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Treating Trauma Among Veterans Using Complementary and Alternative Medicine: A Systematic Review

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**Treating Trauma Among Veterans Using Complementary and Alternative Medicine:
A Systematic Review**

by

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MSW Clinical Research Paper

Presented to the Faculty of the

School of Social Work

St. Catherine University and the University of St. Thomas St. Paul, Minnesota

in Partial fulfillment of the Requirements for the Degree of

Master of Social Work

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The Clinical Research Project is a graduation requirement for MSW students at St. Catherine University/University of St. Thomas School of Social Work in St. Paul, Minnesota and is conducted within a nine-month time frame to demonstrate facility with basic social research methods. Students must independently conceptualize a research problem, formulate a research design that is approved by a research committee and the university Institutional Review Board, implement the project, and publicly present the findings of the study. This project is neither a Master's thesis nor a dissertation.

Abstract

In this systematic review, literature and empirical intervention studies pertaining to the treatment of trauma among veterans using a Complementary and Alternative Medicine was analyzed. Using two databases, PsycINFO and PILOTS, 10 studies were located and key data was identified on theoretical foundations, therapy components, populations being served, as well as outcomes of interventions treating trauma among veterans via Complementary and Alternative Medicine. Each study was analyzed in full, to determine types of Complementary and Alternative Medicine interventions as well as results of the interventions utilized. The findings produced two major themes of Complementary and Alternative Medicine research treating trauma among veterans; Mindfulness-based and non-mindfulness based practices. The findings suggested that all interventions studied showed promising results in Complementary and Alternative Medicine interventions treating trauma among veterans, and implications for future research should focus on additional research and inquiry into the use of Complementary and Alternative Medicine treating trauma among veterans.

Keywords: complementary and alternative medicine, trauma, posttraumatic stress disorder (PTSD), veterans

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Introduction

Despite large scale efforts to support veterans since the post 9/11 wars began, mounting evidence suggests that both evidence-based talk therapies and psychopharmacological interventions fall short of adequately treating those whom experience posttraumatic stress disorder (U.S. Department of Veteran Affairs [VA], 2014). In hopes of finding alternative options for veterans facing Posttraumatic Stress Disorder (PTSD) and traumatic stressors after war, holistic approaches—commonly referred to as Complementary and Alternative Medicine (CAM)—have become increasingly recognized as viable treatment options for supporting military-connected populations (Strauss, Lang, & Schnurr, 2017). While limited evidence supports the effectiveness of CAM in the treatment of PTSD (Strauss et al., 2017), additional research exploring these specific approaches for veterans experiencing PTSD is indicated.

The Problem Defined

There are a few concerns in the current treatment, or potential to receive treatment, of PTSD among veterans. These concerns include the cost to treat veterans with PTSD, barriers to receiving treatment, and medication concerns (overmedicating and medication overdose; VA, 2015a).

One of the headlining treatments in addressing the problem of PTSD in veterans is the use of talk-therapy. There are barriers to talk therapy, however, that have proved to provide increased drop-out rates and low turnover times. Per the VA (2014), barriers to adequately treating veterans using talk therapies include: veterans feeling they will get better on their own, problems getting care (denied coverage, finding a therapist, transportation, or cost), not knowing that PTSD treatments work, thinking that services are for other people and not veterans, and primarily stigma (Kim et al., 2010).

In recent news, it is often observed headlines pertaining to PTSD and veterans. In various texts, treatment of PTSD is being noticed as a concerning issue due to cost. Two-year costs associated with PTSD were projected at \$5,904 to \$10,298 per veteran. The report also states that using evidence-based treatments for PTSD and major depression could save as much as \$1.7 billion or \$1,063 per veteran (Tanielian et al., 2008).

Active duty members and veterans face barriers to receiving treatment as well. Per the United States Government Accountability Office [USGAO], 2011, “Some barriers that have been identified that may limit veterans’ ability and/or willingness to seek treatment may include long wait times; fear of personal embarrassment, shame, or being seen as weak; potential stigma; lack of understanding or awareness; logistical problems getting to treatment; concerns over treatment offered at the VA; and, demographic barriers” (United States Government Accountability Office [USGAO], 2011, p. 12).

Another concern, aside from the cost and the barriers, is the risk of medications to treat PTSD. Dr. Paula Caplan (2013), says the unknowns outweigh the benefits, “When some veterans could be taking upwards of 20 to 40 different pills a day, half of them psychotropic, the results can be unpredictable” (Caplan, 2013, para. 12). In addition to the amount of psychotropic medications available, barriers to accessing treatment for it, medication concerns, there is also the unfortunate fact that PTSD oftentimes does not find itself a lonely diagnosis. PTSD and a traumatic brain injury, as well as PTSD and a substance abuse disorder (SUD) can commonly occur comorbidity (VA, 2016a).

