Distribution Statement

Distribution A: Public Release.

The views presented here are those of the author and are not to be construed as official or reflecting the views of the Uniformed Services University of the Health Sciences, the Department of Defense or the U.S. Government.

Brief Behavioral Therapy for Improved Sleep: A Process Improvement Project

Stephanie Doane and Heidi Wilson

Uniformed Services University of the Health Sciences

Copyright Acknowledgement Statement

"The author(s) hereby certify that the use of any original work by another author or copyrighted material used in the DNP project entitled: *"Brief Behavioral Therapy for Improved Sleep Quality: A Process Improvement"* is either appropriately cited within the manuscript or used with formal written permission of copyright release by the owner of the original work."

[redacted]

Stephanie Doane, BSN, RN, Capt, USAF, CEN
DNP-FNP
Daniel K. Inouye Graduate School of Nursing
Uniformed Services University
6 Apr 2018

[redacted]

Heidi Wilson, BSN, RN, Maj, USAF, Med Surg
DNP-FNP
Daniel K. Inouye Graduate School of Nursing
Uniformed Services University
6 Apr 2018

Copyright Acknowledgement Statement

"The author(s) hereby certify that the use of any original work by another author or copyrighted material used in the DNP project entitled: *"Brief Behavioral Therapy for Improved Sleep Quality: A Process Improvement"* is either appropriately cited within the manuscript or used with formal written permission of copyright release by the owner of the original work."

[redacted]

Stephanie Doane, BSN, RN, Capt, USAF, CEN
DNP-FNP
Daniel K. Inouye Graduate School of Nursing
Uniformed Services University
6 Apr 2018

[redacted]

Heidi Wilson, BSN, RN, Maj, USAF, Med Surg
DNP-FNP
Daniel K. Inouye Graduate School of Nursing
Uniformed Services University
6 Apr 2018

Table of Contents

Abstract

According the CDC, over one-third of Americans are not achieving the recommended seven hours of sleep per night which can cause a significant increased incidence of chronic disease including diabetes, heart disease, depression and cancer (CDC, 2017). It has been estimated that as many as 600,000 service members and veterans have been diagnosed with conditions related to sleep disturbances (Mysliwiec et al. 2013). Achieving high quality sleep is mission essential within the active duty population. Multiple tools are available to evaluate sleep disturbances, but the subjective nature of sleep quality is difficult to assess (Schutte-Rodin, Broch, Buysse, Dorsey & Sateia, 2008). For this Doctor of Nursing Practice (DNP) project, the Pittsburgh Sleep Quality Index (PSQI) was used as a measurement to assess squadron sleep health.

Brief behavioral treatment for insomnia (BBTi) has provent to be a highly effective, evidence based treatment for sleep disturbances (Troxel et al., 2015). This service is provided within the Family Health clinic by the Behavioral Health Optimization Program (BHOP). The goal of this project was to increase sleep health awareness. Employing a community outreach approach, squadrons were provided education on the importance of achieving quality sleep and encouraged to attend the Sleep Enhancement Class (SEC).

The cumulative PSQI data indicated unit sleep quality to be deficient, demonstrating poor quality sleep. Of the 67 individuals performing the PSQI the sleep averaged 5-6 hours per night, consistent with literature that reports ADSM receiving less than the recommended 7 hours (Luxton et al., 2011). The SEC attendance slightly increased following the intervention, but due to the anonymous nature of the project, the increase cannot be attributed directly to the

educational intervention. While not the initial intent, this project allowed for open dialogue and in-person delivery of evidence-based resources and actionable data for leadership.

Introduction

Sleep quality (how well one sleeps) does not equate to sleep quantity (how much one sleeps). Defining sleep quality is a complex, individualized response, based on both subjective and objective information. Sleep quality is based on one's perceived quality of sleep, tiredness upon waking, daytime dysfunction, feelings of fatigue and an evaluation of sleep patterns (Harvey, Stinson, Whitaker, Moskovitz & Harvinder, 2008). Quality may affect quantity and vice versa, making early identification and treatment imperative in reducing negative health outcomes. Screening, identifying and intervening on those with sleep quality disturbances is a proactive approach toward improving health and wellness to both the civilian and military population.

Significance of the Problem

It has been estimated that as many as 600,000 service members and veterans have been diagnosed with conditions related to sleep disturbances (Mysliwiec et al. 2013). A reduction in quality sleep has been shown to correlate with post-traumatic stress disorder (PTSD), depression, anxiety, and suicidal ideations (Capaldi, Kim, Gerillakis, Taylor & York, 2015). In addition, the combined cost associated with chronic disease and sleep quality issues are taxing on healthcare dollars. In adults age 18-64 diagnosed with insomnia an additional annual medical expense of up to $1800 per person is incurred (Ozminkowski, Wang & Walsh, 2007). This expense is costly to service members and significantly impacts the military health system's (MHS) budget. Screening, identifying and treating those with sleep disturbance promotes overall wellness and reduces the healthcare financial burden.

Why Sleep Quality

Multiple factors play a part in the diagnosis of insomnia, sleep quality being one component. The goal of this DNP project was to increase awareness and offer available resources to the Active Duty population to improve sleep quality. This goal stemmed from an initial question, 'What is the best, evidence based, intervention used for those suffering from reduced sleep quality?'

Our literature review examined the use of Cognitive Behavioral Therapy for Insomnia (CBTi) compared to Brief Behavioral Treatment for Insomnia (BBTi). Clinical guidelines exist to support the initial treatment of insomnia with cognitive behavioral intervention (Sateia, Buysse, Krystal, Neubauer & Heald, 2017; 2015; Schutte-Rodin et al., 2008; Hauk, 2017). No direct comparison was found, yet both CBTi and BBTi were both effective in treating sleep disturbance. This supported the use of BBTi for sleep disturbance by the Behavioral Health Optimization Program (BHOP) within the Family Health clinic among Air Force Military Treatment Facilities (MTFs). Within the military, service members potentially have little control over sleep duration due to operational tempo, deployment environment, shift work and mission support (Troxel et al., 2015). Sleep quality is mission essential among the active duty population.

Prevalence of Poor Sleep Quality

According the CDC, over one third of the American population is not achieving the recommended seven hours of sleep per night (2017). Individuals suffering from shortened sleep duration and/or quality are not likely to self-report due in part to the inability to determine self-impairment and the need for assistance (Dorrian et al., 2003). Currently, there are no evidence based practice guidelines outlining the best screening tools or how often patients should be

screened for sleep disturbance. Patients are often subjected to sleep disorder evaluation when prior screening may have identified a sleep issue.

Effects

Physical. Those who report less than seven hours of sleep per night, have a statistically significant incidence of chronic disease to include diabetes, heart disease, depression and cancer (CDC, 2017). Additionally, behavioral risk factors to include obesity, sedentary lifestyles and the use of tobacco and alcohol are higher in those reporting less than seven hours of sleep (CDC, 2017). Cardiovascular disease, respiratory disorders and pain are aggravated by an inflammatory process at the cellular level due, in part, to the lack of quality sleep that is necessary to facilitate proper healing and health promotion within the human body (Tibbitts, 2008). The CDC reports timing, quality and duration of sleep are essential to providing critical metabolic, emotional, and cognitive homeostasis, thus helping to restore protective mechanisms for the body, staving off chronic illness (2013). Lacking quality sleep can affect other areas of well-being to include mental health.

Mental. Poor sleep quality affects cognitive functioning, interfering with pathways for learning and memory (Joo, Yoon, Koo, Kim & Hong, 2012; Longordo, Kopp, & Luthi, 2009). Insomnia may be linked to the development of depression and anxiety (Neckelmann, Mykletun & Dahl, 2007). While both depression and anxiety disorders may occur with repeated exposure to insomnia, anxiety has been shown to occur at a higher rate (Neckelmann, Mykletun & Dahl, 2007).

Cognitive health is equally as important as physical health. The significant effect that sleep plays on both makes it a subject not to be ignored. Among ADSM's, suffering from insomnia prior to deployment increases the risk of post-deployment anxiety, depression and

PTSD (Gehrman et al., 2013). It is worth noting that going into a deployment with a diagnosis of insomnia is a genuine risk for the health and safety of military service members.

Cost. Sleep quality is just one part of the diagnosis of insomnia (Schutte-Rodin et al., 2008). Insomnia along with obstructive sleep apnea are some of the most common diagnoses in the military and civilian population (Capaldi, Guerrero, Kilgore, 2011). Direct cost of treatment for insomnia in the U.S. is estimated at $13.9 billion annually (McCrae, Bramoweth, Williams, Roth & Mosti, 2014).

Safety. According to a 2009 Behavioral Risk Factor Surveillance System (BRFSS), adults age 18-24 reported higher rates of unintentionally falling asleep during at least 1 of 30 days and nodding off while driving (CDC, 2011). It is estimated that 100,000 police reported motor vehicle crashes are related to drowsy driving (Facts and Stats, 2018). Unintentional falling asleep and drowsy driving were not reported as frequently in those receiving the recommended 7-9 hours of sleep (CDC, 2011). The consequences related to drowsiness, fatigue and reduced quality sleep are dangerous.

Work / Occupational Safety. Reduced alertness and slow reaction times lead to workplace injuries, occupational mistakes and medical errors (CDC, 2011). Fatigue is an additional factor that may play a role in the risk for on and off the job mishaps. According to Patterson et al. (2010), a cross-sectional convenience survey of 119 prehospital providers demonstrated elevated sleep quality index scores, correlating with poorer quality sleep in those reporting severe fatigue by the use of validated assessment tool (p. 189-190). The Chalder Fatigue Questionnaire and the Pittsburgh Sleep Quality Index (PSQI) were used to quantify fatigue and sleep quality. The concern lies in the plausible correlation with fatigue, reduced sleep quality and risk for injury. Worker fatigue has been shown to increase risk for injury with

an almost 40% increase to those working 12 hour shifts (Dembe, Ericson, Delbos & Banks, 2005). The direct and indirect cost associated with occupational mishaps, accidents on and off the job and lost productivity have been estimated at $136 billion annually (Ricci, Chee, Lorandeau & Berger, 2007). The cost, both physically and financially are high. The concern for safety and workplace injury is not solely an issue within the civilian population, but can cross over to the military.

Military. As many as 600,000 service members and veterans have been diagnosed with conditions related to sleep disturbances (Mysliwiec et al., 2013). The reduction in quality sleep has been linked to post traumatic stress disorder (PTSD), depression, anxiety, and suicidal ideation (Capaldi, Kim, Gerillakis, Taylor, & York, 2015). In order to ensure the health, well-being and readiness of the service member sleep must be emphasized as a priority.

Real world concerns. The recent tragedy of the U.S. Navy (USN) destroyer Fitzgerald colliding with another ship was determined to be partly due to fatigue (Ziezulewicz, 2017). This is an example of an unfortunate consequence that can occur when individuals work long hours and lack quality sleep. The USN has initiated a plan to synchronize work schedules based on circadian rhythms to reduce errors and ensure the opportunity for quality sleep (Ziezulewicz, 2017). Mission, physical, mental and operational readiness are not solely unique to the ADSM population, but may unintentionally compound the risk for developing sleep disturbances thereby increasing errors in the workplace or deployed environment (Troxel et al., 2015). Unfortunately, the number of service members affected by sleep disturbances is significant to operational readiness and attainment of mission specific goals.

Operational Readiness & Awareness. It is common for ADSM to work long, variable shifts, which adds to the concern for workplace, operation and personal safety. Some literature

supports a plausible relationship between fatigue and reduced sleep quality by way of quick turnaround time for shifts and high stress positions (Dahlgren, Tucker, Gustavsson, and Rudman, 2016; De Lange et al., 2009). Policy regarding shifts and work cycles is minimal within the DoD. The large portion of operational policy regulating work cycles is for combat operations and execution of military exercises (Troxel et al., 2015). Service members at risk for occupational injuries and mishaps due to unpredictable work cycles which could cause harm to themselves, others, and the mission.

In order to meet key strategic goals related to individual, family and psychological health, awareness on the role of sleep must not go unnoticed (Department of Defense, 2012). Individuals who lack the appropriate amount and quality of sleep are less able to determine their own degree of impairment (Dorrian et al., 2003). Sleep is not commonly incorporated into preventative healthcare assessments. An estimated 43% of primary care clinics include questions related to sleep health in their exam (CDC, 2013). Knowledge of sleep related disorders, screening tools and in-clinic resources are important for providers within the civilian and military health system (MHS).

Military specific resources. One resource for providers within Air Force Military Treatment Facilities (MTFs) is the embedded BHOP team. Behavioral health providers are readily available to those self-identifying or provider-identified with sleep health concerns.

Utilization of the BHOP service assists with individual psychological health and provides education to the member, all integral to operational readiness. Sleep issues must be addressed, proactively, rather than reactive in order to prevent adverse effects that may follow (Troxel et al., 2015). Maintaining a ready, fit, fighting force is paramount to the military mission. Not only must military leaders, primary care teams and service members understand the importance of

sleep, but they must be aware of the burden reduced quality sleep may have if not addressed early. In order to impact health, wellness and operational readiness early identification of reduced sleep quality is necessary.

Summary. Sleep lacking in quality and quantity can lead to avoidable errors, impaired driving, and accidents in the workplace and on the road (Colten & Altevogt, 2006). Poor sleep quality also affects cognitive functioning and interferes with pathways for learning and memory (Joo, Yoon, Koo, Kim & Hong, 2012; Longordo, Kopp & Luthi, 2009). In order to impact healthcare cost, physical and mental health, mission and operational readiness, sleep quality must be addressed early and often. Supporting evidence shows behavioral interventions for sleep disturbance are efficacious and first line treatment for sleep disturbance. Healthcare teams are a conduit for education, collaboration and ensuring first line interventions are offered. Safety, mission and operational readiness require the education, collaboration and interventions from healthcare teams.

Screening

Validated Screening Tools

Insomnia and sleep related disorders are evaluated and diagnosed through a detailed history and physical exam with additional use of self-administered questionnaires, a sleep diary, screening for anxiety or depression, and an interview with a bed partner (Schutte-Rodin et al., 2008). The most current clinical guideline utilized by the American Academy of Sleep Medicine lists the following for a thorough sleep evaluation: the use of the Epworth Sleepiness Scale, a two week sleep diary, evaluation of daytime dysfunction, the impact on quality life and dysfunctional beliefs (Schutte-Rodin et al., 2008). The review of the literature identifies additional methods of screening available to healthcare teams, yet one is not identified as the

gold standard screener. Sleep diaries are recommended to be kept for two weeks prior and during active treatment to evaluate efficacy of therapy (Schutte-Rodin et al., 2008). In order to properly evaluate for sleep disturbances, primary care teams must have basic knowledge of current diagnostic criteria.

When evaluating for sleep disturbance, assessing sleep quality is an important starting point. Having background knowledge and an understanding of insomnia is important as it stems from sleep disturbance and adversely affects sleep quality. According to the DSM-5, (Diagnostic and Statistical Manual of Mental Disorders, 5th ed.) an individual must meet all six of the criteria (see Table 1 for criteria).

Table 1

DSM-5 Insomnia Disorder Diagnostic Criteria

	Criteria
1	Unhappiness with the quality or quantity of sleep, to include trouble falling asleep, staying asleep or waking up early and being unable to get back to sleep
2	The sleep disturbance causes significant distress or impairment in functioning, such as within the individual's working or personal life, behaviorally or emotionally

3	Difficulty sleeping occurs at least three times a week and is present for at least three months
4	The problem occurs despite ample opportunity to sleep
5	The difficulty cannot be better explained by other physical, mental or sleep-wake disorders
6	The problem cannot be attributed to substance use or medication

Note. An individual must meet each of the six criteria in order to have the diagnosis. American Psychiatric Association (2013) *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.). Arlington, VA: American Psychiatric Publishing

This definition includes subjective and objective information needed to diagnose insomnia appropriately. Subsequent screening tools will be explained along with their relation to components of the insomnia diagnosis. These screening tools are often used by primary care teams for assessing sleep quality.

Epworth sleepiness scale. This is a self-assessment tool comprised of eight questions that identifies times when a person may be drowsy and have anywhere from no chance to a high chance of dozing off during routine daily activities (Johns, 1991). According to Johns (1991), activities include "sitting and reading, watching tv, sitting inactively in public, as a passenger in an automobile, lying down to rest in the afternoon, sitting and talking with someone, sitting quietly after lunch without alcohol and lastly, while being the driver of a stopped car for a few

minutes in traffic" (p. 541). A score is given to each question per the rated 0-3, with 0 being least likely and 3 being most likely. The total score can range from 0 to 24. If the score is above 10, the greater propensity for daytime sleepiness and thus further need to investigate causes of this sleepiness (Johns, 1991). This scale specifically applies to the distress and impairment piece of the insomnia diagnostic criteria. While this screener does not specifically address sleep, it does looks at how rested an individual feels based on daytime function and dysfunction. This screener is most often used for patients at JBSA-Lackland when they report a sleep disturbance.

Insomnia severity index (ISI). This scale is used to specifically target an individual's subjective understanding of their own sleep satisfaction and additional concerns related to dysfunctional sleep. This index is comprised of seven questions pertaining to the past month and evaluates sleep onset, maintenance, early awakening, satisfaction and dissatisfaction of sleep and daytime difficulties (Morin, Belleville, Belanger, & Ivers, 2011). Additionally, this index assesses perception of others, such as a spouse, regarding distress caused by sleep difficulties. Each question is rated from 0 = no problem, to 4 = very severe problem. The score is then tallied and if above 7 is determined to be moderate in intensity insomnia (Morin et al., 2011). This tool captures the number of episodes of difficulty, sleeping, personal and perceived sleep disturbances. This screening tool is an easy, self-administered assessment used to address the first three criteria of the insomnia diagnosis. It may be used initially as well as a reassessment tool for those diagnosed with insomnia. The final index is used more frequently used to evaluate quality versus severity of insomnia.

Pittsburgh sleep quality index (PSQI). This validated screening tool can be completed in less than five minutes despite the 19 questions asked (Buysse, Reynolds, Monk, Berman, & Kupfer, 1989). This screener responds to questions about sleep quality, latency, duration,

efficiency, disturbances, use of medication and daytime dysfunction (Buysse et al., 1989). This is the only tool of the three mentioned that looks specifically at the use of medication and gives a global sleep quality score that is statistically significant in sensitivity and specificity at 89.6% and 86.5% respectively (Buysse et al., 1989). This was the self-assessment tool chosen for this DNP project. Each question will be explained in further detail below (see Table 2).

Table 2

Pittsburgh Sleep Quality Index (PSQI)

During the past month,

		Not During the past month (0)	Less than once a week (1)	Once or twice a week (2)	Three or more times a week (3)
1	When have you usually gone to bed?				
2	How long (in Min) has it taken you to fall asleep each night?				
3	What time have you usually gotten up in the morning?				
4	a. How many hours of actual sleep did you get at night? b. How many hours were you in bed?				

5	How often have you had trouble sleeping because you: a. Cannot get to sleep within 30 min b. Wake up in the middle of the night or early morning c. Have to get up to use the bathroom d. Cannot breathe comfortably e. Cough or snore loudly f. Feel too cold g. Feel too hot h. Have bad dreams i. Have pain j. Other reasons
6	How often have you taken medicine to help you sleep?
7	How often have you had trouble staying awake while driving, eating meals, or engaging in social activity?
8	How much of a problem has it been for you to keep up enthusiasm to get things done?
9	How would you rate your sleep quality overall?

Note. Component 1 = #9 score; Component 2 = #2 - #5a; Component 3 = #4 score; Component 4 = (Total # hrs of sleep/total # hrs in bed) /100; Component 5 = # sum of 5b to 5j; Component 6 = #6 score; Component 7 = #7 + #8 score. The total of all seven components make up the Global Sleep Quality Index. Buysse, D., Reynolds, C.F., Monk, T.H., Berman, S.R., and Kupfer, D.J. (1989). The Pittsburgh sleep quality index: a new instrument for psychiatric practice and research. *Psychiatry Research, 28*(2): 193-213

Each questions has a specific scoring tool that is calculated by the administrator. Seven components are evaluated with a score from 0 - 3, with best to worst labeled respectively. When the seven components are scored, an overall global sleep quality score from 0 to 21 is provided. A score greater than 5 is indicative of poor sleep quality (Buysse et al., 1989). This validated screening score provides a comprehensive review of sleep quality, helping to identify those who may need intervention and treatment.

When to use them. Current clinical practice guidelines only specify use of the Epworth Sleepiness Scale or assessment tool to rule out other diagnoses potentially causing sleep disturbances and assist in the insomnia diagnosis (Schutte-Rodin, Broch, Buysse, Dorsey & Sateia, 2008). The Epworth Sleepiness Scale evaluates impairment and distress of sleep quality and daytime dysfunction, which can help the provider decide if further screening for differential diagnoses such as insomnia, obstructive sleep apnea, depression, anxiety or PTSD need to be explored. Once a diagnosis of insomnia is made, the ISI may be used to track treatment efficacy. The PSQI is currently the only standardized assessment tool that covers a wide range of indicators of sleep quality, making a case for its use in the majority of individuals with any sleep quality dysfunction (Mollayeva et al., 2015).

Given the varying utility of each screening tool, guidelines suggest clinical judgement when utilizing the ISI and PSQI in addition to the Epworth Sleepiness Scale (Schutte-Rodin et al., 2008). When undergoing the initial evidence based treatment for insomnia, CBTi, the

American College of Physicians recommend the use of the PSQI for screening and treatment evaluation (Qaseem, Kansagara, Forciea, Cooke, & Denberg, 2016). Within the primary care setting this leaves some variability to the evaluation of sleep quality and depending on which screening tool is used, may miss some indicators of reduced quality of sleep. Much of the work up for sleep quality concerns is up to the provider and joint decision making with the patient. In an attempt to catch signs of reduced quality sleep the U.S. Military uses a standard annual health assessment.

Military screening

Military medical readiness is evaluated annually by the Military Health System (MHS) through the use of the Periodic Health Assessment (PHA) and a recently instituted Mental Health Assessment (DoD, 2016). In this assessment, two questions are asked regarding sleep (see Table 3).

Table 3

Sleep Questions on DoD Form 3024, Periodic Health Assessment (PHA)

	Question
1	During the last 2 weeks, how many hours of sleep did you get on most days?
2	During the last 2 weeks, have you felt impaired or unable to adequately perform due to sleepiness or poor quality sleep?

Note. The two PHA questions specifically targeting sleep. Department of Defense (2016, Apr). *Annual periodic health assessment (*DoD Form 3024). Retrieved from http://www.esd.whs.mil/Portals/54/Documents/DD/forms/dd/dd3024.pdf

Although brief, the concern for impairment, performance and sleep quality is challenged. The difficulty with this brief annual assessment is the follow up. There is currently no official

guidance on who should follow up with these patients if sleep is identified as a problem. As of late 2017, the Defense Health Agency (DHA) released guidance that a person-to-person Mental Health Assessment (MHA) must be conducted annually, ideally identifying those individuals at risk for mental health issues to include sleep disturbances (DHA, 2017). The intent of a MHA is to identify individuals at risk and refer them to their primary care provider who will evaluate their reported symptoms.

Current practice

Currently, there is no evidence based guidance regarding the use of a screening tool or which screening tool is most effective in diagnosing sleep disturbances. The aforementioned screening tools (Epworth, ISI, and PSQI) are validated tools but none have universally been selected as the gold standard. In addition, the diagnosis of sleep disturbance includes subjective and objective information. The screeners use subjective information obtained from the individual person and screening relies on provider skill and intuition rather than evidence-based practice.

Barriers to Identification of Sleep Disturbances

Military

In addition to achieving quality sleep, barriers exist in receiving timely identification and treatment of sleep related disturbances within military service members (Troxel et al., 2015). Some areas that have been identified include knowledge of sleep and its importance to physical and mental health, tempo of operational taskings, culture within units and health care system barriers (Troxel et al., 2015). While challenging to overcome, recognition is the first step to impact the health and readiness of the force.

Culture

Lack of sleep is often seen as a way to prove durability with the assumption and that sleep is a luxury and not as a priority to physical and mental readiness. This belief is deeply embedded within military culture (Troxel et al, 2015). In a recent working group conducted by Troxel et al. (2015), military leaders expressed similar sentiments when discussing the problem within the military culture, regarding the lack of importance placed on sleep health (p. 104). There are only a few policies that exist to direct leadership on sleep requirements, usually in the deployed setting. Having these in place as a guide does not necessarily address the ingrained mindset many members have regarding sleep, which is where change ideally must start. The guidelines are subject to mission and operational tempo, and may be altered by leaders as deemed necessary to meet the mission.

Operational Tempo

Depending on the current military climate and unit setting, ADSM work schedule will vary. Many in the deployed setting report receiving only four hours of sleep daily, with no education on the importance of sleep prior to deploying (Miller, Shattuck, Matsangas, 2011). Even when not in the deployed setting, work schedules can vary depending on the mission. Members may feel obligated to complete tasks, letting sleep fall to the wayside. It is not unreasonable there will be times when short sleep duration and reduced quality will be required to meet the mission at hand (Troxel et al., 2015). Education to members and leadership regarding the impact these continued practices have on the health, wellbeing and readiness of service members cannot fall to the wayside.

Knowledge

Troxel et al. (2015), brought to light a theme among military leaders interviewed regarding baseline knowledge of sleep health (p. 109). Many understand that sleep health can

and should be individualized, but the majority did not have knowledge of what healthy and unhealthy sleep is (Troxel et al., 2015). This highlights a gap within the health system and dissemination of general rules for mental and physical wellbeing. In order to properly identify those with sleep related disturbances, whether in quality or quantity, the individual, their co-workers, family and leadership all need a basic understanding of healthy and unhealthy sleep and what to do when a problem is identified.

Currently, the Army is the only service that has a campaign to educate and advertise the importance of sleep as a measurement of personal health (U.S. Army, 2015). This initiative is part of the Performance Triad that includes emphasis on the importance of sleep, activity and nutrition (U.S. Army, 2015). This is a step in the right direction for service members and leaders for education about healthy sleep and methods for early identification of problems. Unfortunately, this campaign only addresses a small percentage of service members and does not fix the larger system gap from the DoD, which has not put out a centralized resource for all service branches (Troxel et al., 2015). The health care system plays a large part in sleep health education and dissemination to leaders and service members.

Health system

Emphasis on screening and reduction of stigma are two of the primary focus areas for the Military Health System (MHS). There is stigma associated with seeking assistance for mental health concerns that may come stand alone or accompany sleep related concerns (Ramchand, Acosta, Burns, Jaycox, & Pernin, 2011). Some encouraging interviews with service members and healthcare personnel suggest reduced stigma for those receiving or inquiring about services related to sleep (Troxel et al., 2015). Current DoD reduction strategies may be beginning to show some decline in relation to stigma of mental health services (Acosta et al., 2016).

The annual health assessment conducted on service members addresses minimal sleep related issues. Troxel et al. (2015), identified that it is believed that sleep not deemed important and members will often wait to come forward until physical or mental health concerns arise (p. 111-112). This highlights the need for basic education on the importance of sleep and its role in individual medical readiness. Healthcare providers have multiple tools at their disposal to screen individuals, but time and applicability to the individual may be a challenge.

Each screening tool contains a variety of different questions, with the goal to determine the underlying cause for the sleep disturbance. Appointments with a healthcare provider are often brief and multiple concerns are rarely addressed, including sleep issues. There are also a multitude of screening questions asked by ancillary staff prior to seeing a healthcare provider. Standardized sleep questions are typically not included in the screening questions (Troxel et al., 2015). This makes early identification of sleep related issues difficult, thus perpetuating the issue of an individual seeking help when other physical or mental health concerns become apparent. Many of these same challenges exist within the civilian sector as well, with its own unique set of barriers.

Civilian

Much like the military, the civilian population faces challenges and barriers related to identifying and treating sleep disturbance. The majority of Americans work Monday-Friday making it difficult to take time off for medical appointments. The appointments are most often for a medical ailment or sickness, not a sleep disturbance. Valente (2015) suggests people don't often identify that sleep may be the cause of their obesity, depression or high blood pressure (2015). Few seek care specifically for insomnia, believing a lack of sleep quality is the norm and

not realizing there are modalities of treatment besides pharmacologic (Valente, 2015). If a sleep disturbance is not identified at the medical visit, it is likely not being treated.

Similarities

Lack of knowledge regarding the importance of sleep health appears to be a common theme seen in military and civilian healthcare. Some initiatives currently in practice include Drowsy Driving Prevention Week and National Sleep Awareness Week. These help to spread the word and educate the general public on the sleep health and what consequences can occur when issues are not addressed (CDC, 2013). Ideally these initiatives will continue to grow and help with the knowledge gaps that have been identified. Much of the barriers mentioned in civilian and military populations exist within the local Joint Base San Antonio (JBSA) Lackland AFB area the area of interest in this DNP project.

Current Barriers at the Local Level

Many of the challenges previously mention exist within the JBSA-Lackland community. Prior to initiating this DNP project, a meeting with a Behavioral Health Optimization Program (BHOP) provider was conducted. Through discussion of current clinical practice within the Wilford Hall family health clinic some screening and treatment challenges were identified.

Provider screening. The use of any screening method is sparse among providers. Many utilize the STOP-BANG questionnaire to evaluate for obstructive sleep apnea (A. Fields, personal communication, June 2017). Some providers utilized the Epworth Sleepiness Scale, but individuals were either started on medications or referred to the BHOP area of the clinic if sleep disturbances were of concern. The majority of any validated screening occurred when an individual was under the care of the BHOP provider (A. Fields, personal communication, June 2017). This would then lead to individual appointments with the patient and the recommended

first line treatment, cognitive behavioral therapy, would proceed. Understanding the importance of sleep health, the BHOP team had a basic sleep hygiene class available for patients enrolled to the family health clinic.

Sleep enhancement class utilization. This class was an initial first step for the BHOP team to provide general sleep education and interventions that could be conducted at home without the need for follow up with a clinic provider. Unfortunately, this class was significantly underutilized, averaging one individual monthly (A. Fields, electronic communication, 2018). This was initiated as a first step for patients self-identifying with sleep disturbances to get education and have the opportunity for further treatment, CBT. This speaks to the barriers previously identified. Many do not know when sleep is not healthy and where to go for assistance. This class was generally not well advertised by the BHOP team within family health clinic. The clinic providers could refer patients, if the individual self-identified an issue. Education for not only individuals on a community level, but within the family health clinic level were areas of need for possible improvements. In order to further discussion with providers, BHOP team members and units within the JBSA-Lackland area, available recommended interventions for reduced sleep quality were appraised.

Interventions

Clinical Practice Recommendations

It is important to realize no clinical practice guideline exists to specifically address reduced quality of sleep as this is a component of insomnia. When referring to clinical guidelines the diagnosis and subsequent treatment recommendations for insomnia will be referenced. The American Academy of Sleep Medicine (AASM), the American College of Physicians (ACP) and the American Academy of Family Physicians recommend the use of sleep

hygiene and nonpharmacological therapy as initial treatment for insomnia (Sateia, Buysse, Krystal, Neubauer & Heald, 2017; 2015; Ramakrishnan & Scheid, 2007; Schutte-Rodin et al., 2008). The focus on behavior change leads to the discussion of cognitive behavioral therapy for insomnia (CBTi) and brief behavioral treatment for insomnia (BBTi).

CBTi/BBTi. CBTI is therapy focused on changing beliefs, attitudes and habits related to sleep. CBT is used frequently by mental health and specifically trained clinicians and has been shown as an effective treatment for insomnia (Troxel et al., 2015). Therapy is usually composed of multiple sessions lasting from 60-90 minutes a piece (Bothelius, Kyhle, Espie & Broman, 2012). Through this therapy there is focus not only on behavior but employing additional techniques such as sleep restriction and stimulus control to assist in management of insomnia (Ramakrishnan & Scheid, 2007). Although evidence strongly supports this modality as a first line treatment for insomnia, significant time must be put forward by the provider and the individual receiving the therapy. Thus the emerging BBTi platform for therapy.

In order to combat clinician shortages and time requirements for CBTi, BBTi consists of two in-person visits and two telephone sessions (Capaldi, Kim, Grillakis, Taylor & York, 2015). There is an emerging military specific version of BBTi, known as the BBTi-MV, which attempts to relate to some of the idiosyncrasies within the military culture that may impact sleep quality (Capaldi, Kim, Grillakis, Taylor & York, 2015). An additional benefit to BBTi is that it can be administered by nursing staff or other health professionals without advanced psychiatric or sleep medicine training (Troxel et al., 2015). This may allow for individual clinic modifications based on staffing and availability of behavioral health staff. There are currently no head-to-head comparison studies of CBTi and BBTi, but each have been identified as efficacious in the

treatment of insomnia and are recommended by leaders in the field of sleep medicine as first-line prior to pharmacological treatment.

Pharmacology. The current recommendations for pharmacologic intervention for sleep disturbance is to use the lowest dosed medication for the shortest amount of time (Valente, 2015). Medication should be used in combination with behavioral therapy intervention. When prescribing sleep aids, it is important to educate that medication is not meant for long term use, there is a risk for addiction and rebound insomnia may occur (Sateia, Buysse, Krystal, Neubauer & Heald, 2017)). According to the most recent American College of Physicians, medications should be used five weeks or less (Hauk, 2017). Follow up for patients prescribed medication should be every 4-6 weeks so that tapering off of medication can be closely monitored. Medication intervention is not a long term solution for sleep disturbance and must be used in combination with other treatment modalities.

Sleep Hygiene. Sleep hygiene is a behavioral intervention in which the person reporting sleep concerns is provided information on how to achieve a better night's sleep. Sleep hygiene education can be found on a google search, provided by clinic staff, given in a patient handout, or through the BHOP clinic. Recommendations are to avoid certain behaviors before bedtime; no caffeine, avoid strenuous activities, have a bedtime routine, and avoid screen time (CDC, 2016). While sleep hygiene should be encouraged to every person suffering from sleep disturbance, it has been proven to be ineffective as a single therapy (Schutte-Rodin et al., 20018). Reminding patients about sleep hygiene is important but not a standalone treatment for improving sleep quality.

Why we chose BBTi. The literature demonstrates the success of behavioral therapy, whether it is CBTi or BBTi on sleep issues. It also supports the guidance that CBTi or BBTi are

first line therapies and should be utilized as such within the primary care setting. The BHOP team is in a position to integrate these practices within the Family Health clinic. Given these results, we chose this as the focus of our evidenced based project. We also chose to utilize the validated objective sleep assessment tool, PSQI for initial subjective data of unit sleep quality.

Community Outreach

Importance

Healthy People 2020 is a program outlining national objectives in an effort to promote overall health and wellness (ODPHP, 2015). The intent is helping people live longer, healthier lives. Highlighted in this initiative is the importance of community outreach to help improve lives through education and disease prevention (ODPHP, 2015). The Air Force has a command directed policy, Air Force Instruction 40-101, focused on health promotion among the military population (Department of the Air Force, 2014). The Medical Commander is responsible for promoting evidence based health initiatives in support of encouraging healthy behaviors (Department of the Air Force, 2014). Promoting health and wellness through community outreach is recommended as a national and military goal.

Knowledge of healthy sleep behaviors has been identified as a barrier to health seeking behaviors of not only civilian, but military members. In support of Healthy People 2020 and Air Force Instruction, community outreach was identified as a way to reach ADSM, bridging the gap between knowledge of sleep health, specifically quality sleep, and seeking assistance when a problem is identified. There are no current studies regarding community outreach for sleep health. This does not diminish the idea that community engagement is effective, especially when education is an established barrier for ADSMs. The ability to break down barriers and meet individuals where they work can encourage health seeking behaviors and preventative health.

This is highlighted by a systematic review of barbershop administered health education to Black men in urban communities across the U.S. (Luque, Ross & Gwede, 2014). This allowed for men to be in a familiar place, reduce any social or cultural barriers and get necessary preventative health information in order to have a well-informed discussion with their primary care provider, when necessary (Luque, Ross & Gwede, 2014). This is a unique way to promote preventative health, but highlights the need to meet individuals in a familiar, non-threatening environment. A more recent initiative by the U.S. Army has worked to break down barriers with a group of adolescents.

The program, Madigan Army Medical Center School Based Health System serves seven local schools to promote physical and mental well-being and puts the adolescent at the center of care and education provided (Heese & Lemmon, 2018). Adolescents are a vulnerable population, especially within the military. This program has been able to successfully break down barriers to give high quality, accessible care (Heese & Lemmon, 2018). This unique program demonstrates not only the importance, but the success that can come from reaching out to individuals in their primary environment, whether school or work. In order to get ADSM timely, effective, evidence-based preventative sleep health, education in the workplace is method worth pursuing. This leads to the development of the DNP project clinical question.

Clinical Question

(P) In non-medically employed Air Force ADSM, (I) does a mobile educational program promoting sleep quality awareness and a sleep self-assessment (C) compared to no intervention (O) affect attendance to the BHOP sleep enhancement course?

Focus Areas

To address reduced sleep quality among ADSM, this project employed community outreach by meeting members in their work setting. Sleep education was provided, through a briefing (face to face or digital video) which facilitated a non-threatening more personal approach. Incorporated in education was stressing the importance of achieving quality sleep, with an emphasis on safety, job performance and quality of life. A validated sleep self-assessment tool, the PSQI was provided, offering individual insight about personal sleep (Buysse et al., 1989).

Identified Stakeholders. Stakeholders for this project were identified as Squadron Commanders and their subordinate leadership, BHOP team members, Family Health team members, hospital administration and empaneled patients.

Identified evidence based screening tool. In reviewing the literature, the PSQI was identified as highly specific and sensitive, validated tool used to identifying sleep disturbance among the adult population. This tool was employed across ADSM in the form of a self-assessment tool provided through a QR-code or a URL link which correlated with their specific squadron.

Identified barriers to practice. Discussion with stakeholders identified several barriers to practice. These included, (a) no established screening tool for sleep quality; (b) individual provider preference for screening; (c) if sleep disturbance was identified, no clinical practice guideline for appropriate treatment; (d) lack of knowledge of the primary care teams as to available resources BHOP offered; (e) lack of advertising for sleep hygiene class offered by BHOP; (f) limited class times offered by BHOP; (g) limited time of service members to attend BHOP classes; (h) ADSM variable work shift times

Relevance to Military Nursing. A national objective for Advanced Practice Registered Nurses (APRN) is advocating for patients and families, focusing on disease prevention and improving quality of life (ANA, 2015). A prioritized role of the APRN includes a basic understanding of the population served and how to best reach them in order to provide evidence based practice. The incidence of sleep disturbance among ADSM's is alarming and military APRN's can help facilitate impactful change for the betterment of the entire community served.

Organizing Framework

Havelock's Theory of Planned Change was the framework model used for this evidence based change. Havelock uses the CREATE (Care, Relate, Examine, Acquire, Try, Extend and Renew) model to build relationships with key stakeholders and bring about change (White & Dudley-Brown, 2012). This change theory facilitated the project, guiding and encouraging those within the BHOP team and out at the unit level to improve sleep quality issues within the ADSM population.

Presenting compelling evidence to ADSM's about the importance of sleep was critical to project success. A convincing introduction is first step to acceptance of Havelock's change theory. Establishing rapport in addition to a short meaningful description of the importance of the project contributed to the relatability and timeliness of this topic. Involving the command team with the findings of the anonymous self-assessment and explaining the ascertained data about sleep among their troops was informative. Establishing initial buy-in and following through with the data obtained at the briefing allowed for development of community relationships and sustainment of the process.

Project Design

General Approach

This project design focused on improving the process in identifying and facilitating attendance of ADSM to a BHOP offered sleep enhancement course, using a community outreach approach. Upon initial evaluation, BHOP offered only a sleep hygiene class which was available once a week at a specific date and time. Patients could also receive this information at a scheduled appointment with the BHOP team. Prior to implementation of the project, attendance at the sleep hygiene class was: 2 attendee's in September 2017; 1 attendee in October 2017; 0 attendee's in November 2017.

In December, BHOP's sleep hygiene class was adjusted in which they offered a one hour BBT-I class, every Tuesday at 2pm. The class offers evidence based interventions for those struggling with reduced quality of sleep. It employs a type of brief behavioral therapy (BBT-I) for sleep issues. This intervention is supported by the literature reviewed and is as efficacious as a longer CBT-I regimen. Identifying underutilization and going into the literature and discussing with subject matter experts (BHOP providers), the direction of the project focused on community outreach of two squadrons, Security Forces (SF) and Force Support Services (FSS). The ultimate goal was to see an increase in attendance to the BHOP class, which would further emphasize the importance of brief education and outreach helping create meaningful change to impact health care outcomes.

Setting

This project was conducted at JBSA, Lackland Air Force Base. ADSM's from two squadrons were given a 15 min briefing in person or through a digital video. Each group was also given an anonymous, validated sleep self-assessment (PSQI) to complete, along with information on the sleep enhancement class and how to attend. For this project, the unit of

measure was attendance of ADSM's to the sleep enhancement course. The PSQI self-assessment was utilized to get a sense of current unit sleep health, with the intent to impact command supported education and health seeking behaviors.

Procedural Steps

Systematic Review of Available Evidence

In order to help define our clinical question and further the intervention of this DNP project an initial evaluation of current literature was conducted to determine whether BBTI or CBTi was more effective in the treatment of decreased sleep quality. This would further guide our discussion with stakeholders and ultimately support the utilization of the Sleep Enhancement Class, a form of BBTi within the family health clinic at JBSA-Lackland.

Search Criteria

The search engines used to explore the literature supporting the clinical question were Public/Publisher Medical Literature Analysis and Retrieval System Online (PubMed), Cumulative Index to Nursing and Allied Health Literature (CINAHL), Cochrane Library and PsycINFO. All databases were accessed through the Uniformed Services University of the Health Sciences' Learning Resource Center. Search terms used in both databases were "brief behavioral treatment*", "brief behavior therapy*", "BBTI", "CBTI", "cognitive behavioral therapy", "cognitive behaviour therapy", "cognitive therapy", "cognitive behavioural therapy", "cognitive behavior therapy", and "insomnia". The limiters were set for articles published within the last ten years and the English language, with additional peer-reviewed for PsycINFO database. The Boolean connector used throughout both searches were "OR" and "AND."

The PubMed search resulted in five articles, and the CINAHL search resulted in zero new articles. PsycINFO resulted in 10 peer-reviewed articles. Cochrane library search terms used were “bbti” OR “brief behavioral” AND “insomnia” AND “cbti” OR “cbt-I” OR “cognitive”. The search resulted in 26 articles. Of the 41 articles, four duplicates were discarded. Inclusion criteria were data-based or case report articles that described one on one brief behavioral treatment of insomnia. Exclusion criteria were articles that reported group based therapy, only cognitive behavioral therapy, conference abstracts, book reviews and articles or case reports specifically targeting individuals with fibromyalgia, cancer, alcohol abuse, and depression. After review of the 37 article titles and abstracts, 30 were discarded, leaving 7 articles of relevance to the clinical question and were appraised and retained for synthesis.

Search Results

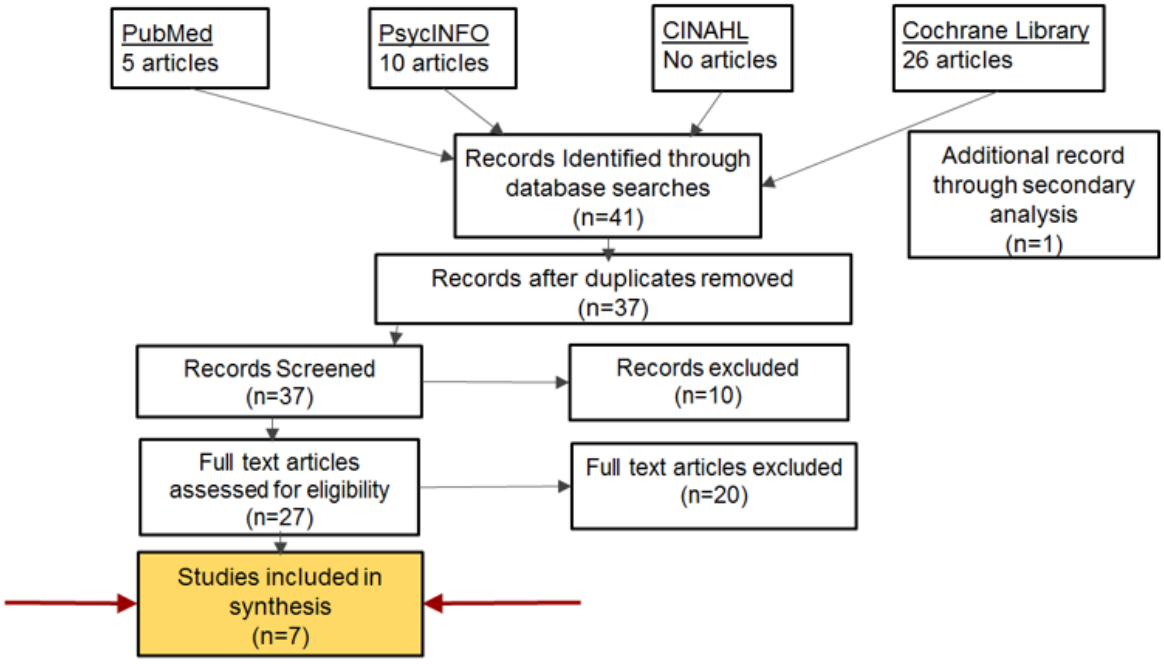


Figure 1. Search strategy PRISMA Chart Brief Behavioral Treatment for Insomnia (BBTI).

Quantity. The quantity of the literature regarding a shorter duration alternative to CBTI was not substantial. There were no direct comparisons in the literature of traditional CBTi to BBTi or other short-term options. Five of the studies that met inclusion criteria for thorough analysis were randomized control trials (RCTs), with one case study and a secondary analysis that specifically looked at predictors of treatment response from RCT by Buysse et al. (2011). While the quantity of the literature was not significant, the quality of the evidence was sufficient for synthesis and directing the project development.

Quality. Based on study design, five RCTs were graded as level of evidence II, and the case study level of evidence IV (LoBiondo-Wood & Haber, 2014). The secondary analysis study provides information for clinical practice, indicating populations that may have better response to BBTI (Troxel, Conrad, Germain, & Buysse, 2013). Of the five RCTs, three met the Johns Hopkins Nursing Evidence-Based Practice criteria for high quality (A) with the remaining two considered good quality (B) (Newhouse, Dearholt, Poe, Pugh, & White, 2005). The secondary analysis and the clinical case were rated good (B) and low (C) quality respectively (Newhouse et al., 2005). The level of evidence (II, IV) and quality of evidence (A-C) supports the conclusion that evidence derived from this review may be considered robust (Newhouse et al., 2005).

Additional study design characteristics increased the validity of the findings. Most studies allowed for controlled comorbid conditions such as depression, anxiety, restless leg syndrome, and sleep apnea provided the treatment for said conditions remained constant throughout the intervention (Buysse et al., 2011; Ellis et al., 2015; Germain et al., 2011; Goodie et al., 2009; Troxel et al., 2013). Inclusion of controlled comorbidities in sample populations increased external validity as most of the patients presenting with poor sleep quality are likely to experience other health problems. Control groups were comprised of information only

conditions, in which participants received minimal intervention such as brochures and overviews of good sleep hygiene (Buysse et al., 2011; Falloon et al., 2015; Germain et al., 2011; Harris et al., 2012), or wait-list groups (Ellis et al., 2015). The researchers in these studies spent equal time with the information only control group, and the intervention group, increasing internal validity.

A direct comparison of BBTI and CBTI was not recovered during the literature search. However, the robust evidence that supports the use of behavioral therapy is noteworthy and sets the framework for the revision of the clinical question, including BBTI as the end goal for intervention. The seven articles revealed recurrent themes that added direction to the project. Those themes include: sleep quality measures, response to treatment and brief therapy intervention.

Sleep quality measures. Accounting for the varied definitions of treatment response, the most common measure of sleep quality was sleep efficiency (SE) data. The use of a sleep diary for moderate to large groups in three of six studies showed a greater than ten percent increase in SE (Germain et al., 2011; Goodie et al., 2009; Ellis et al., 2014). The use of actigraphy in combination with sleep diaries was utilized in three studies, showing that actigraphy did not demonstrate the same rates of improvement as noted with self-reported sleep measures (Buysse et al., 2011, Falloon et al., 2015; Harris et al., 2012; Troxel et al., 2013).

The measurement of sleep quality, no matter the subjective nature remains an integral part of the quality measures recommended by the AASM. The addition of objective sleep measures (wrist actigraphy) to study designs did not demonstrate similar clinically significant outcomes and researchers fell back on outlined subjective qualitative measures such as patient reported sleep satisfaction and patient completed questionnaires such as the Pittsburgh Sleep

Quality Index (PSQI) (Buysse et al., 2011; Falloon et al., 2015; Germain et al., 2006; Harris et al., 2012; Troxel et al., 2013) and the Insomnia Severity Index (ISI) (Falloon et al., 2015; Ellis et al., 2014).

Response to treatment. As discussed, comparing differing definitions of treatment response presented a challenge during the literature review. The American Academy of Sleep Medicine 2015 clinician guideline recommends the use of quality outcome measures to evaluate and manage insomnia treatment. Recommendations include evaluating patient reported sleep quality or satisfaction, subjective sleep latency, the use of prospective sleep diaries, and the use of validated questionnaires (Edinger et al., 2015). While these guidelines were published after the studies in this review and target clinicians rather than researchers, each study consistently utilized patient reported sleep satisfaction, patient completed sleep diaries, and a validated questionnaire such as the Pittsburgh Sleep Quality Index (PSQI), Insomnia Severity Index (ISI), or Sleep Impairment Index as primary or secondary outcome measures.

Those studies that showed a treatment improvement of three points or more on the PSQI in addition to a 10% increase in sleep efficiency based on sleep diary measures also found response rates of 67%, 67% and 71% measured at four weeks, six months, and four weeks respectively post-treatment (Buysse et al., 2011; Falloon et al., 2015; Germain et al., 2006). Remission, defined as response in addition to a PSQI score of less than five and/or a sleep efficiency of greater than 85%, was measured by two studies at six months. One study reported a remission rate of 40%, but the second study categorically lumped response and remission together muddying the 67% reported rate (Buysse et al., 2011; Falloon et al., 2015; Germain et al., 2006).

Brief behavioral therapy intervention. Harris et al. (2012) were the only authors that compared different components of brief behavioral therapy. The study compared 1) sleep restriction, 2) stimulus control therapy, 3) sleep restriction combined with stimulus control therapy, and 4) information control. The authors defined treatment response as 1) a reduction in sleep onset latency (SOL) to an average of less than 30 minutes, or a reduction of SOL by greater than or equal to 50% and 2) SE increase to greater than or equal to 85% (Harris et al., 2012). Intervention groups assessed at six weeks demonstrated response rates of 46.7 %, 37.5%, and 61.1% respectively (Harris et al., 2012). At six months response rates of the sleep restriction only and stimulus control therapy only groups declined (Harris et al., 2012). The intervention group that had received both sleep restriction and stimulus control therapy demonstrated an improved response rate of 65% at six months (Harris et al., 2012). This study in particular suggests better outcomes and longer duration of response may be achieved through the combined application of the components of brief behavioral therapy.

Finally, Ellis et al. (2015) in examining efficacy of one session of CBTi, did not overtly define response, but defined remission with two cut points on the Insomnia Severity Index (ISI). Participants scoring less than eight or less than ten on the ISI were considered to be in remission at four weeks post-treatment. A score of eight or greater represented a significant measure of subclinical insomnia and a score of ten or greater represented a significant "caseness" identifier for insomnia (Ellis et al., 2015). The authors reported remission rates of 50% (< 8) and 60% (< 10) respectively (Ellis et al., 2015). Secondarily, outcomes measured through changes in sleep diaries and ISI scores pre- and post-treatment were examined, but again, specific response or non-response interval changes were not defined.

The literature demonstrates the success of behavioral therapy, whether it is CBTi or BBTi on sleep issues. It also supports the guidance that CBTI or BBTI are first line therapies and should be utilized as such within the primary care setting. Given these results, we chose this as the focus of our evidenced based DNP project. In order to support the use of BBTI in the family health clinic at JBSA-Lackland, it was determined through consultation with stakeholders that the focus would become an educational intervention to get individuals to the evidence based treatment, the Sleep Enhancement Class.

Methodology

In consultation with stakeholders, the 802nd Security Forces Squadron (SFS) and 802nd Force Support Squadron (FSS) were identified as target audiences for the educational brief and online self-assessment tool. A short, less than 10 minute, in-person briefing was conducted for the SFS and a seven minute video was provided to FSS. Each group had the opportunity to complete the PSQI self-assessment during the brief, accounting for the additional three minutes at the in-person SFS briefing. The intent of each brief was to raise awareness of the importance of sleep quality, introduce a tool for self-evaluation and provide resources, specifically the BBTi class offered through BHOP. During the in-person SFS brief, a BHOP representative was in attendance and available to answer any questions. For both briefings, the method of implementation was similar, with exception to the delivery medium.

802 Security Forces Squadron (SFS). The vast majority of this squadron is located at JBSA allowing for easier in-person access. This squadron is comprised of over 400 members to include civilian personnel. To maximize audience exposure, we briefed at two separate assemblies, with a total of 150 individuals in attendance. This squadron received an in-person 10

minute brief, a business card containing the information for BBTi, and a URL/QR-code for the PSQI self-assessment (See Appendix G).

802 Force Support Squadron (FSS). The majority of this squadron is civilian personnel, with an estimated 150 ADSM spread across JBSA. After discussion with the operations officer of the squadron, it was decided the best way to reach the ADSM's would be through use of a video. The video included the same information provided to the SFS squadron: the business card with information about BBTi, a URL/QR-code specific to their squadron, and the PSQI self-assessment. The command staff agreed to e-mail this to all ADSM's within the squadron. The educational component for each squadron was the same, with the initial introduction targeted toward the primary work completed by the squadron in order to make it personally relevant.

Education. The PowerPoint (PPT) slide deck consisted of four slides, with images. They were used as visual representations for the topics discussed. Each brief started with a greeting and proceeded to discuss safety, specifically drowsy driving and the impact short sleep duration and reduced quality of sleep has on an individual (see Table 4).

Table 4

Facts Presented in Educational Briefing

	Statement
1	Did you know that 60% of adult drivers have reported driving drowsy in the past year?[1]
2	Thirty-seven percent of car accidents are related to drowsy driving[1]

3	Being awake for greater than 18 hours is equal to being legally drunk[1]
4	It is recommended that adults should receive 7-9 hours of sleep per night[2]

Note. Information pulled from multiple sources to highlight the significant safety hazards associated with lack of quality sleep. [1] Facts and Stats. (2018). Retrieved from http://drowsydriving.org/about/facts-and-stats/; [2]

Additional information was provided, to include examples of physical and mental manifestations of poor quality sleep and what effects it can have on the body.

Self-Assessment. The PSQI was converted into a surveymonkey.com URL and provided to each individual receiving the brief via business card, PPT slide, or email. The PSQI was explained as a self-assessment tool. The original PSQI assessment did not tabulate individual scores as the intent was for the member to look back and perform a thorough self-evaluation of their sleep quality. Members were provided a link for follow up and information on how to score themselves at the end of each assessment. During both briefs, the cut off score for quality sleep was provided (> 5) along with examples of scores that represented lack of quality sleep. This allowed a general overview of the PSQI without going into detail of every question. The conclusion focused on the available BHOP class, specifically BBTi, explaining the one hour appointment and impact it may have on quality sleep improvement.

Sleep Enhancement Class. If individuals subjectively suffered from poor sleep, whether indicated on the self-assessment or based on self-identified factors, they were encouraged to attend the BBTi course. It was emphasized that an appointment was not necessary to attend the course. To avoid stigma associated with mental health resources, clarification was provided

explaining that BHOP was part of the Family Health Clinic, not mental health. Understanding that time can be a barrier in obtaining care, each squadron received information on the class length time of one hour. BHOP uses an evidence-based BBTi for sleep disturbance. The BHOP provider utilizes a treatment protocol in accordance with up to date evidence and clinical guidelines along with Air Force guidance (A. Fields, personal communication, January 2018). In order to evaluate change in attendance to the class, records were kept from September 2017 through March 2018. The tallying of attendees was performed by BHOP staff members and de-identified prior to disbursement for this project. This ensured no identifying information was released in accordance with the Institutional Review Board (IRB) non-human research determination (see Appendix C). Increasing attendance to this class was the goal of this DNP project. The cumulative data acquired from the PSQI self-assessment revealed insightful information about sleep quality among ADSM's revealing potential areas for improvement among troops.

HIPPA Concerns

Institutional Review Board (IRB) approval was obtained prior to implementation of this project. It was determined that the project was a process improvement initiative and therefore was classified as non-human research (see Appendix C). The primary concern was protection of any personally identifiable information (PII). These Health Insurance Portability and Accountability Act (HIPPA) concerns were mitigated by not collecting any personal data from individuals in attendance to the educational briefing or Sleep Enhancement Class. The attendance to the class was provided solely by the BHOP liaison for the project who was under strict instruction to not provide any PII. The only identifiable information obtained came from the SurveyMonkey URL designation. This designated the squadron only. The self-assessment

(PSQI) data was compiled and used as aggregate descriptive statistics. Permission to use the screening tool was obtained prior to uploading in SurveyMonkey and disseminating to squadron members. Throughout each step of the project extreme care was taken to ensure all information remained anonymous.

Data Collection and Analysis

The primary variable of interest was 30-day attendance rate at the Behavioral Health Optimization Program (BHOP) sleep enhancement course, regularly held at Wilford Hall Ambulatory Surgical Center (WHASC) Clinics. BHOP staff tracked weekly class attendance numbers from December 2017 to Feb 2018.

Unit sleep information was collected in a group setting during a scheduled brief education intervention designed to provide unit members with information about the importance of regular and sufficient sleep, tools for sleep quality self-assessment, and resources for sleep education. After obtaining permission from unit commanders, investigators provided the brief educational intervention to unit members in a group setting. Group participants were provided with a link to an online version of the Pittsburgh Sleep Quality Index (used with permission of the author), to conduct a self-assessment of their sleep quality (M. Gasiorowski, personal communication, November 9, 2017). Data were collected electronically through SurveyMonkey.com; identifying information was not collected, effectively anonymizing the data collected from individual unit members. After the brief education session, data were downloaded, scored, and aggregated using R statistical programming language to create the commander's unit sleep quality report.

Subjective Sleep Quality

The Pittsburgh Sleep Quality Index (PSQI) is a 19-item self-report questionnaire developed by the University of Pittsburgh to assess 1-month historical sleep quality. It provides seven component scores: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction. The sum of scores for these seven components yields one global score with a value ranging 0-21. Lower scores are associated with better the sleep quality; the cutoff between good and poor sleep is set at 5 (Buysse et al., 1989).

802 SFS. The brief education session was presented to the 802 Security Forces Squadron (802 SFS), 150 members attended the brief education session. Of the 150 802 SFS individuals who attended the in-person brief, 67 completed the online self-assessment (see Figure 1).

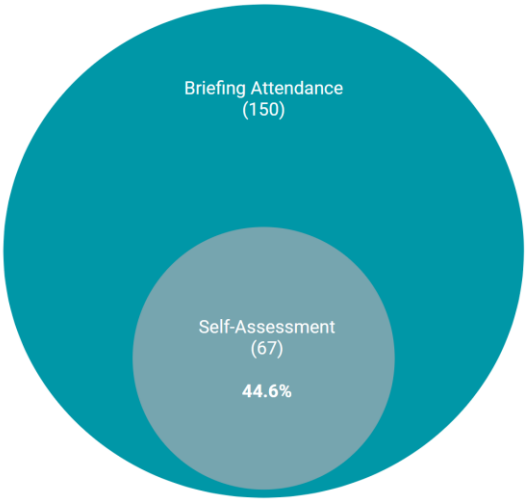


Figure 1. 802 SFS Briefing attendance and self-assessment completion.

802 FSS. In order to deliver the same sleep health brief to 150 members of the 802 FSS, an electronic video was developed. This brief included SEC information, the self-assessment tool and the same education that the 802 SFS was provided in-person. This electronic video method

of delivery yielded four viewings and three completed PSQI self-assessments. While this mode of delivery was not the original intent of the educational intervention, through discussion with the squadron leadership, it was determined to be the best way to reach the ADSM who were spread widely across the JBSA area. Data obtained from 802 FSS is not statistically significant due to meager participation. While this electronic delivery method is convenient, it may not the best way to engage ADSMs and their leadership. Therefore, data obtained from the three FSS participants will not be discussed in the results and discussion.

Results

This project was completely anonymous, to include demographic information. Over the investigation period BHOP SEC attendance increased (see Figure 2). This increase in attendance cannot be attributed to members of the 802 SFS following the intervention.

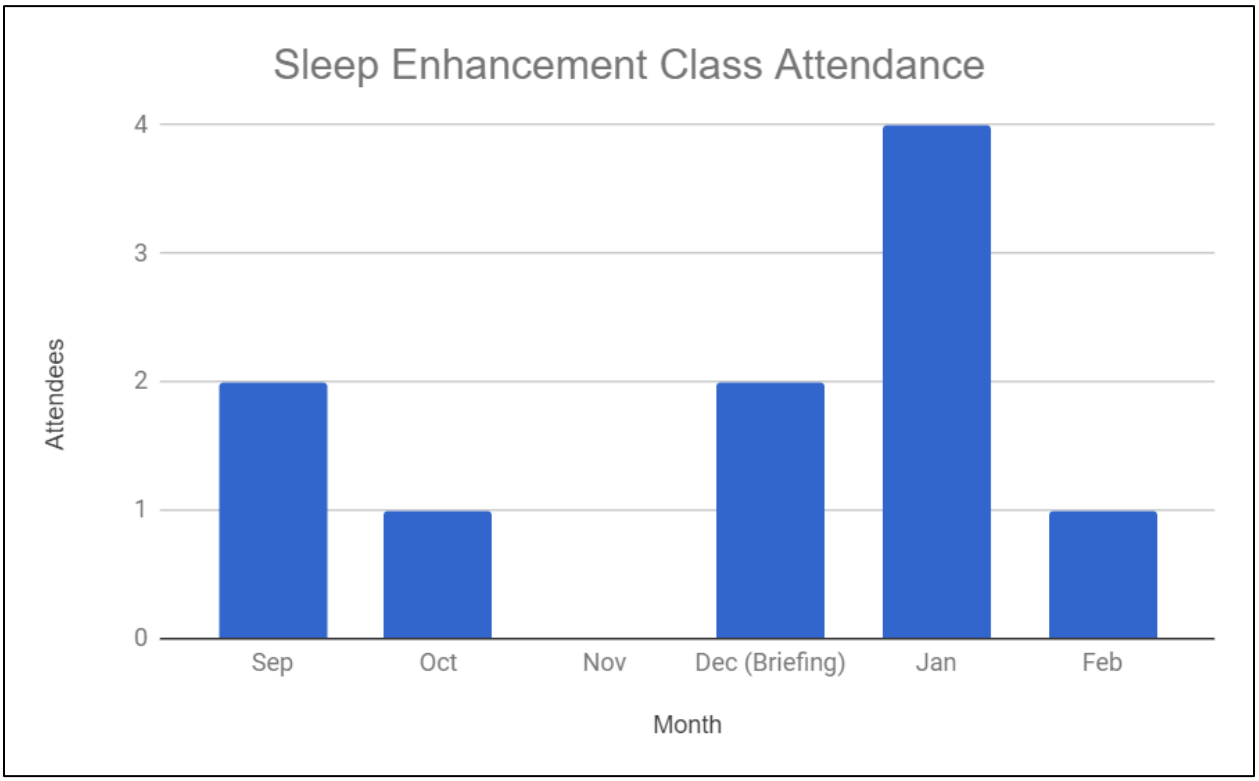


Figure 2. Sleep Enhancement Class Attendance. Table demonstrates total attendees over the six month time interval

As a group, a median global subjective sleep score yielded a score of 9. Most members reported on average 5 to 6 hours of sleep per night, taking 31 to 60 minutes to fall asleep. Collectively, respondents endorsed greater than one and less than nine sleep disturbance factors and reported 3 to 4 days of dysfunction per week related to sleepiness. Overall, sleep was reported as "fairly bad", most reported no sleep medications were taken during the last month, and the calculated sleep efficiency was greater than 85% (see Figure 3 for PSQI scores).

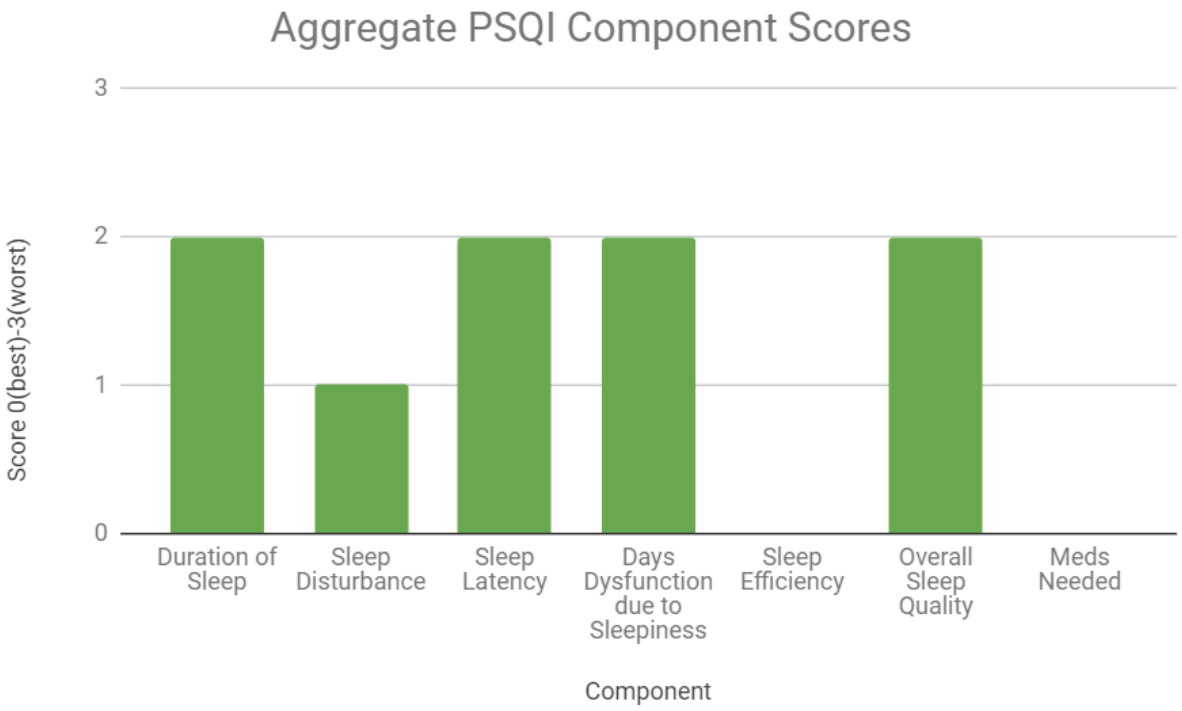


Figure 3. Numerical scores of each of the seven PSQI components, ranging from 0 (best) - 3 (worst).

Discussion

Following the educational brief and availability of the PSQI sleep assessment tool, attendance to the evidence-based BBTi course was monitored to evaluate if attendance would increase. Due to the anonymous nature of this project, to include zero demographic information obtained, a conclusion cannot be made correlating a direct link between the intervention and class attendance. This does not diminish the meaningful increase in attendance. More adults received first line treatment for sleep related disturbances through the BHOP program during the intervention timeframe. It is evident, based on the PSQI data and slight increase in SEC attendance, the need for education, screening and intervention exists.

Due to the lack of response (n=3) from the 802 FSS, the only data that will be discussed, will be that of the 67 individuals from the 802 SFS that completed the self-assessment.

Subjective sleep quality. Overall subjective sleep quality was reported as "fairly bad" among the 802 SFS squadron. The American Time Use Survey describes tradeoffs individuals make with wakeful activities versus sleep (Basner et al., 2007). Widespread, when individuals increased their work time, their sleep time suffered (Basner et al., 2007). Americans often trade sleep for commuting, work, and a variety of leisure activities which may lead to reduced duration of sleep and the succeeding sequelae (Basner et al., 2007). Sleep lacking in quality and quantity can lead to avoidable errors, impaired driving, and accidents in the workplace and on the road (Colten & Altevogt, 2006).

An interview of Operation Enduring Freedom soldiers, found that of the mission sensitive mistakes reported, 50% were attributed to sleep (Office of the Surgeon General, 2013). The tradeoff with sleep can be detrimental in the workplace and in the deployed environment. The self-assessment reaffirms what the literature states regarding reduced sleep quality and duration

among ADSM (Troxel et al., 2015). Understanding the tradeoffs individuals, whether ADSM or the general public, make for sleep the need for education and early intervention is evident.

Sleep duration and latency. Respondents reported an average of a 31-60 minute time lag to fall asleep in order to achieve 5 to 6 hours of sleep per night. This reported sleep latency time aligns with the general public who when surveyed took under 60 minutes to fall asleep (NHANES, 2008). Where ADSM's differ from the general public is in the duration of sleep. Roughly 32-39% of respondents to the 2014 CDC Behavioral Risk Factor Surveillance System (BRFSS) averaged less than 7 hours of sleep (CDC, 2014). According to the Bureau of Labor and Statistics, men and women between the ages of 15 and 64 years, average between 8-9 hours of sleep nightly (Bureau of Labor Statistics, 2015). Mysliwiec and colleagues (2012) found that 42% of 725 joint service members with some combat experience slept less than or equal to 5 hours per night, with almost 90% receiving less than or equal to 7 hours of sleep. The effects of reduced duration of sleep are well documented and support the need for sleep health education and intervention among ADSM's.

Sleep disturbances

Assessing daytime dysfunction is derived by the sum of two factors, (a) trouble staying awake while driving, eating meals, or engaging in social activity and (b) a problem keeping enthusiasm to get things done (Buysse et al., 1989).

Days dysfunction due to sleepiness. On a 0 to 3 scale, the median daytime dysfunction of the SFS unit was 2. Although a small sample, this emphasizes squadron dysfunction and outward effects that reduced quality sleep has on the members.

Habitual sleep efficiency. Sleep efficiency is derived as the number of sleep hours divided by the number of hours in bed attempting to sleep (Buysse et al., 1989). The respondents

averaged greater than 85% sleep efficiency. While this percentage may depict overall good sleep once the individual has fallen asleep, it may not account for possible brief, frequent periods of wakefulness (Shrivastava, Jung, Saadat, Sirohi, and Crewson, 2014). Sleep efficiency and assessing restlessness may affect individual reports of sleep quality.

Use of sleeping medication. As an aggregate, respondents did not utilize medication for sleep within the last month. This did not add significance to the units overall sleep quality score. Multiple over the counter and prescription medications are available for sleep, but inherently have potential untoward side effects that can impact safety and operational effectiveness of service members (Troxel et al., 2015). Although a small sample size, this may not be representative of all sleep medication use by the unit members, making the topic of medication and potential side effects an important part of future sleep health education.

Limitations

A direct causal relationship from the educational brief to the increase in class attendance cannot be made. Cumulative data obtained from the PSQI further supports a continued community outreach intervention along with education on the use of BBTi for sleep quality improvement. The challenge lies with squadrons being geographically separated from the medical facility and the need for medical support to reach beyond the borders of the building. This necessitates medical outreach in order to impact the physical, mental and operational readiness of ADSM for whom they care for. This indispensable, challenging task has potential organizational, policy and practice implications for the care provided inside and outside the MTF.

Organizational Impact/Implications to Practice & Policy

Organizational Impact

The data collected further supported what the literature initially revealed. Service members struggle with obtaining quality sleep, suffer from daytime dysfunction and sleep less than the recommended 7-9 hours. The goal of this DNP project was to set up an educational intervention stressing the importance of sleep health and provide information about available evidence-based treatments. As a measurement tool, the project monitored attendance rates at the Sleep Enhancement Class.

Patient Impact. While not significant, there was an increase in attendance to the Sleep Enhancement Class, which supports the recommended unit level education of healthy and unhealthy sleep behaviors (Troxel et al., 2015). The slight increase in attendance has an impact on the physical, mental and operational readiness of the individual. From the patient perspective, the BHOP team was requested to return to the 802 SFS for life skill training opportunities. This further supports developing a collaborative relationship among squadrons and the medical community.

Military/Squadron Impact. There was an instrumental impact occurring at the squadron level. Approximately 60 days following the educational intervention, the 802 SFS commander was briefed on the findings of the cumulative PSQI data. Using the data provided in unit composite sleep quality report, the SFS commander discussed a program to reduce shifts from 12 to 10 hours (personal communication, Col. Whitehead, January 29, 2018). The goal of shorter hours was to increase personal and operational readiness, in hope of reducing workplace mishaps. The ultimate goal was to increase the opportunity for adequate sleep duration, thereby improving individual sleep quality.

Prior to completion of this project, family health providers were briefed by SFS leadership on proper wear of the security forces gear and potential impact to medical treatment.

An open discussion was also had regarding contact procedures for medically necessary "do not arm" restrictions. This briefing helped facilitate a working relationship between SFS and the family health team. While not the initial intent of this project, an open dialogue was achieved between SFS and the family health team allowing for future collaboration for force health. The ability to have professional, working relationships with commanders, allows for providers to have an understanding of the varying needs of the units they care for. It is difficult for any healthcare professional to know the intricacies of all units on the installation, especially when geographically separated from one another.

Readiness. The ability to report aggregate data to command leadership about their squadrons sleep health status allows for identification of potential focus areas. This information becomes personal and actionable. Current literature highlights the prevalence of poor quality sleep and daytime dysfunction among service members and the effects these pose on personal health and operational readiness (Troxel et al., 2015). The squadron leadership within the 802nd SFS was able to use the self-assessment data to make future changes to shift scheduling in order to increase quality sleep and reduce daytime dysfunction of its service members. This project allowed for open dialogue and in-person delivery of evidence-based resources and actionable data for leadership. This type of unit integration and continued use of BBTi within the family health clinic could make an impact on the health and readiness of service members utilizing the resource based on new found knowledge of sleep health. While this project is but a small sample of a diverse service population, it can be used to deduce future policy and practice decisions.

Potential Implications

Implications to policy and practice include the continued use of the established BBTi protocol by the BHOP team and focus on integration of healthcare professionals within units for

education and assistance in bridging the gap to receiving evidence based treatment. The PSQI data obtained in this project supports what is found in the literature; service members suffer from reduced sleep quality (Troxel et al., 2015). Healthcare professionals, collaborative care, and community outreach may be the answer to helping connect service members with the evidence based interventions in place that are underutilized. Opening the lines of communication with the SFS identified an area of great importance in the continuous struggle to provide access to preventative health education for service members in order to maintain physical, mental and operational readiness.

Future Directions for Research & Practice

Community outreach. Given the interaction with SFS leadership and the use of unit global sleep quality scores, the need for outreach is clear. If additional opportunities with education and intervention are available, the possibility to see continued increase in BBTi attendance exists. In order to increase preventative health initiatives and educate patients on latest evidence based interventions, meeting them in a non-threatening environment is an ideal set up as evidenced by current barbershop and adolescent healthcare initiatives previously discussed (Luque, Ross & Gwede, 2014; Heese & Lemmon, 2018).

Resiliency day. Time for medical appointments was identified as a barrier, one that may contribute to the overall class attendance numbers. The Air Force has a resiliency program, known as Comprehensive Airman Fitness that allows for time outside of normal duty to educate on the mental, physical, social, and spiritual domains of resilience (Department of the Air Force, 2014). Ideally, the integration of sleep health into one of these training events would potentially help bridge the gap of time, knowledge and local resource availability.

Periodic health assessment. The PHA is another focus area which may be used for early identification of sleep related concerns. Although lacking significant detail, if the sleep component of the PHA is completed honestly by the service member, this annual assessment may provide a snapshot of overall sleep health. With the recent implementation of the person-to-person MHA, policy may adjusted to include additional screening for those who identify with sleep quality concerns. There are multiple avenues available to reach service members to address sleep quality. The need for intervention is evident.

Conclusion

A significant number of ADSM do not get the recommended 7-9 hours of quality sleep per night (Luxton et al., 2011). Sleep disturbance correlates to cognitive, mental, physical and emotional health problems. This has been shown to be costly not only on the healthcare system, but on an individuals' physical, mental and operational readiness. Lack of quality sleep can lead to occupational mishaps and is a significant cause for automobile accidents (Facts and Stats, 2018; CDC, 2011). Evidence-based services provided by BHOP are the first line intervention for treating adults with sleep disturbance issues.

This project used a community outreach approach in an attempt to increase awareness about the importance of sleep quality among ADSM's. Use of the PSQI, a validated, highly sensitive and specific screener, helped members self-identify sleep quality issues. While attendance to the BBTi class did not significantly increase, invaluable information was obtained from the PSQI cumulative report.

Lessons were learned regarding method of delivery and the importance of in-person briefing and interaction with leadership and service members. This was clear in the lack of response from the 150 ADSM from the 802 FSS following the electronically delivered sleep

health brief and self-assessment. Only four views and three self-assessments were completed. This allowed reflection on mode of delivery and helped to shape the way forward for community outreach among the ADSM population.

The overall intent of the project was met in that ADSM's became more aware of their sleep habits, learning the importance sleep has on their mental, physical, cognitive health as well as safety on and off the job. The collaborative impact from this project became an invaluable tool for professional relationship development among healthcare providers of the Family Health clinic and for the future direction of community outreach regarding sleep health. Part of the initial development of this project was the establishment of a continuity agreement with the Clinical Health Psychology department. The findings of this project will help to shape further outreach and SEC utilization strategies by the BHOP department.

References

2015 Demographics Report (n.d.). [PDF]. Retrieved March 5, 2018 from http://download.militaryonesource.mil/12038/MOS/Reports/2015-Demographics-Report.pdf

Acosta, J. D., Becker, A., Cerully, J., Fisher, M. P., Martin, L. T., Vardavas, R., Slaughter, M.E., and Schell, T. (2016). Assessing the Department of Defense's Approach to Reducing Mental Health Stigma.

American Psychiatric Association (2013) *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.). Arlington, VA: American Psychiatric Publishing

Backhaus, J., Junghanns, K., Broocks, A., Riemann, D., and Hohagen, F. (2002). Test-retest reliability and validity of the pittsburgh sleep quality index in primary insomnia. *Journal of psychosomatic research*, *53*(3), 737-740.

Baruch, Y. and Holtom, B.C. (2008). Survey response rate levels and trends in organizational research. *Human relations, 61*(8), 1139-1160.

Basner, M., Fomberstein, K.M., Razavi, F.M., Banks, S., William, J.H., Rosa, R.R. and Dinges, D.F. (2007). American time use survey: sleep time and its relationship to waking activities. *Sleep, 30*(9), 1085-1095.

Bothelius, K., Kyhle, K., Espie, C. A., & Broman, J. E. (2013). Manual- guided cognitive–behavioural therapy for insomnia delivered by ordinary primary care personnel in general medical practice: A randomized controlled effectiveness trial. *Journal of sleep research*, *22*(6), 688-696.

Bramoweth, A.D. and Germain, A. (2013). Deployment-related insomnia in military personnel and veterans. *Current psychiatry reports 15*(10), 401.

Bureau of labor statistics. (2015). Average sleep times per day, by age and sex. *American time use survey.* Retrieved from https://www.bls.gov/news.release/archives/atus_06242016.pdf

Buysse, D., Reynolds, C.F., Monk, T.H., Berman, S.R., and Kupfer, D.J. (1989). The Pittsburgh sleep quality index: a new instrument for psychiatric practice and research. *Psychiatry Research, 28*(2): 193-213

Centers for Disease Control and Prevention (CDC). (2011). Unhealthy sleep-related behaviors--12 states, 2009. *MMWR. Morbidity and mortality weekly report*, *60*(8), 233.

Center for Disease Control and Prevention (CDC). (2011). Short sleep duration among U.S. adults. Retrieved from https://www.cdc.gov/sleep/data_statistics.html

Colten, H.R. and Altevogt, B.M. (2006). Sleep disorders and sleep deprivation: an unmet public health problem. *Institute of medicine (US) committee on sleep medicine and research.* Washington, DC: The National Academies Press.

Dahlgren, A., Tucker, P., Gustavsson, P., & Rudman, A. (2016). Quick returns and night work as predictors of sleep quality, fatigue, work–family balance and satisfaction with work hours. *Chronobiology international*, *33*(6), 759-767.

De Lange, A.H., Kompier, M.A., Taris, T.W., Geurts, S.A., Beckers, D.G., Houtman, I.L., and Bongers, P.M. (2009). A hard day's night: a longitudinal study on the relationships among job demands and job control, sleep quality and fatigue. *Journal of sleep research, 18*(3), 374-383.

Dembe, A., Ericson, J.B., Delbos, R.G., Banks, S.M. (2005). The impact of overtime and long work hours on occupational injuries and illness: New evidence from the United States. *Occupational and Environmental Medicine 62*: 588-597.

Department of the Air Force. (2014, Oct 17). *Health promotion* (Air Force Instruction 40-101). Washington, DC: U.S. Government Printing Office.

Department of the Air Force. (2014, Apr 2). *Comprehensive airmen fitness* (Air Force Instruction 90-506). Washington, DC: U.S. Government Printing Office.

Department of Defense (2016, Apr). *Annual periodic health assessment (*DoD Form 3024). Retrieved from http://www.esd.whs.mil/Portals/54/Documents/DD/forms/dd/dd3024.pdf

Dorrian, J., Lamond, N., Holmes, A., Burgess, H.J., Roach, G.D., Fletcher, A., & Dawson, D. (2003). The ability to self-monitor performance during a week of simulated night shifts. *Sleep, 26*(7), 871-877.

Facts and Stats. (2018). Retrieved from http://drowsydriving.org/about/facts-and-stats/

Gehrman, P., Seeling, A.D., Jacobson, I.G., Boyko, E.J., Hooper, T.I.., Gackstetter, G.D., Ulmer, C.S., and Smith, T.C. (2013). Predeployment sleep duration and insomnia symptoms as risk factors for new-onset mental health disorders following military deployment. *Sleep 36*(7): 1009–1018.

Hauk, L. (2017). Treatment of Chronic Insomnia in Adults: ACP Guideline. *American family physician, 95*(10), 669.

Heese, P., and Lemmon, K. (2018). Integrating Army school based health centers and PCMHS to improve access and outcomes for military teens. [meeting abstract]. *Pediatrics, 141*(1):752.

Hirshkowitz, M., Whiton, K., Albert, S., Alessi, C., Bruni, O., DonCarlos, L., Hazen, N., Herman, J., Katz, E., Kheirandish-Gozal, L., Neubauer, D., O'Donnell, A., Ohayon, M., Peever, J., Rawding. R., Sachdeva, R., Setters, B., Vitiello, M., Ware, J., & Hillard, P. (2015). National sleep foundation's sleep time duration recommendations: methodology and results summary. *Sleep Health*. Retrieved from https://www.sciencedirect.com/science/article/pii/S2352721815000157

Johns, M. W. (1991). A new method for measuring daytime sleepiness: the Epworth sleepiness scale. *Sleep*, *14*(6), 540-545.

Luque, J. S., Ross, L., & Gwede, C. K. (2014). Qualitative systematic review of barber-administered health education, promotion, screening and outreach programs in African-American communities. *Journal of community health*, *39*(1), 181-190.

Luxton, D., Greenburg, D., Ryan, J. Niven, A. Wheeler, G. & Mysliwiec, V. (2011). Prevalence and impact of short sleep duration in redeployed OIF soldiers. Sleep, *34* (9): 1189-1195.

Miller, N.L., Shattuck, L.G., and Matsangas, P. (2011). Sleep and fatigue issues in continuous operations: A survey of U.S. Army officers. *Behavioral sleep medicine, 9*(1), 53-65.

Mollayeva, T., Thurairajah, P., Mollayeva, S., Shapiro, C., Burton, K., & Colantonio, A. (2015). The Pittsburgh sleep quality index as a screening tool for sleep dysfunction in clinical and non-clinical samples: A systematic review and meta-analysis. *Sleep Medicine, 16*, S62.

Morgenthaler, T., Aronsky, A., Carden, K., Chervin, R., Thomas, S. & Watson. (2015). Measurement of quality to improve care in sleep medicine. *Journal of Clinical Sleep Medicine*. Retrieved from http://jcsm.aasm.org/viewabstract.aspx?pid=29928

Morin, C.M., Belleville, G., Belanger, L., and Ivers, H. (2011). The insomnia severity index: psychometric indicators to detect insomnia cases and evaluate treatment response. *Sleep, 34*(5): 601-608.

Mysliwiec, V., McGraw, L., Pierce, R., Smith, P., Trapp, B. and Roth, B. (2013). Sleep disorders and associated medical comorbidities in active duty military personnel. *Sleep, 36*(2): 167-174.

Neckelmann D; Mykletun A; Dahl AA. (2007). Chronic insomnia as a risk factor for developing anxiety and depression. *Sleep* 30(7):873- 880.

National Health and Nutrition Examination Survey (2009). Retrieved from https://wwwn.cdc.gov/Nchs/Nhanes/2007-2008/SLQ_E.htm#References

Office of the Surgeon General: Mental Health Advisory Team 9 (MHAT 9), Operation Enduring Freedom (OEF), October 2013, 20-23.

Ozminkowski, R.J., Wang,S., and Walsh, J.K. (2007). The direct and indirect costs of untreated insomnia in adults in the United States. *Sleep 2007*(30): 263-73.

Patterson, P.D., Suffoletto, B.P., Kupas, D.F., Weaver, M.D., and Hostler, D. (2010). Sleep quality and fatigue among prehospital providers. *Prehospital emergency care, 14(*2), 187-193.

Perry, G.S., Patil, S.P., and Presley-Cantrell, L.R. (2013). Raising awareness of sleep as a healthy behavior. *Preventing chronic disease (10)*: 130081.

Qaseem, A., Kansagara, D., Forciea, M.A., Cooke, M., & Denberg, T.D. (2016). Management of chronic insomnia disorder in adults: a clinical practice guideline from the American College of Physicians. *Annals of internal medicine, 165*(2), 125-133.

Ramakrishnan, K. and Scheid, D. (2007). Treatment options for insomnia. *American Family Physician*, 76:517-528.

Ramchand, Rajeev, Joie Acosta, Rachel M. Burns, Lisa H. Jaycox, and Christopher G. Pernin (2014, July 10). *The war within: preventing suicide in the U.S. military*, Santa Monica, Calif.: RAND Corporation, MG-953-OSD, 2011.

Ricci, J.A., Chee, E., Lorandeau, A.L., and Berger, J. (2007). Fatigue in the U.S. workforce: Prevalence and implications for lost productive work time. *Occupational and Environmental Medicine 49*(1): 1-10.

Sateia, M., Buysse, D., Krystal, A., Neubauer, D., Heald, J. (2017). Clinical practice guideline for the pharmacologic treatment of chronic insomnia in adults: an american academy of sleep medicine clinical practice guideline. *Journal of Clinical Sleep Medicine*. Retrieved from https://aasm.org/resources/pdf/pharmacologictreatmentofinsomnia.pdf

Schutte-Rodin, S., Broch, L., Buysse, D., Dorsey, C., & Sateia, M. (2008). Clinical guideline for the evaluation and management of chronic insomnia in adults. *Journal of Clinical Sleep Medicine*. Retrieved from https://aasm.org/resources/clinicalguidelines/040515.pdf

Shrivastava, D., Jung, S., Saadat, M., Sirohi, R., & Crewson, K. (2014). How to interpret the results of a sleep study. *Journal of Community Hospital Internal Medicine Perspectives*, *4*(5), 10.3402/jchimp.v4.24983. http://doi.org/10.3402/jchimp.v4.24983

U.S. Army. (2015). *Triad: P3 soldier guide.* [PDF]. Retrieved from https://usaphcapps.amedd.army.mil/HIOShoppingCart/Uploads/DownloadableProds/684_P3%20Guide%20TEXTBOOK%202-18-2015%20web.pdf

Valente, S. (2015). Evaluating and managing insomnia: non-pharmacologic treatment. *Journal of Sleep Disorders and Therapy.* Retrieved from https://www.omicsonline.org/open-

access/evaluating-and-managing-insomnia-nonpharmacological-treatments-2167-0277.1000189.pdf

Wesensten, N.J. and Balkin, T.J. (2013). The challenge of sleep management in military operations. *U.S. Army medical department journal.* Oct-Dec 2013; Pp. 109-118.

Ziezulewicz, G. (2017, September 20). Navy issues new sleep and watch schedule rules for surface fleet. Retrieved from https://www.navytimes.com/news/your-navy/2017/09/20/navy-issues-new-sleep-and-watch-schedule-rules-for-the-surface-fleet/

Appendices

Appendix A

CITI Certificates

COLLABORATIVE INSTITUTIONAL TRAINING INITIATIVE (CITI PROGRAM)
COURSEWORK REQUIREMENTS REPORT*

* NOTE: Scores on this Requirements Report reflect quiz completions at the time all requirements for the course were met. See list below for details. See separate Transcript Report for more recent quiz scores, including those on optional (supplemental) course elements.

- **Name:** Stephanie Doane (ID: 4984742)
- **Email:** stephanie.doane@usuhs.edu
- **Institution Affiliation:** Uniformed Services University of The Health Sciences (ID: 395)
- **Institution Unit:** Graduate School of Nursing
- **Phone:** 316-644-4023

- **Curriculum Group:** OUSD P&R Human Research (Current)
- **Course Learner Group:** Biomedical Investigators and Research Study Team
- **Stage:** Stage 1 - Biomedical Investigators

- **Report ID:** 16985609
- **Completion Date:** 08/23/2015
- **Expiration Date:** 08/22/2018
- **Minimum Passing:** 80
- **Reported Score*:** 94

REQUIRED AND ELECTIVE MODULES ONLY	DATE COMPLETED
Records-Based Research (ID: 5)	08/23/15
Vulnerable Subjects - Research Involving Children (ID: 9)	08/23/15
Vulnerable Subjects - Research Involving Pregnant Women, Human Fetuses, and Neonates (ID: 10)	08/23/15
FDA-Regulated Research (ID: 12)	08/23/15
Basic Institutional Review Board (IRB) Regulations and Review Process (ID: 2)	08/23/15
Informed Consent (ID: 3)	08/23/15
History and Ethics of Human Subjects Research (ID: 498)	08/23/15
Social and Behavioral Research (SBR) for Biomedical Researchers (ID: 4)	08/23/15
Genetic Research in Human Populations (ID: 6)	08/23/15
Populations in Research Requiring Additional Considerations and/or Protections (ID: 16680)	08/23/15
Recognizing and Reporting Unanticipated Problems Involving Risks to Subjects or Others in Biomedical Research (ID: 14777)	08/23/15
Conflicts of Interest in Research Involving Human Subjects (ID: 488)	08/23/15
Avoiding Group Harms - U.S. Research Perspectives (ID: 14080)	08/23/15
Office of the Under Secretary of Defense (Personnel and Readiness) (ID: 912)	08/23/15
Module for Non-DoD Personnel Conducting Research Involving Human Subjects Supported by the DoD (ID: 16769)	08/23/15
Stem Cell Research Oversight (Part I) (ID: 13882)	08/23/15

For this Report to be valid, the learner identified above must have had a valid affiliation with the CITI Program subscribing institution identified above or have been a paid Independent Learner.

CITI Program
Email: citisupport@miami.edu
Phone: 305-243-7970
Web: https://www.citiprogram.org

COLLABORATIVE INSTITUTIONAL TRAINING INITIATIVE (CITI PROGRAM)

COURSEWORK REQUIREMENTS REPORT*

* NOTE: Scores on this Requirements Report reflect quiz completions at the time all requirements for the course were met. See list below for details. See separate Transcript Report for more recent quiz scores, including those on optional (supplemental) course elements.

- **Name:** Heidi Wilson (ID: 4985797)
- **Email:** heidi.wilson@usuhs.edu
- **Institution Affiliation:** Uniformed Services University of The Health Sciences (ID: 395)
- **Institution Unit:** GSN
- **Phone:** 210-531-6720

- **Curriculum Group:** OUSD P&R Human Research (Current)
- **Course Learner Group:** Biomedical Investigators and Research Study Team
- **Stage:** Stage 1 - Biomedical Investigators

- **Report ID:** 16968418
- **Completion Date:** 08/20/2015
- **Expiration Date:** 08/19/2018
- **Minimum Passing:** 80
- **Reported Score*:** 83

REQUIRED AND ELECTIVE MODULES ONLY	DATE COMPLETED
Records-Based Research (ID: 5)	08/20/15
Vulnerable Subjects - Research Involving Children (ID: 9)	08/20/15
Vulnerable Subjects - Research Involving Pregnant Women, Human Fetuses, and Neonates (ID: 10)	08/20/15
FDA-Regulated Research (ID: 12)	08/20/15
Basic Institutional Review Board (IRB) Regulations and Review Process (ID: 2)	08/20/15
Informed Consent (ID: 3)	08/20/15
History and Ethics of Human Subjects Research (ID: 498)	08/20/15
Social and Behavioral Research (SBR) for Biomedical Researchers (ID: 4)	08/20/15
Genetic Research in Human Populations (ID: 6)	08/20/15
Populations in Research Requiring Additional Considerations and/or Protections (ID: 16680)	08/20/15
Recognizing and Reporting Unanticipated Problems Involving Risks to Subjects or Others in Biomedical Research (ID: 14777)	08/20/15
Conflicts of Interest in Research Involving Human Subjects (ID: 488)	08/20/15
Avoiding Group Harms - U.S. Research Perspectives (ID: 14080)	08/20/15
Office of the Under Secretary of Defense (Personnel and Readiness) (ID: 912)	08/20/15
Module for Non-DoD Personnel Conducting Research Involving Human Subjects Supported by the DoD (ID: 16769)	08/20/15
Assessing Risk - SBE (ID: 503)	08/20/15

For this Report to be valid, the learner identified above must have had a valid affiliation with the CITI Program subscribing institution identified above or have been a paid Independent Learner.

CITI Program
Email: citisupport@miami.edu
Phone: 305-243-7970
Web: https://www.citiprogram.org

Appendix B

USU (VPR) Form 3202N

UNIFORMED SERVICES UNIVERSITY
of the Health Sciences

OFFICE OF RESEARCH
4301 JONES BRIDGE ROAD
BETHESDA, MAYLAND 20814
PHONE: (301) 295-3303; FAX: (301) 295-6771

NOTICE OF PROJECT APPROVAL

Change Number: Original

VPR Site Number:	T0-GSN-61-9398-01
Principal Investigator:	Doane, Stephanie (GSN-61)
Department:	Graduate School of Nursing
Project Type:	Student
Project Title:	Brief Behavioral Therapy for Improved Sleep
Project Period:	11/3/2017 to 11/2/2018

Assurance and Progress Report Information:

Name	Sup	Approval Type	Status	Approved On	Forms Received
Progress Report	0			To be Submitted	N/A

Remarks:
This Notice of Project Approval has been reviewed and approved. Please remember that you must submit a final Progress Report (Form 3210) upon completion of this project.

Questions regarding this approval should be directed to the following person in the Office of Research:
Ronda Dudley, (301) 295-9818.

[redacted]

Yvonne T. Maddox, Ph.D. Date
Vice President for Research
Uniformed Services University of the Health Sciences

cc: Doane, Stephanie (GSN-61)
Vernell Shaw
File
Linda Wanzer

Appendix C

JBSA-Lackland IRB Approval Letter

59th Medical Wing (59th MDW)
Institutional Review Board (IRB)
59th Clinical Research Division/SGVUS/(210) 292-7143
2200 Bergquist Dr, Bldg 4430, Lackland AFB, TX 78236-5300

19 September 2017

FINAL DETERMINATION – NON-HUMAN RESEARCH

Determination Date: 19 Sep 2017

Project Lead: Capt Stephanie Doane/SGVT

Reference Number: FWH20170119N

Project Title: Brief Behavioral Therapy for Improved Sleep

You may begin your project, as you would any other clinical or operational activity, with the approval and sponsorship of your leadership.

Your project was determined on 19 Sep 2017 to be considered **not human research** as defined by DoD regulation **32 CFR 219 and FDA regulation 21 CFR 56**. Continued IRB oversight for this activity is not required. The proposed project does not include non-routine intervention or interaction with a living individual for the primary purpose of obtaining data regarding the effect of the intervention or interaction, nor do the researchers obtain private, identifiable information about living individuals.

Since the IRB does not have regulatory oversight for your study, it is the investigator's responsibility to validate the study's scientific merit and research design and to ensure the conduct of the study is upheld by the highest ethical standards, as required by the Wing. Should you require assistance in reviewing the scientific merit and research design of your study, please contact the Protocol Office. Protection of subjects' rights safety and welfare and responsibility for protecting PHI/PII and research data now fall on the investigator and their commander.

In accord with DoDI 6000.08 any intramural funding of this study as research or as a clinical investigation may continue to be received or sought regardless of this IRB determination.

Your study has received a one-time research determination. If the goals and/or activities of the project change during the course of the project, or if new activities are proposed that would constitute human subjects research, re-contact the Protocol Office, so that a regulatory expert may determine whether or not the revised plan involves human subject research activities.

[redacted]

Thomas Gibbons, PhD
Designated Exempt Reviewer

Appen dix D

PAO Clearance

DEPARTMENT OF THE AIR FORCE
59TH MEDICAL WING (AETC)
JOINT BASE SAN ANTONIO - LACKLAND TEXAS

12 April 2018

MEMORANDUM FOR SGVT
ATTN: CAPT STEPHANIE DOANE

FROM: 59 MDW/SGVU

SUBJECT: Professional Presentation Approval

1. Your poster presentation, briefing presentation and article, entitled **Brief Behavioral Therapy for Improved Sleep: Process Improvement** presented at/published to **TSNRP Research and Evidence-Based Practice Dissemination Course 2018, April 30 - May 3, San Antonio, TX and Uniformed Services University of the Health Sciences, Bethesda, MD 14 May-18 May** in accordance with MDWI 41-108, has been approved and assigned local file #**17820.**

2. Pertinent biographic information (name of author(s) title, etc.) has been entered into our computer file. Please advise us (by phone or mail) that your presentation was given. At that time, we will need the date (month, day and year) along with the location of your presentation. It is important to update this information so that we can provide quality support for you, your department, and the Medical Center commander. This information is used to document the scholarly activities of our professional staff and students, which is an essential component of Wilford Hall Ambulatory Surgical Center (WHASC) internship and residency programs.

3. Please know that if you are a Graduate Health Sciences Education student and your department has told you they cannot fund your publication, the 59th Clinical Research Division may pay for your basic journal publishing charges (to include costs for tables and black and white photos). We cannot pay for reprints. If you are a 59 MDW staff member, we can forward your request for funds to the designated Wing POC at the Chief Scientist's Office, Ms. Alice Houy, office phone: 210-292-8029; email address: alice.houy.civ@mail.mil.

4. Congratulations, and thank you for your efforts and time. Your contributions are vital to the medical mission. We look forward to assisting you in your future publication/presentation efforts.

[redacted]
PAUL T. BARNICOTT, GS-15
Deputy Director, Clinical Investigations & Research Support

DTIC Y (N)

Warrior Medics – Mission Ready – Patient Focused

Appendix E

Unit Composite Sleep Quality Report

```
## [1] "Generated: 2018-01-18 17:04:51 local time; observations = 64"
```

Unit Composite Sleep Quality Report

Summary

Global Sleep Quality

```
## 9
```

Duration of sleep

```
## ...between 5 and 6 hours per night
```

Sleep disturbance

```
## ...equal to or greater than 1 and less than 9
```

Sleep latency

```
## ...31 to 60 minutes.
```

Days dysfunction due to sleepiness

```
## ...between 3 and 4.
```

Sleep efficiency

```
## ...equal to or greater than 85%.
```

Overall sleep quality

```
## fairly bad.
```

Need meds to sleep

```
## ...not during the past month.
```

Unit Composite Sleep Quality Report

Detail

Global Sleep Quality Score

The global sleep score is the sum of all component scores and provides an estimate of sleep quality. The minimum score is 0 (best) and the maximum score is 21 (worst). Scores less than 5 are associated with good sleep quality, while scores greater than 5 are associated with poor sleep quality. The median global score for this unit is...

```
## 9
```

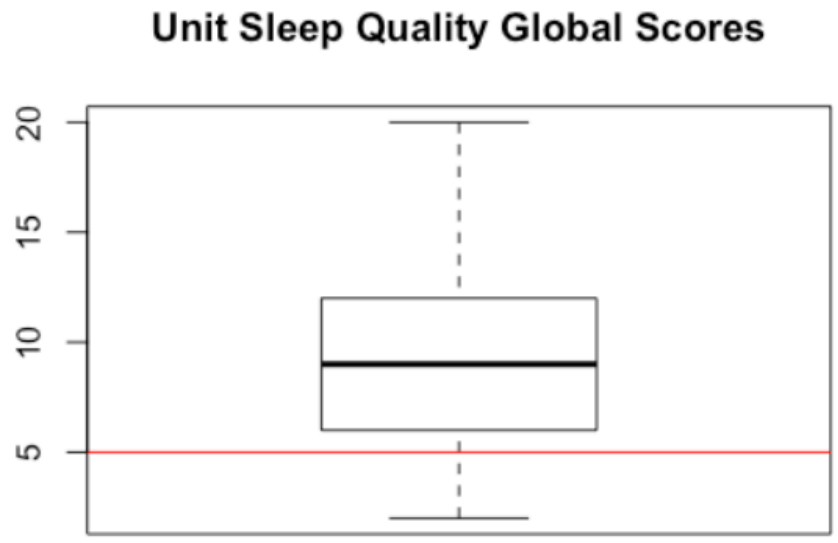


Figure 1. Distribution of Global Sleep Scores; Minimum Score = 0 (better); Maximum Score = 21 (worse). Interpretation: TOTAL < 5 associated with good sleep quality; TOTAL > 5 associated with poor sleep quality

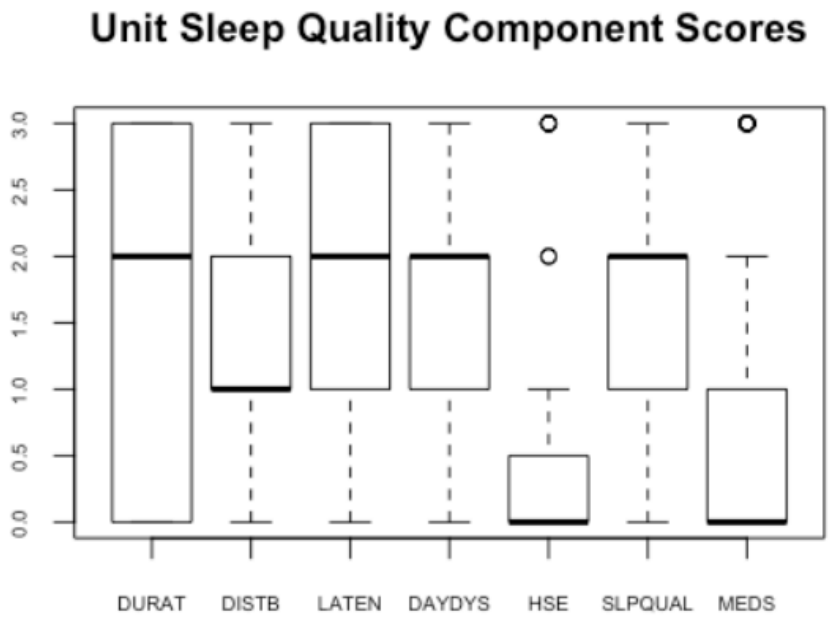


Figure 2. Distribution of unit sub-scale scores for DURAT = sleep duration; DISTB = sleep disturbance; LATEN = sleep latency; DAYDYS = daytime dysfunction from sleepiness; HSE = sleep efficiency; SLPQUAL = self-reported sleep quality; MEDS = use of medication sleep aids; minimum score = 0 (better); maximum = 3 (worse).

Duration of sleep

Sleep duration is assessed by respondent's self-selecting a value from 0.0 to 24.0 hours. Scoring: If sleep duration is greater than 7 hours, score is zero; if sleep duration is equal to or greater than 6 and less than 7 hours, the score is 1; the sleep duration is equal to or greater than 5 hours and less than 6, then score is 2; if sleep duration is less than 5 hours, then score is 3. The minimum score is 0 (best) and the maximum score is 3 (worst). The median sleep duration for this unit is...

```
## ...between 5 and 6 hours per night
```

"Increasing evidence suggests an association between both short and long duration of habitual sleep with adverse health outcomes...Both short and long duration of sleep are significant predictors of death in prospective population studies."[1]

Sleep disturbance

To assess sleep disturbance, respondents endorse one of four ordinal frequency responses for each of nine factors affecting sleep when asked, "During the past month, how often have you had trouble sleeping because you…." Scoring: If the sum of all sleep disturbance sleep disturbance factors is equal to 0, then the score is 0; if the the sum is equal to or greater than 1 and equal to or less than 9, then the score is 1; if the sum is greater than 9 and equal to or less than 18, then the score is 2; if the sum is greater than 18, then the score is 3. The minimum score is 0 (best) and the maximum score is 3 (worst). For this unit, the median sum of sleep disturbance factors is…

```
## ...equal to or greater than 1 and less than 9
```

Sleep latency

Sleep latency is the time difference between attempting to fall asleep and falling asleep. To assess sleep latency, respondents endorse one of four ordinal responses: "less than 15 minutes" is scored as 0; "16 to 30 minutes" is scored as 1; "31 to 60 minutes" is scored as 2; "more than 60 minutes" is scored as 3. The minimum score is 0 (best) and the maximum score is 3 (worst). For this unit, the median sleep latency is…

```
## ...31 to 60 minutes.
```

Days dysfunction due to sleepiness

This is a measure of daytime dysfunction due to sleepiness, derived as the sum of two dysfunction items. When the sum is equal to 0, then the score is 0; when the sum is equal to 1 or equal to 2, then the score is 1, when the sum is equal to 3 or equal to 4, then the score is equal to 2, when the sum is equal to 5 or equal to 6, then the score is 3. The minimum score is 0 (best) and the maximum score is 3 (worst). For this unit, the median daytime dysfunction due to sleepiness score is…

```
## ...between 3 and 4.
```

Sleep efficiency

Sleep efficiency is a calculated measure derived as the number of sleep hours divided by the number of hours in bed attempting to sleep. The score is is calculated from respondent's reported hours of sleep divided by the hours in bed. When the calculated value is greater than 85%, then the score is 0; when the calculated value is between 75% and 84%, then the score is 1; when the calculated value is between 65% and 74%, then the score is 2; when the calculated value is less than 65%, then the score is 3. the minimum score is 0 (best) and the maximum score is 3 (worst). For this unit, the median sleep efficiency score is…

```
## ...equal to or greater than 85%.
```

Overall sleep quality

Overall sleep quality is the respondent's endorsement of one of four ordinal quality responses in response to the question, "During the past month, how would you rate your sleep quality overall?" For "very good" the score is 0; for "fairly good" the score is 1; for "fairly bad" the score is 2; for "very bad" the score is 3. The minimum score is 0 (best) and the maximum score is 3 (worst). For this unit, the median overall sleep quality endorsed is...

```
## fairly bad.
```

Need meds to sleep

This is the respondent's endorsement of one of four ordinal frequency responses to the question, "During the past month, how often have you taken medicine (prescribed or "over the counter") to help you sleep?" For "not during the past month" the score is 0; for "less than once per week" the score is 1; for "once or twice a week" the score is 2; for "three or more times per week" the score is 3. The minimum score is 0 (best) and the maximum score is 3 (worst). For this unit, the median overall frequency of medication sleep aid use is reported as ...

```
## ...not during the past month.
```

Pittsburgh Sleep Quality Index

"The Pittsburgh Sleep Quality Index (PSQI) is a self-rated questionnaire which assesses sleep quality and disturbances over a 1-month time interval. Nineteen individual items generate seven"component" scores: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction. The sum of scores for these seven components yields one global score. Clinical and clinimetric properties of the PSQI were assessed over an 18-month period with "good" sleepers (healthy subjects, n = 52) and "poor" sleepers (depressed patients, n = 54; sleep-disorder patients, n = 62). Acceptable measures of internal homogeneity, consistency (test-retest reliability), and validity were obtained. A global PSQI score greater than 5 yielded a diagnostic sensitivity of 89.6% and specificity of 86.5% (kappa = 0.75, p less than 0.001) in distinguishing good and poor sleepers. The clinimetric and clinical properties of the PSQI suggest its utility both in psychiatric clinical practice and research activities."[2]

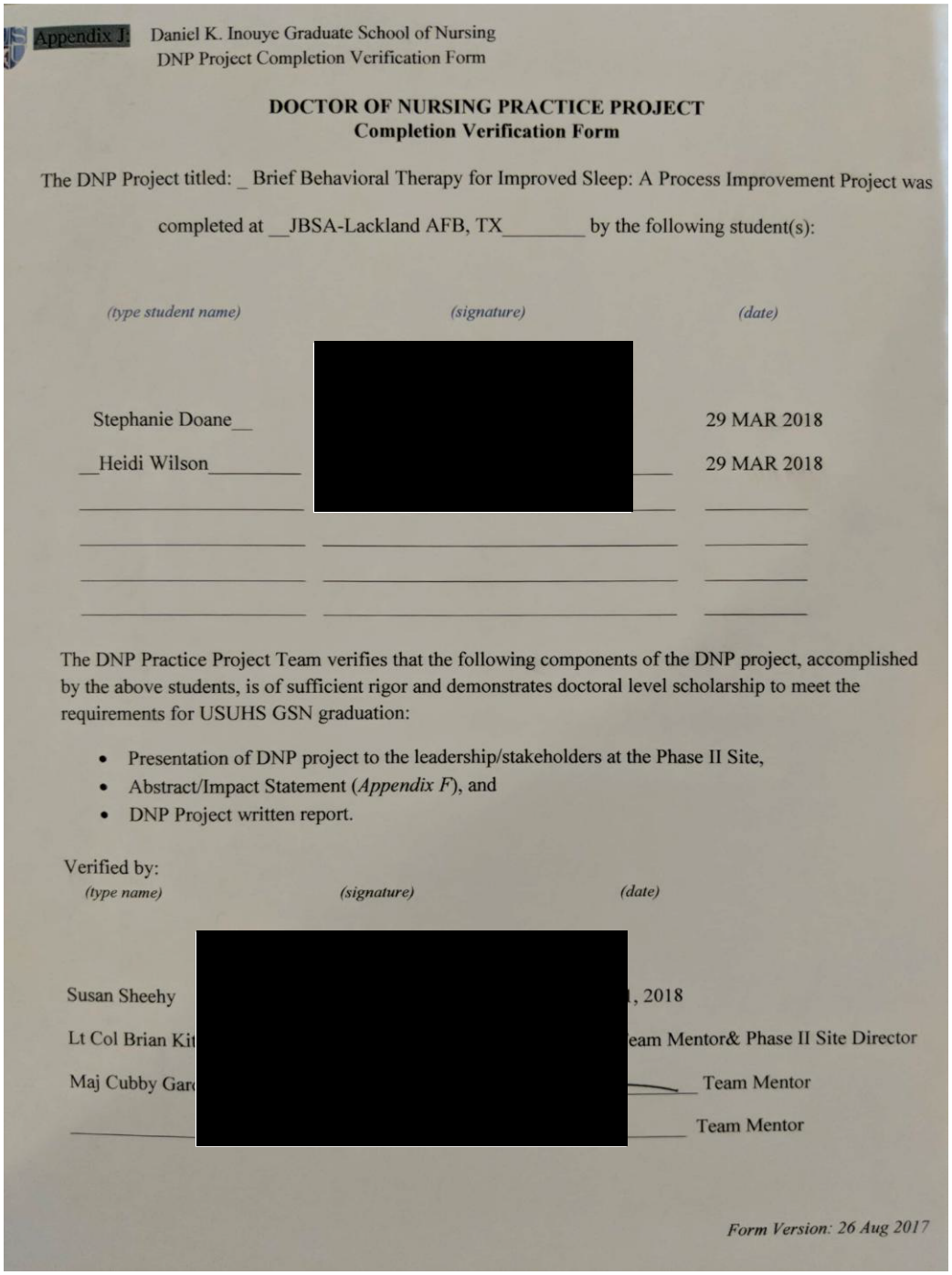
Notes

1. Cappuccio FP, D'Elia L, Strazzullo P, Miller MA. "Sleep duration and all-cause mortality: a systematic review and meta-analysis of prospective studies." Sleep. 2010 May;33(5):585-92. PMCID: PMC2864873.

2. Buysse DJ(1), Reynolds CF 3rd, Monk TH, Berman SR, Kupfer DJ. "The Pittsburgh Sleep Quality Index: a new instrument for psychiatric practice and research." Psychiatry Res. 1989 May;28(2):193-213.

Appendix F

DNP Project Completion Verification Form



Appendix J: Daniel K. Inouye Graduate School of Nursing
DNP Project Completion Verification Form

DOCTOR OF NURSING PRACTICE PROJECT
Completion Verification Form

The DNP Project titled: _ Brief Behavioral Therapy for Improved Sleep: A Process Improvement Project was completed at __JBSA-Lackland AFB, TX_____ by the following student(s):

(type student name)	*(signature)*	*(date)*
Stephanie Doane__	[redacted]	29 MAR 2018
__Heidi Wilson_____		29 MAR 2018

The DNP Practice Project Team verifies that the following components of the DNP project, accomplished by the above students, is of sufficient rigor and demonstrates doctoral level scholarship to meet the requirements for USUHS GSN graduation:

- Presentation of DNP project to the leadership/stakeholders at the Phase II Site,
- Abstract/Impact Statement (*Appendix F*), and
- DNP Project written report.

Verified by:

(type name)	*(signature)*	*(date)*	
Susan Sheehy	[redacted]	, 2018	
Lt Col Brian Kit			eam Mentor& Phase II Site Director
Maj Cubby Gar			Team Mentor
			Team Mentor

Form Version: 26 Aug 2017

Appendix G

802nd SFS Business Card with QR code & URL

Standard Business Cards: Back side

Table 1

Evidence Level and Grade in Systematic Review

	Buysse et al., 2011	Ellis et al., 2014	Falloon et al., 2015	Germain et al., 2006	Goodie et al., 2009	Harris et al., 2012	Troxel et al., 2013
Study design	RCT (Level II)	RCT (Level II)	RCT (Level II)	RCT (Level II)	Case study (Level IV)	RCT (Level II)	Secondary analysis of Buysse et al., 2011 (Level III)
Quality (John Hopkins Nursing Evidence- Based Practice Criteria)	A	A	A	B	C	B	B
Intervention	BBTI	One CBTI session (60-70 min)	Simplified Sleep Restriction (SSR)	BBTI	BBTI (modified)	Intensive Sleep Retraining (ISR) & Stimulus Control Therapy (SCT)	BBTI
Age (mean)	>60 (71.7)	No parameters (32.9 +/-13.72)	16-75 (55.4-51.8)	>60 (70.2 +/-6.4)	>18 (40.5)	18-65 (40.9)	>60 (71.7)
Co-morbidities allowed	Controlled co-morbidities allowed	No sleep medication	No co-morbidities allowed, no sleep medications	Controlled co-morbidities allowed	Controlled co-morbidities allowed	Extensive exclusion criteria, no sleep medications	Controlled co-morbidities allowed
Provider	Master's level psychiatric NP	Psychologist	Study GP (no other credentials given)	Master's level psychiatric NP	Psychologist (behavioral health consultant)	Psychologist	--
Follow-up	4 weeks, 6 months (n=25)	1 week/ 4 weeks	2 weeks, 3 months, 6 months (n=43)	4 weeks	None	6 weeks, 6 months (unspecified)	--

Table 2

Evidence Review Sheets

Title	Author(s)	year pub	Journal	Link	Relevance (0-++++)	Purpose	keywords	#of subjects analyzed	inclusion criteria	exclusion criteria	study design	Independent / Subject Variable(s)	Dependent variables/ measures collected	Measurement tool	baseline assessment	Reassessment	Definition of sleep quality/insomnia	Findings	Relevance (++++)	Notes	F/U
Efficacy of brief behavioral treatment for chronic insomnia in older adults	Buysse, D. J.	2011	Arch Intern Med	duplicate	—			Control group = 40, Intervention group = 39. Convenience sample from a single primary care practice (n=21) + recruitment from community advertisements (n=61).	1) met DSM-IV-TR criteria for *primary insomnia* , 2) met ICSD-2 criteria for *generalized insomnia disorder* (international classification of sleep disorders)	1) dementia, 2) untreated psychiatric, substance use, or other sleep disorder, 3) recent hospitalization, 4) ongoing chemotherapy or other cancer treatment, and 5) life expectance < 5months. +++ Individuals with treated depressive, anxiety, or sleep disorders were not excluded"	RCT; "a single mental health nurse practitioner delivered both interventions .	BBTI (brief behavioral treatment for insomnia); IC (information control). "The BBTI consists of a 45-60minute individual intervention session followed by a 30-minute follow-up session 2 weeks later and 20-minute telephone calls after 1 and 3 weeks" (pp.888-889). IC "included instructions to read and review 3 publications from the American Academy of Sleep Medicine: *Insomnia, Sleep as We Grow Older,* and *Sleep Hygiene* ... Two weeks later, IC participants received a 10-minute follow-up telephone call to encourage continued participation. Participants were referred nack to the brochures for specific sleep-related questions" (p.889).	1) Hamilton Rating Scale for Depression, 2) Hamilton Anxiety Rating Scale, 3) PSQI, 4) Epworth Sleepiness Scale, 5) SF-36.	Additionally Actigraphy and Sleep Diaries were used for the first 2 weeks to determine objective sleep-wake patterns.				Participant characteristics for the intervention groups were compared using *t* tests, Chi-square tests, and Fisher Exact statistics.		This article has a higher mean population than our 18-60 population, but does give good evidence to the effectiveness of BBTI over traditional informational handout	
Treating acute insomnia: A randomized controlled trial of a "single-shot" of cognitive behavioral therapy for insomnia	Ellis, Jg	2015	Sleep	Link	(+, +, -, +)	implement a single brief CBTI intervention + provide pamphlet	single shot CBTI	40	DSM 5 insomn	sleep medicat	pragmatic parallel group RCT	I: Single shot CBTI + pamphlet	improved sleep	ISI scores	ISI and sleep d	One week afte	Acute insomni	Single shot CBTI + pamphlet showed stat sig improvement	(+, +, -, +)	This was a trial that looked specifically at Brief single shot behavioral treatment for acute insomnia. Currently one other study specifically focusing on acute insomnia showed annual incidence of 36.6%. They gave good description of limitations, as the sample was self-selected and the findings may not be representative of all individuals with acute insomnia	The use of ISI for measurement of efficacy
Simplified sleep restriction for insomnia in general practice: A randomised controlled trial	Falloon, K	2015	British journal of general practice	Link	(+,+,-,+)	compare SSR (BBTI) + sleepy hygiene to sleep hygiene only : RCT	simplified sleep restriction, insomnia	97	primary care pt's ages 16--75, insomnia > 6 months, no OSA, no mental health, no comorbidities, no hypnotic medication x 2 weeks before baseline test	on RX sleep medications or unwilling to stop	RCT	I: SSR (BBTI) + sleep hygiene	improved sleep	PSQI scores and ISI scores	PE and sleep observation prior to study			SSR (BBTI) + sleep hygiene showed stat sig improvement vs sleep hygiene alone	(+, +, -, +)		

A randomized controlled trial of intensive sleep retraining (ISR): a brief conditioning treatment for chronic insomnia	Harris, J	2012	Sleep	Link	(+++)	investigate the effectiveness of intensive sleep retraining in comparison and combination with traditional behavioral intervention for chronic primary insomnia	Chronic insomnia, classical conditioning, behavioral treatment, intensive sleep retraining	79	reported sleep onset insomnia, with or without concurrent difficulty maintaining sleep; 1) age 18-65 years, 2) mean sleep diary sleep onset latency >30min, for >/= 3 nights per week, 3) insomnia symptoms for >/=6 months, 4) reported daytime consequences of poor sleep. *Individuals taking daily antidepressant medication (stable dosage for 3 months) were considered suitable for inclusion, provided they were willing to continue on the same dose for the period of the study, and met inclusion criteria on the Beck Depression Index. Participants using sleep medication were considered for inclusion following a withdrawal and wash-out period of >/= 3 weeks (8-10 of the participants in each group).	other sleep disorders (e.g., obstructive sleep apnea, delayed sleep phase disorder, periodic limb movement disorder), other medical or psychiatric disorders likely to affect sleep and daytime functioning (e.g., chronic pain, bipolar disorder, chronic fatigue syndrome), pregnancy, being a heavy smoker, or taking medications likely to affect sleep. Those with significant depression were excluded (Beck Depression Inventory score >28).	RCT	Intensive Sleep Retraining (ISR), Stimulus Control Therapy (SCT), ISR + SCT, or sleep hygiene (control)		1) Sleep-wake diary (lights out time, sleep onset time, estimated periods of sleep overnight, final wake-up time, out of bed time, estimates of sleep onset latency (SOL) and wake after sleep onset (WASO)); 2) Actigraphy; 3) Questionnaires (Pittsburgh Sleep Quality Index (PSQI), Self-Efficacy Scale (SES), Dysfunctional Beliefs and Attitudes about Sleep (DBAS) scale, Daytime Feeling and Functioning Scale (DFFS)); 4) Polysomnography for those undergoing ISR.			categorized by severity of insomnia: severe >60min SOL; mild-moderate </=60min SOL				
Predictors of treatment response to brief behavioral treatment of insomnia (BBTI) in older adults	Troxel, W. M.	2013	J Clin Sleep Med	Link	(-, +,-,+)	Examine demographic, clinical, and sleep characteristics as predictors of clinically significant treatment response to brief behavioral treatment of insomnia (BBTI) in older adults with insomnia.	Insomnia, behavioral treatment, treatment response, predictors, cognitive-behavioral	39	60 years of age or older, meet the general criteria for insomnia in the DSM-IV-TR,	presence of dementia (identified by history or score of <25 on the Folstein Mini Mental Status Exam), or delirium; previously undiagnosed and untreated depressive, anxiety, psychotic, or substance abuse disorders (those with stably treated depressive and anxiety symptoms were not excluded); untreated severe obstructive sleep apnea (apnea-hypopnea index >20), restless leg syndrome or another sleep disorder (those with stably treated sleep disorders were not excluded); hospitalization within the past 2 weeks; ongoing chemotherapy or other cancer treatment; and terminal illness with life expectancy of <6 months.	RCT	BBTI intervention vs information only control	PSQI, ISI,	PSQI, ISI	PSQI, ISI, Pittsburgh sleep diary, wrist actigraphy, quantitative EEG sleep	PSQI, ISI	change in score of approximately -8 on the ISI; clinical remission defined as no longer meeting the DSM-IIIV-TR and ICSD-2 criteria for insomnia disorder after treatment; change in PSQI 3 or above points, or increase in diary SE of 10% or greater.....	Patients with insomnia who have greater distress at baseline or prolonged sleep latency are more likely to show positive response to BBTI. In contrast, short sleepers at baseline are less likely to have resolution of insomnia diagnosis following BBTI, perhaps due to the sleep restriction component of the treatment. Identifying the characteristics that predict postive BBTI treatment outcomes can facilitate personalized behavioral treatment to improve outcomes.			

Effects of a brief behavioral treatment for late-life insomnia: preliminary findings.	Germain, A., Moul, D.E., Franzen, P.L., Miewald, J.M., Reynolds, J.M., Monk, T.H., Buysse, D.J.	2006	Journal of Clinical Sleep Medicine	no link, copied to share drive	(-,+,-,+)	Present preliminary findings from an ongoing study of brief behavioral therapy of insomnia (BBTI) in older adults with the typical psychiatric and medical comorbidities associated with aging.	insomnia, aging, sleep, stimulus control, sleep restriction		35	60 years of age or older, meet the general criteria for insomnia in the DSM-IV-TR but without the medical or psychiatric exclusion criteria (participants with stable medical or psychiatric conditions were allowed to participate), individuals using prescribed or over-the-counter hypnotics were included if they reported insomnia and agreed to continue to use the sleep aid.	Individuals with unstable or untreated psychiatric. medical, substance abuse, or sleep disorders were excluded. Participants who endorsed symptoms of restless leg syndrome, periodic leg movement disorder, or delayed sleep phase syndrome on most nights were excluded. Participants with significant sleep apnea were excluded (none of the participants in the study had sleep apnea).	RCT	BBTI vs. information-only control	PSQI, sleep efficiency (% f time spent asleep divided by the total time spent in bed)	PSQI, sleep efficiency, Pittsburgh sleep diary,	PSQI, sleep efficiency, Pittsburgh sleep diary, Hamilton Rating Scale for depression/anxiety	PSQI, sleep efficiency, Pittsburgh sleep diary, Hamilton Rating Scale for depression/anxiety	Reduction of 3 points or more on the PSQI or an increase in sleep efficiency of at least 10% based on sleep diary measures. Remission defined as meeting response criteria and having a PSQI of 5 or less after treatment or sleep efficiency greater than 85% after treatment.	BBTI was associated with significant improvements in sleep measures and in daytime symptoms of anxiety and depression. BBTI appears to be a promising intervention for older adults with insomnia.			

Table 3

Project Timeline

Timeline

Project Year 2 (2017)												
Activity/Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
USUHS VPR Submission and Approval									X	X	X	
Site IRB Submission and Approval								X	X			
Project Planning			X	X	X	X	X	X	X	X	X	
Project Implementation/Data Collection												X
Data Analysis												
Dissemination												

Project Year 3 (2018)						
Activity/Month	JAN	FEB	MAR	APR	MAY	
USUHS VPR Submission and Approval						
Site IRB Submission and Approval						
Project Planning						
Project Implementation/ Data Collection	X	X				
Data Analysis		X	X			
Dissemination			X	X	X	