framework, mantram use becomes habitual. As adapted from the mindfulness framework (Vago & Silbersweig, 2012), distraction and disengagement from the intervention impacts the ability for the Veteran to get to a place of using mantram as a habit (Figure 1). Each of these stages can be interrupted, causing Veterans to fall back into disruptive sleep patterns. With intention and motivation Veterans can re-integrate their mantram in daily practice again at any time, and continue to progress through this cycle until it becomes habitual, which initiates the relaxation response, and as a result, sleep. This adapted framework describes the process of improving sleep quality and the steps needed to make change through the use of MP, but can also be very versatile in illustrating many types of change scenarios.

Implications for Nursing

With new cases of PTSD being diagnosed every day, more research is needed to identify best practices to improve sleep quality for current and future Veterans. With the present gaps in research involving the impact of interventions, such as MP, on sleep in Veterans with PTSD, this research aims to provide clinicians with an evidence-based and data grounded intervention that promotes symptom improvement. Results from this study will add to the foundation of sleep intervention research on Veterans with PTSD, in hopes to aid in symptom relief of Veterans who have suffered with the adverse effects of the disorder. Research results will further support the MP intervention, aiding in its dissemination for others to learn and practice as a part of their daily routine. This study addresses the global issues of PTSD, hoping to further expand treatment availability to those currently diagnosed with PTSD, and those at risk.

CHAPTER TWO: Manuscript One

Interventions to Improve Sleep in Veterans with PTSD: review of current literature

Introduction

Prevalence of PTSD in Veterans of the Afghanistan and Iraq conflicts were reported to be 13.8% in a 2008 study (N=1,938) (Tanielian & Jaycox, 2008) . Research has also reported a 10.1% presence of PTSD in Gulf War Veterans (Kang, Natelson, Mahan, Lee, & Murphy. 2003), and a staggering 30.9% prevalence in Veterans of Vietnam (Kulka, et al., 1990). The most frequently documented symptoms of PTSD include anxiety, restlessness, anger, avoidance, and insomnia, all of which interfere with quality of life and function in daily activities. Statistics show that 87% of Veterans with PTSD report sleep disturbances and 52% report nightmares, these complaints being the second most common reason for Veterans to seek mental health care upon return from deployment (Germain, et al. 2006). Participant retention data show drop out rates from mental health care to be as high as 21% (Hembree & Foa, 2003), with up to 50% nonresponsive rates on mail-in documentation (Schotenbauer, Glass, Arnkoff, Tendick, & Grey. 2008). Research on pharmacologic and nonpharmacologic interventions to improve daytime symptoms of PTSD have been published, but more research is needed to evaluate these interventions on sleep quality of those diagnosed with PTSD.

Current behavioral therapies available for the treatment of PTSD include prolonged exposure (PE), eye movement desensitization and reprocessing (EMDR), image rehearsal (IR), cognitive behavioral therapy for insomnia (CBTI), mindfulness strategies, and meditation (Nappi, et al. 2011). Pharmacological treatment protocol for

PTSD is varied, with the use of multiple approaches including medications such as antidepressants, antipsychotics, anticonvulsants, adrenergic-inhibiting agents, and sedative hypnotics (Nappi, et al. 2011). The Veteran Affairs (VA) and DOD Clinical Practice Guideline for Management of Post Traumatic Stress recommends nonpharmacological treatments as first choice for insomnia and nightmares (Shoenfield, et al. 2012). Significant research results have been published to support the use of nonpharmacologic therapy interventions on PTSD alone and in conjunction with medication to improve overall PTSD symptom burden. Many fewer studies have been published exploring the effects of these interventions, specifically measuring the improvement of sleep quality. As these therapies are the recommended first line of intervention, the purpose of this section is to perform a literature review of published research on therapies that focus on sleep quality in Veterans with PTSD. It will identify gaps in the research utilizing nonpharmacologic therapies, and how these interventions relate to sleep quality.

Principal Literature Reviews

Multiple online libraries were used in compiling the research articles for this literature review. Ovid, Medline, PubMed, and Cumulative Index to Nursing and Allied Health Literature (CIHNAL), and online university libraries were used to search for published works. Both classic articles and current research publications were gathered using search terms including PTSD, trauma, Veterans, sleep, alternative therapies, complementary therapies, and mindfulness interventions. This was cross-referenced with anxiety, anger, avoidance, nightmares, and insomnia. Search queries yielded published works examining a multitude of interventions and their impact on PTSD. Chosen

research for this review will discuss interventions using behavioral and complementary therapies to improve sleep quality in multiple populations meeting diagnostic criteria for PTSD, including studies focused on military Veterans.

A literature review on sleep and posttraumatic stress aims to provide an overview of sleep and its effect on PTSD. Within this review, published work of Morrison (1989) described sleep disturbances as the hallmark symptom of PTSD. In this study, which included military Veterans, Holocaust survivors, and prisoners of war, all had been diagnosed with PTSD. Ninety seven percent of participants reported complaints of poor sleep quality and nightmares. Within this review, highlighted studies were divided into subjective and objective reports of sleep disturbances. Subjective reports included sleep-onset insomnia, sleep maintenance insomnia, early awakening, and nightmares. Two studies showed similar reports of difficulty in sleep onset and maintenance, 44% and 91% respectively of those in the National Vietnam Veterans Readjustment Study (Neylan et al. 1998), and 41% and 47% of participants in sleep disturbances in psychiatric disorders associated with PTSD in the general population (Ohayon & Shapiro, 2000). A study published by Inman, Silver, and Doggramji (1990) compiled six themes found within their study surrounding the characteristics of sleep related anxiety. These included fear, waking up disheveled, traumatic thoughts, outbursts during sleep, confusion upon arousal, and difficulty returning to sleep in the middle of the night.

Sleep

Within the literature review, Harvey, Jones, and Schmidt (2003), discuss the potential of 'subjective insomnia' when interviewing subjects, where participants report a greater degree of sleep disturbance than the actual amount of sleep obtained during the

night. Researchers have suggested this can occur in many populations with insomnia, and suggest future studies collect both a subjective and objective measure of total sleep time in order to adequately assess sleep deprivation. Arousal and awaking thresholds, rapid eye movement (REM) sleep, body/limb movement during sleep, and breathing related sleep disorders are identified as other impacting factors that can have either medical or psychological origin. The review shows indications that these happenings should also be addressed when evaluating overall PTSD, as resolving these issues individually can decrease overall PTSD severity.

The most recently published review of the literature published by Shoenfeld, DeViva, and Manber (2012) discussed multiple research studies on sleep and PTSD. Key words used in their literature search included PTSD, stress, stress response, sleep disorder, sleep disturbance, and insomnia. Terms were cross-referenced using Veterans, nightmares, cognitive behavioral therapy, imagery rehearsal, polysomnography, physiology, drug, and drug class. Data showed up to 87% of diagnosed PTSD cases suffer from sleep disturbances (Shoenfeld, et al. 2012). Sleep is the second most common reason for referral to mental health services in Veterans returning from deployment. Monitored sleep studies found participants to have more frequent dreams, more awakenings during the night, greater number of REM cycles, and a decreased amount of time spent in stage four sleep (Shoenfeld, et al. 2012). The review concluded that PTSD affects sleep by compounding daytime symptoms, and continues to impede recovery long after daytime symptoms begin to alleviate.

Another literature review published by Nappi, et al. (2012) presented a thorough collection of past and current research interventions for sleep in populations with PTSD.

This literature review included populations that had been diagnosed with PTSD from any traumatic incident, not necessarily related to military service. Authors reported a lack of behavioral based interventions to study sleep and PTSD. Common themes found during this review discussed the great impact of insomnia on PTSD symptom burden, which then creates fear secondary to sleep deprivation, as well as leading to increased suicidal ideation. It also showed that nightmares and insomnia interfere with recovery from traumatic experiences and are linked to compounding daytime impairment and distress. (Nappi, et al. 2012). Suggestions for future studies discussed in this literature review involve the inclusion of a control group for means of comparison to those with diagnosed PTSD in order to best compare characteristics between groups.

Nonpharmacologic Interventions on Sleep and PTSD

Nappi, et al. (2012) described a multitude of pharmacologic and non-pharmacologic therapies treatments currently used to improve sleep in PTSD. Behavioral therapies included IR, exposure therapies, and CBT-I. Prior to 2011, only two validated measures of sleep had been studied in Veterans with PTSD, and it was emphasized that further research was necessary to provide evidence for complementary therapies and their effect on sleep quality in Veterans using of validated and reliable sleep measures. The review discussed CBT-I as the intervention using the best-validated tools to measure and treat insomnia in Veterans with PTSD. Research shows consistent data reporting decreases in insomnia and improvement of sleep quality with CBT-I for populations without PTSD, through the use of multiple data collection methods. CBT-I has been shown to improve sleep hygiene, sleep restriction, and stimulus control through conditioned arousal, examining reasons sleep disturbances are present, and working at

decreasing sleep arousal and worry. An article by Zayfert and DeViva (2004) discussed a retrospective review of a small sample (n=27) of Veterans that fell below the threshold of PTSD after CBT-I treatment. Data points were measured using specific questions from within the CAPS. This study reported anger was the PTSD symptom most associated with insomnia, and after the CBTI intervention, there was seen to be a significant decrease in the reports of both insomnia and anger, though no validated sleep assessments were used in the study (Zayfert & DeViva, 2004). Only one study by Raboni, et. al. (2006) used polysomnography, sleep onset latency, and wake after sleep onset over two points during the intervention to directly assess for improvement of sleep quality (Nappi, et al. 2012).

Cognitive Behavioral Therapy for Insomnia

Swanson, Favorite, Horin, and Arnedt. (2009) published results showing significant improvement of nightmares when CBT-I was combined with a separate nightmare treatment program, with similar results yielded by Germain, et al. (2006) and Krakow, et al. (2001). Using different tools of data collection, the ability to report on the impact of CBT-I therapy alone was unable to be ascertained (Nappi, et al. 2012). Overall, this review of sleep literature illustrates the impact of sleep disturbances in PTSD, and the need for more studies using validated measures to assess improvement of sleep quality and PTSD symptoms. Inconsistent findings due to a wide range of invalidated and subjective tools further support this call for research. When reported by Cooper and Clum (1989), 77% of their participants reported recurrent nightmares after a three-month behavioral therapy program and stated the desire for treatments specific to improve sleep quality.

A factor analysis on sleep quality in Veterans with PTSD was published in 2012 to identify impact, association, and predictability using the Pittsburg Sleep Quality Index (PSQI) (Babson, Blonigen, Boden, Drescher, & Bonn-Miller, 2012). The purpose of this study was to shed light on the importance of properly assessing sleep quality in Veterans and recommendations to determine sleep quality using the PSQI. 226 Veterans with PTSD were included in the study and assessed using the PSQI to measure sleep quality, the CAPS for diagnosis of PTSD, and the Beck Depression Inventory to measure depressive symptoms. Exploratory factor analysis and path analysis were used to determine the factor structure of the PSQI. One factor focused on sleep latency, quality, disturbance, and impact on daily functioning. The second aimed to assess sleep efficacy and duration using the PSQI. Using factor analysis investigators were able to observe which portions of the assessments measured depressive symptoms versus symptoms of PTSD. Results showed an association of correct PTSD diagnosis through measures focused on sleep quality. Limitations to the study focused on the study population, being predominantly older male Veterans. Future studies would need to be conducted on a broader population in order to generalize results.

Schoenfield, et al. (2012) discussed sleep disorders that often coincided with insomnia, including periodic limb movement disorder, which is a sudden movement of extremities during sleep, rapid eye movement sleep behavior disorder, and sleep disordered breathing, and obstructive sleep apnea (OSA). Multiple alternative therapies were presented, along with the mechanisms on which they impact stress and insomnia. Interventions included trauma-focused cognitive behavioral therapy for PTSD, with a potential link between CBT-I and sleep, though no direct relationship was studied in the

research. Another study reviewed by Shoenfeld, et al. (2012) found that sleep quality was not always impacted in the same way daytime symptoms were alleviated by the intervention. These outcomes could be explained by nightmare occurrence, extended amounts of time spent awake in bed, and the studies not addressing specific applications of the intervention to sleep and nighttime activities.

In the Shoenfeld, et al. (2012) review of CBT-I as an intervention to improve sleep quality was found to be as beneficial or better than pharmacological treatments for insomnia in the general population. Lasting effects up to two years post-intervention were reported in two meta-analyses performed by Morin, Cublert, and Schwartz (1994) and Murtagh and Greenwood (1995), containing a combined 3,640 participants. Research reviewed in this meta-analysis showed CBT-I interventions for PTSD reporting significant improvements in sleep by DeViva et al. (2005). These results were similar to previous studies, but in some cases, diagnostic criteria for PTSD had not been met by many of the participants, and many had been enrolled in previous cognitive behavior therapy research studies. These factors limited the significance of their CBT-I intervention alone.

A combined intervention study looking at imagery rehearsal and CBT-I was studied in participants with PTSD and found mixed results, with one study finding subjects reporting improvement in sleep quality and overall PTSD symptoms, while others found no significant impact from CBT-I. Drawbacks to CBT-I are the intensity of the program and small number of interventions conducted in the PTSD population, specifically Veterans with PTSD. While CBT-I taught positive habits to improve sleep, the relaxation training and cognitive restructuring did not address specific needs of

Veterans, who suffered not only from insomnia and nightmares, but the vast array of symptoms indicative of a PTSD diagnosis. More research is needed on Veteran participants meeting diagnostic criteria for PTSD related to military duty to ascertain the effects of CBT-I in this population.

A study by Krakow, et al. (2001) used IR, where participants were instructed to take a recurrent nightmare and practice changed scenarios in order to interrupt the nightmare repetition when sleeping. A technique previously used to treat nonspecific chronic nightmares was applied in a population of sexual assault victims with PTSD, which resulted in a decrease in nightmare prevalence and improved sleep quality. Forbes, Phelps, and McHugh (2001) published a pilot study applying IR to combat servicemen with PTSD and nightmares, with similar findings. Shoenfeld, et al. (2012) reported the application and technique of teaching IR to be varied by study, and though report of nightmares decreased and sleep quality improved initially, there were no significant improvements at follow up appointments after the intervention was completed. The exact mechanism of IR in nightmares is not known, but multiple explanations exist for its success. Research suggests there to be a release of anxiety associated with the nightmare when different scenarios are practiced during awake hours (Shoenfeld, et al. 2012). The Standards of Practice Committee of the American Academy of Sleep Medicine reported IR therapy to be a Level A intervention for nightmares and effective in PTSD, but looking closer at the participant demographics, many were found to not have met diagnosis for PTSD in both the intervention and control groups at enrollment (Shoenfeld, et al. 2012).

Imagery Rehearsal and Exposure Therapy

IR and exposure therapy (ET), including exposure in isolation, exposure within systematic desensitization, and exposure, rescripting and relaxation therapy have not been found by Cook, et al. (2010) to be any more effective than other behavior therapies on sleep quality and nightmares. It was found that many of the research studies involving Veterans with PTSD had low recruitment rates and high dropout percentages, as well as an unreliable means of data collection and reportability. There were positive results with the practice of IR during the day and a decrease in the prevalence of nightmares. The important factor found to be missing in most data collection on behavioral therapies and their effect on sleep quality and nightmare occurrences was the inclusion of a PTSD diagnostic tool to confirm PTSD in participants, and consistent tracking sheets to collect data targeting sleep quality using validated methods and measures.

An Eye Movement Desensitization and Reprocessing (EDMR) intervention to improve sleep quality by Shapiro (2001), (n=9), showed improvement in sleep habits, though it was noted the habitual routine of the intervention activities could have skewed data pertaining to the improvement of symptoms (Nappi, et al. 2012). None of the previous studies had participants report nightmare prevalence or intensity.

In a pilot study conducted by Germain et al. (2006) IR, sleep and nightmare education, the implementation of stimulus control, and sleep restriction were compared to a control group to see the effect on sleep quality. Each participant in the treatment group attended one ninety-minute session covering these variables and using the tools to complete a sleep diary for 7-10 days, whereas the control group was asked to maintain sleep diaries without intervention. Measurements included total sleep time, sleep latency,

wake time after onset, and sleep efficiency. They also recorded the number of nightmares reported each night. Seven participants completed all necessary assessments. Through the use of Wilcoxon signed rank tests and the computation of Cohen's d (d) effect sizes, there was found to be small to moderate significance in improvement of symptoms after the intervention when compared to the control (Germain, et al. 2006). This study used a variety of validated tools to assess sleep quality improvement over time, but given the minimal amount of education and maintenance assistance during data collection, the results may not accurately assess the intervention. With a larger number of participants receiving the intervention and with education through a group or individual meeting on a more frequent basis, it would be possible to collect more data to ascertain the effects of any behavioral therapy on sleep quality.

Yoga

In a treatment study on yoga for chronic insomnia researchers collected data on 20 participants who met criteria for insomnia using variables of sleep efficiency, total sleep time, sleep onset latency, wake time after sleep onset, and number of awakenings. Intervention included a pre-treatment method, which was daily life without yoga practice, then daily yoga practice lasting an hour per day for eight weeks. During yoga poses, participants were taught a mantra to use during breathing exercises. To interpret the data, a two-way repeated measures analysis of variance (ANOVA) was used. Results showed a significant decrease in total wake time, $F(4,76)=9.14$; $p<.001$; and increases in sleep efficiency, $F(4,76)=8.86$; $p<.001$; total sleep time, $F(4,76)=6.02$; $p<.001$; and wake after sleep onset $F(4,76)=6.42$; $p<.001$ (Khalsa. 2004). No significant improvement was found in quality of restfulness, number of awakenings, and sleep efficacy. Khalsa (2004)

compared these results to two meta-analyses of behavioral therapy interventions to improve insomnia, the first by Morin et al. (1994), and the second by Murtagh and Greenwood (1995), which showed concurrent results. However, it is difficult to determine how much improvement presented in the results was due to mantra repetition with yoga as opposed to yoga alone. As an uncontrolled study, more research is needed to explore the effects of yoga alone in a randomized control trial. Using the participants for the intervention and comparing their pre-intervention sleep diaries to those collected after implementation of the yoga intervention, the data cannot be assumed to project similar results to those with a control group.

Mindfulness

In a pilot study conducted by Ong, Shapiro, and Manber (2010) 21 participants between the ages of 18-65, who met criteria for physiological insomnia were asked to retrospectively look at sleep quality after a mindfulness meditation and CBTI program. Using total sleep time, total wake time, time spent in bed, and occurrences of awakenings during the night, researchers were able to rate sleep quality, daytime sleepiness, and daytime tiredness using sleep diaries. Data was also collected using the Insomnia Sleep Index (ISI), Pre-Sleep Arousal Scale (PSAS), Glasgow Sleep Effort Scale (GSES), positive and negative affect schedule, and the insomnia episode questionnaire (Ong, et al. 2009). Follow up meetings were scheduled at six and 12 months, where at each time, one week of sleep diaries were collected. Results of the study showed benefits from the intervention that was maintained through follow up appointments. Limitations of the study were not having participants complete sleep diaries during the intervention, only collecting sleep data after program completion.

Benson and Kippler (1976) published *The Relaxation Response*, which was one of the first books of its kind to link the relaxation response and its effect physiologically on the human body. The relaxation response (RR) has been practiced for centuries, with reports of practitioners able to control their blood pressures, heart rates, oxygen consumption, and metabolism. In conjunction with the Harvard Medical School and the Beth Israel Hospital in Boston, Dr. Benson was able to disseminate the relaxation response and its beneficial effects on the body to the Western world through the eyes of medicine. He found that he was able to take Eastern philosophy and apply it to modern science, making connections between stress and disease pathology, specifically hypertension, strokes, and kidney disease. His research showed that by initiating the RR, it was possible to decrease stress by lowering the heart rate, respiratory rate, muscle oxygen consumption, and metabolic rate. The RR could break the stress cycle induced by the sympathetic nervous system as seen in the fight-or-flight mechanism (Benson & Klipper, 1976).