And finally, although the monetary cost of PTSD in veterans is high, the all-embracing cost is much more sobering. In the year 2014, more than 7,400 veterans took their own lives, accounting for 18 percent of all suicides in America (VA, 2014).

Addressing the Problem

In contrast to the barriers, talk-therapies are still being used in conjunction with other PTSD interventions. Basic psychotherapy, along with prolonged-exposure therapy, cognitive-processing therapy, stress-inoculation training, other forms of cognitive therapy, including cognitive restructuring and cognitive therapy and eye-movement desensitization and reprocessing (EMDR) have been utilized by the VA for treatment of PTSD among veterans, and have been proven effective. CAM can be used in junction with talk therapies or medications, or used solely on its own as an option for treatment (VA, 2016a).

Scope of Problem Summary

Summarizing the problem associated with present treatments, there are many concerns in relation to PTSD and its effect on veterans. Many service members do not complete a standard number of treatment sessions in an evidence-based treatment for PTSD. The average dropout rate was 23% (Steenkamp & Litz, 2013). Compared to combat veterans of other eras, recently returning veterans may hold more negative attitudes about treatment and dropout at a higher rate. Considering these challenges, pressure to develop increasingly effective and creative alternatives supporting veterans in the treatment of PTSD continue to mount (Goetter et al., 2015). The two-year costs associated with PTSD were projected at \$5,904 to \$10,298 per veteran (Tanielian et al., 2008). Active duty members and veterans face multiple barriers to receiving treatment as well, with some major ones being lack of resources or awareness, long wait times to receive services, and personal concerns with receiving treatment at the VA. Even one or two of these concerns are enough to start looking at other directions and options (USGAO, 2011). Roughly twenty veterans a day commit suicide nationwide, per data from the VA in 2014.

Social Workers' Role

Social work is one of many professions that practice mental health counseling and assist in treating the military population. Social work has grown and developed within the last several decades into a profession whose primary aim is to “enhance human wellbeing and help meet the basic human needs of all people, with particular attention to the needs and empowerment of people who are vulnerable, oppressed, and living in poverty” (National Association of Social Work [NASW], 2005).

Clinical social workers incorporate basic professional social work knowledge, while including clinical observation and diagnosis of their clients. Social workers help people overcome social and health problems, such as poverty, mental illness, child abuse and neglect, emotional instability, illness, economic uncertainty, domestic violence, traumatic incidents, and drug abuse. They work directly with individuals, couples, families, and groups to identify and overcome these problems. Some social workers also work with communities, organizations, and/or systems to improve services and/or administrate social and health programs (NASW, 2005).

Social workers are found in many settings, including private practice, mental health clinics, health clinics, schools, community agencies, public welfare, agency administration, and policy and planning (NASW, 1997-2002). While CAM has mostly been associated with the treatment of physical problems at medical facilities, it is becoming more common in the behavioral health field (Reardon, 2009). Practices such as acupuncture, herbal medicine, meditation, and massage have been touted as remedies for everything from addiction and depression to anxiety and insomnia. Social workers have eagerly incorporated CAM into their work. Knowledge of CAM's potential benefits and pitfalls is becoming essential for social

workers who want to empower clients to make wise choices regarding its use (Reardon, 2009). “There is a crucial role social workers can play in becoming very highly informed about these approaches so they can talk intelligently about them”... ..“then people can make up their own minds” on the care they choose to receive (Reardon, 2009, para. 5) .

Introducing this Systematic Review

The purpose of this systematic review is to examine empirical Complementary and Alternative Medicine (CAM) intervention studies used to treat PTSD among veterans. The goal of this research is to take the focus away from the present intervention options, and investigate authentic, applicable empirical research surrounding CAM and veterans suffering from PTSD. This research will examine the current literature on CAM interventions, and provide an inside look to empirical studies that may assist patients, client and practitioners in choosing alternative or ancillary treatment options, away from psychopharmacological and talk-therapy interventions.

Included will be a review of the findings, previous research, history behind PTSD, the neuroscience of trauma, and the notion that Complementary and Alternative Medicines, given its organic design, can assist in alleviating symptoms in PTSD by implementing the antidote of anxiety and will hopefully be a catalyst to the reduction of posttraumatic symptoms in veterans.

Literature Review

When reviewing the literature, there was a substantial amount of information on CAM interventions, as well as PTSD and veterans. In this literature review, PTSD, trauma diagnosis, research around PTSD and CAM, as well as CAM measures will be addressed. Presented will be the history of PTSD and CAM interventions, the neuroscience of PTSD and how it affects the brain, as well as an overall sense of mind-body interventions, to compare to the effects of PTSD. The goal of this literature review is to set a foundational framework for the research presented.

Historical Roots of PTSD

It is important to have a grasp on the historical context of PTSD in relation to this systematic review. PTSD has evolved significantly over the years, from the diagnosis terminology to the neurobiological science behind it.

Early Recognition of PTSD

Per Herman (1992), the history of trauma has been one of episodic amnesia. Periods of active investigation into the roots of psychological trauma have been alternated with periods of oblivion. Alternating between periods of research and curiosity, to ignorance and accusation, trauma has had held many names throughout history (Herman, 1992).

One of the first physicians to study a and curiosity, to ignorance, John Erichsen in the 1860s, treated individuals involved in railway accidents known as “railway spine” neurological symptoms suffered by those who suffered effects of trauma (Herman, 1992). Psychological trauma has held several names over the past few centuries, from hysteria to a more recently early 20th century “Shell Shock” in relation to soldiers (Herman, 1992).

PTSD in the 20th Century: Shell shock. An early recognition of PTSD in the twentieth century was the development of “Shell Shock”. In 1919, President Wilson proclaimed November 11th as the first observance of Armistice Day, the day World War I ended. At that time, some symptoms of present-day PTSD were known as "shell shock" because they were a reaction to the explosion of artillery shells (Friedman, 2013). "War neuroses" was also a name given to the condition during this time (Friedman, 2013). During World War I, treatment was varied. Soldiers often received only a few days' rest before returning to the war zone. In World War II, the shell shock diagnosis was replaced by Combat Stress Reaction (CSR), also known as "battle fatigue" (Friedman 2013).

The Development of PTSD as a Diagnosis. In 1952, the American Psychiatric Association (APA) produced the first Diagnostic and Statistical Manual of Mental Disorders (DSM-I), which included "gross stress reaction" (Friedman, 2013). This diagnosis was proposed for people who were relatively normal, but had symptoms from traumatic events such as disaster or combat (Friedman, 2013). The official designation of PTSD did not come about until the publication of the Third edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-III) in 1980 (Friedman, 2013).

Trauma Research

In the latest revision of the DSM-5 (2013), research sparked a catalyst of an evolved diagnosis yet again. PTSD in DSM-5 has expanded to include anhedonic/dysphoric presentations, which are most prominent. (Friedman, 2016). Such presentations are marked by negative cognitions and mood states as well as disruptive (e.g. angry, impulsive, reckless and self-destructive) behavioral symptoms. (Friedman, 2016). Furthermore, because of research-

based changes to the diagnosis, PTSD is no longer categorized as an Anxiety Disorder (Friedman, 2016).

The advances in trauma and PTSD research continue to make headway in the medical and psychological fields. Neurobiological research indicates that PTSD may be associated with stable neurobiological alterations in both the central and autonomic nervous systems (Friedman, 2016), and longitudinal research has shown that PTSD can become a chronic psychiatric disorder and can persist for decades and sometimes for a lifetime (Friedman, 2016).

Frontline Interventions in Treating PTSD

Psychopharmacological interventions. There is an exponential amount of literature and research that encompasses the treatment of PTSD by way of using psychopharmacological interventions. Per Gorman, (2007), psychopharmacology is the branch of medicine that specializes in the use of medication to correct psychiatric illness (Gorman, 2007).

Psychopharmacology medications fall into loose categories based on the chemistry of how they work in one's body or their primary effect on the central nervous system (Tilton & Tilton, 2015).

In treating veterans, there has only been one medication specifically that has been approved by the FDA to treat PTSD. The current evidence base for PTSD psychopharmacology is strongest for the selective serotonin reuptake inhibitors (SSRIs), and currently only sertraline (Zoloft) and paroxetine (Paxil) are approved by the Food and Drug Administration (FDA) for PTSD (Friedman, 2016).

Psychotherapy. Evidence based treatments for military-related PTSD include psychotherapy and pharmacotherapy options (VA and Department of Defense [DOD], 2010 as cited Moore & Barnett (2013)). Two individual psychotherapies with strong research support are prolonged exposure (PE) and cognitive processing therapy (CPT; Moore & Barnett, 2013).

Historical Roots of Complementary and Alternative Medicine (CAM)

Ancient history. The actual date of conception of the term and conception of “alternative medicine” is unknown, however some researchers believe it could date back over 5,000 years ago. It evidently began as an eastern medicine practice, and is known as one of the oldest forms of medicine tracing back through Chinese history (The Complete Herbal Guide, 2016). The ancient Chinese, in much the same way as alternative medicine, is used today, based their healing on the importance of the body and spirit being in balance. Much of the philosophy of Chinese Medicine is based on Taoist and Buddhist principals and the belief that a person and their environment are closely interlinked (The Complete Herbal Guide, 2016).

Modern history. As interest in and use of non-mainstream health care practices has evolved into “Western Medicine” and into United States over the past several decades, the terminology used to describe CAM systems, practices, and products has had to evolve as well. Historically, because many consumers appeared to be using unconventional health care practices as alternatives to conventional health care, the term "alternative medicine" was widely adopted in the United States and Europe in the later 1980s (Furnham & Smith, 1988). This perception, however, was largely dispelled by surveys in the early 1990's, which found that people were using the two systems of health care-mainstream and alternative-simultaneously (Eisenberg, Kessler, & Foster, 1993; Lerner & Kennedy, 1992). These surveys found that health care consumers were accessing a range of therapeutic and preventive options, both alternative and conventional, to essentially "complement" one another. Thus, the term "complementary medicine" was widely adopted not long afterwards to describe systems of health care and individual therapies that people used as adjuncts to their conventional health care (Ernst, 1995; Joyce, 1994).

Today, The National Institutes of Health (NIH, 2013, para. 1) has defined CAM as “a group of diverse medical and health care systems, practices, and products that are not presently considered to be part of conventional medicine.” The National Center for Complementary and Alternative Medicine (NCCAM, 2008) further classifies CAM therapies into five distinct categories, including,

“alternative whole medical systems (homeopathic and naturopathic, Chinese, and Ayurvedic medicine), mind–body interventions (meditation, prayer, mental healing, art, music, and dance therapy), Biologically-based therapies (herbs, foods, vitamins and other dietary supplements, including natural products such as shark cartilage), manipulative and body-based methods (chiropractic and osteopathic manipulation, massage) and energy therapies (*qi gong*, Reiki, therapeutic touch, and electromagnetic field exposure)” (NCCAM, 2008, para. 2).

These approaches have provided additional treatment options to patients and clients in the medical field, to assist in reducing physical and psychological symptoms (NCCAM, 2008).

Evolved CAM Research

As with any form of research, CAM research has had to adapt and evolve into the world of medicine and billable practice. People have used CAM practices for thousands of years in pursuit of health and well-being (NIH, 2013). However, rigorous, well-designed clinical trials for many CAM therapies are often lacking; therefore, the safety and effectiveness of many CAM therapies are uncertain. This is not an uncommon fact; oftentimes doctors will advise against CAM therapies because of the lack of research. The National Center for Complementary and Alternative Medicine (NCCAM, 2008) is presently sponsoring research designed to fill this knowledge gap by building a scientific evidence base about CAM therapies—whether they are safe, whether they work for the conditions for which people use them and, if so, how they work (NCCAM, 2008).

In 1999, NCCAM was established as the arm of the NIH to rigorously evaluate the safety and efficacy of CAM therapies, train researchers to conduct CAM research, and provide information to the public and health care professionals. Since its inception, NCCAM has funded more than 2,500 research projects to learn about how CAM therapies work as well as their safety and efficacy (NIH, 2013).

Recent CAM Research for veterans

There are a few studies available that measure the percentage of veterans whom use complementary and alternative treatments. Cohen, Li, and Chesney (2013), surveyed 683 veterans about their use of different therapies for PTSD; of the 292 veterans who reported using any therapy for PTSD, 24% used a complementary or alternative modality (generally meditation, yoga, or acupuncture), and 61% used a complementary or alternative therapy in conjunction with conventional treatments, such as psychotherapy or pharmacotherapy.

Many VA specialized PTSD treatment programs incorporate such complementary and alternative therapies as guided imagery, progressive muscle relaxation, and stress management–relaxation therapy, but there is considerable variability in what is offered in any program. In a survey of 125 of the specialized programs (outpatient, residential, and inpatient), 120 of them reported offering at least one complementary or alternative therapy (Libby, Pilver, & Desai, 2012).

Systematic Reviews

Strauss, Coeytaux, McDuffie, Nagi, and Williams (2011) conducted a systematic review, reviewing Randomized Controlled Treatments ("RCTs") within the CAM realm. The focus of this specific systematic review was to connect the relationship between mind-body CAM therapies. The systematic review identified seven RCTs and two nonrandomized studies of CAM

interventions for PTSD. This studies' review of relevant studies registered with www.ClinicalTrials.gov further suggests that this modest empirical foundation is growing (Strauss et al., 2011).

The term "CAM" encompasses a broad range of treatments—not all of which may hold the same level of promise as applications for PTSD. The current absence of a strong signal pointing to anyone CAM approach over others argues for investment in a set of adequately-powered trials to evaluate the most promising therapies, rather than a single large trial for any one treatment (Strauss et al., 2011).

Barriers to CAM

Not only are there barriers to conventional PTSD treatment and concerns of efficacy, there also lies concerns with CAM interventions. There have been various studies published that evaluate the efficacy of CAM and its ability to integrate itself into the conventional medicine world. Specifically, Gardiner, