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2nd Place Research Paper: Treatment of Post-Traumatic Stress Disorder in a Veteran Population: Efficacy of Complementary and Alternative Medicine Therapies

Brooke D. Snelgrove
Chapman University, snelg102@mail.chapman.edu

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Comments

Brooke Snelgrove won Second Place in the 2014-2015 Kevin and Tam Ross Undergraduate Research Prize for her essay about researching the treatment of post-traumatic stress disorder (PTSD) among veterans with Complementary and Alternative Medicine therapies. This essay is the original scholarship that emerged from that research.

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Brooke D. Snelgrove

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Abstract

It is estimated that a half million veterans from recent deployments in the Middle East conflicts and about 479,000 veterans deployed during the Vietnam War are diagnosed with Post Traumatic Stress Disorder (PTSD). Current treatments are limited by a relatively high frequency of patients who do not continue with their therapy. With increased PTSD diagnosis and limited effectiveness of treatments, there is a growing need to research and develop new therapies to better assist affected service members. The present study assessed the clinical validity of Complementary and Alternative Medicine therapies for the treatment of PTSD symptoms in a military population using a systematic review design. It was hypothesized that a veteran diagnosed with PTSD who is treated with Complementary and Alternative Medicine (CAM) therapies will experience a greater improvement in their PTSD symptoms than a veteran diagnosed with PTSD who is treated with other, current evidence-based treatments (CEBT). Data were obtained from empirical articles that compared and contrasted CAM therapies against CEBT's across commonly used PTSD symptom assessment scales. Though CAM therapies were not shown to be significantly superior to other therapies, the findings did indicate that select CAM therapies have valid, clinical implications for the reduction of PTSD symptoms in a veteran population. More research is needed to assess, isolate, and standardize CAM therapies for the treatment of PTSD in different veteran populations.

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I. Introduction

A. Brief History and Current State of Post-Traumatic Stress Disorder and its Treatment

Post-Traumatic Stress Disorder (PTSD) was added to the Diagnostic and Statistical Manual of Mental Disorders (DSM-III) in 1980. Before this addition, PTSD was not a recognized mental health disorder and its inclusion into the DSM-III was considered controversial (Friedman, 2014). The classification of Post-Traumatic Stress Disorder was added to the DSM-III in response to the Vietnam war and the adjustment issues Vietnam veterans were experiencing once they returned to civilian life. At the time, their PTSD symptoms were classified into a condition called "Post-Vietnam Adjustment" (Brooks & Scarano, 1985). It was the research on this population that propelled the literature forward to where it currently stands, recognizing the symptoms to be indicative of a disorder caused by an etiological agent, a traumatic stress, outside of the individual and not due to an inherent weakness in mental functioning, like neurosis (Friedman, 2014). Nevertheless, since Post-Traumatic Stress Disorder was added to the DSM-III, a professional consensus has not been made about the nature of PTSD, the causes of it, nor the proper treatment standard of how to address the psychological and psychosomatic symptoms of PTSD (Lake, 2015). The purpose of the present thesis seeks to add to this gap in literature of PTSD treatment.

1. Prevalence of Post-Traumatic Stress Disorder and its Impact on the Patient

It is estimated that a half million veterans from recent deployments in the Middle East conflicts and about 479,000 veterans deployed during the Vietnam War are diagnosed with Post Traumatic Stress Disorder (PTSD) (Niles et al., 2012). PTSD related to military or combat-

exposure has increased in prevalence from 0.2% in 2002 to 21.8% in 2008 and the occurrences of soldier suicides related to PTSD have also increased (Ben-Zeev, Corrigan, Britt, & Langford, 2012). Approximately 22 veterans die by suicide daily in the United States in response to their suffering with PTSD (Cerel et al., 2015). The Department of Veterans Affairs (2010) reports that while veterans represent a small percentage of the U.S. population, they make up 20% of all suicide deaths every year and currently, the number of Army soldiers dying by suicide exceeds the number of those killed in action (Cerel et al., 2015). The impact of PTSD on the patient's well-being is very detrimental and many of these individuals have faced or are facing lifetime struggles with their disorder (Church & Brooks, 2014; Staples, Hamilton, & Uddo, 2013). This is especially concerning because PTSD treatment is one of the largest expenses for the Veterans Affairs (VA) Health Care and Benefits system which makes PTSD treatment a financial concern to society since the VA is supported by the United States taxes (Niles et al., 2012; Ben-Zeev et al., 2012).

2. Current Challenges in Post-Traumatic Stress Disorder Treatment for the Military Population

Treating PTSD in a veteran population is an added challenge to an already complicated disorder because the stressors occur in a war context and because of the culture facilitated in the military. In the military, they place an emphasis on competence, confidence, and stoicism and a premium is placed in training on one's ability to remain resilient in the face of obstacles (Vogt, Fox, & Di Leone, 2014; Nash et al., 2009). Together, the training emphases produces a culture that cultivates negative beliefs and stigmas about mental health which in turn births a strong fear of social rejection if a negative mental affect is admitted (Vogt et al., 2014). Thus, the soldier compensates their negative disposition in the military culture by internalizing these beliefs and choosing to not express them, creating a stern barrier for treatment seeking behavior (Britt et al.,

2007; Niles et al. 2012). In fact, one out of every three OEF/OIF veterans report that they are afraid of being stigmatized if they seek out mental healthcare, and if a veteran has PTSD than this fear doubles in intensity (Hoge et al., 2014). Furthermore, one out of five veterans believed that mental health treatment should only be sought after as a last resort (Kim, Britt, Klocko, Riviere, & Adler, 2011) and in another study, 44% would feel down on themselves if they did seek therapy (Elbogen et al., 2013).

Additionally, the American society has a stigmatic view that mental health is controllable and the sufferer is accountable for the behaviors and negative affects that emerge as a result of a psychological disorder. Clinicians have articulated that the military culture strengthens this societal stigma to such an extent that soldiers during their service have an inclination to distance themselves from those with PTSD and some blame their comrades who have PTSD for their own symptoms. Such group behavior increases the fear of social exclusion if a solider were to admit having PTSD symptoms, and so they do not (Britt et al., 2007). Furthermore, the majority off the military personnel is men. Generally, men are less likely than women to seek mental health services and so the combination of the gender majority with the nature of the military culture intensifies the likelihood that a veteran with PTSD feels responsible for their symptoms and that they need to fix themselves independently to keep their sense of honor, which makes them very unlikely to seek therapy (Britt et al., 2007).

In the military population, most cases of PTSD are complex to treat because the source of the psychological trauma stems from multiple emotionally traumatic events rather than a single-incident trauma (Church, 2010). The common stressors reported by soldiers in PTSD treatment are roadside bombings, length of deployment, handling human remains, killing an enemy, seeing dead or injured Americans, and being unable to stop a violent situation. More than 90% of

soldiers returning from Iraq have said they encountered one or more of the common stressors and 12% also experienced physical harm/injury related to the stressor (Britt, Greene-Shortridge, & Castro, 2007). Stressors from a warzone invoke a wide range of emotions at the time of the trauma and personal reactions to it in the aftermath also vary greatly (Maguen & Burkman, 2013). As a result, war-related PTSD puts incalculable comorbid stresses on the patients. There are discernible deficits in personal mentality and a high prominence of sleeping disorders; chronic pain and miscellaneous physical disease; a heightened risk of developing problems in interpersonal relationships and domestic abuse; decreased occupational functioning; drug and alcohol addictions; and overall increased mortality rates (Staples et al., 2013; Church, 2010).

The personal and repercussive implications of PTSD in veterans is huge and because of the large population of veterans who are PTSD-positive there is a need to develop therapies that are effective, and effective in a limited number of sessions and that are approachable to military personnel (Church, 2010). Currently, the common interventions for PTSD include Prolonged Exposure Therapy, Cognitive Processing Therapy, Eye Movement Desensitization Therapy, and Cognitive Behavioral Therapy (Owens, Walter, Chard, & Davis, 2012; Church, 2010). These evidence-based treatments have the potential to offer relief to many veterans with PTSD, however many of these service members do not seek mental health care and a quarter of veterans report that they do not trust mental health professionals (Britt et al., 2007). This may be explained by a negative reputation being created in the population about the current evidence-based treatments (CEBT) available because of those who do seek treatment, a noticeable proportion either drop out of therapy or report they are not substantially helped by it (Niles et al., 2012). In fact, a review of 55 studies on empirically supported PTSD treatments concluded that it was not uncommon for nonresponse and dropout rates to be up to 50% (Schottenbauer, Glass,

Arnkoff, Tendick, & Grey, 2008). Moreover, the exposure therapies pose additional risk to the PTSD patients because some individuals worsen in their symptoms from the therapy which further deters individuals from seeking treatment (Staples et al., 2013).

Current evidence-based treatment (CEBT) are additionally limited because they do not neatly address the emotional aftermath of killing (Litz et al., 2009). The topic of killing is particularly important to consider when developing PTSD treatments for a veteran population because 40% of Iraq veterans (Maguen et al., 2010) and 50% of Vietnam veterans have killed in war or were responsible for death in war (Maguen et al., 2009). This means they have experienced risk of injury on their morals because soldiers under duty, for a variety of reasons, may be required to act in ways that go against their moral beliefs or value systems. Morals and values greatly vary in content and intensity between individuals which produces a lack of similarity in war-related traumas in addition to the already wide range of stressors that can cause PTSD (Maguen & Burkman, 2013). Killing during war can occur in multiple contexts such as in self-defense, because of an order, or to protect others, but regardless of the context killing or being responsible for death is the stressor with the greatest impact on the individual (Litz et al., 2009).

Despite the significance of killing on the person, it is a hushed topic in therapy and the patients experience with killing may never be discussed. This is a huge challenge to a veteran's recovery from Post-Traumatic Stress Disorder (PTSD). The clinician is never required to directly ask their patient about their participation in causing death in the existing models of current evidence-based treatments (Maguen & Burkman, 2013). Instead, they rely on the notion that the veteran will volunteer information about their experience with death and killing. The problem with this is that a clinician cannot assume that a veteran will be willing to discuss killing if they are not directly asked to. The societal stigmas associated with the act of killing can be strong

enough to prevent the patient from even brushing on the subject. Plus, research has shown veterans feel that because they were trained to kill for combat than they shouldn't be bothered by it and so they do not discuss it (Maguen & Burkman, 2013). Furthermore, because of the context of war and the hierarchy chain of militant command, the soldier experience of engaging in actions that go against their moral beliefs, particularly the act of killing, are not predominantly done out of a fear-based response (Ben-Zeev et al., 2012). These cases make CEBT not appropriate for treating PTSD in a military population, especially exposure therapies, because there is no need to produce a habituation of a fear response, which may partially explain why high dropout rates and therapy ineffectiveness are so commonly reported in this population (Maguen & Burkman, 2013).

3. Why Complementary and Alternative Medicine for Post-Traumatic Stress Disorder?

Together, all of the above factors indicate that there is not a one-size-fits-all treatment for war-related Post-Traumatic Stress Disorder (PTSD). One treatment may work for one patient but not for another, which is why it is necessary to develop novel therapies for the military population through research. The noted limitations in the current therapies for treating PTSD bids researchers an invitation to consider open-minded approaches to develop innovative treatments that have better success rates. The continuance of war in the Middle East is ensuring that the rates of those returning from deployment with PTSD symptoms will not cease in prevalence but instead will increase which is indicative of the urgency and need to develop and standardize therapies that can provide relief to those diagnosed (Lake, 2015; Bormann, Thorp, Wetherell, & Golshan, 2008). Complementary and holistic therapies for PTSD treatment may be a step forward in the right direction towards improving the therapy options.

Surveys among the military population reveal an interest among service members in complementary approaches and that they would use such therapies if the corresponding programs were available to them (Bormann et al., 2008). Already, the Marine Corps has recognized certain benefits of CAM approaches and has implemented them into the training of their soldiers to help stave off post-traumatic stress. The program is called Mind Fitness which relies on a regimen of meditation exercises believed to alter the brain by strengthening areas to help keep focus and improve stress coping (Sanborn, 2011). The marine meditation training serves as a preventative to developing PTSD. This thesis is focused on CAMs for those already diagnosed with PTSD, but the Marine Corps implementation of Mind Fitness in their training regime reveals that the American military mentality is altering itself to be accepting of CAM approaches for psychological healthcare.

Complementary medicine is difficult to define because it is a very broad, constantly evolving field that can includes a variety of diverse practices such as yoga, mindfulness meditation, acupuncture, traditional Chinese medicine, and hypnosis (Barnett, Shale, Elkins, & Fisher, 2014). This is because the literature is still in its infancy. The supposed benefit to implementing CAM therapies in a military population is that there is a potential for rapid success rates and rapid increase in positive affect, encourage those who benefit from the therapies to encourage others to seek the treatments as well (Lake, 2015). The absence of talk-based therapy decreases the fear associated with talking about emotions stemmed from the military culture and provides a more welcoming and attainable therapy (Nash et al., 2009). As a result, patients have a higher tendency of compliance in CAM therapies than in current evidence-based treatments (CEBT) which is greatly significant since one of the largest barriers in PTSD treatment is the

poor treatment seeking behavior in veterans as a result of the population's hearsay about CEBT poor effects and frequent drop outs. (Sargent, Campbell, Richter, McLay, & Koffman, 2013).

4. Importance of Thesis

Active duty military personnel and veterans with Post-Traumatic Stress Disorder compose a population that is in great need of aid for managing and decreasing their symptoms. Coping with PTSD is seriously debilitating to the veteran and their disorder interferes with multiple aspects of their wellbeing and functioning and the risk of potential suicide is high. The treatment options available to this population are not sufficient enough in their effectiveness and they are limited specifically to the veterans because the war-context of the stressors to their disorder is not addressed in any current treatment model. Thus the motivator to this thesis is to answer the question of whether or not there is clinical validity in the treatment effectiveness of CAM therapies for Post-Traumatic Stress Disorder in a veteran population when they are compared and contrasted with current-evidence based treatments. If efficacy is found, the benefits could be quickly translated into improved care because CAM therapies offer affordable and assessable treatment that the patient can continue from home, increasing the number of patients a clinician can see while maximizing VA Healthcare resources.

B. Hypothesis and Operational Definitions

1. Statement of Hypothesis

If a veteran is diagnosed with Post-Traumatic Stress Disorder (PTSD) and treated with Complementary and Alternative Medicine therapies, then they will experience a greater improvement in their symptoms compared to a veteran diagnosed with PTSD who is treated with other current evidence-based therapies.

2. Independent Variables Operationally Defined

a. Veteran.

Men and women who have served on active duty, even for a short time, but are not currently serving, in the U.S. Army, Navy, Air Force, Marine Corps, or the Coast Guard, or who served in the U.S. Merchant Marine during World War II. People who served in the National Guard or Reserves are classified as veterans only if they were ever called or ordered to active duty, not counting the four to six months for initial training or yearly summer camps. While it is possible for 17 year olds to be veterans of the Armed Forces, primarily veterans are 18 years old or older (Veterans: Definitions and concepts, 20103).

b. Post-Traumatic Stress Disorder (PTSD).

According to the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders, Post-Traumatic Stress Disorder (PTSD) is an anxiety disorder that causes clinically significant distress or impairment to the individual's social interactions, occupational capacity, and other important areas of functioning (American Psychiatric Association, 2013b). Generally, the root of the cause of PTSD is an exposure to actual or threatened death, serious injury, or sexual violation and it is not the result of another medical condition or substances such as medications, drugs, or alcohol. Specifically, the triggers of PTSD must include one or more of the following scenarios: (a) direct experience to a traumatic event; (b) witness to a traumatic event in person; (c) learn of a traumatic event that occurred to a close family member or close friend in which the actual or threatened death was either violent or accidental; (d) and/or experience first-hand extreme or repeated exposure to aversive details of a traumatic event that is not through media, pictures, television, or movies unless that exposure is related to the individuals work.

c. Complementary and Alternative Medicine (CAM).

The National Center for Complementary and Alternative (NCCAM) (2014) describes the terms complementary medicine and alternative medicine to refer to an array of health care approaches with a history of use or origins outside of mainstream medicine. Complementary Medicine refers to using a non-mainstream approach together with conventional medicine. Alternative Medicine refers to using a non-mainstream approach in place of conventional medicine. Often the true use of alternative medicine is not common because most people complement their therapies with conventional treatments. Tan, Dao, Smith, Robinson, and Jensen (2010) describe CAM therapies to include treatments that are nontraditional to Western medical practices and intended to either be used in association with or to replace the Western medical practices. They are not typically taught in medical schools, nor generally used in hospitals, and not usually reimbursed by medical insurance companies.

i. Acupuncture.

A technique that consists of a practitioner stimulating specific points on the body which is most often done so by inserting thin needles through the skin (National Center for Complementary and Alternative Medicine, 2014).

ii. Emotional Freedom Therapy (EFT).

A trauma-focused, meridian-based therapy that assumes emotional disturbances, such as those experienced by individuals with PTSD, are a by-product of disturbances in the body's energy field (meridian system) that were caused by exposure to a traumatic event. Emotional Freedom Therapy requires stimulation of traditional acupuncture points representing the endpoints of meridians on the face, upper body, and hands while focusing on the traumatic event (Craig, 2010).

iii. Healing Touch Therapy.

A biofield therapy that utilizes specific techniques of noninvasive touch with the intent of working with the body's vital energy system to clear, energize, and balance the human and environmental energy fields affecting physical, mental, emotional and spiritual health. The goal of Healing Touch is to restore balance and harmony in the energy system to stimulate a self-healing response (Healing Touch Worldwide Foundation, 2015).

iv. Hypnotherapy.

A mind-body therapy in which a patient is provided auditory suggestions for relaxation and mental imagery while in an altered, meditative state of consciousness (Barnett et al., 2014).

v. Meditation.

Most meditation techniques, such as mindfulness meditation, involve ways in which a person learns to focus attention (National Center for Complementary and Alternative Medicine, 2014). There are many forms of meditation techniques, but the ones used in this thesis are guided imagery (GI), transcendental meditation (TM), a mindfulness-based stress reduction program (MBSR), a general mindfulness based intervention (MBI), and mind-body bridging (MBB).

vi. Music Therapy.

A therapy aimed at increasing independence, autonomy, and initiation of musical ideas to alleviate the symptoms of the disorder in question. A wide range of musical instruments are used. The patient determines which instrument they prefer, chosen for accessibility and previous experience or skill levels. Sessions involve a combination of active and receptive activities with an emphasis on free improvisation (Wigram, 2004).

vii. Spirituality Strengthening.

Spiritually integrated interventions are designed to address concerns about the ultimate truth, life purpose or meaning, and religion through a spiritually oriented social reference group. (Pargament, 2007). Spirituality oriented programs in this thesis include a mantram repetition program and Building Spiritual Strength (BSS), a manualized group therapy that addresses spiritual concerns specific to trauma survivors (Harris et al., 2011).

viii. Yoga.

An ancient practice originating from India that is designed to bring a proper balance between the physical and mental aspects of a person to awaken the subtle energies of the body. There are many different forms and schools of yoga but all cultivate muscular strength, endurance, and flexibility to enhance mental acuity and mindfulness (Mishra, 1987). This thesis additionally examines Sudarshan Kriya yoga which is a group manualized yoga that focuses on controlled breathing through meditation exercises with several types of yogic stretching (Brown & Gerbarg, 2005).

d. Current Evidence-Based Therapies (CEBT).

This is abroad term to refer to conventional, Western treatment methods that have been developed by researchers through empirical research. It is medicine usually practiced by holders of an MD or DO and by their allied health professionals like physical therapists, psychologists, and registered nurses (National Center for Complementary and Alternative Medicine, 2014). According to the National Center for PTSD (2014a), Cognitive Processing Therapy (CPT) and Prolonged Exposure (PE) Therapy have empirically been shown to be most effective in treating the symptoms of PTSD in a military population. Additional research has described Cognitive Behavioral Therapy (CBT) and Eye Movement Desensitization Reprocessing (EMDR) therapy

to be effective interventions for PTSD symptoms (Hollifield, Sinclair-Lian, Warner, & Hammerschlag, 2007).

i. Cognitive Behavioral Therapy.

The treatment goal is for participants to identify personal resources of value that have either been lost to them, are at-risk, are feared, or that are avoided; plan to engage in those situations using cognitive restructuring and/or imagery rehearsal to desensitize behavioral responses; and to engage in activities that will help establish a resource gain cycle using materials from daily life experiences (Hollifield et al., 2007).

ii. Cognitive Processing Therapy.

The treatment goal is to help individuals with PTSD understand their symptoms and condition to help facilitate a change in the way they think about their trauma and its after-effects it had on them (National Center for PTSD, 2014a).

iii. Eye Movement Desensitization and Reprocessing Therapy (EMDR).

The treatment goal is to change how the patient reacts to memories of trauma. The patient is asked to hold in mind an image of the trauma, a negative self-cognition, negative emotions, and related physical sensations about the trauma. While doing so, the client is instructed to move her or his eyes quickly and laterally back and forth for about 15 to 20 seconds (Wilson, Becker, & Tinker, 1995).

iv. Pharmacotherapy.

The use of prescribed medication to treat a psychological disorder. For Post-Traumatic Stress Disorder, selective serotonin reuptake inhibitors (SSRIs) are most commonly prescribed in addition to other antidepressants. Common SSRIs include citalopram (Celexa), fluoxetine (such as Prozac), paroxetine (Paxil), and sertraline (Zoloft) (National Center for PTSD, 2014a).

v. Prolonged Exposure Therapy.

The treatment goal is to reduce the fear PTSD individuals have from their memories of the trauma through repeatedly talking about it with a therapist (National Center for PTSD, 2014a).

vi. Psychoeducation.

Treatment goal is to increase one's understanding of stress reactions, readjustment difficulties, and recovery, as well as to normalize the patient's experiences, and to assist them with identifying their symptoms that may reflect the mental disorder being treated (Niles et al., 2012).

3. Dependent Variable Operationally Defined

a. Post-Traumatic Stress Disorder Symptoms.

The fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association, 2013a) categorizes the symptomology of Post-Traumatic Stress Disorder (PTSD) into four distinct diagnostic clusters that include the following: re-experiencing, avoidance, negative cognitions and mood, and arousal. Specifically, re-experiencing symptoms are spontaneous recollection of the traumatic event experienced, recurrent dreams related to the trauma, or other intense or prolonged psychological distress. Avoidance symptoms describe active attempts to repress or avoid distressing memories, thoughts, feelings, or external stimuli related to the trauma. Negative cognitions and mood represents a persistent and distorted sense of self-blame or blame by proxy, myriad feelings, and the inability to remember key aspects of the traumatic event. Lastly, arousal symptoms are marked by aggressiveness, reckless or self-destructive behavior, sleep disturbances, hyper-vigilance or related problems. There are multiple assessment tools to measure these symptoms (National Center for PTSD, 2014a).

i. Clinician Administered PTSD Scale (CAPS).

Considered the gold-standard for PTSD assessment, the CAPS is a 30-item structured interview that assess all the DSM-IV diagnostic criteria for PTSD. The test is conducted by a clinician who rates the frequency and intensity of each symptom on a five point scale to compute a sum (Blake et al., 2000).

ii. Impact of Events Scale (IES).

A 22-item self-reported scale created to explore the psychological impact of a variety of traumas (Weiss & Marmar, 1996). It does not measure the hyperarousal symptoms of PTSD diagnosis, however it is still a widely used instrument (Sundin & Horowitz, 2002).

iii. Post-Traumatic Diagnostic Scale (PDS).

A 49-item self-report measure recommended for use in clinical or research settings to measure severity of PTSD symptoms related to a single identified traumatic event. The PDS inquires about the past month. Total scores range from zero to 51. This scale also includes the PTSD Symptom Scale- Self Report (PSS-SR) that involves a 17 item checklist (Foa, Cashman, Jaycox, & Perry, 1997).

iv. Post-Traumatic Stress Disorder Checklist (PCL).

A 17-item self-report measure reflecting DSM-IV symptoms of PTSD. A total symptom severity score is obtained by asking the patient to rate each symptom on a scale from one (not at all) to five (extremely) for a total symptom severity score range of 17 to 85. It is determined whether the patient meets the criteria for PTSD if their total symptom severity score exceeds 50 in addition to indicating at least one B item (questions one through five), three C items (questions six through 12), and at least two D items (questions 13-17). Clinically meaningful change is standardized at a reduction of ten points or more (Blanchard, Jones-Alexander,

Buckley, & Forneris, 1996; National Center for PTSD, 2014b). There is also two other versions of the PCL that follow the same scoring criteria, a military version and a civilian version. The PTSD Checklist Military Version (PCL-M) asks individuals about PTSD symptoms in response to "stressful military experiences" (Forbes, Creamer, & Biddle, 2001). It is often used with active service members and Veterans (National Center for PTSD, 2014b). This scale is widely used and said to have high consistency, reliability, and validity which is what makes it a great measurement for PTSD symptoms (Hoyt & Renshaw, 2014). The PTSD Checklist Civilian Version (PCL-C) is also primarily used in a military population and demonstrates high internal validity, but it assesses all trauma of the individual and doesn't limit to traumatic events specific to the military experience (Karstoft, Andersen, Bertelsen, & Madsen, 2014).

II. Results

A. Summary Results Tables.

Current research examining Complementary and Alternative Medicine (CAM) treatments for Post-Traumatic Stress Disorder (PTSD) is in its infancy and thus the types of CAM's being examined in studies widely vary. It is for this reason the following results are grouped by the CAM being studied underneath three sections separating the supporting, refuting, and mixed evidence. The listing of CAM's is ordered by the strength of its ability at reducing the symptoms of PTSD with the first CAM listing being the strongest and the last CAM listing being the weakest. If a particular CAM has multiple studies examining it, then the order in which the studies are presented are also organized by strongest to weakest strengths. The results are presented in this manner to allow for quick identification of the strongest and weakest types of CAM's for PTSD treatment.

A. Table 1: Summary of Studies Demonstrating CAM Therapies as More Effective than CEBT's

Organized by CAM used and subcategorized by strength of support to thesis hypothesis

Study	Subjects	Study Design	CAM Used	Treatment	Control	Diagnosis Measure(s)	Results
Church et al 2013	59 Veterans (90% Male)	RCT	EFT	6 one hour sessions over the course of one month	TAU	PCL-M	EFT more effective than TAU ($p < 0.0001$). EFT PCL-M mean scores decreased from 64.40 to 37.31 and maintained at 6 month follow-up.
Alvarez et al 2011	197 Male Veterans	QEC	n/a	14 sessions of CPT during a 60-90 day residential program	TAU	PCL	CPT shown to be mildly effective ($p = .032$) but at post-treatment 86.6% still had clinical PTSD and of that 10.6% worsen in their PCL scores.
Church & Brooks 2014	109 Male Veterans	EIP	EFT (with CAM's of choice)	Six separate week long retreats of four 4 hour EFT group sessions and daily 1 hour individual sessions of the subject's CAM of choice	n/a	PCL-M	EFT with a CAM suite shown to be significantly effective ($p < 0.001$). Participants with clinical PTSD decreased from 82.6% to 28.4% and maintained at 4-6 week follow-up.
Church 2010	7 Male 4 Female Veterans	Pilot	EFT	2-3 one hour sessions a day for five days	n/a	PCL-M	EFT shown to be an effective PTSD treatment ($p = 0.001$). PCL-M scores decreased from 62.3 to 23.3 post-treatment. At the 30-day follow up scores rose to 32.5 and were maintained at 1-year follow-up.
Engel et al 2014	55 Service Members (69% Male)	RCT	ACU +TAU	60 minute sessions twice per week for four weeks.	TAU	PCL-C CAPS	ACU+TAU showed significantly greater improvements than TAU only. PTSD symptoms are seen on both the PCL-C and CAPS ($p < 0.0001$)
Jain et al 2012	123 Veterans (91% Male)	RCT	HT/GI w/TAU	6 one hour long sessions for 3 weeks with encouraged GI CD homework	TAU	PCL-M	The intervention group more effective than TAU ($p < 0.0005$; $d = 0.85$). HT/GI w/TAU average PCL-M scores decreased from 54.0 to 40.7.

Table 1 Continued

Seppälä et al 2014	21 Male Veterans	RCT	SK Yoga	Daily 3 hour long group sessions for 7 days	WLC	PCL-M	SK Yoga showed to be more effective than the WLC with reductions in the average PCL-M scores (d = 1.00; 95% CI[0.05, 1.86]).
Abramowitz et al 2008	32 Male Veterans	RCT	Hypno-therapy	90 minute sessions twice a week for two weeks	PHRM	PDS	Hypnotherapy more effective than PHRM ($p < 0.001$). Hypnotherapy PDS mean scores decreased from 35.9 to 27.5 and were maintained at 1 month follow-up.
Carr et al 2011	17 PTSD Patients	RCT	Music Therapy	Weekly one hour group sessions for 10 weeks	WLC	IES	Music Therapy more effective than TAU ($p = 0.0035$). Music Therapy IES mean scores decreased from 52.69 to 30.87.
Monson et al 2006	60 Veterans (54 Male)	RCT	n/a	Biweekly CPT sessions for 6 weeks	WLC	PCL-M CAPS	CPT shown to be mildly effective. 50% improved in their symptoms but remained clinical. The additional 50% experienced no change.
Rosenthal et al 2011	5 Veterans	Pilot	TM	20 minute daily meditations for 12 weeks	n/a	PCL-M CAPS	Meditation shown to be an effective PTSD treatment for all subjects on both the PCL-M and the CAPS ($p = 0.02$)
Barnes, Rigg, & Williams 2013	3 Service Members (100% Male)	Case Study	TM	TM taught through a course involving 5-6 hours of instruction over 4 days with the first session being 1 hour, individual and the succeeding sessions being 1.5 hours in a group setting. TM prescribed for two months 15-20 minute meditations twice daily.	n/a	PCL	On the PCL, all decreased their scores at least 10 points, which is clinical significance. Patient 1 decreased from 60 baseline, to 54 at 4 weeks, to 41 at 6 weeks. Patient 2 decreased from 82 baseline, to 67 at 4 weeks, to 71 at 6 weeks. Patient 3 decreased from 84 baseline to 51 at 4 weeks and no 6 week follow up data is available.