Over time, the RR was applied to different populations to assess its efficacy on stress reduction. Many comparisons between the RR and sleep were presented within Dr. Benson's publications to associate these links with his. In discerning whether RR was a form of sleep, Benson found many of the known variables of sleep were not present during the relaxation response. Lack of REM, frequent and stronger alpha brain waves, faster decline of oxygen consumption, and a decrease in lactate levels were indicative of the RR, whereas the opposite was known to be true during sleep. Nevertheless, the idea was presented of possibly using the RR to aid in falling asleep as well as overall reported sleep quality (Benson & Klipper, 1976).

In the last ten years, researchers have taken Benson's work on the RR to further study the physiology of stress on the body. Esch, Fricchione, and Stefano (2004) made reference to Benson's work and strengthened the connection between the RR and its beneficial effect of stress. Esch, et al. (2004) discussed 'allostasis', the ability to maintain stability through change, and the effect over time this has on the body if unable to adapt to change, or stress, and to find the mechanism in the body to ascertain if meditation could improve symptoms. In building on current research correlating stress to cortisol and norepinephrine, he proposed that anandamide and melatonin in conjunction with nitric oxide (NO) was also related to the stress and RRs in the body. Using peer-reviewed references, there was found to be a basal level at which NO is expressed on a regular basis (Esch, et al. 2004). Results also showed that NO can both potentiate the effects of meditation, as well as hinder the desired outcome, depending on the person and co-morbidities present. Most importantly, there needed to be a balance of NO expression, and at low levels it deemed beneficial to the body, counteracting norepinephrine release, further aiding in the RR (Esch, et al. 2004). As this was a literature review and there was no intervention to test the hypothesis, there was not enough evidence to provide a direct correlation between NO pathways and RR as a means of reducing stress.

Various forms of meditation can initiate the RR. Three of the most practiced types of meditation are concentrative, open monitoring, and transcendental (Travis & Shear, 2010). Concentrating meditation involves focusing on a single object, such as the breath, a word or mantra, a picture or an image. Open monitoring is a focus on thoughts passing through the mind, or on present activity. Transcendental Meditation (TM) utilizes a sound or an assigned mantra to be repeated silently while sitting with eyes closed to

experience a state of 'transcendence' beyond thoughts (Travis & Shear, 2010). Meditation allows a person to become and remain focused and calm, acknowledging all the thoughts passing through the mind, but letting them go to return to focus and calmness, while maintaining a non-judgmental state.

Out of the University of California College of Medicine, Walsh and Shapiro (2006) published *The Meeting of Meditative Disciplines and Western Psychology* to discuss the steps necessary in building the relationship between western medicine and complementary therapies, where it has come from, and where it will need to go in the future to continue to flourish. It describes the history as first having been mutual ignorance, followed by a paradigm clash, and finally assimilative integration. The article then goes on to describe three future stages being necessary to ensure interdisciplinary success. They are being mutual enrichment, an integrative step to properly combine the two processes, and finally a state of cohesiveness in which both meditative disciplines and Western psychology are equally represented through theoretical frameworks. The article discusses where current research lies and its application through studies on TM. It examines its psychotherapeutic effects, its impact on well-being, and current known limitations in research, and offers suggestions for tailoring future studies to address current gaps. Next the article discusses the mechanics and process of meditation, and the potential impacts on western psychology. Areas of improvement depicted in the article include attention, sense withdrawal, thought and cognition, lucidity, emotional intelligence, equanimity, motivation, and moral maturity. It is then suggested that this is only the beginning of the potential impact of meditation, with some of the benefits having not yet been explored (Walsh & Shapiro, 2006).

Meditation

In 2008, an article was published describing the neuroscience behind meditation. Lutz, Slagter, Dunne, and Davidson (2008) categorize meditation into focused attention, choosing an object to focus and concentrate on, and open monitoring, monitoring experiences as they happen. Multiple areas of the brain are said to be responsible for concentration, engagement, and redirection, with specific areas identified in the mechanisms of conflict monitoring, selective attention, and sustained attention. Studies described within this publication show correlation between brain function and meditation. One's ability to become refocused comes with continued practice. The article emphasized these findings as preliminary in the greater understanding of meditation on brain function, and that future tests will be needed to better understand the mechanics and effects scientifically (Lutz, Slagter, Dunne, & Davidson, 2008).

Lang, et al. (2012) presented three types of meditation as contenders to improve PTSD and alleviate symptoms associated with the diagnosis. Mindfulness meditation is based on attention, being present in the moment, without judgment as defined by Kabat-Zinn (1994). This is applicable to the veteran population with PTSD in that focused attention allows redirection of thoughts away from triggers that expose negative thoughts and feelings. In a similar vein, mantra meditation, loving kindness, and compassion meditation involve reduction of physiological arousal, increase positive emotion, and increase social connectedness. These are hypothesized to improve PTSD symptoms, though additional studies are necessary. Possible outcomes of meditative practice on PTSD symptoms include increased control of thoughts and memories, shifting attention, and improving emotional self-regulation, while reducing worry, avoidance, hyperarousal,

and negative thoughts. With these improvements, Veterans may be able to improve coping skills and resilience, and also be able to increase social support systems (Lang, et al. 2012).

Mantram Repetition

Mantra or mantram repetition is a way of initiating the RR brought to the United States from India by Eknath Easwaran (1910-1999) by his teaching at the University of California Berkeley. Mantram repetition is an adaptation of mantra meditation, used for centuries in other cultures and religions. Derived from Eknath Easwaran and his eight-point passage meditation program, the MP focuses on three of the eight points to help with redirecting thoughts, improving concentration, and regulating emotions. After conducting a study with significant results using mantram repetition to alleviate stress in a population of patients with HIV/AIDS, Bormann and colleagues decided to expand her research to include Veterans of war, specifically those with PTSD, to assess whether the mantram program could have a significant improvement on daily living and a reported decrease in symptoms (Bormann, et al. 2012).

In a randomized study on the mantram intervention for Veterans with PTSD showed significant reductions in PTSD symptom severity, when used in combination with treatment as usual, as compared to those receiving usual treatment only (Bormann, et al. 2012). The study focused on Veterans having been diagnosed with PTSD as a result of their service. Enrolled Veterans were 97% male, serving predominantly in the Vietnam War, Korean War, and Operation Desert Storm, with an average age of 57 years. Prior to the intervention, Veterans were asked to complete a CAPS assessment, PTSD Checklist-Specific (PCL-S), Brief Symptom Intensity -18, Health Survey Short Form (SF12), and

the Functional Assessment of Chronic Illness Therapy –Spiritual Well-being Scale (FACIT-SP). Of 146 participants, 130 were retained for the length of the study. Twenty-four percent reported significant improvement, no longer meeting PTSD diagnostic criteria on CAPS, in comparison to the usual treatment group reporting improvement of twelve percent. Further improvement was seen at the six-week follow up. Per current research results, significant improvement in PTSD scores are met when participants have a 10 point or greater reduction on their CAPS score post-intervention and a total score less than 45. To analyze data, the study used ANOVA design for each dependent variable, a two tailed alpha at 0.05 to test the hypothesis, and the utilization of Fisher's exact test allowing for interpretation of CAPS ratings (Bormann, et al. 2012). Ninety-seven percent of Veterans enrolled in the study reported high treatment satisfaction, and there were no adverse effects noted by any of the participants. Sleep and nightmares were not assessed during treatment, although Veterans stated an improvement in their daily life quality and well being.

Bormann, Hurst, and Kelly (2013) published a qualitative analysis on the effect of MRP in Veterans with PTSD. Data for this publication was collected by phone interviews 3 months after the completion of their attended MRP classes. Two questions were asked during the interview: "Can you think of a time that you used the mantram to manage your PTSD symptoms?" and "Can you tell me about any other situations (unrelated to PTSD) in which you used the mantram?". Inductive classification was used to analyze the information gathered from the Veterans. Themes were organized into four primary categories: triggering events, symptomatic responses to events, symptom coping, and outcomes (Bormann, Hurst, Kelly, 2013). Ninety-two percent of Veterans were found to

still be using their mantrams effectively. Most common applications of mantram were found to help calm down and relax, let go of negative feelings, to help think clearly and rationally, and disengage triggers. Driving, social interactions, sleep, and interpersonal relationships were documented as the most common event triggers in which mantrams were utilized. Veterans reported sleep improvement with the use of their mantram during these interviews. This provides to warrant this study of sleep using validated and reliable tools to assess the efficacy of MRP on sleep specifically within this population.

Bormann, Kemppainen, Becker, Gershwin and Kelly (2006) published research to assess mantram repetition for stress management in Veterans and hospital employees. Though sleep quality and efficacy was not assessed directly within the study, 19 of the 66 (29%) participants self reported improvement in sleep quality during their interview held three months after the mantram program was completed (Bormann, et al. 2006). In qualitative study using the MP in a population of participants with human immunodeficiency virus (HIV) by Kemppainen, et al. (2012), interviews were collected two months after completion of the MRP to assess the effects of mantram repetition on quality of daily life. Mantram use for assistance in falling asleep was mentioned eight times, from a total subject population of 32 people (Kemppainen, et al. 2009). This data shows a connection between mantram repetition and sleep quality, and suggests the need for further research to assess mantram repetition directly on sleep quality.

Gaps in the Literature

Information gathered from this literature review shows there to be a gap in the research looking at complementary therapies to improve sleep quality in Veterans with PTSD. Previous studies have been published stating the improvement of sleep symptom

burden in the Veteran PTSD population, but without the use of valid and reliable measures to assess interventions on sleep. This has weakened the evidence of these study outcomes. In other cases, reports of sleep improvement have been documented in studies, when sleep was not the primary outcome focus of the intervention. This study aims to fill this gap, by focusing on valid and reliable sleep measures to assess improvement of sleep quality of the MRP in Veterans with PTSD.

Summary

The results of this literature review highlighted the importance of sleep and its impact on daily function in populations with PTSD. These published works emphasized behavioral therapies as the preferred method of treatment, and showed the correlation between sleep interventions and improvement of sleep and its efficacy on overall health. While poor sleep quality, sleep deprivation, and nightmares are among the most commonly reported side effects in the Veteran population with PTSD, research focused on improving these symptoms is limited. More research is required to ascertain the effect of these interventions specifically using validated variables assessing sleep efficacy, insomnia, sleep effort, and sleep arousal. Interventions that improve these nighttime symptoms can aid in improving daytime symptoms of PTSD, and the general wellbeing of Veterans diagnosed and suffering from PTSD.

CHAPTER THREE

Research Methods

Design

Secondary analysis of supplemental data collected from a larger study looking to assess the feasibility and acceptability of the Mantram Program (MP) was analyzed to assess the efficacy of MP on sleep in Veterans with PTSD. The VA Office of Mental Health was seeking meditation interventions for PTSD. The study took place at two sites, VA San Diego Healthcare (VASDHS) system and VA Loma Linda (VALLHS). Goals of the study were to assess PTSD severity, mindfulness, acceptance, and experience through treatment. The VASDHS collected supplemental data to assess sleep quality. This was a nonrandomized comparative study, using pre–posttest within subjects design. During the enrollment process, participants were asked to choose either MP or the PTSD101 Educational Group. For this study, only data from the San Diego location were used, and more specifically those who self-selected enrollment in the MP arm of the study. Self-assessment tools and one semi-structured interview were completed before and after the eight week MP.

Sample and Sample Size Calculation

This study examined the effects of MP on sleep quality in Veterans. Participants had to have completed 6 of 8 MP sessions. The study sample included Veterans diagnosed with PTSD, with complaints of continued symptom burden from combat related or non-military trauma. Military service included World War II, Korean War, Vietnam, Persian Gulf, Operation Iraqi Freedom (OIF), and Operation Enduring Freedom

(OEF). In order to be included, Veterans were required to be 18 years or older with the ability to read and write in English. Veterans had to have a PCL-S score of >50 and CAPS >45 . Veterans were to be free of alcohol and drug dependence for a minimum of three months, and stable on all current medication regimens. Other exclusions to the study were cognitive impairment, unmanaged psychotic symptoms, and bipolar disorder. Veterans were also to be without severe suicidal intent, or dementia type diagnoses. Once screened, Veterans were given a choice to participate in either MP or PTSD101.

Participants were recruited at the VASDHS or VALLHS locations. Original sample size recommendations for both sites were to recruit $N=182$ Veterans, which would allow for 20% attrition rate. Each location was to enroll 76 Veterans, split evenly to each arm of the study. Due to the high demand for MP, of the 95 Veterans enrolling in the San Diego site, 12 chose to participate in PTSD101. Supplemental assessments on sleep quality were administered to the VASDHS MP group. Solely evaluating the San Diego arm, 83 Veterans were enrolled in the MP. Throughout the course of the study, 22 dropped out, and two Veterans did not have complete post-CAPS scores at the end of the study. The remaining 59 completers were included in the analysis of sleep quality in Veterans with PTSD. In order to have a medium to large effect, the target sample size was created using a power of .80. With this study being an efficacy study looking at within group differences, Cohen d 's effect size value will be used to evaluate sample size for each assessment tool (Figure 2).

Informed Consent

The principal investigator had ultimate responsibility for the conduct of the study and the data produced. The study research plan was submitted to both the VA

Institutional Review Board (IRB) and the University of San Diego IRB for approval. Throughout the study, there was protection of human subjects. There was not inclusion of vulnerable subjects in the screening process. All members of the team were adequately and competently trained in all areas of study and subject interaction. This included review of medical history, psychiatric and medical diagnoses, current medication list, and psychiatric comorbidities. Psychiatric and medical appointments conducted in the last month were reviewed to ensure it was appropriate for Veterans to participate in research. At any point during the study, if a participant expressed suicidal ideations or appeared to be subject to harm, that participant would be escorted to the mental health clinic for immediate evaluation. All group MP sessions and CAPS interviews were administered by personnel trained to do them. All courses were audio taped and reviewed to ensure inter-rater reliability. MP classes were reviewed for treatment fidelity and quality control. Confidentiality was ensured throughout the study.

Instrumentation

Veterans were asked to answer questions about their demographics, as well as complete four sleep tools, and complete a semi-structured interview to assess PTSD for sleep quality symptom burden. Semi-structured interviews were given to assess symptom burden using the CAPS. Other instruments included the PCL-S, a self-report PTSD rating; the Insomnia Severity Index (ISI); the Glasgow Sleep Effort Scale (GSES); and the Pre Sleep Arousal Scale (PSAS).

Clinician Administered PTSD Scale

The CAPS is considered the gold standard for PTSD assessments and the most frequently used interview for diagnosing and identifying the severity of PTSD symptoms

(Weathers, Keane, & Davidson, 1999). The interview is a 30 item structured interview corresponding to the DSM-IV criteria for PTSD. Each question has two parts, rating the intensity and frequency independently on a Likert Scale that ranges from (*0=none, to 4=extreme*), with the totals combined for a total severity score. The CAPS is able to accurately identify three types of PTSD: acute, current, and lifetime. The questions have been formulated to assess symptom impact, frequency, and intensity.

The most appropriate tests for validity and reliability for CAPS are inter-rater reliability and test-retest designs (Weathers, Ruscio, & Keane, 1999). Inter-rater designs are the simplest, having two people rate the same interview, either simultaneously, or through audio or videotape after the initial rating is completed. Reliability and validity are found through identical scoring from the same subject interview. Test-retest involves two different raters administering and score as assessment at separate times. This is a better test of reliability as it assesses scoring between two raters using the same subject but allowing each rater to perform the interview, then comparing results for continuity of scoring.

In a study to test for inter-rater reliability, there were found to be statistically significant results in all symptom clusters assessed by CAPS, re-experiencing, numbing and avoiding, and hyper-arousal, $p < .001$ (Weathers, et al. 2001). Internal consistency was evaluated using Chronbach's alpha coefficient with results ranging from 0.73 to 0.85. Another study by Blanchard, et al. (1996) proved inter-rater reliability and convergent validity evaluating 15 re-scored interviews. Reliability was 0.82 to 0.99, with a mean of .98. This was also compared to the PCL-S, which showed statistically strong similarities in ratings between subject and rater (Blanchard, et al. 1996). Overall assessment of

CAPS ratings were consistently above the .90 levels, with some studies boasting 100% correlation (Weathers, et al. 2001).

PTSD Checklist - Specific

The PCL-S is a seventeen-item self-assessment of the burden of PTSD symptoms. This study uses a five-point Likert scale to score each item (*0=none, to 4=extreme*). Results of the assessment are based on total score in combination with scoring requirements using three symptom clusters within the tool. Moderate responses to one reexperiencing symptom, three avoidance and psychic numbing symptoms, and two hyperarousal symptoms must be present before assessing total score (Blanchard, et al. 1996). First presented at the Annual Meeting of International Society for Traumatic Stress Studies, two studies were presented to assess the PCL-S's predictive power of PTSD in Vietnam and Persian Gulf Veteran populations. Using a cutoff score of 50, the study of Vietnam Veterans found an internal consistency of .97 overall, and .93 in criterion B, .92 in criterion C, and .92 for criterion D. Validity was also assessed against other tools, including the Mississippi Scale (.93), Keane PTSD Scale (PK) (.77), Impact of Event Scale (.90), and the Combat Exposure Scale (.46). In the PTSD population, mean score on the PCL-S were 63.58 (14.14), and in non-PTSD participants 34.40 (14.09) (Weathers, et al. 1993).

Blanchard, et. al. (1996) published a study focusing on a population of adults who had been involved in a severe automobile accident, or victim of a sexual assault. PCL-S and CAPS assessments were collected from each participant to examine sensitivity (.78), specificity (.86), positive and negative predictive power (0.82, .82), and diagnostic efficiency (.82). Mean PCL-S scores were 45.8 (SD=16.1), and CAPS mean scores were

very close at $M=45.9$ ($SD=29.1$). Pearson's correlation was $r(38)=0.929$, $p<.0001$.

Internal consistency remained high when compared to Weathers et al. (1993).

Insomnia Severity Index

The Insomnia Severity Index (ISI) is a brief instrument used to assess a subject's current perception of insomnia. The assessment is comprised of seven questions, with each question having a Likert scale that ranges from (*1=not at all, to 4 very much*) identifying presence and severity of symptoms. Total scores range from 0–28, with scores over eight representing moderate to severe clinical presentations of insomnia. Questions target the severity of sleep problems including falling asleep, staying asleep, and early wakening. The assessment also evaluates how satisfied the rater is with their sleep habits, the extent to which sleep interferes with daily functioning, how noticeable others perceive their inability to sleep, and how worried the person is about their sleep habits (Bastien, Vallieres, and Morin, 2001).

In a validation study, Bastien, et al. (2001) published a comparison of studies reporting two studies looking at ISI results and predictability against polysomnography, the gold standard for assessing sleep disorders. Internal consistency was estimated using Chronbach's coefficient alpha, showing a change in the alpha coefficient from 0.56 pretreatment, 0.69 post-treatment, and 0.72 at the three month follow up. Internal reliability remained constant 0.76 prior to treatment, and 0.78 three months after completion. Concurrent validity assessments were constructed comparing the ISI to polysomnography and sleep diaries, also with significant results. Sensitivity to changes were examined along with predictive and content validity, all reporting reliable results

using the ISI when compared with other assessments examining the perception of insomnia (Bastien, et al. 2001).

Glasgow Sleep Effort Scale

The GSES encompasses seven questions related to sleep effort, with categorical responses of very much, to some extent, and not at all. Questions refer to how much effort is put into sleeping, as well as the sense of control, fear, worry, inability, anxiety, and consequences of sleep quality and effort felt by the subject completing the assessment. A validation study published in 2005 compared patients diagnosed with insomnia and a control group of “good sleepers” to determine the effectiveness of the GSES in predicting sleep effort. Previous studies presented the relationship that with increased effort used in falling asleep, the less efficient sleep would be (Broomfield & Espie, 2004). The American Sleep Disorders Association has reported that ‘trying too hard to sleep’ exacerbates insomnia, and when asking good sleepers about pre sleep routines to improve sleep, minimal conscious behavior exists.

In assessing for internal consistency reliability, Cronbach’s alpha was 0.77. The GSES also had the ability to readily distinguish subjects with insomnia 93.9% correctly, with good sleepers identified in 87.3% of cases. Predictive and likelihood ratios were high in identifying the incidence of insomnia. Box and whisker plots also categorized good sleepers with those presenting with insomnia well. GSES scores were not affected by those with insomnia taking sleep medications to improve sleep, showing the strong ability of the tools for insomnia prediction, regardless of current intervention for sleep improvement. A benefit to this assessment is the participant’s ability to complete the

questionnaire in less than five minutes, and rater completion for scoring the tool timed at less than one minute (Broomfield & Espie, 2005).

Pre Sleep Arousal Scale

The Pre Sleep Arousal Scale (PSAS) presents a total of sixteen questions focused on evaluating cognitive and somatic arousal symptoms experienced prior to going to bed. On a five point Likert Scale that ranges from (*1=not at all, to 5=extremely*), patients are asked to rate the intensity of pre sleep arousal asking about presence of somatic responses such as a racing heart, nervousness, shortness of breath, tight muscles, cold sweaty palms, stomach disturbances, perspiration, and dry mouth describe somatic symptoms. The other set of questions ask about different types of perceived cognitions, or thoughts keeping people up at night. Cognitive assessment includes questions about time spent worrying, reviewing day's events, depressive thoughts being mentally alert, inability to shut thoughts off, distraction, and presence of racing thoughts.

With the development of the PSAS, validation and reliability tests were performed against other somatic and cognitive assessments of insomnia, anxiety, and depression. Research on the cognitive impact on insomnia has become important because of the clinical relationship found between reported large amounts of time spent with worrying about sleep and the inability to relax the mind (Nicassio, Mendlowitz, Petras & Fussell, 1984). A 1980 study of insomnia found out of 296 subjects with reported sleep disturbances surveyed, 54.7% reported cognitive symptoms as the primary reason for their insomnia (Lichstein & Rosenthal, 1980). When observing the reliability and scale structure of the PSAS, it was found to be internally consistent over time. Chronbach's alpha for cognitive and somatic symptom reportability in insomniacs was .76 and .81, and in

good sleepers, .67 and .84. This held consistent with test-retest results. Results of comparisons for all subscales were statistically significant ($p < .001$), also showing impressive unshared variance, explaining the presence of symptoms but not affecting the presence or absence of other symptoms (Lichstein & Rosenthal, 1980). Cognitive and somatic symptom responses were statistically significant in reporting higher sleep-onset latency, less total sleep, increased number of awakenings, and feeling lethargic during the daytime. The cognitive subscale showed strong correlation and predictive ability of sleep, while the somatic scale is a good assessor of depression and anxiety in relation to sleep difficulty (Nicassio, et al. 1984).

Data Collection, Safety, and Monitoring Protocol

In the original data collection stage, participants were referred to the study, or responded to distributed marketing materials and presentations. Veterans had to have recent documentation of a diagnosis of PTSD with a history of traumatic experience during military service, combat related or not. The initial screening for the Mantram Repetition Study took place at VASDHS. During the visit the subject gave informed consent to participate in study screening and completed a battery of assessments, including the PSAS, ISI, GSES, and PCL-S. CAPS was administered and with a diagnosis of current PTSD symptoms, the veteran was given a subject ID and included in the study. Subjects were contacted after first meeting and enrolled in the Mantram Program, with group sessions taking place in La Jolla and Mission Valley. The MP intervention was comprised of twelve hours of total class time, divided into eight week 1.5 hour sessions. Subjects were asked to choose a mantram, and through the weekly meetings Veterans were taught

the practice of mantram, and given activities to utilize outside of class. Class time allowed for individual reflection, practice, application scenarios, and discussion aiming to provide tools to alleviate PTSD symptom burden. Upon completion of the intervention, another CAPS assessment was administered, along with a repeated PCL-S, ISI, GSES, and PSAS.

Data for this study was extracted from supplemental tools collected during a larger study on Mantram Repetition in Veterans. Written informed consent was obtained for all participants in the study prior to initial screening for inclusion to the study. This consent included the participant agreeing to the use of data collected in future studies. Screening and recruitment involved minimal risk to participants, with no adverse effects to the rights and welfare of the participants.

All documents for the study were de-identified. Paper consents and all other participant documentation were locked in filing cabinets accessible only by the principal investigator and qualified staff. Subjects were identified only as their subject number. All electronic documentation remained within the VA firewall. No subject information was shared electronically otherwise. All data gathered in at VASDHS were taken from the paper source collected from the Veteran and entered into a computer program called Infopath where the information was then coded. Data were exported to Excel, then to SPSS for cleaning and analysis. For this study, variables representative of participant demographics, PTSD symptoms, and sleep related pre/post assessments for all MP participants were extracted from the master data set.

Statistical Analysis

Descriptive statistics were used to describe, compare, and characterize items within the veteran sample. Bivariate statistics, specifically Pearson's r correlation, was used to compare sleep measures to PTSD symptom severity. T-tests and Chi-square tests were performed to assess the demographic differences and similarities between Veterans with and without improvements in sleep quality upon completion of the intervention. T-tests were used to find significant differences between pre- and post-treatment measures. Assessing for bias is also very important when conducting a research study. Potential biases in data collection must be accounted for while interpreting data and presenting results. Three main types of biases that will be discussed include non-response bias, selection bias, and attrition bias. Type I errors will be controlled through the level of significance at the .05 level (Polit & Lake, 2010).

Limitations

Limitations in this study include the use of secondary data for analysis. As the data had already been collected, the number of participants was final and the assessment tools were chosen and data collected. Questions that arose during the analysis were not able to be answered, as there was no way to collect more information.

There are potential confounders in assessing the significance of the results. Participants having previously practiced meditation or who were currently meditating at the time of enrollment could explain results during MP. The study was comprised predominantly of male Veterans. Future research to study the effect of MP on sleep in women Veterans is needed. Other factors that could affect results of the study include the

use of sleep medications, and the limited information collected on participation in other treatment programs prior to mantram. The lack of a control group does not allow for determining effectiveness of the intervention. In future studies, it would be appropriate to compare results to usual care of PTSD and further assess the effectiveness of the MP. Results of MP may be compared to other sleep intervention studies to assess results between treatments. Study length may be another limitation. Having a long-term, follow-up CAPS interview would help to assess long term sustainability of the program's efficacy. Future studies to include a control group, more women Veterans, and the random assignment of subjects to usual care might also impact significance of the intervention.

CHAPTER FOUR: Manuscript Two

Introduction to Mantram Repetition

The origin of the word “mantra” dates back as early as 1500 Before Common Era (BCE) (Flood, 1996). Mantra was first documented in the Vedas, the original scriptures of Hinduism, which included the written account of the Gayatri Mantra. This mantra was described as a gift from the Supreme Being to the sage Vishwamitra, said to have been a reward for his lifetime of meditation and sacrament and a gift to all humanity (Chandra-Shekar, 2007). The Gayatri mantra focused on peace and wisdom, translated as “May the divine light of the Supreme Being illuminate our intellect, to lead us along a path of righteousness”. What began in the Hindu tradition expanded to other religions and cultures, including Buddhism, Sikhism, Taoism, Christianity, and Zoroastrianism.

Since its conception, mantra has taken many shapes in the way of its practice, its evolution, and its integration into Western society. Over the last thirty years, mantra and other mindfulness therapies have been implemented into hospital and clinic settings. One practice is mantram repetition, a portable meditative practice that has been seen to improve the quality of life in patients diagnosed with HIV, and family caregivers, as well as Veterans with posttraumatic stress disorder (PTSD). Analysis of mantram repetition in these populations revealed positive improvements in Veterans with PTSD, with suggestions of improvement in sleep. This concept analysis aims to define mantram repetition in its ability to aid in sleep quality.

Benson and Klipper (1976) wrote *The Relaxation Response*, one of the first books of its kind to describe the relaxation response and its effect physiologically on the human body. It has been reported by practitioners that the relaxation response (RR) aids in the control of blood pressure, heart rate, oxygen consumption, and metabolism. In conjunction with Harvard Medical School and the Beth Israel Hospital in Boston, Dr. Benson began studying and disseminating the RR and its beneficial effects on the body to the Western world through the eyes of medicine. He found that he was able to take Eastern philosophy and apply it to modern science, making connections between stress and disease pathology, specifically hypertension, strokes, and kidney disease. His research showed that by initiating the RR, it was possible to influence physiological mechanics by breaking the stress cycle induced by the sympathetic nervous system as seen in the fight-or-flight mechanism (Benson & Klipper 1976).

Over time, the RR was studied in different populations to assess its efficacy on stress reduction. Many comparisons between the RR and sleep were presented with Benson and Klipper's publications to associate these links with his. In discerning whether RR was a form a sleep, Benson found many of the known variables of sleep were not present during the RR. Lack of rapid eye-movement, frequent and stronger alpha brain waves, faster decline of oxygen consumption, and a decrease in lactate levels were indicative of the RR, whereas the opposite was known to be true during sleep, though the idea was presented of possibly using the RR to aid in falling asleep as well as overall reported sleep quality (Benson & Klipper, 1976).

In the last ten years, researchers have further studied RR relationships to the

physiology of stress on the body. Esch, Fricchione, & Stefano (2004), made reference to Benson and Klipper's work and strengthened the connection between the RR and its beneficial effect of stress. Esch, et al. (2004) discussed 'allostasis', the ability to maintain stability through change, and the effect over time this had on the body if unable to adapt to change, or stress, and to find the mechanism in the body to ascertain if meditation could improve symptoms. In building on current research correlating stress to cortisol and norepinephrine, he proposed that anandamide and melatonin in conjunction with nitric oxide (NO) was also related to stress and relaxation responses in the body. Using peer-reviewed references, there was found to be a basal level at which NO is expressed on a regular basis (Esch, et al. 2004). Results also showed that NO can both potentiate the effects of meditation, as well as hinder the desired outcome depending on the person and co-morbidities present. Most importantly, there needed to be a balance of NO expression, and at low levels it seems to be beneficial to the body, counteracting norepinephrine release, further aiding in the relaxation response (Esch, et al. 2004). As this was a literature review and there was no intervention to test the hypothesis, there was not enough evidence to provide a direct correlation between NO pathways and RR as a means of reducing stress.

The RR can be initiated by various forms of meditation, three of the most practiced types being concentrative, open monitoring, and transcendental (Travis & Shear, 2010). Concentrating meditation involves focusing on a single object, such as the breath, a word or mantra, a picture or an image. Open monitoring is a focus on thoughts or present activity passing through the mind. Transcendental meditation (TM) utilizes a sound or mantra to be repeated silently while sitting with eyes closed to experience a

state of ‘transcendence’ beyond thoughts (Travis & Shear, 2010). Meditation allows a person to become and remain focused and calm, acknowledging all the thoughts passing through the mind, but letting them go to return to focus and calmness, eventually achieving a non-judgmental state.

Identification of Uses of the Concept

The sacred definition of “Mantra” is a verbal formula repeated in prayer, meditation, or incantation through the use of a syllable, portion of scripture, or spell, believed to have an inherent power to affect reality (Mantra, Oxford Dictionary). In Sanskrit, the literal translation is “man”- meaning to think, and “tra” – instrument or thought. The Chinese translation of mantra is zhenyan, true words. Other translations of mantra vary widely, from an instrument of thought (Macdonell, 1927), a sacred utterance (Mantra, Encyclopedia Britannica), or a thought behind speech or action (Mantra, Oxford Dictionary).

The oxford dictionary defines a mantra as a commonly repeated word or phrase. Google describes a mantra as a word or sound repeated to assist in meditation and improve concentration. (Mantra, Google Dictionary). Mantra can also be a method used in guided visualization or hypnotherapy. Synonyms of mantra include hymn, melody, shout, singing, tune, carol, croon, incantation, intonation, lilt, psalm, song, trill, warble, and chant.

Corporations will often use the terms mantra and slogan interchangeably. Most notable are Nike’s Just Do It, Burger King’s Have it Your Way, McDonald’s I’m Lovin’ It, and Nokia Connecting People (Anderson, 2010). Google’s mantra was said to have been born during a business meeting during its formative years, when the need to grow

and expand created a fear losing control in company growth and direction. Their mantra kept them focused– ‘don’t be evil’. Apple’s story follows suit with their mantra ‘think different’, which has been credited to Steve Jobs. He created it in reference to other men who followed paths other than the expected, Alfred Hitchcock, Jim Henson, and Fred Turner (Lobello, C. 2013).

Facebook creator Mark Zuckerberg has often discussed mantras used throughout the company. Most important to them is “The Hacker Way” followed by others including “Code wins arguments”, “Move fast and break things”, and “Done is better than perfect.” This originated with the company’s inception, while he and his fellow code writers were working late nights competing to showcase their updated software possibilities. What began as friendly competition became the building blocks for the company, remaining motivators for both employees and investors (Lobello, C. 2013).

Mantra can also be found frequently in the entertainment world. Some examples include Mantra, a comic book series written by Mike Barr. Mantra, and the title of two songs, one authored collaboratively by Dave Grohl, Josh Homme, and Trent Reznor in 2013, the other by the band Tool in 2001. Mantra was the title of a film in 2007, a 1970 musical composition written by Karlheinz Stockhausen, and is currently the active title of a film production company. Mantra is also used in Mantra Records as a branch of Beggars Banquet Records, an Indo-Nepalese rock and roll band, a South Indian actress, and a fusion restaurant in Boston, Massachusetts. Mantra is also the name of a computer-rendering program (Wikipedia.org).

In Yoga, a mantra is often incorporated into the practice to aid in centering the body and mind. The Yoga Sanctuary of Canada defines a mantra as having three arms. It

explains mantra as a powerful tool, which creates an energy-based sound, sending vibrations from thought through the body. Mantra is said to increase prana, which is Sanskrit word to describe the energy exchange between people (Ashley-Farrand, 2004).

Eknath Easwaran played a significant role in introducing meditation to the United States, and through his study and dedication to the practice, he developed his own form of passage meditation. From India, Easwaran came to the United States and taught what is now known to be the first college level course on meditation at the University of California Berkeley. A mantram is a portion of Sanskrit text that has been taken out of its original context and used alone. Through his teachings of Mantram, he spent his life practicing with his pupils a method of meditation that could be used outside of the traditional solitary process of meditation. This eight-point program begins with meditating for 30 minutes each morning on a scriptural phrase or passage. This continues through the day with the repetition of a mantram, to help attain one pointed attention and for overall slowing down. After time one can begin to train the senses, learn to put others first, and engage in spiritual fellowship. The last point of the program is to continue to build and strengthen one's foundation of meditation through spiritual readings and fellowship (www.easwaran.org).

The Mantram Program (MP) was adapted from Easwaran's teachings to further disseminate mantram to multiple groups such as nurses, caretakers, patients, and Veterans. MP is being used to provide Veterans with PTSD a contemplative mobile meditation intervention to be one-pointed and slow down. During the program, Veterans are provided with a course manual and *The Strength in the Storm*. In class, a list of mantrams is presented for the Veterans to choose from. These words and phrases are

predominantly written in Sanskrit , with spiritual and religious translations (Table 1).

During class sessions, Veterans discuss daily activities and hurdles they face as a result of military trauma. Veterans practice repeating their mantram in class. Applications of mantram practice are reviewed, identifying situations where mantram use can help the participant regain focus and become one-pointed, overcoming difficult situations. Over the course of the program, personal experiences using mantram repetition between sessions are shared within the group. Study exercises are included for weekly completion, in hopes of creating awareness of daily mantram application.

Mantram repetition is an adaptation of mantra meditation, used for centuries in other cultures and religions. After conducting a study with significant results using mantram repetition to alleviate stress in a population of patients with HIV/AIDS, Dr. Bormann and colleagues decided to expand her research to include Veterans of war, specifically those with PTSD, to assess whether the mantram program could have a significant improvement on daily living and a reported decrease in symptoms (Bormann, et al. 2013).

In a randomized study on the MP intervention for Veterans with PTSD results showed significant reductions in PTSD symptom severity, when used in combination with treatment as usual, as compared to those receiving usual treatment only (Bormann, et al. 2013). Twenty-four percent reported significant improvement, no longer meeting PTSD diagnostic criteria on CAPS, in comparison to the usual treatment group reporting improvement of twelve percent. Further improvement was seen at the six-week follow up. Ninety-seven percent of Veterans enrolled in the study reported high treatment satisfaction, and there were no adverse effects noted by any of the participants. Sleep and

nightmares were not assessed during treatment, although Veterans stated an improvement in their daily life quality and well being.

Bormann, Hurst, & Kelly (2013), published a qualitative analysis on the effect of MP in Veterans with PTSD. Data for this publication were collected by phone interviews 3 months after the completion of their attended MP classes. Two questions were asked during the interview: “Can you think of a time that you used the mantram to manage your PTSD symptoms?” and “Can you tell me about any other situations (unrelated to PTSD) in which you used the mantram?”. Inductive classification was used to analyze the information gathered from the Veterans. Themes were organized into four primary categories: triggering events, symptomatic responses to events, symptom coping, and outcomes (Bormann, Hurst, Kelly, 2013). Ninety-two percent of Veterans were found to still be using their mantrams effectively. Most common applications of mantram were found to help calm down and relax, let go of negative feelings, to help think clearly and rationally, and disengage triggers. Driving, social interactions, sleep, and interpersonal relationships were documented as the most common event triggers in which mantrams were utilized. As Veterans report sleep improvement with the use of their mantram during these interviews, enough evidence is present to warrant the study of sleep through validated and reliable tools to assess the efficacy of MP on sleep specifically within this population.

Bormann, Kemppainen, Becker, Gershwin and Kelly (2006) published research to assess mantram repetition for stress management in Veterans and hospital employees. Though sleep quality and efficacy was not assessed directly within the study, 19 of the 66 (29%) participants self reported improvement in sleep quality during their interview held

six months after the mantram program was completed (Bormann, et al. 2006). In qualitative study using MP in a population of participants with HIV by Kemppainen et al. (2012), interviews were collected two months after completion of the MP to assess the effects of mantram repetition on quality of daily life. Mantram use for assistance in falling asleep was mentioned eight times, from a total subject population of 32 people (Kemppainen et al., 2009).

Defining Attributes of the Concept

Using graph words.com and other thesaurus websites, mantra is divided most significantly into two definition arms (Figure 3). One definition containing the religious affinity of the term, the other developed more modern translation. The secular arm of a mantra defines a mantra as a religious writing or sacred text used in meditative practices. In the more modern definitions, it refers to a motto, catchword, slogan, or shibboleth. The latter depicts the incorrect application of the 'idea', defined as a word, sound or custom that a person unfamiliar with its significance may not pronounce or perform correctly relative to those who are. (www.wikipedia.org). Three main defining attributes of mantra that have been derived from the uses of the concept as described above are: (1) the use of words, usually without specific meaning or 'goal', in which to find clarity to remain centered and focused; (2) a means of iteration for forward progress; and, (3) obtainment of spiritual empowerment to overcome, improve, connect, reconnect, or maintain. Overall a mantra is a vehicle, which through continued practice and repetition, can enable improved quality of life and standards both singularly and shared with others.

Identification of Model Cases

Further examining the recently published qualitative study by Bormann, et. al. (2013), Mantram repetition is taught to Veterans to aid with symptom management of PTSD. Veterans comment on the effect of mantram repetition on different aspects of their daily lives including assistance with sleep disturbances, improving interpersonal relationships, and coping with life struggles. Below are three examples of the use of a Mantram (Bormann, Hurst, & Kelly, 2013).

“I use my mantram often when I have trouble falling asleep because, you know, I just, my mind just gets going and going and going and going and so, what I do is, I concentrate on my mantram and ah, ah also my breathing and then I can finally settle down to go to sleep. Otherwise, I just lay there and my agitation just won’t, won’t go away.” (Bormann, et. al. 2013)

“Basically I think what my mantram does is it gives me a pause, to think about doing what I would think would be the correct thing in a situation with relatives or friends, or whatever, when I could say something, you know, just throw it out there and hurt someone’s feelings or I can think about it and not say it, or should I say it or whatever, but my mantram give me time to think about what I could do under the, you know, circumstances.” (Bormann, et. al. 2013)

“I was laid off from my job and I really liked that job and for about a week, you know, I was... I live downtown in a residential hotel, and for about a week, I wasn’t doing anything. I didn’t apply for unemployment or anything. I was just sitting in my room and oh my god, oh my god, and then I thought I should use my mantram, so I did and it really calmed me down. It calmed me down and it made me go searching for a job

and when I did go searching for a job, I remembered an agency was putting together a winter shelter. So I went over there and applied for that and got that job. So I guess using my mantram kept me rather levelheaded, down to earth and, you know, able to, you know, get through that ordeal.” (Bormann, et. al. 2013).

These modern-day model cases encompass the defining attributes of a mantra: finding clarity within a situation, using mantra to move through the situation, and finding inner power and strength to overcome struggles without allowing negative influences overcome and prevent progression. Within each case, the subject is able to identify the negative situation, recognize that the current or possible reaction without thinking may not be the correct decision, and with the aid of a mantra is able to become one-pointed and centered, ultimately allowing objective decision making, all while maintaining control over self and situation. Similarly, as stated above, the use of a mantra, or mantram, has been described to aid in sleep quality. Racing thoughts, fear, and other symptoms within the PTSD diagnosis that present at bedtime can be dampened with the use of mantram repetition on daytime symptoms of PTSD, and improvements in sleep qualities.

Identification of Additional Cases

Additional cases can be categorized as borderline in comparison, related to and/or contrary. Walker and Avant define these as cases that fit some or most of the attributes of the concept, but not all. Borderline and related cases would include examples of mantras such as “I will not fail my test”, “work hard”, “don’t eat sugar”. In all three cases, the mantra is stated to maintain a certain path, working toward a goal, and to not let other

thoughts distract from the path. In these cases the mantra chosen is directly linked to the overall goal to be achieved.

Another related case would be the act of concentration. Concentration can be utilized in many situations, whether it is concentrating in class, on homework, on the jobsite, while driving, etc. In these cases, the concentration aims to center and focus on something specifically happening around the person. This differs slightly from concentration on a mantra, in which you are looking for spiritual clarity, usually in a quiet, calm space and the concentration is focused inward. Although they meet the definition of a mantra by more modern day criteria, there is no clarity through this focus on words and there is a specific goal the mantra is speaking to.

Contrary cases are situations in which the concept or attributes are being utilized. Examples of this would include people having a large amount of stress, inability to concentrate, and lack of focus without an intervention or outlet to break the cycle. In these cases, people do not have the tools or know how to seek the use of a mantra. Disorganization and anxiety are also contrary cases to mantra.

Identification of Antecedents and Consequences

Antecedents are defined as events or actions in place before the utilization of the concept. In order for a mantra to be adapted into practice, one would first have to recognize the need for change. Prochaska began working on the stages of change in the 1970s. Prochaska and DiClemente (1992) published their work on the transtheoretical model of Health Behavior Change. These steps begin with precontemplation, where the thought for a need to change may not even be present. This is followed by contemplation, or getting ready, where the idea of change has come, first as a passing thought then as a

decision with a unspecified timeframe to initiate change. The next stage is preparation, where the person has decided to make a change and plans are in place to begin working towards change. The final steps to change are taking action and maintenance. In the action stage, the change is being made and in place, but still requires effort to continue to change practices. Maintaining lifestyle changes requires effort to continue the change along with the knowledge that it is possible to revert back to previous habits and behaviors (Prochaska, et al. 2010).

Building on this, a framework was developed to show the process of a mindfulness intervention and the steps it takes to habitually use mechanisms of mindfulness. This framework illustrates how through intention and motivation, a mindfulness intervention can be initiated. It shows that distraction and disengagement can disrupt the process and further impact change. In order to learn the art of mantra, practice and repetition are necessary. The framework is applicable to the mantra in that it requires effort, engagement, habit, and executive monitoring in order to become automatic responses (Vago & Silbersweig, 2012).

The article discusses the Buddhist origin of the word sadness, said to have been created to describe the inability to avoid unwanted thoughts. This, combined with the present day conceptual model for suffering, depicts its cyclical reinforcement of negative symptoms. Also in the Buddhist practice, breaking free of the negative thoughts requires balance and mental clarity. Equanimity, or the ability to openly acknowledge the passing of thoughts and experiences, allows one separation from the thoughts focused on avoidance (Vago & Silbersweig, 2012). The intent for mindfulness interventions is to

bring a sense of calm, the ability to recognize thoughts and feelings, and continue with minimal reaction.

As defined by Walker and Avant, consequences are the product of a concept. Outcomes of mantra repetition have been very positive across multiple applications, having effects on the mind and body. As shown in the model cases presented above, mantram repetition has been used to aid in the healing and recovery process of Veterans with PTSD. Mindfulness based therapies have also been linked to decreased stress levels and reported depressive symptoms when evaluated during studies on caregivers and patients with HIV (Bormann, et al. 2012). Mantra improves thoughtfulness, clarity, and becoming one-pointed, and is able to aid in decreasing heart and respiratory rates, all consequences with positive outcomes.

Definition of Empirical Referents

There are no instruments that measure the implicit use of mantra. There are assessments that measure the related constructs that can help to quantify many and practical application. Measurements of mindfulness, coping, concentration, hope and resiliency can be utilized to assess characteristics of what a mantra can provide. Through the use of these assessments, practitioners are able to collect supplemental information to support the phenomena.

Implications for Future Research

In recent years, the idea of routine health care has shifted, and an interest in incorporating more complementary therapies to use in conjunction with standard practice is growing. In some arenas, mantra comes with a pre-conceived stigma of it being religious based, and therefore, remains discussed sensitively in the healthcare settings.

This concept analysis was conducted to re-define what today's mantra has become, and the ways it can be used successfully in symptom management to improve quality of life. It explored the spiritual and physiological responses, and its applicability and practicality in the nursing practice. Mantram repetition has been shown to improve quality of life, and PTSD symptoms in various populations, specifically in Veterans. Research has shown improvements. Future research is necessary to continue to show the benefits of mantram repetition on sleep quality. Further dissemination of mantra to improve sleep quality may initiate conversations with others who have not yet integrated alternative therapies into their practice.

CHAPTER FOUR: Manuscript Three

Results of Mantram Repetition on Sleep in Veterans with PTSD

Introduction

Posttraumatic stress disorder (PTSD) affects over seven million (3.5%) of the United States adult population, 36% of whom are categorized with a severe diagnosis. PTSD is defined as a psychiatric disorder that is triggered by a traumatic incident ranging from natural disasters, sexual assaults, and military combat exposure (American Psychiatric Association, 2000). Some survivors are able to heal over time, but those with PTSD are unable to cope effectively. From nightmares to flashbacks these symptom cause impairment in social and occupational functioning. The most frequently documented symptoms of PTSD include anxiety, restlessness, anger, avoidance, unwanted memories, guilt, and insomnia, all of which interfere with quality of life (American Psychiatric Association, 2000). Studies have shown changes on magnetic resonance imaging (MRI) of function and tissue formation changes in the brain (Canive, et al. 1997; Jatzko, et al. 2006). Medical and complementary therapies are available for symptom treatment, the latter recommended by the Department of Defense (DOD) (Shoenfield, DeViva, & Manber, 2012). Recent reviews of published articles focusing on interventions to improve sleep quality in Veterans have shown complementary therapies are having a positive impact on sleep, though more research is needed. Examples of modalities to aid in symptom alleviation include cognitive behavioral therapy (CBT),

imagery rehearsal (IR), prolonged exposure (PE), meditation, and mindfulness interventions, though researchers are continually seeking improved methods of treatment.

Until 1980, PTSD was not considered to be a diagnosable disorder. It was first believed to be present only in Veterans unable to cope with the experiences of war. Tanielian and Jaycox (2008) found in a sample of Veterans of the Afghanistan and Iraq conflicts (n=1,938) reported a PTSD prevalence rate of 13.8%. Research has also reported a 10.1% presence of PTSD in Gulf War Veterans (Kang, Natelson, Mahan, Lee, & Murphy, 2003), and a staggering 30.9% prevalence in Veterans of Vietnam (Kulka, et al. 1990).

PTSD management and treatments cost the United States billions of dollars each year. The profile of those diagnosed with PTSD includes younger males with lower levels of education, having grown up in lower income households, and a history of multiple traumatic life events prior to service (Seal, et al. 2009). Research has found that 87% of Veterans with PTSD report sleep disturbances and 52% report nightmares. These complaints are the second most common reason for Veterans to seek mental health care upon return from deployment (Germain, Shear, Hall, & Buysee, 2006). The effect of PTSD on sleep quality is an essential component of Veteran treatment. Poor sleep quality also compounds daytime impairment, leads to an increased reaction to stimuli, inability to focus and achieve goals and concentrate. It is also responsible for an increased risk of suicide (Nishith, Resick, & Mueser, 2001). Research shows a significant relationship between sleep deprivation and continued exposure to high amounts of stress, leading to decreased health outcomes (Clum, Pallavi Nishith, & Resick, 2001). Research on pharmacologic and nonpharmacologic interventions to improve daytime effects of PTSD

have been published (Nappi, Drummond, & Hall, 2011), but more research is needed to evaluate interventions on sleep quality in this publication.

Mantra or mantram repetition is a way of initiating the RR brought to the United States from India by Eknath Easwaran (1910-1999) by his teaching at the University of California Berkeley. Mantram repetition is an adaptation of mantra meditation, used for centuries in other cultures and religions. Derived from Eknath Easwaran and his eight-point passage meditation program, the Mantram Program focuses on three of the eight points to help with redirecting thoughts, improving concentration, and regulating emotions.

Bormann and colleagues (2013) conducted a prospective, single blind, randomized trial to compare usual treatment with the Mantram Program (MP) in Veterans with PTSD. MP is an eight-week program teaching Veterans portable meditation-like practices to be one-pointed and slow down. Mindfulness based therapies have been linked to decreased stress levels and reported depressive symptoms (Vago & Sibersweig, 2012). Results showed significant symptom improvement in PTSD scores collected with the Clinician-Administered PTSD Scale (CAPS). Based on the significant results indicating overall improvement of PTSD symptoms using MP, this efficacy study was conducted to assess its effects on sleep in Veterans with PTSD (Bormann, et al. 2012).

Purpose and Specific Aims

The purpose of this study was to ascertain the efficacy of MP on sleep in Veterans with PTSD. Mantram repetition, when used to help alleviate daytime symptoms in caregivers and Veterans with PTSD, has yielded significant results. Research reports have shown there to be a positive association between sleep quality and daytime

symptoms of PTSD, but no studies have investigated whether MP can improve sleep quality. Specific aims were to:

1. Evaluate the efficacy of MP on sleep quality in Veterans with PTSD.
2. Examine demographics in a sample of Veterans with PTSD who have completed MP.
3. Describe the relationship between previous/current meditation practices and assessment scores.

Theoretical Framework

The theoretical framework Improving Sleep Quality with the MP was developed to depict the introduction and maintenance of MP to Veterans with PTSD, and journey towards improving sleep quality. This was adapted from three previously published frameworks (Prochaska, Norcross, & DiClemente, 1995; Vago & Silbersweig, 2012; Bormann, Gershwin, Wittry, Kelly, Belding, & Warren, 2014).

Improving Sleep Quality with the Mantram Program

First, Prochaska's parent theory of readiness to change begins the process of recognizing a bad habit and the mental preparation and action required for successful behavior change. Second, the mindfulness process model published by Vago and Siberswieg (2012) accurately illustrates the cyclical process when implementing change through the introduction of an intervention, and the opportunity to both succeed in change, or revert to previous behaviors. Lastly, Bormann's representation of the stages of progression in practicing mantram repetition depicts the practice and progression experienced through the use of MP. This blend of frameworks combines the processes hypothesized to improve sleep quality through MP. The individual is initially stuck in cycle of poor sleep quality. After recognition of the problem, the individual needs motivation to participate in an intervention to improve sleep quality. Using the MP as the intervention, the individual begins the mechanical application of mantram repetition into everyday life. With practice, this eventually becomes experiential, where the use of mantram repetition occurs without first reminding oneself to, and finally habitual initiation, without queue. As shown below, this is not a flawless transition. As in all change processes, there are factors that impede change. Distractive situations and thoughts can interfere while using a mantram and the individual has the potential to revert to previous habits. The final goal is using the mantram habitually, and as a hypothesis, improve sleep quality.

Design

Variables analyzed in this study were extracted from a previously completed, two-site study that allowed Veterans to self-select participation in MP or PTSD101 to evaluate the effectiveness of MP on PTSD symptom burden in the Veteran population.

Supplemental data on sleep were collected from the Veterans Affairs (VA) San Diego Healthcare System (VASDHS), and secondary analysis of sleep variables were examined to assess the efficacy of MP on sleep in the Veteran PTSD population. This study utilized a single group, pre –posttest, within subjects design. Four self-assessment tools and one semi-structured interview were completed before and after an eight week MP.

Veterans were recruited through the VASDHS or VA Loma Linda Healthcare System (VALLHS) locations. Original sample size recommendations were for both sites to recruit N=182 Veterans, which would allow for 20% attrition rate. Each location was to enroll 76 Veterans, split evenly to each arm of the study. Due to the high demand for MP, of the 95 Veterans enrolling at VASDHS, 12 chose to participate in PTSD101. Supplemental assessments on sleep quality were administered to the VASDHS MP group. Solely evaluating the VASDHS arm of Veterans, 83 Veterans were enrolled in the MP. Throughout the course of the study, 22 dropped out, and two Veterans did not have complete post-CAPS scores at the end of the study. The remaining 59 completers were included in the analysis of sleep quality in Veterans with PTSD. In order to determine the target sample size, a power of .80 was used to detect a medium sized effect with .05 criterion of statistical significance.

After enrolling in the MP arm of the study, Veterans participated in eight weekly group MP sessions. During this time, Veterans were provided with a course handbook and a *The Mantram Handbook*. In class, a list of mantrams was presented for the Veterans to choose from. These were predominantly written in Sanskrit , with spiritual and religious translations (Table 1). During class sessions, Veterans discussed daily activities and hurdles they faced as a result of military trauma. Veterans practiced

repeating their mantram in class. Applications of mantram practice were reviewed, identifying situations where mantram use can help the Veteran regain focus and become one-pointed, overcoming difficult situations. Over the course of the program, personal experiences using mantram repetition between sessions were shared within the group. Study exercises were included for weekly completion, in hopes of creating awareness of daily mantram application.

Participants

Veterans enrolled in this study were recruited from various locations throughout VASDHS. The study included Veterans diagnosed with PTSD having previous CAPS scores greater than 45, and complaints of continued symptom burden from combat-related or non-military trauma. Veterans reported serving in multiple wars and deployments, including World War II, Korean War, Vietnam, Persian Gulf, Operations Iraqi Freedom (OIF), and Operation Enduring Freedom (OEF). In order for enrollment, Veterans were required to be 18 years or older with the ability to read and write in English. A previous PTSD Checklist (PCL-S) score greater than 50 and a Clinician Administered PTSD Scale (CAPS) score greater than 45 were necessary for enrolment into the study. Veterans were to be free of alcohol and drug dependence for a minimum of three months, and stable on current medication regimens. Other exclusions to the study were cognitive impairment, unmanaged psychotic symptoms, and bipolar disorder. Veterans were also to be without severe suicidal intent, or dementia type diagnoses.

Data Collection

Four self-assessment tools were the Insomnia Severity Index (ISI), Glasgow Sleep Effort Scale (GSES), Pre Sleep Arousal Scale (PSAS) and PTSD Checklist (PCL-S).

There was one semi-structured interview, the CAPS, that was collected prior to the start of MP, and again within one month's timeframe after completion of the program.

Clinician Administered PTSD Scale

The CAPS is considered the gold standard for PTSD assessment of symptoms, and the most frequently used interview for diagnosing and identifying the severity of PTSD symptoms (Weathers, Keane, & Davidson, 2001). The interview is a thirty-item semi structured interview corresponding to the DSM-IV criteria for PTSD. Each question has two parts, rating the intensity and frequency independently on a Likert scale from 0-4 (*0=none, 4= extreme*), and then combining the two for a total severity score.

Within the CAPS assessment, criteria must be met to accurately diagnoses the presence of PTSD. First the Veteran must have a traumatic event. Information is obtained to assess for life threat and serious injury, as well as investigate emotional responses during and after the event. Criteria B, C, and D ask questions directed at symptom groups, including re-experiencing, avoidance and numbing, and hyperarousal, respectively. Questions regarding symptoms of re-experiencing include intrusive recollections, distressing dreams, flashbacks, psychological distress, and physiological reactivity. Avoidance symptom evaluation includes avoidance of thoughts and feelings, activities, places, or people, and the inability to recall important aspects of the traumatic experience. Other questions within this group assess for diminished interest in activities,

detachment or estrangement, restricted range of affect, and sense of a foreshortened future. Finally, criteria D, hyperarousal, assesses for difficulty falling or staying asleep, irritability or outbursts of anger, difficulty concentrating, hypervigilance, and an exaggerated startle responses. The duration of symptoms must have been present more than one month.

CAPS has been proven to be reliable and valid in its ability to accurately identify acute, current, and lifetime diagnoses of PTSD, while also assessing symptom impact, frequency, and intensity (Blanchard, Jones, Buckley, and Forneris, 1996). Weathers, Keane, & Davidson (2001) define the CAPS severity scoring as remission ($0=19$), partial ($20-39$), PTSD ($40-59$), severe ($60-79$), and very severe (≥ 80) with a cutoff of >50 to diagnose PTSD, though different studies have reported using a small range of cutoff thresholds. A decrease in overall score by ten points is considered a clinically meaningful improvement.

PTSD Checklist- Specific

The PTSD Checklist- Specific (PCL-S-S) is a seventeen-item self-assessment of symptom burden. This study also uses a 5 point Likert scale ($1 = \text{not at all}$, to $5 = \text{extremely}$), to score each item. Results of the assessment are based on total score in combination with scoring requirements using three symptom clusters within the tool. Moderate responses to one reexperiencing symptom, three avoidance and psychic numbing symptoms, and two hyperarousal symptoms must be present before assessing total score (Blanchard, Jone-Alexander, Buckley, & Forneris, 1996). First presented at the Annual Meeting of International Society for Traumatic Stress Studies, two studies were presented to assess the PCL-S's predictive power of PTSD in Vietnam and Persian

Gulf Veteran population. Using a cutoff score of 50, the study of Vietnam Veterans found an internal consistency of .97 overall, .93 in criterion B, .92 in criterion C, and .92 for criterion D. Validity was also assessed against other tools, including the Mississippi Scale (.93), Keane PTSD Scale (PK) (.77), Impact of Event Scale (.90), and the Combat Exposure Scale (.46). In the PTSD population, mean scores on the PCL-S were 63.58 (14.14), and in non-PTSD Veterans reported 34.40(14.09) (Weathers, Litz, Herman, Huska, & Keane, 1993). In 1993 Blanchard et. al., published a study focusing on a population of adults who had been involved in a severe automobile accident, or had ever been a victim of sexual assault. PCL-S and CAPS assessments were collected from each Veteran to examine sensitivity (.78), specificity (.86), positive and negative predictive power (0.82, .82), and diagnostic efficiency (.82). Mean PCL-S scores were 45.8 (SD=16.1), and CAPS mean scores corresponded 45.9 (29.1). Pearson's r correlation was $r(38)=0.929, p<.001$ (Blanchard et. al., 1996). Internal consistency remained high in relationship to other studies also testing validity and reliability of the tool in other populations. The alpha coefficient for total score in this study was 0.86.

Insomnia Severity Index

The ISI is a brief instrument used to assess a Veterans' current perception of insomnia. The assessment is comprised of seven questions, with each having a Likert scale rating (*0= not at all, to 4= very much*), the total score identifying the presence and severity of symptoms. Scores range from 0-28, with overall scores of 15 or more representing moderate to severe clinical presentations of insomnia. The total score may be categorized as severe, moderate, or mild insomnia. Questions target the severity of sleep issues including falling asleep, staying asleep, and early awakening. The assessment

also evaluates how satisfied the rater is with his/her overall sleep, the extent to which sleep interferes with daily functioning, how noticeable others perceive the Veteran's sleep habits, and how worried the rater is about his/her general sleep patterns. Validity was confirmed in 2001 with the publication of an internal reliability of 0.78 when compared to polysomnography, the gold standard in assessing sleep disorders (Bastien, Vallieres, and Morin, 2000). The alpha coefficient to assess internal consistency reliability for this study at baseline was 0.89.

Glasgow Sleep Effort Scale

The GSES is comprised of seven questions to quantify sleep effort, with scores ranging from (*1 = very much true, to 3 = not at all*). Items aim to assess effort required to fall asleep, as well as capture the degree of fear, worry, inability, anxiety, and sense of control surrounding the sleep process. A validation study published in 2005 highlighted research that compared good sleepers to those with an active diagnosis of insomnia to determine the effectiveness of the GSES in predicting sleep effort. Internal consistency, Chronbach's $\alpha = 0.77$ (Broomfield & Espie, 2004). This tool had a positive predictive value of 0.87, and a negative predictive value of -0.94 using a cut off score of 2 (Broomfield & Espie, 2004). The alpha coefficient for this study was 0.82.

Pre Sleep Arousal Scale

The PSAS is a self-report questionnaire focused on evaluating the cognitive and somatic arousal symptoms experienced before going to bed. Using a likert-scale (*1 = not at all, to 5 = extremely*), Veterans are asked to rate the intensity of pre sleep arousal through the presence of somatic symptoms such as nervousness, fast heartbeat, shortness of breath, tight muscles, cold sweaty palms, stomach disturbances, perspiration, and dry

mouth. Cognitive questions aim to assess for time spent worrying, reviewing the day's events, depressive thoughts, being mentally alert, inability to shut thoughts off, distraction, and racing thoughts. Chronbach's alpha for the cognitive subscale for college students was 0.88, for normal sleepers 0.67, and for those with insomnia, 0.81 . When analyzing the somatic symptoms, Chronbach's alpha was 0.79 for students, 0.84 for good sleepers, and 0.81 for those diagnosed with insomnia (Lichstein & Rosenthal, 1980). The alpha coefficient for this study was 0.89 for the total score, and 0.85 for somatic symptoms, and 0.88 for the cognitive subscale. All items of the subscale were shown to correlate better with the total score of their subscale than with the total score of the other subscale. When compared to other scores that assess similar cognitive and somatic symptoms like anxiety and depression, there was high correlation in all comparisons.

Data Analysis

Variables from a larger study by Bormann were extracted to ascertain the overall efficacy of MP on Veterans with PTSD. The Institutional Review Board (IRB) of both the VASDHS and the University of San Diego approved study. All information was de-identified and necessary computations were made to tailor the data set to proceed with the analysis. Frequencies and distribution tests were run on the Veterans to examine the demographics of the population, specifically looking at gender, age, marital status, educational background, occupation, income, military branch, and theater of deployment. Other variables of importance included previous or current meditation practice, and total months duration of PTSD prior to MP. Paired t-tests were then conducted on pre-post assessments to assess for significant change between all pre and post assessments after the implementation of MP. These same tests were also used to assess the significance in

the difference of the scores between tools, and to obtain information on the impact of previous or current meditation practice at the start of MP on the scoring of the population throughout the intervention.

Ethical Protections

Ethical considerations were followed to ensure appropriate use of secondary data for analysis. Research plans and actions were discussed with the principal investigator of the umbrella study containing the data for this research. As stated previously, IRB approval was obtained from the VASDHS and the University of San Diego. Original consents obtained from Veterans included consent for supplemental data collected during the study to be used for future research. Education was provided at enrollment and available throughout and after study should a Veteran have any questions or concerns about the research process. All data points were de-identified prior to any analysis of the data. This included Veteran's name, dates and location of birth, dates of deployment, as well as any other identifying information.

Results

Initially, 178 Veterans were screened to participate in the study. Eighty-three Veterans completed the initial screening process, and 59 completed the post assessment CAPS interview. In other supplemental assessments administered, fewer Veterans completed pre and post assessment for each supplemental tool (Table 3). Data extracted from the feasibility study was used to examine the efficacy of MP on sleep. Data were cleaned and prepped for analysis. Assessing for outliers, one outlier was identified within the PSAS cognitive subscale pre-assessment score with an extreme low of 11. This Veteran was included in the study for demographic information and baseline scores. This

Veteran did not complete the post assessment PSAS instrument, so pre score was not included in the analysis to identify a relationship between pre and posttest scores. All other assessment scores and demographics were normally distributed with no outliers. See Table 2 for the demographics of the enrolled Veterans. The mean age of the population was 50.64 (11.94), with 89.2% being male. Average length of PTSD symptoms was 22 years (SD=16.25). Sixty-seven percent of the Veterans were white, with African Americans (26.5%), and other races (6.3%) accounting for smaller proportions. Most Veterans were at the time unemployed (77.1%) with the highest percentage claiming disability and inability to work due to poor health (37.3%). Marital status had less variance; divorced, married, and single were 38.6%, 31.3%, and 22.9% respectively. Approximately forty-eight percent of the Veterans had attended some college, the majority (38.6%) earned under \$20,000/ year, and only 39.8% having ever practiced meditation in the past and 21.7% currently practicing meditation at the time of study enrollment. Assessing both current and past meditation practices, Veterans were asked how many times a week they practiced (M=1.37, SD=4.23) and how many minutes of meditation each session (M=4.78, SD=11.40). Types of meditation practiced varied, including the use of breath, mindfulness, mantram repetition, practicing awareness, as well as meditation through music, prayer, relaxation techniques, yoga, Transcendental Meditation, and guided imagery.

Table 3 shows the pre-post test results of tools collected throughout the MP. Using the CAPS (N=59) assessment scores, pretreatment scores were 'severe' (M=73.41, SD= 15.38). Using a cutoff score for PTSD of ≥ 45 , and using the guidelines set by Weathers et. al. (2001), having a 10 point minimum reduction on the post-test as

significant, showed a clinical improvement of PTSD symptoms, with a mean change in score of minus 16.52 points. Posttreatment CAPS scores ($M=54.48$, $SD=24.96$) did not fall below the threshold of PTSD diagnosis, but were significant ($p<.000$) with a large effect size ($d=0.92$).

Three subgroups of symptoms encompass the CAPS score; reexperiencing (criteria B), avoidance (criteria C), and hyperarousal (criteria D). Criteria B and D had moderate effect sizes ($d=.60$, $d=.61$), while criteria C had a large effect size ($d=.87$). All three criteria had changes in scores that were significant ($p<.001$) from pre to posttest.

The PCL-S ($n=50$) had a large effect size ($d=0.80$), with a significant change in score (11.36) between the pre and posttest ($p<.000$). The ISI ($n=55$) had a moderate effect size ($d=0.61$), and the change in score was significant ($p<.001$). The posttest score ($M=14.50$, $SD=7.23$) was 4.01 points lower than pretest score, and Veterans remained above the cutoff of >8 for identifying the presence of insomnia. At pre-test ($n=78$) using the ISI categories for insomnia, not clinically significant insomnia (0-7) ($n=5$), subthreshold insomnia (8-14) ($n=13$), moderate clinical insomnia (15-21) ($n=33$), and severe clinical insomnia (22-28) ($n=27$). Post assessment scores ($n=56$) decreased resulting in 12 Veterans showing no clinically significant insomnia, 18 categorized as having subthreshold insomnia, 16 with moderate insomnia, and 10 still rating their insomnia as severe.

The GSES ($n=16$) and the PSAS ($n=16$) each had a much smaller response rate than the other tools. The small sample size of the GSES affected both the significance of the test ($p>.05$) and effect size ($-.33$). Examining further, when GSES is dichotomized based on gender. Both females who completed the GSES pre and posttest had a decrease

in score of six points. Males' ($n=14$) change in score was significant ($p<.05$) with equal variances were assumed using Levine's test for inequality of variances ($p=.116$). The PSAS when divided into somatic and cognitive subcategories both showed moderate-to-large effect sizes ($d= 0.80$ and 0.75 respectively). Changes in assessment score pretest to posttest were also significant in both groups ($p<.05$, $p=.007$ and $p<.001$). With the analysis of demographics in Veterans that did not complete the PSAS, a total of 57 Veterans did not complete the pre, post, or either assessment. No difference in demographics was found in Veterans that did not complete the GSES and CAPS post assessments compared to those who did.

Table 4 shows the correlations between test differences. The CAPS and ISI ($p<.000$), ISI and PCL-S ($p<.05$), ISI and GSES ($p<.05$), and CAPS and PCL-S ($p<.001$), were all significant in their correlations. PSAS scores were dichotomized into a somatic score and cognitive score. Significance was found when comparing PSAS somatic symptom item scores to ISI ($p<.05$), and GSES ($p<.01$). Pre score results of all variables were also compared independently to see if there was a significance in test scores prior to the start of MP vs. after. Results were comparable to the scores of the difference in pre-post tests (table 3).

Previous use of holistic practices including mantram repetition, meditation, and focused breathing were assessed for relationships against the assessment pre-test scores. Focused breathing was significant ($p<.05$) in association with CAPS criterion B. No other significance was found for focused breathing, mantram, or meditation. At enrollment, six (7.2%) Veterans reported using mantram sometimes or often. Veterans reported more frequent use of meditation (27.7%) and focused breathing (39.7%). At the post-test, 44

(56.6%) of Veterans reported often or routine use of mantram repetition, more than meditation (36.1%), or focused breathing (36.2%).

The majority of Veterans that did not complete the study made less than \$20,000 a year (57.7%), completed some college (73%), with 84.6% not working at the time of enrollment. It was also found that of the 24 Veterans who did not complete the post CAPS assessment, 20 (76.9%) were not currently practicing meditation, and 15 (57.7%) had never practiced meditation in the past. Forty-four percent of females dropped out of the study. Data gathered from the attrition population is important to better tailor future studies and help identify Veterans more likely to drop out. This can also help to improve retention by identifying areas for changes in study development to ensure Veterans are able to complete the study.

Assessment scores collected from Veterans that did and did not complete the final CAPS assessment were analyzed. CAPS completers were of similar age ($M=48.13$, $SD = 12.19$), in comparison to dropout demographics. GSES and ISI scores were similar at baseline ($p<.05$), as were the ISI, PCL-S, and cognitive subscale of the PSAS ($p<.01$). No other identifiers were found to suggest a reasons why they did not complete the study.

Discussion

Analysis of the data showed there to be a significant improvement in scores for most sleep assessment tools after the intervention. The total CAPS scores decreased by an average of 18.93 points. The change from the pre to posttests had a large effect size, as did subscale criteria C, numbing, suggesting both had very high practical significance. Cohen's effect size value for criteria B, reexperiencing, and D, hyperarousal, had moderate to high practical significance. These effect sizes show the MP effect on the

population was strong. Posttreatment CAPS scores on average were higher than the PTSD cutoff for the scale, but a remarkable 28 (41.8%) of the Veterans fell below the PCL-S cutoff score of 50 after MP. PCL-S scores also showed large effect size, with an average decrease in score of 11.6. This self-report improvement in symptoms was large enough to lower the mean post-assessment score below the threshold for PTSD diagnosis. These changes in scores, both the CAPS and PCL-S, suggest the impact of mantram repetition on overall PTSD symptom burden to be very effective.

Many of the Veterans were not meditating at the time of enrollment, or had never tried meditation in the past. Of those who stated they had practiced using meditation, the average reported sessions per week were low, and for a short period of time.

Relationships between current and previous meditation practice at the time of enrollment were assessed in association to other tools collected. A significant association was noted between the different scores of the PCL-S and previous meditation practice. No other significant relationships were found in other tools, suggesting previous or current meditation practice at the start of MP did not impact pre-assessment scores.

Total number of hours of sleep desired when asked within the CAPS interview did not change significantly from pre to post test. Number of reported hours of sleep improved by 0.43 hours per night, but the change was not significant. As stated previously, reports of sleep effort are frequently perceived as worse than observed sleep effort. This may also impact significance and reporting of this variable.

Examining all pre-assessment scores, the ISI scores were statistically significantly associated with CAPS, PCL-S, GSES and PSAS somatic scales. The ISI scores responded positively when mantram repetition was introduced, bringing the mean level of

severity from moderate (clinical) insomnia, to subthreshold insomnia. This information is very significant to the study, showing that MP can improve symptoms of insomnia. In some cases, Veterans reported mild, or even no symptoms of insomnia following the intervention. It would be important in future studies to assess improvement at a third point in time for maintenance of practice and continued improvement.

Due to the small number of GSES assessments completed, larger sample sizes are needed to ascertain a more sufficient effect of MP on sleep effort. To correlate the GSES positively with the other tools, the GSES was recoded from the original data. When examining GSES tool collection, initially 36 Veterans completed the pre-intervention GSES, and 30 Veterans completed the post-MP GSES, with 16 Veterans having completed both the pre and post GSES. Effect size was small, suggesting effect size was small to moderate and non-significant. Statistical significance was found with the ISI, and somatic subscale of the PSAS. There was a decrease in self-report by 1.38 points. Further research would need to be conducted to gather more significant information to calculate the effect of mantram on sleep effort assessed in the GSES.

The pre-post PSAS assessment had a low response rate, but in this case effect sizes for both somatic and cognitive subscales were large, and results were significant. Somatic subscale and ISI improvements in scores were also significant ($p < .05$). Different levels of significance between the somatic and cognitive subscales are explained by the subscale predictability found in reliability and validity studies (Nicassio, Medlowitz, Petras, & Fussell, 1984). Cognitive subscales show strong predictability of sleep quality, focusing on time spent worrying and reviewing events, depressive thoughts, being mentally alert, racing thoughts, and other mental stimulants. The somatic subscale

questions evaluated physiological responses including, but not limited to, shortness of breath, anxiety, tight muscles, and sweaty palms; the assessment of depressive and anxiety symptoms that surround sleep (Nicassio, Medlowitz, Petras, & Fussell, 1984).

Veterans who did not complete the study were predominantly male (90.5%), not employed (76.9%), having attended some college (53.8%), earning under \$40,000 a year (79.2%), but none of these characteristics were significantly different from those who completed the study. Enrollment for future studies should aim to broaden Veteran recruitment and demographics to obtain generalizable effect of mantram repetition. Of the 39.8% of Veterans that reported having used a meditation practice in the past, only 18 Veterans (21.7%) reported current meditation practice at enrollment.

Further assessing the GSES, 43 Veterans who completed the post CAPS interview did not complete the post GSES. Demographics of those who did not complete the post GSES resembled the overall dropout population. These Veterans were found to have an educational level that included some college, a normalized distribution of income, with a greater number of Veterans having meditated in the past. GSES scores did show a relationship amongst other assessments collected in this study except for the ISI. This could be because both tests assess for hyperarousal prior to sleep, a common symptom found in insomnia as well. The PCL-S, ISI, PSAS, and CAPS, all resulted in statistically significant correlations among tools at baseline assessment.

There were only nine women that completed the post CAPS interview, fewer completing the PCL-S, ISI, GSES, and PSAS. Future studies to include more women Veterans diagnosed with PTSD would be critical to assesses sleep habits in this population and to provide them with tools to improve sleep quality and lower overall

PTSD symptom burden. Only two women completed the pre and post GSES assessment, and their scores both dropped by 6 points. This would need to be examined in a larger population of women to report significant results, but the drop in score is a step in the right direction. Reports of sleep effort improved after the MP, and indicate mantram's potential beneficial impacts in women, needed to be assessed in a larger population.

Current statistics show attrition from mental health care to be as high as twenty-one percent (Hembree & Foa, 2003), with up to fifty percent nonresponsive rates on mail-in documentation (Schotenbauer, Glass, Arnkoff, Tendick, & Grey, 2008). Attrition rates were higher, where in this study, 69.88% of the Veterans completed the study, and 30.12% of the Veterans dropping out after enrollment. An explanation for the lack of younger Veteran enrollment could be due to the group delivery of MP taught and practiced in-group format. In a current study, preliminary reports show a higher occurrence of younger Veterans with PTSD enrolling in individual treatment. Also, in re-evaluating the abovementioned theoretical framework illustrating the use of mantram on sleep quality in Veterans, in order to participate in a study, the Veteran recognized a reason to change, made the decision and took the first step to seek a way to change. Since the Veterans are actively involved in the enrollment and intervention participation, there is greater potential for them to succeed, thus resulting in improved sleep habits.

The majority of post treatment scores had statistically significant results while remaining above the thresholds. Sean Drummond, PhD, Associate professor of Psychiatry of UCSD and the Co-Director UCSD/VA Psychology Internship Training Program in the Laboratory of Sleep and Behavioral Neuroscience, reported similar

findings when using the ISI in a study with a prolonged exposure intervention to improve sleep habits (S. Drummond, personal communication, December 27, 2013).

With the review of the literature on sleep and PTSD, it was found that future research interventions are necessary to assess the efficacy of complementary therapies on sleep quality in Veterans with PTSD. Studies presented within these reviews discussed the need for validated and reliable sleep measures to be collected during interventions to adequately assess the improvement of sleep habits during these interventions. Mantram repetition was shown to have significant results in overall PTSD symptoms in Veterans and other populations, with references made to improvements in sleep quality during those studies. No research specific to mantram repetition and its effect on sleep has been conducted, hence the importance of this study to evaluate sleep improvement in Veterans through the mantram program. This research aims to fill the gap present in Veteran sleep quality improvement through an intervention using valid and reliable assessment tools.

As an efficacy study to determine if MP had an impact on sleep quality, significant results were produced to show positive effects in this study. This warrants further studies to evaluate the effectiveness of MP on sleep quality in Veterans compared to a control group. With this data more information can be extracted to assess the impact on sleep. Demographic data, including gender and military branch were analyzed for significance in sleep score changes after MP. Preliminary results show gender may impact improvement scores in certain tools, but given small sample sizes of females Veterans, specifically in the GSES, it is important to conduct future studies that include more women Veterans to assess effect of MP on sleep in this population.

Implications of Findings

This study was the first of its kind to formally assess the efficacy of MP on sleep using reliable and valid quantitative instruments in Veterans with PTSD. Results showed MP to have a statistically significant impact on sleep quality having moderate to large effect sizes in a sample size . Subsequent studies including a third point of data collection after the completion of the program to assess for continued improvement of symptoms would further assess change in scores with MP maintenance. Male Vietnam Veterans encompassed the majority of the participant group for this study, therefore, other studies to include younger Veterans of both sexes would be beneficial in gaining a better-balanced indication of MP on the general Veteran population. These findings show Mantram Program as a useful aid in sleep in this preliminary study, is evidence-based and data grounded, and promotes symptom improvement. Results from this study will be another pillar in the foundation of sleep intervention research on Veterans with PTSD. With its dissemination, it will continue to aid in symptom relief of Veterans who have suffered with the adverse effects of the disorder. This study addresses the global issues of PTSD, to expand treatment availability to those currently diagnosed with PTSD, those at risk, and to discover ways to prevent PTSD in the future.

CHAPTER FOUR: Manuscript Four

A Framework to Improve Sleep Quality in Veterans with PTSD

Introduction

Posttraumatic stress disorder (PTSD) affects over seven million (3.5%) of the United States adult population, 36% of whom are categorized with a severe diagnosis. PTSD is defined as a psychiatric disorder that is triggered by a traumatic incident ranging from natural disasters, sexual assaults, and military combat exposure (American Psychiatric Association, 2000). As some survivors are able to heal over time, those with PTSD are unable to cope effectively. From nightmares to flashbacks, these symptoms cause impairments in social and occupational functioning. The most frequently documented symptoms of PTSD include anxiety, restlessness, anger, avoidance, unwanted memories, guilt, and insomnia, all of which interfere with quality of life (American Psychiatric Association, 2000).

PTSD management and treatment costs the United States billions of dollars each year. The profile of those diagnosed with PTSD includes younger males with lower levels of education, having grown up in lower income households, and a history of multiple traumatic life events prior to service (Seal, Bertenthal, Miner, Sen, & Marmar, 2007). Statistics show that 87% of Veterans with PTSD report sleep disturbances and 52% report nightmares, these complaints being the second most common reason for Veterans to seek mental health care upon return from deployment (Germain, et al. 2006). Studies have shown changes on magnetic resonance imaging (MRI) of function and tissue formation changes in the brain in Veterans with PTSD (Canive et al. 1997; Jatzko, et al. 2006). Medical and complementary

therapies are available for symptom treatment, the latter currently identified as the recommended treatment method by the Department of Defense (DOD) (Shoenfeld, DeViva, & Manber, 2012).

Until 1980, PTSD was not considered a diagnosable disorder. It was first believed to be present only in Veterans unable to cope with the experiences of war. Tanielian and Jaycox (2008) found a sample of Veterans of the Afghanistan and Iraq conflicts (N=1,938) who reported a PTSD prevalence rate of 13.8%. Research has also reported a 10.1% presence of PTSD in Gulf War Veterans (Kang, Natelson, Mahan, Lee, & Murphy, 2003), and a 30.9% prevalence in Veterans of Vietnam (Kulka, et al. 1990).

The effect of PTSD on sleep quality is an essential component of Veteran treatment. Poor sleep quality compounds daytime impairment, leading to an increased reaction to stimuli, and an inability to focus, concentrate, and achieve goals. Impaired sleep has also been associated with an increased risk of suicide (Nishith, Resick, & Mueser, 2001). Research shows a significant relationship between sleep deprivation and continued exposure to high amounts of stress leading to decreased health outcomes (Clum, Pallavi Nishith, & Resick, 2001).

The Mantram Program

Bormann and colleagues (2013) conducted a prospective, single blind, randomized trial to compare usual treatment with the Mantram Program (MP) in Veterans with PTSD. A mantram, when translated from Sanskrit, means “to cross the mind”. It is a short phrase or word repeated in silence anytime, anywhere, to center and find focus (Easwaran, 2008). MP is an eight-week program teaching a portable, meditation-like practice of mantram repetition, which provides tools to help the Veteran become one-pointed and slow down. Veterans are provided with a course manual and *The Mantram Handbook*. In class, a list of

mantrams is presented for the Veterans to choose from. These are predominantly written in Sanskrit, with spiritual and religious translations (Table 1). During class sessions, Veterans discuss daily activities and hurdles they face as a result of military trauma. Veterans practice repeating their mantram in class. Applications of mantram practice are reviewed, identifying situations where mantram use can help the Veteran regain focus and become one-pointed, overcoming difficult situations. Over the course of the program, personal experiences using mantram repetition between sessions are shared within the group. Study exercises are included for weekly completion, in hopes of creating awareness of daily mantram application.

This research reported MP to be statistically significant ($p < .05$) in reducing PTSD Checklist-Specific (PCL-S) and Clinician Administered PTSD Scale (CAPS) scores at posttreatment and these improvements continued after the intervention had completed. Significant results ($p < .001$) were also seen on the Brief Symptom Inventory-18 (BSI) depression subscale (Bormann, Thorp, Wetherell, Golshan, & Lang, 2013). Mindfulness based therapies have been linked to decreased stress levels and a reduction in reported depressive symptoms (Vago and Silbersweig, 2012). Results of significant symptom improvement in PTSD scores supports previous studies with family caregivers of Veterans with dementia (Bormann, et al. 2009) and patients with Human Immunodeficiency Virus (HIV) (Bormann, Gifford, Shively, Smith, Redwine, Kelly, ... & Belding, 2006). Based on the significant results indicating overall improvement of PTSD symptoms using the MP, this theoretical framework was developed to illustrate how MP works to improve sleep quality in Veterans with PTSD.

Creating a Framework to Describe Sleep Quality in Veterans

While assessing the effect of MP on Veterans with PTSD, Bormann and colleagues have collected both quantitative and qualitative information that supports the impact of MP on PTSD symptom burden. Veterans comment on the effect of mantram repetition on different aspects of their daily lives including assistance with sleep disturbances, improving interpersonal relationships, and coping with life struggles. Below are three examples of the use of a Mantram (Bormann, Hurst, & Kelly, 2013).

“I use my mantram often when I have trouble falling asleep because, you know, I just, my mind just gets going and going and going and going and so, what I do is, I concentrate on my mantram and ah, ah also my breathing and then I can finally settle down to go to sleep. Otherwise, I just lay there and my agitation just won’t, won’t go away.” (Bormann, et. al. 2013, p. 778).

“Basically I think what my mantram does is it gives me a pause, to think about doing what I would think would be the correct thing in a situation with relatives or friends, or whatever, when I could say something, you know, just throw it out there and hurt someone’s feelings or I can think about it and not say it, or should I say it or whatever, but my mantram give me time to think about what I could do under the, you know, circumstances.” (Bormann, et. al. 2013, p. 778)

“I was laid off from my job and I really liked that job and for about a week, you know, I was... I live downtown in a residential hotel, and for about a week, I wasn’t doing anything. I didn’t apply for unemployment or anything. I was just sitting in my room and oh my god, oh my god, and then I thought I should use my mantram, so I did and it really calmed me down. It calmed me down and it made me go searching for a job and when I did go searching for a job, I remembered an agency was putting together a winter shelter. So I

went over there and applied for that and got that job. So I guess using my mantram kept me rather levelheaded, down to earth and, you know, able to, you know, get through that ordeal.” (Bormann, et. al. 2013, pg 778).

Though none of the studies until now involving MP were tailored to specifically address sleep issues, its impact on sleep quality has been found in Veteran interviews and during MP courses. Focusing to understand the effect of MP on sleep quality, a retrospective review of supplemental sleep data was completed to determine the efficacy of MP on sleep in Veterans with PTSD. Five measures were used to assess sleep quality before and after the eight week MP. There were four self-assessments: the PCL-S, Insomnia Severity Index (ISI), Glasgow Sleep Effort Scale (GSES), and the Pre Sleep Arousal Scale (PSAS), and one structured interview, the CAPS. Results from this study showed statistical and clinical significance in the mean assessment scores after participation in MP (Holt, 2014). With no framework previously developed to describe the MP intervention to improve sleep quality, this framework aims to appropriately depict the change process.

Theoretical Framework

The theoretical framework Improving Sleep Quality with the MP was developed to depict the introduction of MP to Veterans with PTSD, and the journey towards improving sleep quality (Figure 1). This was adapted from three previously published frameworks (Prochaska, Norcross, & DiClemente, 1995; Vago & Silbersweig, 2012; Veteran Affairs San Diego Healthcare System, 2014). Currently there is no theoretical framework to describe the process of improving sleep quality in Veterans with PTSD. As stated previously, sleep quality plays a significant role on overall PTSD symptom burden. Without proper understanding of the change process specific to sleep quality, it will be difficult to assess interventions to improve sleep. In creating this framework, these guidelines were observed to create a successful depiction of the stages needed for improving sleep quality in Veterans.

First, Prochaska's parent theory of readiness to change begins the process of recognizing a bad habit and the mental preparation and action required for successful behavior change. Prochaska began exploring the stages of change in the 1970s, and with years of work, Prochaska, DiClemente, and Norcross (1992) published their work on the transtheoretical model of Health Behavior Change. These steps begin with pre-contemplation, where the thought for a need to change may not be present. This is followed by the contemplation stage, where the idea of change has come, first as a passing thought and then as a decision with a unspecified timeframe to initiate change. The next stage is preparation, where the person decides to make a change and puts plans in place to begin working towards change. The final steps to successful change are taking action and maintaining the changed habits. In the action stage, the behavioral change is being made, but still requires effort to maintain it. Maintaining lifestyle changes requires effort to continue the change along with the knowledge that it is possible to revert back to previous habits and behaviors (Prochaska, et al. 1995).

Prochaska and DiClemente's change theory was created to describe the stages required to improve addictive behaviors. Though the stages can be applied to other habits, such as the cyclical nature of impaired sleep, it does not adequately depict the process of improving sleep habits. The basis of Prochaska and DiClemente's framework appropriately describes successful change as progressive, and not always with forward motion. Setbacks are described within this model, as well as anticipated, as the process of change takes time, practice, and continual effort to maintain.

Building on this, Vago and Silbersweig (2012) published a framework to display the process of a mindfulness intervention and the steps it takes to habitually use mechanisms such as working memory and executive monitoring to focus and obtain emotional regulation. This framework illustrates how through intention and motivation, a mindfulness intervention can be initiated. It describes the manner in which distraction and disengagement can disrupt the process and further interrupts positive behavior change. The framework is applicable to the MP in that it requires effort, engagement, habit, and executive monitoring in order for mantram repetition to become automatic responses (Vago & Silbersweig, 2012).

Within this article, Buddhist origin of the word "sadness" signified the inability to avoid unwanted thoughts. As in Buddhist practice, breaking free of the negative thoughts requires balance and mental clarity. Equanimity, or the ability to openly acknowledge the passing of thoughts and experiences, allows one to separate from the thoughts of avoidance (Vago & Silbersweig, 2012). If unable to separate from the unwanted thoughts and feelings, there remains a cyclical reinforcement of negative symptoms. The intent of mindfulness interventions is to bring a sense of calm, the ability to recognize thoughts and feelings, without attachment to them, and to continue with minimal reaction.

As previously discussed, sleep disturbances of Veterans with PTSD effect daytime symptom burden, which in turn continues to impact nighttime PTSD symptoms. Further examining the Mindfulness Process Model, it is found that mantram repetition can be comfortably expressed within a portion of this framework. In order to participate in MP, intention and motivation must be present to initiate involvement. Stuck in a cycle of impaired sleep, the choice is made to participate in changing behaviors with the goal to improve sleep quality. Individually, each framework was able to identify a portion of the adapted framework needed to exemplify the process of improving sleep quality in Veterans through mantram repetition. Prochaska and DiClemente highlight the steps needed to create and maintain change. Vago and Silbersweig (2012) illustrate the mechanism in which intention and practice initiate participation in a practice, while also highlighting the distractions and disengagement that takes place while instituting change.

In the case of MP as the intervention, the framework describes the process of change, as presented by the Veteran Affairs Healthcare System (VAHCS) within the Mantram Program Manual. After recognizing the need/want to change, and initiating the participation in change behaviors, practice is mechanical. Intent must be present to start familiarizing your mantram, and mental cues are given to initiate using the mantram, when it is needed and not. At this stage the first tools are available to help improve sleep, but the opportunity to revert to previous sleep habits is a constant. Practiced repetition in times where distress is not present leads to recognition of stressful situations and the use of mantram. Named the experiential stage, the mantram use at bedtime is used effectively, beginning to improve sleep quality. The last stage of this framework, mantram use becomes habitual. As adapted from the mindfulness framework (Vago & Siberswieg, 2012), distraction and disengagement from the intervention impacts the ability for the Veteran to get to a place of using mantram

as a habit (Figure 1). Each of these stages can be interrupted, causing Veterans to fall back into disruptive sleep patterns. With intention and motivation, Veterans can re-integrate their mantram in daily practice again at any time, and continue to progress through this cycle until mantram repetition becomes habitual, which initiates the relaxation response, and as a result, sleep. This adapted framework is able to express the process of improving sleep quality and the steps needed to make change through the use of MP, but can also be very versatile in illustrating many types of change scenarios.

Implications for nursing

With new cases of PTSD being diagnosed every day, more research is needed for best practices to improve sleep quality for current and future Veterans. With the present gaps in research involving the impact of interventions, such as MP, on sleep in Veterans with PTSD, this theoretical framework aims to provide clinicians with an evidence-based and data grounded depiction of the implementation of an intervention that promotes symptom improvement. This framework adds to the foundation of sleep research on Veterans with PTSD, in hopes to aid in symptom relief of Veterans who have suffered with the adverse effects of the disorder. Research results will further support the MP intervention, aiding in its dissemination for others to learn and practice as a part of their daily routine. This study addresses the global issues of PTSD, hoping to further expand treatment availability to those currently diagnosed with PTSD, as well as those at risk.

Table 1. Study Enrollment Process

Table 2. Preferred list for Mantram Repetition Program

Mantrams (pronunciation)	Descriptions
Om Mani Padme Hum (Ohm Mah-nee Pahd-may Hume)	An invocation to the jewel (Self), in the lotus of the heart
Namo Butsaya (Nah-mo Boot-sie-yah)	I bow to the Buddha
My God and my All	St. Francis of Assisi's mantram
Maranatha (Mar-ah-nah-tha)	Lord of the Heart [Aramaic]
Kyrie Eleison (Kir-ee-ay Ee-lay-ee-sone)	Lord have mercy
Jesus, Jesus or Lord Jesus Christ	Son of God
Hail Mary, full of grace the Lord is with you [me]	Catholic Rosary
Lord Jesus Christ, Son of God, have mercy on us [me]	Jesus Prayer
Rama (Rah-mah)	Eternal joy within [Gandhi's mantram]
Om Namah Shivaya (Ohm Nah-mah Shee-vah-yah)	An invocation to beauty and fearlessness
Om Prema (Ohm Pray-Mah)	A call for universal love
Om Shanti (Ohm Shawn-tee)	In invocation to eternal peace
So Hum (So Hum)	I am that Self within
Barukh Atah Adonoi (Bah-rookh At-tah Ah-doh-nigh)	Blessed art Thou, King of the Universe
Ribono Shel Olam (Ree-boh-no Shel O-lahm)	Master of the Universe
Shalom (Shah-lohm)	Peace, wellness
Sheheena (Sha-khee-nah)	Feminine aspect of God
Allah (Ah-lah)	The Supreme Being
Allahu Akbar (Ah-lah-oo Ah-bahr)	God is greatest
Bismallah Ir-rahman Ir-rahim (Beese-mah-lah Ir-rah-mun Ir-rah-heem)	In the name of Allah, the merciful, the compassionate
Wakan Tanka (Wah-Kah Tahn-Kah)	Great Spirit

Table 3. Mantram Definition as a Concept

Table 4. Veteran Demographics

Variable (range)	M (SD)
Age (26-71)	50.64 (11.94)
Years with PTSD (.08-60)	22(16.25)
Meditation time/week (0-28)	1.37(4.23)
Minutes of meditation/session (0-60)	4.78(11.40)

	n(%)		n(%)
Gender		Level of Education	
Males	74(89.2)	Some high school	2(2.4)
Females	9(10.8)	High school equivalent	2(2.4)
Ethnicity		High school graduate	13(15.7)
White	56(67.5)	Some college	40(48.2)
African American	22(26.5)	Bachelor's degree	15(18.1)
Other	5(5.8)	Graduate degree	11(13.3)
Marital Status		Income	
Single	19(22.9)	Under \$20,000	32(38.6)
Married	26(31.3)	\$20,001 - \$40,000	26(31.3)
Separated/Divorced	32(38.6)	\$40,001 - \$60,000	8 (9.6)
Domestic Partner	3(3.6)	\$60,001 - \$80,000	7(8.4)
Widowed	3(3.6)	Over \$80,001	10(12.0)
Employment		Previous meditative practice	
Part-time	7(8.4)	No	50(60.2)
Full-time	12(14.5)	Yes	33(39.8)
Not employed	64(77.1)	Current meditation practice	
Reason for no employment		No	65(78.3)
Temporarily laid off	4(4.8)	Yes	18(21.7)
Student	3(3.6)		
Poor health/ disability	31(37.3)		
Retired	16(19.3)		
Homemaker	1(1.1)		
Other	28(33.8)		

Table 5. Mantram Repetition and Sleep Quality Pre – Post Test Results

Outcome (range)	N	M(SD)	t(df)	p	Cohen's d	r
CAPS (0-136)	59					
Pretest		73.41 (15.38)	6.19 (58)	.000	.92	.42
Posttest		54.48 (24.96)				
CAPS Criteria B	61					
Pretest		20.22 (6.42)	4.45 (60)	.000	.61	.29
Posttest		15.64 (8.65)				
CAPS Criteria C	61					
Pretest		29.66 (8.75)	5.76 (60)	.000	.87	.40
Posttest		20.14 (12.90)				
CAPS Criteria D	59					
Pretest		24.06 (5.82)	4.31 (58)	.000	.60	.29
Posttest		19.63 (8.75)				
PCL (17-85)	50					
Pretest		60.10 (10.74)	5.66 (49)	.000	.80	.37
Posttest		48.74 (17.08)				
ISI (0-28)	55					
Pretest		18.51 (6.02)	4.73 (54)	.000	.61	.29
Posttest		14.50 (7.23)				
GSES (0-14)	16					
Pretest		8.32 (4.05)	1.65 (15)	.121	.33	.16
Posttest		6.94 (4.41)				
PSAS Somatic (8-40)	16					
Pretest		20.94 (5.86)	3.10 (15)	.001	.93	.42
Posttest		16.13 (6.25)				
PSAS Cognitive (8-40)	16					
Pretest		28.94 (6.16)	4.22 (15)	.001	.75	.35
Posttest		23.63 (7.99)				
PSAS Total	16					
Pretest		49.88 (10.46)	4.82 (15)	.000	.93	.42
Posttest		39.75 (11.74)				
Total hours sleep/night	60					
Pretest		5.20 (1.78)	-1.61 (59)	.115		
Posttest		5.63 (2.06)				
Desired hours sleep/night	60					
Pretest		7.60 (1.22)	-.42 (59)	.682		
Posttest		7.65 (0.95)				

Table 6. Correlations of Study Tools at Pre-Test

	1	2	3	4	5	6	7	8	9	10	11
CAPS	---										
Criteria B	.75**	---									
Criteria C	.84**	.42**	---								
Criteria D	.66**	.29**	.32**	---							
ISI	.41**	.30**	.28**	.37**	---						
PCL	.66**	.53**	.49**	.49**	.57**	---					
GSES	.34	.27	.22	.33	.60**	.36	---				
PSAS –somatic subscale	.05	-.12	.04	.35	.40*	.26	.48**	---			
PSAS – cognitive subscale	.34	.17	.31	.31	.35	.57**	.53**	.53**	---		
Current meditation	-.03	-.09	.06	-.04	.05	.08	.19	-.02	-.07	---	
Previous meditation	-.20	-.13	-.19	-.10	-.08	.06	.20	.21	.03	.65**	---

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Appendix B.
Clinician Administered PTSD Scale

National Center for PTSD

CLINICIAN-ADMINISTERED PTSD SCALE FOR DSM-IV

Screening ID: _____ Date: _____

Interviewer: _____

Study: 11-1448 Disseminating the Mantram Repetition Program (MRP) to Veterans with PTSD

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Behavioral Science Division - Boston
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Revised July 1998

Criterion B. The traumatic event is persistently reexperienced in one (or more) of the following ways:

1. (B1) young children, repetitive play may occur in which themes or aspects of the trauma are expressed.-1) recurrent and intrusive distressing recollections of the event, including images, thoughts, or perceptions.

<p>Frequency Have you ever had unwanted memories of (EVENT)? What were they like? (What did you remember?) [IF NOT CLEAR:] (Did they ever occur while you were awake, or only in dreams?) [EXCLUDE IF MEMORIES OCCURRED ONLY DURING DREAMS] How often have you had these memories in the past month (week)?</p> <p>0 Never 1 Once or twice 2 Once or twice a week 3 Several times a week 4 Daily or almost every day</p> <p>Description/Examples</p>	<p>Intensity How much distress or discomfort did these memories cause you? Were you able to put them out of your mind and think about something else? (How hard did you have to try?) How much did they interfere with your life?</p> <p>0 None 1 Mild, minimal distress or disruption of activities 2 Moderate, distress clearly present but still manageable, some disruption of activities 3 Severe, considerable distress, difficulty dismissing memories, marked disruption of activities 4 Extreme, incapacitating distress, cannot dismiss memories, unable to continue activities</p> <p>QV (specify)</p>	<p>Past week</p> <p>F ____ I ____</p> <p>Past month</p> <p>F ____ I ____ Sx Y N</p> <p>Lifetime</p> <p>F ____ I ____ Sx Y N</p>
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2. (B-2) recurrent distressing dreams of the event. Note: In children, there may be frightening dreams without recognizable content.

<p>Frequency Have you ever had unpleasant dreams about (EVENT)? Describe a typical dream. (What happens in them?) How often have you had these dreams in the past month (week)?</p> <p>0 Never 1 Once or twice 2 Once or twice a week 3 Several times a week 4 Daily or almost every day</p> <p>Description/Examples</p>	<p>Intensity How much distress or discomfort did these dreams cause you? Did they ever wake you up? [IF YES:] (What happened when you woke up? How long did it take you to get back to sleep?) [LISTEN FOR REPORT OF ANXIOUS AROUSAL, YELLING, ACTING OUT THE NIGHTMARE] (Did your dreams ever affect anyone else? How so?)</p> <p>0 None 1 Mild, minimal distress, may not have awoken 2 Moderate, awoke in distress but readily returned to sleep 3 Severe, considerable distress, difficulty returning to sleep 4 Extreme, incapacitating distress, did not return to sleep</p> <p>QV (specify) _____</p>	<p>Past week</p> <p>F ____ I ____</p> <p>Past month</p> <p>F ____ I ____ Sx Y N</p> <p>Lifetime</p> <p>F ____ I ____ Sx Y N</p>
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3. (B-3) acting or feeling as if the traumatic event were recurring (includes a sense of reliving the experience, illusions, hallucinations, and dissociative flashback episodes, including those that occur on awakening or when intoxicated). Note: In young children, trauma-specific reenactment may occur.

<p>Frequency Have you ever suddenly acted or felt as if (EVENT) were happening again? <i>(Have you ever had flashbacks about [EVENT]?)</i> [IF NOT CLEAR:] <i>(Did this ever occur while you were awake, or only in dreams?)</i> [EXCLUDE IF OCCURRED ONLY DURING DREAMS] Tell me more about that. How often has that happened in the past month (week)?</p> <p>0 Never 1 Once or twice 2 Once or twice a week 3 Several times a week 4 Daily or almost every day</p> <p>Description/Examples</p>	<p>Intensity How much did it seem as if (EVENT) were happening again? <i>(Were you confused about where you actually were or what you were doing at the time?)</i> How long did it last? What did you do while this was happening? <i>(Did other people notice your behavior? What did they say?)</i></p> <p>0 No reliving 1 Mild, somewhat more realistic than just thinking about event 2 Moderate, definite but transient dissociative quality, still very aware of surroundings, daydreaming quality 3 Severe, strongly dissociative (reports images, sounds, or smells) but retained some awareness of surroundings 4 Extreme, complete dissociation (flashback), no awareness of surroundings, may be unresponsive, possible amnesia for the episode (blackout)</p> <p>QV (specify)</p>	<p>Past week</p> <p>F ____ I ____</p> <p>Past month</p> <p>F ____ I ____ Sx Y N</p> <p>Lifetime</p> <p>F ____ I ____ Sx Y N</p>
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4. (B-4) intense psychological distress at exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event

<p>Frequency Have you ever gotten emotionally upset when something reminded you of (EVENT)? <i>(Has anything ever triggered bad feelings related to [EVENT]?)</i> What kinds of reminders made you upset? How often in the past month (week)?</p> <p>0 Never 1 Once or twice 2 Once or twice a week 3 Several times a week 4 Daily or almost every day</p> <p>Description/Examples</p>	<p>Intensity How much distress or discomfort did (REMINDERS) cause you? How long did it last? How much did it interfere with your life?</p> <p>0 None 1 Mild, minimal distress or disruption of activities 2 Moderate, distress clearly present but still manageable, some disruption of activities 3 Severe, considerable distress, marked disruption of activities 4 Extreme, incapacitating distress, unable to continue activities</p> <p>QV (specify)</p> <p>_____</p>	<p>Past week</p> <p>F ____ I ____</p> <p>Past month</p> <p>F ____ I ____ Sx Y N</p> <p>Lifetime</p> <p>F ____ I ____ Sx Y N</p>
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5. (B-5) physiological reactivity on exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event

<p>Frequency Have you ever had any physical reactions when something reminded you of (EVENT)? (Did your body ever react in some way when something reminded you of [EVENT]?) Can you give me some examples? (Did your heart race or did your breathing change? What about sweating or feeling really tense or shaky?) What kinds of reminders triggered these reactions? How often in the past month (week)?</p> <p>0 Never 1 Once or twice 2 Once or twice a week 3 Several times a week 4 Daily or almost every day</p>	<p>Intensity How strong were (PHYSICAL REACTIONS)? How long did they last? (Did they last even after you were out of the situation?)</p> <p>0 No physical reactivity 1 Mild, minimal reactivity 2 Moderate, physical reactivity clearly present, may be sustained if exposure continues 3 Severe, marked physical reactivity, sustained throughout exposure 4 Extreme, dramatic physical reactivity, sustained arousal even after exposure has ended</p> <p>QV (specify) _____</p>	<p>Past week F _____ I _____</p> <p>Past month F _____ I _____ Sx Y N</p> <p>Lifetime F _____ I _____ Sx Y N</p>
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Criterion C. Persistent avoidance of stimuli associated with the trauma and numbing of general responsiveness not present before the trauma, as indicated by three or more of the following.

6. (C-1) efforts to avoid thoughts, feelings, or conversations associated with the trauma

<p>Frequency Have you ever tried to avoid thoughts or feelings about (EVENT)? (What kinds of thoughts or feelings did you try to avoid?) What about trying to avoid talking with other people about it? (Why is that?) How often in the past month (week)?</p> <p>0 Never 1 Once or twice 2 Once or twice a week 3 Several times a week 4 Daily or almost every day</p>	<p>Intensity How much effort did you make to avoid (THOUGHTS/FEELINGS/CONVERSATIONS)? (What kinds of things did you do? What about drinking or using medication or street drugs?) [CONSIDER ALL ATTEMPTS AT AVOIDANCE, INCLUDING DISTRACTION, SUPPRESSION, AND USE OF ALCOHOL/DRUGS] How much did that interfere with your life?</p> <p>0 None 1 Mild, minimal effort, little or no disruption of activities 2 Moderate, some effort, avoidance definitely present, some disruption of activities 3 Severe, considerable effort, marked avoidance, marked disruption of activities, or involvement in certain activities as avoidant strategy 4 Extreme, drastic attempts at avoidance, unable to continue activities, or excessive involvement in certain activities as avoidant strategy</p> <p>QV (specify) _____</p>	<p>Past week F _____ I _____</p> <p>Past month F _____ I _____ Sx Y N</p> <p>Lifetime F _____ I _____ Sx Y N</p>
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7. (C-2) efforts to avoid activities, places, or people that arouse recollections of the trauma

<p>Frequency Have you ever tried to avoid certain activities, places, or people that reminded you of (EVENT)? (What kinds of things did you avoid? Why is that?) How often in the past month (week)?</p> <p>0 Never 1 Once or twice 2 Once or twice a week 3 Several times a week 4 Daily or almost every day</p> <p><i>Description/Examples</i></p>	<p>Intensity How much effort did you make to avoid (ACTIVITIES/PLACES/PEOPLE)? (What did you do instead?) How much did that interfere with your life?</p> <p>0 None 1 Mild, minimal effort, little or no disruption of activities 2 Moderate some effort avoidance definitely present, some disruption of activities 3 Severe considerable effort, marked avoidance marked disruption of activities or involvement in certain activities as avoidant strategy 4 Extreme drastic attempts at avoidance, unable to continue activities or excessive involvement in certain activities as avoidant strategy</p> <p>QV (specify) _____</p>	<p>Past week</p> <p>F ____ I ____</p> <p>Past month</p> <p>F ____ I ____ Sx Y N</p> <p>Lifetime</p> <p>F ____ I ____ Sx Y N</p>
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8. (C-3) inability to recall an important aspect of the trauma.

<p>Frequency Have you had difficulty remembering some important parts of (EVENT)? Tell me more about that (Do you feel you should be able to remember these things? Why do you think you can't?) In the past month (week), how much of the important parts of (EVENT) have you had difficulty remembering? (What parts do you still remember?)</p> <p>0 None, clear memory 1 Few aspects not remembered (less than 10%) 2 Some aspects not remembered (approx 20-30%) 3 Many aspects not remembered (approx 50-60%) 4 Most or all aspects not remembered (more than 80%)</p> <p><i>Description/Examples</i></p>	<p>Intensity How much difficulty did you have recalling important parts of (EVENT)? (Were you able to recall more if you tried?)</p> <p>0 None 1 Mild, minimal difficulty 2 Moderate, some difficulty could recall with effort 3 Severe, considerable difficulty even with effort 4 Extreme completely unable to recall important aspects of event</p> <p>QV (specify) _____</p>	<p>Past week</p> <p>F ____ I ____</p> <p>Past month</p> <p>F ____ I ____ Sx Y N</p> <p>Lifetime</p> <p>F ____ I ____ Sx Y N</p>
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9. (C-4) markedly diminished interest or participation in significant activities

<p>Frequency Have you been less interested in activities that you used to enjoy? (What kinds of things have you lost interest in? Are there some things you don't do at all anymore? Why is that?) [EXCLUDE IF NO OPPORTUNITY, IF PHYSICALLY UNABLE, OR IF DEVELOPMENTALLY APPROPRIATE CHANGE IN PREFERRED ACTIVITIES] In the past month (week), how many activities have you been less interested in? (What kinds of things do you still enjoy doing?) When did you first start to feel that way? (After the [EVENT]?)</p> <p>0 None 1 Few activities (less than 10%) 2 Some activities (approx 20-30%) 3 Many activities (approx 50-60%) 4 Most or all activities (more than 80%)</p> <p>Description/Examples</p>	<p>Intensity How strong was your loss of interest? (Would you enjoy [ACTIVITIES] once you got started?)</p> <p>0 No loss of interest 1 Mild, slight loss of interest, probably would enjoy after starting activities 2 Moderate, definite loss of interest, but still has some enjoyment of activities 3 Severe, marked loss of interest in activities 4 Extreme, complete loss of interest, no longer participates in any activities</p> <p>QV (specify) _____</p> <p>Trauma-related? 1 definite 2 probable 3 unlikely Current Lifetime</p>	<p>Past week F _____ I _____</p> <p>Past month F _____ I _____</p> <p>Sx Y N</p> <p>Lifetime F _____</p> <p>Sx Y N</p>
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10. (C-5) feeling of detachment or estrangement from others

<p>Frequency Have you felt distant or cut off from other people? What was that like? How much of the time in the past month (week) have you felt that way? When did you first start to feel that way? (After the [EVENT]?)</p> <p>0 None of the time 1 Very little of the time (less than 10%) 2 Some of the time (approx 20-30%) 3 Much of the time (approx 50-60%) 4 Most or all of the time (more than 80%)</p> <p>Description/Examples</p>	<p>Intensity How strong were your feelings of being distant or cut off from others? (Who do you feel closest to? How many people do you feel comfortable talking with about personal things?)</p> <p>0 No feelings of detachment or estrangement 1 Mild, may feel "out of synch" with others 2 Moderate, feelings of detachment clearly present, but still feels some interpersonal connection 3 Severe, marked feelings of detachment or estrangement from most people, may feel close to only one or two people 4 Extreme, feels completely detached or estranged from others, not close with anyone</p> <p>QV (specify) _____</p> <p>Trauma-related? 1 definite 2 probable 3 unlikely Current Lifetime</p>	<p>Past week F _____</p> <p>Past month F _____</p> <p>Sx Y N</p> <p>Lifetime F _____</p> <p>Sx Y N</p>
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11 . (C-6) restricted range of affect (e.g., unable to have loving feelings)

<p>Frequency Have there been times when you felt emotionally numb or had trouble experiencing feelings like love or happiness? What was that like? (What feelings did you have trouble experiencing?) How much of the time in the past month (week) have you felt that way? When did you first start having trouble experiencing (EMOTIONS)? (After the [EVENT]?)</p> <p>0 None of the time 1 Very little of the time (less than 10%) 2 Some of the time (approx 20-30%) 3 Much of the time (approx 50-60%) 4 Most or all of the time (more than 80%)</p> <p>Description/Examples</p>	<p>Intensity How much trouble did you have experiencing (EMOTIONS)? (What kinds of feelings were you still able to experience?) [INCLUDE OBSERVATIONS OF RANGE OF AFFECT DURING INTERVIEW]</p> <p>0 No reduction of emotional experience 1 Mild, slight reduction of emotional experience 2 Moderate, definite reduction of emotional experience, but still able to experience most emotions 3 Severe, marked reduction of experience of at least two primary emotions (e.g., love, happiness) 4 Extreme, completely lacking emotional experience</p> <p>QV (specify)</p> <p>_____</p> <p>Trauma-related? 1 definite 2 probable 3 unlikely</p> <p>Current Lifetime</p>	<p>Past week</p> <p>F</p> <p>F</p> <p>Sx: Y N</p> <p>Lifetime</p> <p>F</p> <p>Sx: Y N</p>
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12. (C-7) sense of a foreshortened future (e.g., does not expect to have a career, marriage, children, or a normal life span)

<p>Frequency Have there been times when you felt there is no need to plan for the future that somehow your future will be cut short? Why is that? [RULE OUT REALISTIC RISKS SUCH AS LIFE-THREATENING MEDICAL CONDITIONS] How much of the time in the past month (week) have you felt that way? When did you first start to feel that way? (After the [EVENT]?)</p> <p>0 None of the time 1 Very little of the time (less than 10%) 2 Some of the time (approx 20-30%) 3 Much of the time (approx 50-60%) 4 Most or all of the time (more than 80%)</p> <p>Description/Examples</p>	<p>Intensity How strong was this feeling that your future will be cut short? (How long do you think you will live? How convinced are you that you will die prematurely?)</p> <p>0 No sense of a foreshortened future 1 Mild, slight sense of a foreshortened future 2 Moderate, sense of a foreshortened future definitely present, but no specific prediction about longevity 3 Severe, marked sense of a foreshortened future, may make specific prediction about longevity 4 Extreme, overwhelming sense of a foreshortened future, completely convinced of premature death</p> <p>QV (specify)</p> <p>_____</p> <p>Trauma-related? 1 definite 2 probable 3 unlikely</p> <p>Current Lifetime</p>	<p>Past week</p> <p>F</p> <p>F</p> <p>Sx: Y N</p> <p>Lifetime</p> <p>F</p> <p>Sx: Y N</p>
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Criterion D. Persistent symptoms of increased arousal (not present before trauma), as indicated by two or more of the following

13. (D-1) difficulty falling or staying asleep

<p>Frequency Have you had any problems falling or staying asleep? How often in the past month (week)? When did you first start having problems sleeping? (After the [EVENT]?)</p> <p>0 Never 1 Once or twice 2 Once or twice a week 3 Several times a week 4 Daily or almost every day</p> <p>Sleep onset problems? Y N Mid-sleep awakening? Y N Early a.m. awakening? Y N</p> <p>Total # hrs sleep/night _____ Desired # hrs sleep/night _____</p>	<p>Intensity How much of a problem did you have with your sleep? (How long did it take you to fall asleep? How often did you wake up in the night? Did you often wake up earlier than you wanted to? How many total hours did you sleep each night?)</p> <p>0 No sleep problems 1 Mild, slightly longer latency, or minimal difficulty staying asleep (up to 30 minutes loss of sleep) 2 Moderate, definite sleep disturbance, clearly longer latency, or clear difficulty staying asleep (30-90 minutes loss of sleep) 3 Severe, much longer latency, or marked difficulty staying asleep (90 min to 3 hrs loss of sleep) 4 Extreme, very long latency, or profound difficulty staying asleep (> 3 hrs loss of sleep)</p> <p>QV (specify) _____</p> <p>Trauma-related? 1 definite 2 probable 3 unlikely Current _____ Lifetime _____</p>	<p>Past week F</p> <p>F</p> <p>Sx: Y N</p> <p>Lifetime F</p> <p>Sx: Y N</p>
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14. (D-2) irritability or outbursts of anger

<p>Frequency Have there been times when you felt especially irritable or showed strong feelings of anger? Can you give me some examples? How often in the past month (week)? When did you first start feeling that way? (After the [EVENT]?)</p> <p>0 Never 1 Once or twice 2 Once or twice a week 3 Several times a week 4 Daily or almost every day</p> <p>Description/Examples _____</p>	<p>Intensity How strong was your anger? (How did you show it?) (IF REPORTS SUPPRESSION) (How hard was it for you to keep from showing your anger?) How long did it take you to calm down? Did your anger cause you any problems?</p> <p>0 No irritability or anger 1 Mild, minimal irritability, may raise voice when angry 2 Moderate, definite irritability or attempts to suppress anger, but can recover quickly 3 Severe, marked irritability or marked attempts to suppress anger, may become verbally or physically aggressive when angry 4 Extreme, pervasive anger or drastic attempts to suppress anger, may have episodes of physical violence</p> <p>QV (specify) _____</p> <p>Trauma-related? 1 definite 2 probable 3 unlikely Current _____ Lifetime _____</p>	<p>Past week F</p> <p>F</p> <p>Sx: Y N</p> <p>Lifetime F</p> <p>Sx: Y N</p>
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15. (D-3) difficulty concentrating

<p>Frequency Have you found it difficult to concentrate on what you were doing or on things going on around you? What was that like? How much of the time in the past month (week)? When did you first start having trouble concentrating? (After the [EVENT]?)</p> <p>0 None of the time 1 Very little of the time (less than 10%) 2 Some of the time (approx 20-30%) 3 Much of the time (approx 50-60%) 4 Most or all of the time (more than 80%)</p> <p>Description/Examples</p>	<p>Intensity How difficult was it for you to concentrate? [INCLUDE OBSERVATIONS OF CONCENTRATION AND ATTENTION IN INTERVIEW] How much did that interfere with your life?</p> <p>0 No difficulty with concentration 1 Mild, only slight effort needed to concentrate. little or no disruption of activities 2 Moderate, definite loss of concentration but could concentrate with effort, some disruption of activities 3 Severe, marked loss of concentration even with effort, marked disruption of activities 4 Extreme, complete inability to concentrate, unable to engage in activities</p> <p>QV (specify) _____</p> <p>Trauma-related? 1 definite 2 probable 3 unlikely Current _____ Lifetime _____</p>	<p><u>Past week</u> F _____</p> <p>F _____</p> <p>Sx Y N</p> <p><u>Lifetime</u> F _____</p> <p>Sx Y N</p>
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16. (D-4) hypervigilance

<p>Frequency Have you been especially alert or watchful, even when there was no real need to be? (Have you felt as if you were constantly on guard?) Why is that? How much of the time in the past month (week)? When did you first start acting that way? (After the [EVENT]?)</p> <p>0 None of the time 1 Very little of the time (less than 10%) 2 Some of the time (approx 20-30%) 3 Much of the time (approx 50-60%) 4 Most or all of the time (more than 80%)</p> <p>Description/Examples</p>	<p>Intensity How hard did you try to be watchful of things going on around you? [INCLUDE OBSERVATIONS OF HYPERVIGILANCE IN INTERVIEW] Did your (HYPERVIGILANCE) cause you any problems?</p> <p>0 No hypervigilance 1 Mild, minimal hypervigilance, slight heightening of awareness 2 Moderate, hypervigilance clearly present, watchful in public (e.g., chooses safe place to sit in a restaurant or movie theater) 3 Severe, marked hypervigilance, very alert, scans environment for danger, exaggerated concern for safety of self/family/home 4 Extreme, excessive hypervigilance, efforts to ensure safety consume significant time and energy and may involve extensive safety/checking behaviors, marked watchfulness during interview</p> <p>QV (specify) _____</p> <p>Trauma-related? 1 definite 2 probable 3 unlikely Current _____ Lifetime _____</p>	<p><u>Past week</u> F _____ I _____</p> <p><u>Past month</u> F _____ I _____</p> <p>Sx Y N</p> <p><u>Lifetime</u> F _____ I _____</p> <p>Sx Y N</p>
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17. (D-5) exaggerated startle response

<p>Frequency Have you had any strong startle reactions? When did that happen? (What kinds of things made you startle?) How often in the past month (week)? When did you first have these reactions? (After the [EVENT]?)</p> <p>0 Never 1 Once or twice 2 Once or twice a week 3 Several times a week 4 Daily or almost every day</p> <p>Description/Examples</p>	<p>Intensity How strong were these startle reactions? (How strong were they compared to how most people would respond?) How long did they last?</p> <p>0 No startle reaction 1 Mild, minimal reaction 2 Moderate, definite startle reaction, feels "jumpy" 3 Severe marked startle reaction, sustained arousal following initial reaction 4 Extreme excessive startle reaction, overt coping behavior (e.g. combat veteran who "hits the dirt")</p> <p>QV (specify) _____</p> <p>Trauma-related? 1 definite 2 probable 3 unlikely Current _____ Lifetime _____</p>	<p>Past week F _____ Sx: Y N</p> <p>Lifetime F _____ Sx: Y N</p>
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Criterion E. Duration of the disturbance (symptoms in Criterion B, C, and D) more than 1 month.

18. onset of symptoms

<p>[IF NOT ALREADY CLEAR:] When did you first start having (PTSD SYMPTOMS) you've told me about? (how long after the trauma did they start?) More than 6 months?</p>	<p>_____ total # months delay in onset</p> <p>With delayed onset? (>6 months) No Yes</p>
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19. duration of symptoms

<p>[Current] How long have These (PTSD SYMPTOMS) lasted altogether?</p> <p>[Lifetime] How long did these (PTSD SYMPTOMS) last altogether?</p>	<p>Duration more than 1 month? Total # months duration?</p> <p>Acute {<3 months} Chronic {>3 months}</p>	<p>Current No Yes _____</p> <p>Acute Chronic</p>	<p>Lifetime No Yes _____</p> <p>Acute Chronic</p>
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Criterion F. The disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of function

20. subjective distress

<p>[CURRENT] Overall, how much have you been bothered by these (PTSD SYMPTOMS) you've told me about? [CONSIDER DISTRESS REPORTED ON EARLIER ITEMS]</p> <p>[LIFETIME] Overall, how much were you bothered by these (PTSD SYMPTOMS) you've told me about? [CONSIDER DISTRESS REPORTED ON EARLIER ITEMS]</p>	<p>0 None 1 Mild, minimal distress 2 Moderate, distress clearly present but still manageable 3 Severe, considerable distress 4 Extreme, incapacitating distress</p>	<p>Past week _____ Past month _____ Lifetime</p>
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21. impairment in social functioning

<p>[CURRENT] Have these (PTSD SYMPTOMS) affected your relationships with other people? How so? [CONSIDER IMPAIRMENT IN SOCIAL FUNCTIONING REPORTED ON EARLIER ITEMS]</p> <p>[LIFETIME] Did these (PTSD SYMPTOMS) affect your social life? How so? [CONSIDER IMPAIRMENT IN SOCIAL FUNCTIONING REPORTED ON EARLIER ITEMS]</p> <p style="text-align: center;">-</p>	0 No adverse impact	Past week
	1 Mild impact, minimal impairment in social functioning	—
	2 Moderate impact, definite impairment, but many aspects of social functioning still intact	Past month
	3 Severe impact, marked impairment, few aspects of social functioning still intact	—
	4 Extreme impact, little or no social functioning	Lifetime
		—

22. impairment in occupational or other important area of functioning

<p>[CURRENT -- IF NOT ALREADY CLEAR] Are you working now?</p> <p>IF YES: Have these (PTSD SYMPTOMS) affected your work or your ability to work? How so? [CONSIDER REPORTED WORK HISTORY INCLUDING NUMBER AND DURATION OF JOBS, AS WELL AS THE QUALITY OF WORK RELATIONSHIPS. IF PREMORBID FUNCTIONING IS UNCLEAR, INQUIRE ABOUT WORK EXPERIENCES BEFORE THE TRAUMA. FOR CHILD/ADOLESCENT TRAUMAS, ASSESS PRE-TRAUMA SCHOOL PERFORMANCE AND POSSIBLE PRESENCE OF BEHAVIOR PROBLEMS]</p> <p>IF NO: Have these (PTSD SYMPTOMS) affected any other important part of your life? [AS APPROPRIATE, SUGGEST EXAMPLES SUCH AS PARENTING, HOUSEWORK, SCHOOLWORK, VOLUNTEER WORK, ETC.] How so?</p> <p>[LIFETIME -- IF NOT ALREADY CLEAR] Were you working then?</p> <p>IF YES: Did these (PTSD SYMPTOMS) affect your work or your ability to work? How so? [CONSIDER REPORTED WORK HISTORY INCLUDING NUMBER AND DURATION OF JOBS, AS WELL AS THE QUALITY OF WORK RELATIONSHIPS. IF PREMORBID FUNCTIONING IS UNCLEAR, INQUIRE ABOUT WORK EXPERIENCES BEFORE THE TRAUMA. FOR CHILD/ADOLESCENT TRAUMAS, ASSESS PRE-TRAUMA SCHOOL PERFORMANCE AND POSSIBLE PRESENCE OF BEHAVIOR PROBLEMS]</p> <p>IF NO: Did these (PTSD SYMPTOMS) affect any other important part of your life? [AS APPROPRIATE, SUGGEST EXAMPLES SUCH AS PARENTING, HOUSEWORK, SCHOOLWORK, VOLUNTEER WORK, ETC.] How so?</p>	0 No adverse impact	Past week
	1 Mild impact, minimal impairment in occupational/other important functioning	—
	2 Moderate impact, definite impairment, but many aspects of occupational/other important functioning still intact	Past month
	3 Severe impact, marked impairment, few aspects of occupational/other important functioning still intact	—
	4 Extreme impact, little or no occupational/other important functioning	Lifetime
		—

Global Ratings

21. global validity

ESTIMATE THE OVERALL VALIDITY OF RESPONSES. CONSIDER FACTORS SUCH AS COMPLIANCE WITH THE INTERVIEW, MENTAL STATUS (E.G., PROBLEMS WITH CONCENTRATION, COMPREHENSION OF ITEMS, DISSOCIATION), AND EVIDENCE OF EFFORTS TO EXAGGERATE OR MINIMIZE SYMPTOMS.	<table> <tr> <td>0</td><td>Excellent, no reason to suspect invalid responses Good factors present that may adversely affect validity</td></tr> <tr> <td>2</td><td>Fair, factors present that definitely reduce validity</td></tr> <tr> <td>3</td><td>Poor, substantially reduced validity</td></tr> <tr> <td>4</td><td>Invalid responses, severely impaired mental status or possible deliberate "faking bad" or "faking good"</td></tr> </table>	0	Excellent, no reason to suspect invalid responses Good factors present that may adversely affect validity	2	Fair, factors present that definitely reduce validity	3	Poor, substantially reduced validity	4	Invalid responses, severely impaired mental status or possible deliberate "faking bad" or "faking good"
0	Excellent, no reason to suspect invalid responses Good factors present that may adversely affect validity								
2	Fair, factors present that definitely reduce validity								
3	Poor, substantially reduced validity								
4	Invalid responses, severely impaired mental status or possible deliberate "faking bad" or "faking good"								

22. global severity

ESTIMATE THE OVERALL SEVERITY OF PTSD SYMPTOMS. CONSIDER DEGREE OF SUBJECTIVE DISTRESS, DEGREE OF FUNCTIONAL IMPAIRMENT, OBSERVATIONS OF BEHAVIORS IN INTERVIEW, AND JUDGMENT REGARDING REPORTING STYLE.	0 No clinically significant symptoms, no distress and no functional impairment	<i>Past week</i> _____
	1 Mild, minimal distress or functional impairment	
	2 Moderate, definite distress or functional impairment but functions satisfactorily with effort	<i>Past month</i> _____
	3 Severe, considerable distress or functional impairment, limited functioning even with effort 4 Extreme, marked distress or marked impairment in two or more major areas of functioning	<i>Lifetime</i> _____

23. global improvement

RATE TOTAL OVERALL IMPROVEMENT PRESENT SINCE THE INITIAL RATING. IF NO EARLIER RATING, ASK HOW THE SYMPTOMS ENDORSED HAVE CHANGED OVER THE PAST 6 MONTHS. RATE THE DEGREE OF CHANGE, WHETHER OR NOT IN YOUR JUDGMENT, IT IS DUE TO TREATMENT.	<table> <tr> <td>0</td><td>Asymptomatic</td></tr> <tr> <td>1</td><td>Considerable improvement</td></tr> <tr> <td>2</td><td>Moderate improvement</td></tr> <tr> <td>3</td><td>Slight improvement</td></tr> <tr> <td>4</td><td>No improvement</td></tr> <tr> <td>5</td><td>Insufficient information</td></tr> </table>	0	Asymptomatic	1	Considerable improvement	2	Moderate improvement	3	Slight improvement	4	No improvement	5	Insufficient information
0	Asymptomatic												
1	Considerable improvement												
2	Moderate improvement												
3	Slight improvement												
4	No improvement												
5	Insufficient information												

Current PTSD Symptoms

<i>Criterion A met (traumatic event)?</i>	NO	YES
_____ # <i>Criterion B sx (? 1)?</i>	NO	YES
_____ # <i>Criterion C sx (? 3)?</i>	NO	YES
_____ # <i>Criterion D sx (? 2)?</i>	NO	YES
<i>Criterion E met (duration?: 1 month)?</i>	NO	YES
<i>Criterion F met (distress/impairment)?</i>	NO	YES

CURRENT PTSD (Criteria A-F met)? NO YES

IF CURRENT PTSD CRITERIA ARE MET, SKIP TO ASSOCIATED FEATURES.

IF CURRENT CRITERIA ARE NOT MET, ASSESS FOR LIFETIME PTSD. IDENTIFY A PERIOD OF AT LEAST A MONTH SINCE THE TRAUMATIC EVENT IN WHICH SYMPTOMS WERE WORSE.

Since the (EVENT), has there been a time when these (PTSD SYMPTOMS) were a lot worse than they have been in the past month? When was that? How long did it last? (*At least a month?*)

IF MULTIPLE PERIODS IN THE PAST: When were you bothered the most by these (PTSD SYMPTOMS)?

IF AT LEAST ONE PERIOD, INQUIRE ITEMS 1-17, CHANGING FREQUENCY PROMPTS TO REFER TO WORST

PERIOD: During that time, did you (EXPERIENCE SYMPTOM)? How often?

Lifetime PTSD Symptoms

<i>Criterion A met (traumatic event)?</i>	NO	YES
_____ # <i>Criterion B sx (? 1)?</i>	NO	YES
_____ # <i>Criterion C sx (? 3)?</i>	NO	YES
_____ # <i>Criterion D sx (? 2)?</i>	NO	YES
<i>Criterion E met (duration?: 1 month)?</i>	NO	YES
<i>Criterion F met (distress/impairment)?</i>	NO	YES

LIFETIME PTSD (Criteria A-F met)? NO YES

CAPS SUMMARY SHEET

Name _____ ID# _____ Interviewer _____ Study _____ Date _____

A Traumatic event:

B Reexperiencing symptoms	PAST WEEK			PAST MONTH			LIFETIME		
	Freq	Int	F+I	Freq	Int	F+I	Freq	Int	F+I
(1) intrusive recollections									
(2) distress in dreams									
(3) acting or feeling as if event were recurring									
(4) psychological distress at exposure to cues									
(5) physiological reactivity on exposure to cues									
B subtotals									
Number of Criterion B symptoms (need 1)									

C Avoidance and numbing symptoms	PAST WEEK			PAST MONTH			LIFETIME		
	Freq	Int	F+I	Freq	Int	F+I	Freq	Int	F+I
(6) avoidance of thoughts or feelings									
(7) avoidance of activities places or people									
(8) inability to recall important aspect of trauma									
(9) diminished interest in activities									
(10) detachment or estrangement									
(11) restricted range of affect									
(12) sense of a foreshortened future									
C subtotals									
Number of Criterion C symptoms (need 3)									

D Hyperarousal symptoms	PAST WEEK			PAST MONTH			LIFETIME		
	Freq	Int	F+I	Freq	Int	F+I	Freq	Int	F+I
(13) difficulty falling or staying asleep									
(14) irritability or outbursts of anger									
(15) difficulty concentrating									
(16) hypervigilance									
(17) exaggerated startle response									
D subtotals									
Number of Criterion D symptoms (need 2)									

Total Freq, Int, and Severity (F+I)	PAST WEEK			PAST MONTH			LIFETIME		
	Freq	Int	F+I	Freq	Int	F+I	Freq	Int	F+I
Sum of subtotals (B+C+D)									

E Duration of disturbance	CURRENT		LIFETIME	
(19) duration of disturbance at least one month	NO	YES	NO	YES

F Significant distress or impairment in functioning	PAST WEEK		PAST MONTH		LIFETIME	
(20) subjective distress						
(21) impairment in social functioning						
(22) impairment in occupational functioning						
AT LEAST ONE > 2?	NO	YES	NO	YES	NO	YES

PTSD diagnosis	CURRENT		LIFETIME	
PTSD PRESENT ALL CRITERIA (AF) MET?	NO	YES	NO	YES
Specify:				
(18) with delayed onset (> 6 months delay)	NO	YES	NO	YES
(19) acute (< 3 months) or chronic (> 3 months)	acute	chronic	acute	chronic

Appendix C.
PTSD Checklist – Specific

PTSD Checklist Stressor Specific Version (PCL-S)

Please insert event and date of event below – do not leave event blank

The event you experienced was:

on: _____

Instruction to patient: Below is a list of problems and complaints that veterans sometimes have in response to stressful life experiences. Please read each one carefully, put an "X" in the box to indicate how much you have been bothered by that problem in the last month.

No.	Response:	Not at all (1)	A little bit (2)	Moderately (3)	Quite a bit (4)	Extremely (5)
1.	Repeated, disturbing memories, thoughts, or images of the stressful experience?					
2.	Repeated, disturbing dreams of the stressful experience?					
3.	Suddenly acting or feeling as if the stressful experience were happening again (as if you were reliving it)?					
4.	Feeling very upset when something reminded you of the stressful experience?					
5.	Having physical reactions (e.g., heart pounding, trouble breathing, or sweating) when something reminded you of the stressful experience?					
6.	Avoid thinking about or talking about the stressful experience or avoid having feelings related to it?					
7.	Avoid activities or situations because they remind you of the stressful					

	experience?					
8.	Trouble remembering important parts of the stressful experience?					
9.	Loss of interest in things that you used to enjoy?					
10.	Feeling distant or cut off from other people?					
11.	Feeling emotionally numb or being unable to have loving feelings for those close to you?					
12.	Feeling as if your future will somehow be cut short?					
13.	Trouble falling or staying asleep?					
14.	Feeling irritable or having angry outbursts?					
15.	Having difficulty concentrating?					
16.	Being "super alert" or watchful on guard?					
17.	Feeling jumpy or easily startled?					

Appendix D.
Insomnia Severity Index

Insomnia Severity Index (ISI)

Name: _____ Date: _____

1. Please rate the current (i.e., last week) **SEVERITY** of your insomnia problem(s).

	15-30 min None	30-45 min Mild	45-90 min Moderate	90-120 min Severe	>120 min Very
Difficulty falling asleep:	0	1	2	3	4
Difficulty staying asleep:	0	1	2	3	4
Problem waking up too early:	0	1	2	3	4

2. How **SATISFIED**/dissatisfied are you with your current sleep pattern?

Very Satisfied					Very Dissatisfied
0	1	2	3	4	

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

Not at all Interfering	A Little	Somewhat	Much	Very Much Interfering
0	1	2	3	4

4. How **NOTICEABLE** to others do you think your sleeping problem is in terms of impairing the quality of your life?

Not at all Noticeable	Barely	Somewhat	Much	Very Much Noticeable
0	1	2	3	4

5. How **WORRIED**/distressed are you about your current sleep problem?

Not at all	A Little	Somewhat	Much	Very Much
0	1	2	3	4

Appendix E.
Glasgow Sleep Effort Scale

GSES

The following seven statements relate to your night-time sleep pattern *in the past week*. Please indicate by checking one response how true each statement is for you.

	Very much true	To some extent true	Not at all true
1. I put too much effort into sleeping at night when it should come naturally.	☐	☐	☐
2. I feel I should be able to control my sleep at night.	☐	☐	☐
3. I put off going to bed at night for fear of not being able to sleep.	☐	☐	☐
4. I worry about not sleeping if I am in bed at night and cannot sleep.	☐	☐	☐
5. I am no good at sleeping at night.	☐	☐	☐
6. I get anxious about sleeping before I go to bed at night.	☐	☐	☐
7. I worry about the long-term consequences of not sleeping at night.	☐	☐	☐

Appendix F.
Pre Sleep Arousal Scale

PSAS

Please rate how intensely you generally experience each item as you attempt to fall asleep in your own bedroom in the past week. Please complete the dates that you are rating below. The dates should be the same as your sleep diary.

Week of _____ to _____

	Not at All (1)	Slightly (2)	Moderately (3)	A lot (4)	Extremely (5)
1. Heart racing, pounding or beating irregularly	☐	☐	☐	☐	☐
2. A jittery, nervous feeling in your body.	☐	☐	☐	☐	☐
3. Shortness of breath or labored breathing.	☐	☐	☐	☐	☐
4. A tight, tense feeling in your muscles.	☐	☐	☐	☐	☐
5. Cold feeling in your hands, feet, or body in general.	☐	☐	☐	☐	☐
6. Have stomach upset (knot or nervous feeling in stomach, heartburn, nausea, gas, etc.)	☐	☐	☐	☐	☐
7. Perspiration in palms of your hands or other parts of your body.	☐	☐	☐	☐	☐
8. Dry feeling in mouth or throat.	☐	☐	☐	☐	☐
9. Worry about falling asleep.	☐	☐	☐	☐	☐
10. Review or ponder events of the day.	☐	☐	☐	☐	☐
11. Depressing or anxious thoughts.	☐	☐	☐	☐	☐
12. Worry about problems other than sleep.	☐	☐	☐	☐	☐
13. Being mentally alert, active.	☐	☐	☐	☐	☐
14. Can't shut off your thoughts.	☐	☐	☐	☐	☐
15. Thoughts keep running through your head.	☐	☐	☐	☐	☐
16. Being distracted by sounds, noise in the environment (e.g., ticking of clock, house noises, traffic)	☐	☐	☐	☐	☐

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