Table 1 Continued

Note. ACU=Acupuncture; CAM=Complementary and Alternative Medicine; CAPS=Clinician Administered PTSD Scale; CEBT=Current Evidence-Based Treatments; CPT=Cognitive Processing Therapy; *d*=Cohen's *d* Effect Size; EFT=Emotional Freedom Therapy; EIP=Experimental Intervention Program; HT/GI=Healing Touch with Guided Imagery; IES=Impact of Events Scale; PCL=PSTD Checklist; PCL-C=PTSD Checklist-Civilian; PCL-M=PTSD Checklist-Military; PDS=Post-Traumatic Diagnostic Scale; PHRM=Pharmacological intervention; QEC=Quasi-Experimental Cohort; RCT=Randomized Controlled Trial; SK Yoga= Sudarshan Kriya yoga, a breathing-based meditation intervention; TAU=Treatment as Usual; TM=Transcendental Meditation; WLC=Wait-list Control

B. Table 2: Summary of Studies Demonstrating CEBT's as More Effective than CAM Therapies

Organized by CAM used and subcategorized by strength of refute to thesis hypothesis

Study	Subjects	Study Design	CAM Used	Treatment	Control	Diagnosis Measure(s)	Results
Kearney et al 2013	47 Veterans	RCP	MBSR	Biweekly 2.5 hour sessions for 8 weeks with 45 minute homework sessions 6 days per week	TAU	PCL-C	MBSR shown to not be an effective PTSD treatment, PCL-C scores dropped from a mean of 59.88 to 52.45 but sample remained at clinical levels of PTSD. Also, PCL-C scores increased to 54.43 at the 4 month follow-up.
Niles et al 2012	33 Male Veterans	RCT	MBI	2 in person 45 minute sessions followed by 6 weekly telephone sessions	PsyEd	PCL-M	MBI is not an effective PTSD treatment, 60% of participants remained at clinical PTSD levels on the PCL-M.
Oman & Bormann 2014	132 Veterans (98% Male)	RCT	MRP	6 weekly 90 minute sessions with daily homework	TAU	CAPS	MRP is not an effective PTSD treatment.
Karatzias et al 2011	46 PTSD Patients	RCT	EFT	1 weekly session for 8 weeks	EDMR	PCL CAPS	Both EFT and EDMR produce significant PTSD symptom reductions (d = 0.80) in equal number of sessions. The EDMR was slightly more effective (d = 1.1) than EFT (d = 1.0) but not significant.
Hollifield et al 2007	84 PTSD Patients (32% Male)	RCT	ACU	Biweekly one hour long sessions for 12 weeks	CBT WLC	PSS-SR	Compared to the WLC, ACU shown to be effective ($p < 0.01$) in equal strength to CBT ($p < 0.01$). Both maintained scores at follow-up.

Table 2 Continued

Staples et al 2013	12 Veterans (10 Male)	Pilot	Yoga	Biweekly one hour long sessions for 6 weeks	n/a	PCL-M	Overall, there were no treatment gains to non-clinical PTSD levels on the PCL-M. Scores went from a mean of 58.2 to 57.1 (p = 0.678).

Note. ACU=Acupuncture; CAM=Complementary and Alternative Medicine; CAPS=Clinician Administered PTSD Scale; CBT=Cognitive Behavioral Therapy; CEBT=Current Evidence-Based Treatments; EDMR=Eye Movement Desensitization and Reprocessing Therapy; EFT=Emotional Freedom Therapy; MBI= Mindfulness Based Intervention; MBSR=Mindfulness-based Stress Reduction Program; MRP=Mantram Repetition Program; PCL=PSTD Checklist; PCL-C=PTSD Checklist-Civilian; PCL-M=PTSD Checklist-Military; PSS-SR=Post-Traumatic Symptom Scale-Self Report; PsyEd=Psychoeducation; PTSD=Post-Traumatic Stress Disorder; RCP=Randomized Controlled Pilot; RCT=Randomized Controlled Trial; TAU=Treatment as Usual; WLC=Wait-list Control.

C. Table 3: Studies with Mixed Evidence of CAM Therapies Comparative Effectiveness to CEBT's

All mixed studies involved mindfulness-based interventions and so are organized by strength of support to thesis hypothesis

Study	Subjects	Study Design	CAM Used	Treatment	Control	Diagnosis Measure(s)	Results
Bormann et al 2008	29 Male Veterans	RCT	MRP	90 minute sessions once per week for 6 weeks	TAU	PCL CAPS	MRP more effective treatment than TAU. The PCL showed large effect size (d = -0.72) and the CAPS showed a small effect size (d = -0.33)
Bormann et al 2013	146 Veterans (97% Male)	RCT	MRP + TAU	Weekly 90 minute group sessions for 6 weeks	TAU	PCL CAPS	MRP more effective than TAU at reducing symptom scores on the PCL and CAPS (η^2_p =.03;p = 0.05). The MRP average PCL scores dropped -5.62 points and the CAPS showed 24% with clinically meaningful change. Improvements relied on participant's ability to improve spiritual awareness.
Harris et al 2011	54 Veterans (89% Male)	RCT	BSS	Two hour sessions once per week for eight weeks	WLC	PCL	BSS produced clinically significant results and WLC did not. Post-treatment, 46% of veterans in BSS maintained clinical PTSD scores on the PCL and 69% in the WLC.
Owens et al 2011	149 Veterans (75% Male)	LONG	MBI with CPT	Group sessions once per week for 7 weeks	CPT	PCL CAPS	Participants receiving the MBI improved their PTSD symptoms on both the PCL and CAPS ($p < 0.05$) only if their mindfulness skillset also increased. Women scored slightly higher on mindfulness assessments.

Table 3 Continued

Kearney et al 2012	70 Male 22 Female Veterans	EIP	MBSR	2.5 hour long sessions once per week for 8 weeks plus one 7 hour Saturday session	n/a	PCL-C	MBSR mildly effective. PCL-C subscale effect sizes were re-experiencing (d = -0.40), avoidance (d = -0.36), and hyperarousal (d = -0.64). 47% maintained clinical symptom reduction at 6 month follow-up
Nakamura et al 2010	63 Veterans (95% Male)	RCP	MBB	Two sessions once per week for 1.5 hours (MBB) or one hour (SHP)	SHP	PCL-M **secondary measure*	For all veterans, mean PCL-M scores dropped -8.1 for MBB and -2.6 for SHP (p = 0.029). For veterans who scored above the PCL-M clinical PTSD threshold (N=20) at baseline, greater gains in PTSD symptoms were observed in the MBB group compared to SHP (p = 0.001). All symptom gains were facilitated by noted changed in mindfulness.

Note. BSS=Building Spiritual Strength; CPT=Cognitive Processing Therapy; CAM=Complementary and Alternative Medicine; CAPS=Clinician Administered PTSD Scale; CEBT=Current Evidence-Based Treatments; *d*=Cohen's *d* Effect Size; EIP=Experimental Intervention Program; LONG=Longitudinal Design; MBI=Mindfulness Based Intervention; MBB=Mind-Body Bridging; MBSR=Mindfulness-based Stress Reduction Program; MRP=Mantram Repetition Program; η^2_p=Partial eta-squared values, the effect sizes are small (.01), medium (.06), and large (.15); PCL=PTSD Checklist; PCL-C=PTSD Checklist-Civilian; PCL-M=PTSD Checklist-Military RCP=Randomized Controlled Pilot; RCT=Randomized Controlled Trial; SHP=Sleep Hygiene Program; TAU=Treatment as Usual; WLC=Wait-List Control

B. Evidence Supporting Hypothesis

The Complementary and Alternative Medicine (CAM) therapy providing the strongest support for this thesis hypothesis is Emotional Freedom Therapy (EFT). Dr. Dawson Church is the leader in the field of EFT research and three of his studies on EFT are utilized in this thesis. The study with the most superior support was conducted by Church and colleagues (2013) who examined the impact of an Emotional Freedom Therapy (EFT) intervention on the symptoms of Post-Traumatic Stress Disorder in a predominantly male (90%) sample of 59 veterans. They hypothesized that EFT would be more effective at reducing PTSD symptoms than the patients usual care. A randomized controlled trial was implemented to compare the two conditions. The experimental group (N = 30) received six, one-hour sessions of EFT over the course of one month and the control group (N = 29) continued with their usual care for the same period of time. Symptoms of PTSD were recorded using the PTSD Checklist –Military (PCL-M) at pre-intervention, after three EFT sessions, post-intervention, at a three month follow-up, and at a six month follow-up. The results of the study supported the researcher's hypothesis. The PCL-M preliminary average score was 64.40 and after three sessions of EFT the average PCL-M score dropped to 47.38 and then to 37.31 at post-treatment compared to the control group whose final PCL-M mean score remained clinical at 63.23. Overall, the results demonstrated a significant effect size ($p < 0.0001$) for the EFT intervention and the symptomology gains were upheld at both the three month follow-up and the six month follow-up, giving strong support to this thesis.

The second study supporting EFT done by Church with his colleague Brooks (2014) lacks a comparative group. For the purpose of this thesis, the research by Alvarez et al. (2011) serves as a comparative study. Together, these studies examine the effectiveness of Cognitive Processing Therapy (CPT) compared to the usual trauma-focused therapy (TAU) (Alvarez et al., 2011) and

Emotional Freedom Therapy (EFT) supplemented by a suite of Complementary and Alternative Medicine (CAM) therapies of the patients choice (Church and Brooks, 2014). Alvarez et al. (2011) hypothesized that the cohort treated with CPT would show more improvement on clinical measures than the cohort treated with the TAU. In contrast, Church and Brooks (2014) hypothesized that Emotional Freedom Therapy (EFT) allied with a suite of CAM interventions aimed at resource-building and interpersonal bonding would provide clinical benefits to participants when delivered in the context of family and social support.

To test the hypotheses, 197 male veterans participating in a Veterans Health Administration PTSD 60 to 90 day rehabilitation program were randomized to either CPT (N = 104) or TAU (N = 93) (Alvarez et al., 2011) and 109 male veterans and their wives participated in the EFT intervention. Those receiving CPT did so in a group setting over the course of 14 sessions and their PTSD symptoms were monitored using the PTSD Checklist (PCL) self-report at beginning intake and discharge evaluations of the program. Those receiving EFT attended one of the six seven day retreats that immersed the participants into an intensive intervention of EFT that included four daily four hour EFT group sessions with seven daily afternoon sessions of a CAM therapy of choice. Measures of PTSD symptoms were taken using the PCL military version, which is similar in diagnostic criterion as the PCL, at baseline, post-intervention, and follow-up four to six weeks later.

The results of both studies supported their hypotheses, however the data of Church and Brooks (2014) was much stronger. The results of this study reported baseline clinical PTSD levels in 82.6% of veterans which decreased to 28.4% post-intervention and the participants maintained their symptom improvement at follow-up. Alvarez et al. (2011) reported post-intervention scores in the CPT group to include 16.3% as recovered, 41.3% as improved but still

clinical, 31.7% as unchanged, and 10.6% deteriorated to more severe clinical levels. In comparing the statistical, p-value significance of each study, Church and Brooks (2014) found high clinical significance ($p < 0.001$) whereas Alvarez et al. (2011) found milder significance ($p = 0.032$). Additionally, the EFT intervention took seven days to complete and the 14 sessions of CPT took much longer as the patients were in a 60 to 90 day program. This signifies EFT to not only be more effective than CPT but it is more effective in less sessions. Thus, the combined results of these studies support the present hypothesis of this thesis that CAM therapies will produce a greater reduction in PTSD symptoms.

The final study Emotional Freedom Therapy (EFT) that was conducted by Dawson Church (2010) supporting the present hypothesis implemented a longitudinal design. It has a small sample size and the lack of a comparison group which gives the study certain limitations, but the EFT intervention lasted less than a week and produced significant, long-lasting results that were monitored for one year. This study hypothesized that EFT would have a noticeable impact on the severity of Post-Traumatic Stress Disorder (PTSD) symptoms. To test the hypothesis, seven male and four female veterans with PTSD participated in the EFT treatment intensively for five days, receiving two to three individual, one-hour sessions per day. PTSD symptoms were assessed on the PTSD Checklist –Military (PCL-M) immediately before the first treatment, at post-treatment, and at three follow-up assessments conducted 30 days, 90 days, and one year after the end of the intervention. The results concluded significant gains in PTSD symptoms ($p = 0.001$). The average PCL-M scores before the intervention was 62.3 which dropped to 23.3 post-intervention. The PCL-M scores rose slightly to 32.5 at the 30-day follow-up, but then remained stable at the 90-day (32.6) and one year (33.43) follow-ups. Thesis findings support this thesis because they show EFT to be a quick intervention that produces long-standing PTSD symptom improvements.

This yearlong monitoring of the participant's PTSD symptoms strongly supports the present thesis hypothesis. The small sample size is not ideal, but the longitudinal design validates the findings because the intervention lasted only five days and still produced the significant, long-lasting results.

Following Emotional Freedom Therapy, Acupuncture (ACU) is the second strongest CAM therapy at reducing PTSD symptoms. Engel and their research team (2014) examined ACU using a 2-parallel randomized controlled trial in which 55 service members (69% Male) with PTSD were recruited from the primary care clinics at Walter Reed Army Medical Center to participate in the study. They either continued with their usual treatment (TAU) or complemented their TAU with acupuncture (ACU+TAU) under the hypothesis that ACU+TAU would be significantly more effective than TAU alone. Those receiving TAU continued with their usual psychotherapy, either prolonged exposure therapy or non-trauma focused cognitive behavioral therapy, and/or pharmacotherapy, commonly selective serotonin reuptake inhibitors and antidepressants. Those receiving ACU+TAU had eight, 60-minute sessions of ACU throughout four weeks. The ACU sessions were focused to specified ACU points that facilitate the clearing of trauma, calming the spirit, and balancing Qi. Symptoms of PTSD were assessed using the Post-Traumatic Stress Disorder Checklist –Civilian (PCL-C) at baseline and post-treatment plus two follow-up assessments at eight and 12 weeks. The Clinician Administered PTSD Scale (CAPS) was also used to quantify PTSD scores at baseline and at the 12 week follow-up. Outcome measures revealed ACU+TAU to have significantly greater improvements than TAU on both the PCL-C and the CAPS ($p < 0.0001$). Specifically, the initial means scores to the 12 week follow-up assessment in the TAU group dropped less than 10 points to 45.8 from 55.4 on the PCL-C and mean scores on the CAPS dropped from 70.0 to 59.2. Conversely, the ACU

group on the PCL-C dropped from a mean of 58.1 to 38.7 (d = 1.4; 95%CI[1.2,1.6]) and on the CAPS dropped from 76.2 to 41.2 (d = 1.6; 95%CI[1.4,1.8]). Conclusively, the hypothesis was supported that the addition of acupuncture as a complementary therapy to the TAU produced better symptom reductions than TAU only. Thus, the study provides support for the present thesis.

Following acupuncture in the strength of CAM therapies for treating Post-Traumatic Stress Disorder is Healing Touch therapy with Guided Imagery meditation (HT/GI). Jain et al. (2012) conducted their HT/GI study at the Marine Corps Base Camp in Camp Pendleton, California. A total of 123 active duty personnel volunteered for random assignment to either receive HT/GI with their usual treatment (HT/GI+TAU) or to receive only their usual treatment (TAU), which in this study included various forms of psychotherapy and medications. Jain et al. (2012) hypothesized that experimental HT/GI+TAU group would be more effective than TAU alone at reducing PTSD symptoms. Those in the HT/GI+TAU group continued with their usual care and also received six treatments of HT over three weeks in which each session was complemented with GI to produce an atmosphere where the participant could allow themselves to engage into a relaxed state to ensure maximum benefit from the HT. The HT sessions used three specific techniques: chakra connection, mind clearing, and chakra spread. Changes in PTSD symptoms were measured by the PTSD Checklist –Military (PCL-M) at pre- and post-treatment. The results supported the researcher's hypothesis, HT/GI+TAU produced significant reductions in PCL-M scores and the TAU did not ($p < 0.0005$; d = 0.85). This study lacked a follow-up assessment and admitted minimal adherence monitoring which limited the strength of support to this thesis.

Another CAM therapy receiving only adequate support in the literature for PTSD treatment is yoga.The effects of Sudarshan Kriya (SK) yoga on the symptoms of PTSD was assessed by

Seppälä and colleagues (2014) under the hypothesis that SK yoga would be successful at reducing PTSD scores on the PTSD Checklist –Military (PCL-M) when compared to a waitlist control (WLC) group. Sudarshan Kriya yoga is a breathing-based yoga with meditations combined with periods of stretching. The researchers randomly assigned 21 veterans to either the WLC group or to the group receiving SK yoga. The SK yoga group participated in daily, group sessions for seven days with each session lasting three hours. PCL-M measures were obtained one week before (T1) and after (T2) the intervention as well as at a one month (T3) and one year (T4) follow-up. The results found SK yoga to be effective at reducing PTSD symptoms. Overall PCL-M scores produced large effect sizes in the SK yoga group when compared to the WLC at T2 (d = 1.16; 95%CI[0.05, 1.86]), T3 (d = 0.94; 95%CI[0.00, 1.80]), and T4 (d = 1.00; 95%CI[0.05, 1.86]). Hyperarousal symptoms decreased most significantly ($p < 0.001$) in the SK yoga group compared to other subscales of the PCL-M, but these changes were not seen in the WLC. The study is limited by their sample size but the longitudinal monitoring of the participants strengthens their findings are thus the study provides adequate support to the present thesis.

Abramowitz, Barak, Ben-Avi, and Knobler (2008) evaluated the benefits of a complementary hypnotherapy intervention and found supporting evidence for the present hypothesis. The researchers randomly assigned thirty-two male veterans with combat-related PTSD to either a Zolpidem pharmacotherapy group (N = 15) or to an experimental hypnotherapy group (N = 17) under the assumed hypothesis that the hypnotherapy would better reduce the severity of PTSD symptoms. Both of the interventions lasted 14 days. Those receiving the Zolpidem were instructed to take 10 milligrams nightly and those receiving hypnotherapy had biweekly 90 minute sessions. PTSD symptoms were assessed on the Post-Traumatic Diagnostic Scale (PDS)

at baseline, post-treatment, and at a one month follow-up. The results supported the researcher's hypothesis and showed the hypnosis intervention to be significantly more effective than the Zolpidem pharmacotherapy at reducing PTSD symptoms ($p < 0.001$). The hypnotherapy group scored an average of 35.9 at baseline, 27.5 post-treatment, and maintained their gains at the follow-up assessment (26.7) versus the Zolpidem group who scored 37.5 at baseline and 36.5 post-treatment which faltered little at follow-up (36.9). The findings suggest hypnosis to be a short-lasting treatment modality in addition to being more effective than other interventions.

Music therapy is also supported in the literature to be effective at reducing PTSD symptoms. Carr et al. (2011) assessed the impact of a 10-week group music therapy on reducing PTSD symptoms. The researchers expected the music therapy to modulate and reduce affect responses of PTSD while the group setting would address symptoms of avoidance. In a sample of 17 PTSD-positive patients who had previously completed Cognitive-Behavioral Therapy (CBT) but retained significant symptom scores at discharge on the Clinician-Administered PTSD Scale (CAPS), half of the sample was randomized into the 10-week, group music therapy treatment (N = 9) that met once per week for one hour and the other half was randomized to the control group (N = 8) who was offered the music therapy treatment after the study. PTSD symptoms were assessed on the Impact of Events Scale (IES) at baseline and post-treatment. The results of the study supported the researcher's hypothesis and showed a significant reduction in overall PTSD symptoms in the music therapy group when compared to the control group ($p < 0.0035$). More specifically, the IES scores for the group receiving the music therapy went from 52.69 to 30.87 and there was significant reductions in symptoms across all three IES symptomology subcategories of avoidance ($p = 0.0004$), hyperarousal ($p = 0.0150$), and re-experiencing ($p = 0.0463$). Thus, the findings of this study support the thesis hypothesis because the music therapy

group did produce a significant reduction in PTSD symptoms. The sample size was small and only 78% of the participants attended seven or more sessions, but the methodology was strong and the study included a follow-up assessment to verify long-term treatment effectiveness.

Finally, the CAM therapy with the weakest support in the literature for its ability to decrease Post-Traumatic Stress Disorder (PTSD) symptoms is transcendental meditation. One research study examining the transcendental meditation (TM) as a PTSD intervention was conducted by Monson, Schnurr, Resick, Friedman, Young, and Stevens (2006) and the findings of Rosenthal, Grosswald, Ross, and Rosenthal (2011) serve as comparative. They both examined treatment effectiveness for military personnel with Post-Traumatic Stress Disorder (PTSD) and diagnostically assessed PTSD symptom severity levels using the Clinician-Administered PTSD Scale (CAPS) and monitored symptomology with the PTSD Checklist –Military Version (PCL-M).

B. Evidence Refuting Hypothesis

A study conducted by Kearney, McDermott, Malte, Martinez, and Simpson (2013) most strongly refuted the thesis hypothesis. They assessed the effectiveness of a mindfulness-based stress reduction (MBSR) program compared to a treatment as usual (TAU) group through a randomized controlled trial on 47 veterans with Post-Traumatic Stress Disorder (PTSD). It was hypothesized that the MBSR group would have greater improvement in PTSD symptoms compared the TAU. They implemented the programs during the course of eight weeks, those in the MBSR program (N = 25) met once per week for 180 minutes with an additional seven hour meditation retreat session on the last Saturday of the program. The MBSR participants received homework assignments that included daily meditation for 45 minutes six days per week using CDs as a guide. PTSD symptoms were assessed using the PTSD checklist –Civilian (PCL-C) at

baseline, post-treatment, and at a four month follow-up. The results of the study did not concur with the researchers' hypothesis, there were no significant changes in PTSD symptoms scores from baseline to post-treatment for either group. The findings of this study strongly refute the thesis hypothesis, there were no observed PTSD symptom improvements for either group and the study was well executed and participants were closely regulated by the experimenters.

Another study examining the effectiveness and feasibility of mindfulness (Niles et al., 2012) compared the CAM therapy to psychoeducation for 33 veterans with combat related Post-Traumatic Stress Disorder (PTSD). The researchers hypothesized that a mindfulness telehealth intervention would be associated with a clinically significant reduction of PTSD symptoms at post-treatment and at a six week follow-up. The participants were randomly assigned to either the psychoeducation or mindfulness groups. In both groups, the participants first received tow in-person 45 minutes sessions which were followed by six weekly 20 minute telephone sessions and the PTSD Checklist –Military Version (PCL-M) was administered pre-treatment, post-treatment, and at a six week follow-up to assess PTSD symptoms. The participants in the experimental group were given a detailed handbook about mindfulness, a CD player, and disks with five to 15 minute guided meditations to use outside of the sessions. The results of the study did not support the study's hypothesis. The PCL-M average score dropped significantly from 52.8 at baseline to 42.8 at post-treatment, however the percentage of those with clinical improvement was less than 40%. At the six-week follow-up assessment, the scores rose to an average of 50.75 (*SD* = 12.27), which indicated a lack of long-term symptom relief. The results of the study function as refuting evidence to the hypothesis of the thesis because over 60% of the participants still had clinical PTSD and all symptom gains were not long-term.

In milder refutation, Karatzias et al. (2011) studied Emotional Freedom Techniques (EFT) and its compared treatment effectiveness differences to Eye Movement Desensitization and Reprocessing Therapy (EMDR) for Post-Traumatic Stress Disorder (PTSD). Their hypothesis stated that the EFT group would produce more significant improvement in PTSD symptoms than EMDR. The researchers blindly randomized 46 participants into either EMDR (N = 23) or EFT (N = 23) to test their hypothesis. Each treatment group took place over eight weeks with eight sessions once per week. PTSD symptoms were assessed using the Clinician Administered PTSD Scale (CAPS) and the PTSD Checklist (PCL) at baseline, pre-treatment, post-treatment, and at three month follow-up. The results of the study did not support the researchers' hypothesis because there was no difference between the two therapies. Both interventions produced significant PTSD symptom gains in an equal number of sessions and both treatment effect sizes were large (d = 0.80). In comparing the two therapies, the EDMR group slightly outperformed the EFT group but the difference was not significant. Therefore, the results of this study refutes the present hypothesis because the EMDR group did produce a slightly larger effect size than the EFT group and the study was well executed with a good methodology, an absent of bias, and had a respectable sample size.

In another study that found equivalent effect sizes between a CAM and a CEBT was piloted by Hollifield, Sinclair-Lian, Warner, and Hammerschlag (2007). They evaluated and compared the effectiveness of an acupuncture (ACU) treatment, a cognitive behavioral therapy (CBT) group, and a wait-list control (WLC) under the hypothesis that ACU would significantly reduce the symptoms of PTSD with effect sizes larger than the WLC and similar in magnitude to CBT. To test the hypothesis, 84 PTSD patients (32% male) participated in a randomized control trial over the course of 12 weeks. During this time, ACU met twice a week for one hour, CBT

met once a week for two hours, and WLC received no intervention. Assessment of PTSD symptoms were taken at baseline, post-treatment, and at a three month follow-up using the Post-Traumatic Symptom Scale- Self Report (PSS-SR). The results of this study supported the researchers' hypothesis. The reduction of PTSD symptoms observed in the ACU and CBT groups were both significant with large effect sizes when compared to WLC. Specifically, the PSS-SR scores for WLC was 30.79 at baseline and 27.92 at post-treatment and at the follow-up. For CBT, the participant's scores were 32.52 at baseline, 20.02 post-treatment, and 16.68 at follow-up. Finally, ACU scored 31.33 at baseline, 15.65 post-treatment, and 15.42 at follow-up. This study had a strong methodology with multiple measures of the PTSD symptoms across time to assess the validity of each treatment protocol. In relation to the present thesis hypothesis, this study serves as a refute because both ACU and CBT produced similar symptom reduction with large effect sizes.

The findings with the weakest refutation to this thesis evaluated the effectiveness of a yoga program as an adjunctive therapy for improving post-traumatic stress disorder (PTSD) symptoms (Staples, Hamilton & Uddo, 2013) in 12 veterans at an outpatient program for PTSD at a Veterans Affairs Hospital. Staples et al. (2013) hypothesized that a yoga program will reduce PTSD symptom severity, their expectations were not further specified. The yoga program was taught by three certified yoga instructors and the intervention took place over the course of six weeks with one hour sessions held twice a week. The program emphasized traditional healing by incorporating postures, visualizations, and breath coordination. PTSD symptoms were assessed on the PTSD Checklist –Military (PCL-M) at baseline and post-intervention.

The results of this study refuted the researchers' hypothesis because significance was not found in the pre- and post- measures on the PCL-M for overall scores. At baseline the average

score was 58.2 and at post-intervention the average score was 57.1. An unexpected change, however, did occur in the hyperarousal sub-category of the PCL-M in which hyperarousal symptoms did significantly improve ($p = 0.014$). Therefore, the results of this study refute the thesis hypothesis. Despite the lack of overall PTSD symptom improvement, however the significant improvement in the hyperarousal symptoms are important to note for this thesis because it suggests yoga to be an effective complementary therapy in reducing specifically the hyperarousal symptoms.

D. Evidence with Mixed Findings

All of the studies that provide mixed evidence to this thesis evaluate various mindfulness or spirituality interventions. Bormann is a leading researcher in a spirituality intervention named Mantram Repetition Program (MRP) and three of their studies evaluating MRP were included in this thesis. The first of these was done by Bormann with Thorp, Wetherell, and Golshan (2008) and they assessed the effectiveness and feasibility of the MRP spiritual practice for the management of PTSD symptoms in veterans. The researchers developed the spirituality intervention to be in a group setting. There is no specific hypothesis stated, however it is apparent the researchers expected the spiritual intervention to be effective at reducing PTSD symptomology. To assess the intervention, 29 veterans were randomly assigned to receive either the MRP, implemented in conjunction with their usual care, or to the control group receiving only their usual care. The MRP intervention was implemented over six weeks with 90 minute sessions once per week and participants were encouraged to repeat the mantras as much as possible throughout every day. The participants' PTSD symptoms were assessed pre- and post-intervention using the self-report PTSD Checklist (PCL) and the Clinician-Administered PTSD Scale (CAPS). The Cohen's d effect sizes for the treatments pre- and post- measures were

reported and supported their hypothesis. Precisely, the PCL calculated large improvement in PTSD symptoms (d = -0.072) and the CAPS assessed the participants to have mild symptom improvement (d = -0.033), thus giving support to this thesis hypothesis. The study's design was strong in that it employed randomized control, but its strength of support is mild because their invention implementation was adequate due to a lack of participant monitoring, which provided higher external validity to the study.

The second study analyzing the Mantram Repetition Program (MRP) pioneered by Bormann was done so later with colleagues Wetherell, Golshan, and Lang (2013). They implemented another randomized controlled trial to examine the Mantram Repetition Program (MRP) in 146 veterans (97% male). These participants were randomized to receive MRP with their usual treatment (N = 66) (MRP+TAU) or to continue with only their treatment as usual (N = 70) (TAU). Those in the MRP+TAU group had the standardized weekly 90 minute group sessions of MRP for 6 weeks. Their PTSD symptoms were assessed using the PTSD Checklist (PCL) and the Clinician Administered PTSD Scale (CAPS) at baseline, pre-treatment, and at a six weekly follow-up. The results showed MRP+TAU was more effective at reducing symptom scores on both the PCL and the CAPS ($p = 0.05$) with a small effect size ($\eta^2_p = 0.03$). The MRP+TAU average PCL scores dropped -5.62 points and the CAPS showed 24% with clinically meaningful change. Improvements, however, relied on the participants ability to improve their spiritual awareness, which the researchers quantified in this study using the Functional Assessment of Chronic Illness Therapy- Spiritual Well-being Scale (FACIT-Sp). They found that from pre- to post-treatment FACIT-Sp scores significantly improved ($p = 0.0001$) with a large effect size ($\eta^2_p = 0.03$). As a result, Bormann et al. (2013) concluded that they FACIT-Sp scores facilitated the

gains observed in PCL and CAPS. Therefore, the findings of this study give mixed evidence to this thesis.

The final study observing mantram repetition is one of Bormann's latest published studies in which Bormann co-investigated with Oman (2014). The pair compared the mantram repetition program (MRP) against a control group receiving their treatment as usual (TAU) to assess the effectiveness of managing PTSD symptoms in a military veteran sample. The researchers again did not report a specific hypothesis but from their introduction it was evident they expected the MRP to have a positive influence on PTSD symptoms severity. To test this, 132 veterans with PTSD were randomized to receive either the MRP or TAU. Those in the MRP group chose a short, sacred phrase. These phrases were to be repeated silently throughout the day to interrupt unwanted thoughts and to improve concentration. The participants also met with an instructor for six weekly 90 minute sessions. The strength of the participants PTSD symptoms were assessed pre- and post-intervention using the Clinician Administered PTSD Scaled (CAPS). The results of the study supported the researchers hypothesis as the data revealed a mild improvement in PTSD symptoms (Cohen's $d = -0.39$) and the MRP positively affected self-efficacy ($p < 0.01$). The results of this study provide mixed evidence for the present thesis because the MRP treatment effects on self-efficacy mediated the CAPS scores ($p < 0.05$). In other words improved PTSD symptoms were contingent upon the participant's ability to increase their self-efficacy.

"Building Spiritual Strength" (BSS) is another spirituality based intervention currently being researched. Harris and co-researchers (2011) assessed the effectiveness of the intervention in reducing symptoms of PTSD in a veteran sample. They hypothesized that a spiritually integrated intervention for military veteran trauma survivors would be effective in reducing their PTSD symptoms as measured by the PTSD Checklist (PCL). To test their hypothesis, the researchers

randomized 54 veterans (89% male) to receive BSS (N = 26) or to a waitlist control group (WLC) (N = 28). Those in the BSS group took part in eight interfaith, manualized group sessions lasting two hours each once per week. The data from the study supported the hypothesis that the BSS would reduce symptoms of PTSD. At post-intervention, 46% of the BSS group and 69% of the WLC still had clinical PTSD. Specifically, on the PCL, pre- and post-intervention mean scores went from 48.32 to 49.31 for the WLC and from 42.53 to 37.09 for the BSS group producing a difference of 12.23 points between groups at post-intervention which exceeds the threshold for clinical significance. The results give mixed evidence to the thesis hypothesis because the researchers also reported that minorities showed enhanced benefit from the BSS and it was concluded that greater spiritual skillset facilitates improved PTSD scores.

In addition to spirituality approaches, mindfulness interventions were also predominantly mixed in evidence for this thesis and three were included for evaluation in this thesis. The first mindfulness study with mixed findings was conducted by Owens, Walter, Chard, and Davis (2011) who assessed the relationship between mindfulness skills and PTSD symptom severity levels in a sample of veterans. The researchers hypothesized that mindfulness skills would increase over the course of treatment and, as those skills improved, the result would be yield a positive change in PTSD symptoms. Their study was executed using 149 veterans who participated in a residential mindfulness treatment program that also included Cognitive Processing Therapy. The program took place over seven weeks in a group setting and included weekly sessions taught by a teacher of the principles of mindfulness. The participants were encouraged to practice their mindfulness skills outside of the sessions, but it was not assigned through homework. Symptoms of PTSD were diagnostically assessed on the Clinician Administered PTSD Scale (CAPS) and on the PTSD Checklist (PCL) at pre-treatment and at

post-treatment, plus the researchers monitored the participant's mindfulness skills using the Kentucky Inventory of Mindfulness Skills (KIMS). Overall, the results partially supported the researcher's hypothesis and for this thesis provides mixed evidence with greater strength in refutation than supporting. They found that the veteran sample's mindfulness skillset on the KIMS did not make meaningful change during the program. There were a few who did, and of those who improved their mindfulness skills on the specific subscale of awareness mindfulness, they experienced slight improvement on the both the CAPS and the PCL scores ($p < 0.05$). Additionally, women scored higher on mindfulness skills than men and therefore made greater improvements in their PTSD symptoms. The researchers' report of limited mindfulness skill change calls concern to the mindfulness intervention since PTSD symptom improvements are mediated by improvements in mindfulness skills which suggests the program does not clearly resonate with the veterans.

The second mindfulness based intervention was completed by Kearney and their colleagues (2012) who sought to evaluate the effectiveness of a mindfulness-based stress reduction (MBSR) program on a veteran sample under the hypothesis that the MBSR program will positively influence Post-Traumatic Stress Disorder (PTSD) symptoms. Symptoms were assessed using the PTSD Checklist –Civilian (PCL-C) at baseline, post-treatment, and at a four month follow. Seventy male and 27 female veterans with PTSD participated in an eight week MBSR course that met once per week for two and a half hours with an additional seven hour session on the last Saturday of the program. Homework assignments included daily meditation or yoga for 45 minutes six days per week using CDs as a guide. The results mildly supported the researcher's hypothesis and showed only 47.7% of the veterans clinically improve in their symptoms from baseline. There were small to medium effect sizes observed in the PCL-C subscales for re-

experiencing (d = -0.40), avoidance (d = -0.36), and hyperarousal (d = -0.64). All gains on the PCL-C relied on the patient's ability to increase their mindfulness skills and so this study serves as mixed evidence for the present thesis.

The final study examining mindfulness based interventions and for this this was done by Nakamura, Lipschitz, Landward, Kuhn, and West (2010). The researchers conducted a randomized controlled pilot study on a mind-body awareness training program utilizing mindfulness meditation called Mind-Body Bridging (MBB). They assessed its effect on 63 veterans (95% male) with self-reported sleeping disturbances. Participants were randomized to either receive two, weekly 1.5 hours MBB sessions or to receive two, weekly one hour sessions of a sleep hygiene program (SHP) that teaches skills to normalize and maintain a sleep pattern. Mindfulness was measured as a primary outcome on the 5-Factor Mindfulness Questionnaire (5F-MQ) and PTSD symptoms were monitored using the PTSD Checklist –Military (PCL-M) as a secondary measure at pre- and post-treatment. The researchers accurately hypothesized that those in the MBB group would exhibit significantly greater improvements in sleep that would in turn also improve PTSD symptoms compared to SHP. The results yielded significant reductions in PCL-M scores for all participants in the MBB and not in the SHP (p = 0.029). For those who scored above the diagnostic criteria for PTSD at baseline (N = 20) in the MBB showed even greater reductions at post-intervention (p = 0.001). Since the changes in mindfulness skills were noted, the researchers were able to definitively conclude that the improvements in PTSD symptoms relied on the patient's ability to increase their mindfulness which constitutes this study as having mixed findings for the present thesis.

IV. Discussion

A. Summary of Studies Evaluating Emotional Freedom Therapy and Acupuncture.

The Complementary and Alternative Medicine approaches with the greatest efficacy in the literature for treating Post-Traumatic Stress Disorder (PTSD) in a veteran population are Emotional Freedom Therapy (EFT) and acupuncture treatments. Emotional Freedom Therapy consistently produces reductions in PTSD symptomology that are significant with large effect sizes (Church et al., 2013; Church & Brooks, 2013; Church, 2010; Karatzias et al., 2011). The EFT study that found the most compelling evidence for its ability to reduce PTSD symptoms was conducted by Church et al. (2013) whose results yielded a significant difference in treatment effectiveness for EFT compared to a treatment as usual condition ($p < 0.0001$) in a sample of 59 veterans. All of the gains in PTSD symptomology, as measured by the PTSD Checklist –Military (PCL-M), were upheld at both the three month follow-up and the six month follow-up which indicates that EFT has outstanding effects on the patient.

To further examine the long-term gains in PTSD symptoms due to EFT, Dawson Church (2010) executed a longitudinal study over the course of one year using an EFT intervention that lasted only five days. There was noticeable impact on the PTSD Checklist –Military (PCL-M) at post-treatment as a result of the therapy ($p = 0.001$). The average drop in PCL-M scores was 40 points which is four times more then what is considered to be clinically meaningful change. The significant improvements in PTSD symptoms were also maintain throughout the next year of monitoring which shows EFT to be a quick intervention that produces long-standing PTSD symptom improvements.

The research conducted by Karatzias et al. (2011) on Emotional Freedom Therapy (EFT) refuted the present hypothesis that CAM's are superior to current evidence-based treatments

because the results revealed that EFT was not significantly better than Eye Movement Desensitization and Reprocessing Therapy (EMDR), they were of the same effect size ($d = 0.80$). Regardless of the miscalculated thesis prediction, EFT still proved itself to be successful at reducing the symptoms of PTSD in a veteran population (N = 46) quantified by both clinician-assessed and self-report measures which does maintain the notion that EFT is an effective treatment for reducing PTSD symptoms. This is especially so because the interventions took place in an equal number of sessions over the same eight week period.

The interesting aspect of EFT is that the core of the treatment is based on acupuncture techniques and acupuncture is also strongly supported in the literature. Engel et al. (2014) used 55 service members with PTSD to look at the comparative difference between an experimental group receiving acupuncture with their usual treatment (ACU+TAU) and a control group who received only their usual treatment (TAU). They found that outcome measures on both the Post-Traumatic Stress Disorder Checklist –Civilian (PCL-C) and the Clinician Administered PTSD Scale (CAPS) revealed ACU+TAU to have significantly greater improvements than TAU ($p < 0.0001$) from pre- to post- measures and PTSD symptom reductions were maintained at eight and 12 week follow-ups. Hollifield et al. (2007) also observed significant reductions in PTSD symptoms as a result of a 12 week acupuncture treatment when compared to a waitlist control ($p < 0.01$) but the findings did not support the thesis hypothesis because cognitive behavioral therapy was effective in equal strength and treatment gains held at a three month follow-up assessment. Conclusively, acupuncture and emotional freedom therapy are both viable treatments for treating Post-Traumatic Stress Disorder. The veteran population positively responses to these interventions and their symptoms are significantly reduced post-treatments and then maintained at follow-up assessments.

B. Summary of Studies Evaluating Mindfulness, Meditation, and Spiritual Interventions.

Guided meditations and hypnotherapy approaches are superior to all other meditation interventions. The potential reason for this is that most meditation or mindfulness interventions examined in this thesis rely more on the individual's mindfulness skills and their personal ability to improve these skills through the therapy (Owens et al., 2011; Kearney et al., 2012; Nakamura et al., 2010). Transcendental meditation (TM) and hypnotherapy, on the other hand, are forms of mediations that are led by an instructor and both influence significant reductions in PTSD symptoms. Abramowitz et al. (2008) compared hypnotherapy to a Zolpidem pharmacological treatment and found that hypnotherapy produced more significant PTSD symptoms ($p < 0.001$). The combined study of Rosenthal et al. (2011) and Monson et al. (2006) observed that when compared to a waitlist control, TM showed significant improvements on the PCL-M ($p < 0.02$) and on the CAPS ($p = 0.02$) but the comparative group receiving Cognitive Processing Therapy (CPT) did not. Barnes, Rigg, and Williams (2013) conducted a three person clinical case series to observe and document the effects of a four day transcendental meditation (TM) course on PTSD symptom reduction in three veterans. All patients experienced clinically significant reductions and reported a high likability of TM. All three soldiers reported similar gains from the treatment which are as follows: a positive change in affect, going from somber or angry to cheerful, less irritable, and more energetic; a return of self-interest and care that was materialized through personal grooming and appearance; improved sleep; that they continued TM regularly outside of the study because it decreased anxiety and irritability; and all asked to return for the next group of TM trainees for its continued benefit and to encourage others to join.

The other mindfulness and meditation interventions include auditory CDs (Kearney et al., 2013; Niles et al., 2012) that are assigned to facilitate the participant's meditation practice, but

these studies do not produce the significant improvements in PTSD symptoms that are seen in guided meditation and hypnotherapy. It can be then concluded that the physical presence of a teacher of mindfulness leading the participant in a mediation practice is a crucial element for seeing therapy effectiveness. These findings indicate that those in the veteran population are more responsive to meditation approaches when there is a practitioner teaching meditation through a guided practice. Otherwise, the strength of effect of meditation interventions on PTSD symptoms in a military population is highly variable because they do rely more on the patient's mind-body connectedness skills.

The same is true for spirituality interventions. The difference is that instead of relying on a mindfulness skillset based in personal awareness, spirituality interventions rely on the participant's ability to increase their spiritual awareness. Bormann et al (2013) found that a mantram repetition program using sacred phrases was more effective at reducing PTSD symptoms than a group receiving their usual care ($p = 0.05$) and this was concluded in an earlier study as well (Bormann et al., 2008) in which a large effect size ($d = -0.72$) was shown on self-report measures and a small effect size ($d = -0.33$) on the clinician assessed measure. The study by Bormann et al. in 2013 also documented changes in spiritual well-being and found that improved spirituality improved PTSD symptoms. Their most recent research (Oman & Bormann), however, found refuting evidence for their MRP. The fact that the same program implemented in three studies led by the same researcher has produced such mixed findings contests to their conclusions that the spirituality programs are only successful if the patient can alter their consciousness to be more spiritually aware. The nature of how to influence the change of spiritual awareness in patients is unclear because spirituality is very personal and widely variant.

The study by Harris et al implemented a program that was directed at building spirituality awareness in veterans called Building Spiritual Strength (BSS). They found support for their hypothesis that the BSS would reduce symptoms of PTSD by elevating spiritual awareness. At post-intervention, 46% of the BSS group and 69% of the WLC still had clinical PTSD. Therefore, it can be settled that greater spiritual skillset facilitates improved PTSD scores in spirituality interventions.

Conclusively, meditation and spirituality interventions are not a strong enough to stand alone in treating PTSD among veterans. The issue is that if there's no practitioner to guide and teach veterans about these skills, then the efficacy of the treatment relies entirely on the patient. If they cannot achieve higher spirituality or meditation skillsets on their own, or if they don't know how to do so, then the treatment is completely ineffective. The strength of these meditation practices is that there is absolutely no risk in trying them. (Owens et al., 2012; Bormann et al., 2013) So, even if meditation or spirituality programs do not directly reduce PTSD symptoms, if a patient feels they are benefiting from the practice then there is no harm in allowing them access to these kinds of therapies. Whether these practices are beneficial to PTSD symptomology is still unclear in the literature and further research is needed.

C. Summary of Studies Evaluating Yoga

Only two studies examining yoga were used in the present thesis, but the results of these studies are meaningful to the field of Post-Traumatic Stress Disorder (PTSD) treatment. Seppälä et al. (2014) found supporting evidence for the effects of Sudarshan Kriya (SK) yoga on the symptoms of PTSD on the PTSD Checklist –Military (PCL-M) when compared to a waitlist control (WLC) group. Overall PCL-M scores produced large effect sizes post-treatment in the SK yoga group when compared to the WLC (d = 1.16). Hyperarousal symptoms decreased most

significantly ($p < 0.001$) in the SK yoga group compared to other subscales of the PCL-M, but these changes were not seen in the WLC. Staples et al. (2013) on the other hand found refuting evidence for a Krishnamacharya Healing (KH) yoga program because no changes in PTSD symptoms were found on the PTSD Checklist –Military (PCL-M). In fact, mean scores of pre- and post- measures only decreased by one point. An unexpected change, however, did occur in the hyperarousal sub-category of the PCL-M in which hyperarousal symptoms did significantly improve ($p = 0.014$). But, despite these opposing findings, both studies experienced significant improvement in their hyperarousal symptoms. The implications of these findings is potentially very encouraging because the current commonly used evidence-based treatment have not demonstrated themselves to be successful at improving the hyperarousal symptoms of PTSD (Staples et al., 2013).

Additionally, Seppälä et al. (2014) examined Sudarshan Kriya (SK) yoga and Staples et al. (2014) examined Krishnamacharya Healing (KH) yoga which may have also accounted for the mixed findings. SK yoga is a gentle yoga with an emphasis on meditation in conjunction with stretches whereas KH yoga is more physically demanding which multiple poses included in the practice. Therefore, it is a possibility that the more physically demanding yoga influences the patient more like physical exercise rather than a psychological healing activity.

Regardless, it can be conclusively assumed that yoga is successful at reducing the hyperarousal symptoms of PTSD and thus, could be a positive complementary therapy to the evidence-based treatments regardless of the CAM therapies ability to reduce overall PTSD scores. More research is needed to further explore the use of yoga in PTSD treatment.

D. Strengths of Results

1. Assessable Treatments with Low-risk and Long-term Symptom Improvements

The greatest strength of Complementary and Alternative Medicine therapy for Post-Traumatic Stress Disorder is that the therapies are affordable and are low-risk treatments to the patient. The affordability of the therapies is expressed through the long-term symptom improvements that CAM''s produce that from a single round of the therapy's protocol (Church et al., 2013; Church, 2010; Abramowitz et al., 2008; Engel et al., 2014) which means those patients who have received their therapy will have a decreased likelihood of relapsing into a PTSD episodic state. The CAM therapies are also affordable because they can be used in a group setting to attend to multiple patients at once (Church & Brooks, 2014; Seppäla et al., 2014; Bromann e al., 2013). The potential for group settings is not only cost-effective for the VA Healthcare system and to the patient, but they also create a supportive environment of trauma-survivors that decreases the stigma of admitting symptoms of Post-Traumatic Stress Disorder that is so commonplace among veterans which in turn motivates treatment seeking behavior in a reluctant population (Harris et al., 2011). The low-risk element of the CAM therapies also encourages veterans to seek out therapy for their PTSD because doing so has no risk of worsening symptoms, there is only the potential for improvement.

2. Randomized-Controlled Trials

Of all the studies used in this thesis, 73 % of them used randomization. Most randomized their experimental CAM therapy against those receiving their treatment as usual. For the state of the current PTSD treatment literature being so new, the high percent of randomized trials was unexpected and allows for more confident conclusions about CAM therapy efficacy for PTSD treatment in a veteran population.

E. Limitations of Results

1. Limited Studies with Women

The majority of the samples used in the studies for this thesis were male dominant and no conclusions can be made about the efficacy of Complementary and Alternative Medicine (CAM) therapies for women. The majority of the military population is male, which means that the participants of the thesis are representative of the population. Even so, it is important not to under look women in PTSD treatment development. Owens et al. (2011) found that women were better at increasing mindfulness skills than men which indicates that CAM's could be even more effective at treatment women with PTSD than men because they may have unique or differing mechanisms than men underlying their affects and change in functioning related to their symptoms.

2. Methodological Inconsistencies

As previously mentioned, the literature on Complementary and Alternative Medicine therapies as a whole is in its infancy and currently the goal of research is to identify which CAMs are effective and which are not. As a consequence, there are disparities between how CAM therapies are executed, even for same kind of CAM. This is not unexpected, but it does notify the field of a need to standardize the implementation of CAMs.

D. Conclusions and Impact of Findings

1. Conclusion Statement

Conclusively, as a whole Complementary and Alternative Medicine (CAM) therapies were not shown to be significantly superior to other therapies. The findings did indicate that select CAM therapies have valid, clinical implications for the reduction of PTSD symptoms in a veteran population. Acupuncture and Emotional Freedom Therapy (EFT) currently have the

strongest support in the literature and the findings of this thesis show that these kinds of therapies have strong validity and feasibility for clinical settings. EFT implements acupuncture techniques which suggests acupuncture in and of itself has profound effects on the symptoms of PTSD through its interactions with the meridians and energy fields. Conclusions on whether or not it is appropriate to replace a current therapy with either EFT or acupuncture cannot be drawn from the data in this thesis and more research on the two therapies is warranted. Hypnotherapy, yoga, and healing touch therapies have mild support. Yoga programs were unique in their effect on PTSD treatment because they are the most effective at decreasing hyperarousal symptoms which indicates yoga to be a positive complementary therapy to a PTSD-positive patient but not effective enough to stand as an alternative intervention.

The refuting evidence for complementary and alternative medicine (CAM) in the treatment of military related Post-Traumatic Stress Disorder (PTSD) is primarily seen in studies that only use mindfulness intervention programs or the results found that the compared therapies of CAM versus CEBT have equal effect sizes. Furthermore, all mixed findings observed mindfulness and spirituality treatment programs. The effectiveness of these therapies is contingent upon the patient's ability to increase their mindfulness or spirituality skills. Thus, the literature shows that mindfulness and spirituality inventions on their own are not powerful enough interventions to treat such an extreme anxiety disorder as PTSD in a veteran population. In this context, the current evidence-based treatments would be a better treatment modality than a CAM based in meditation. Further research is needed to determine if a mindfulness treatment plan or spirituality program implemented in conjunction with another therapy would be useful or not.

2. Impact of Results on Post-Traumatic Stress Disorder Treatment for Veterans

The ecological impact of these findings provide a direction towards improving the state of Post-Traumatic Stress Disorder treatment by offering therapies that produce long-term symptom improvements that are assessable, affordable and that are low risk to the patient. The rapid regression of symptomology in PTSD patients suggests that CAM therapies can increase the number of patients a clinician is able to see.

3. Translational Implications of Findings

Treating Post-Traumatic Stress Disorder in a veteran population is a difficult task because of all the complexities involved with their trauma. This is a population that is typically resistant of treatment seeking behavior and often report dissatisfaction with current therapies. The high response rates of CAMs for PTSD suggest that the insights gained can potentially be translated to treat the general population with other anxiety and depression disorders once standardization of CAM approaches occur. Thus, this thesis procures a progressive direction for the ultimate goal of therapy which is to reduce PTSD symptoms in full instead of merely reducing symptomology to mild-PTSD symptom scores because of the rapid regression of symptoms seen in CAM therapies and their high likability and adherence rates.

G. Future Directions

1. Direction for Discipline.

More research is needed to assess, isolate, and standardize CAM therapies for the treatment of PTSD in different veteran populations. The literature is still mixed and is need of further development and insight into the mechanisms that produce the improvement symptomology of Post-Traumatic Stress Disorder.

2. Proposal of a Subsequent Study

Post-Traumatic Stress Disorder patients have been shown through the literature to be responsive to Acupuncture treatments and Emotional Freedom Therapy (EFT). Future research should direct its focus on examining the clinical effects of Acupuncture and EFT through randomized-controlled trials that implement an experimental group, a comparative group receiving a current evidenced-based treatment, and a wait-list control. Measures of PTSD symptoms should be quantified using the Clinician-Administered PTSD Scale (CAPS) and the PTSD Checklist –Military Version (PCL-M) across multiple measures, including at the minimum a pre-treatment, post-treatment, and one 30 day follow-up assessment. A longitudinal study measuring symptoms for one year is ideal if feasible.

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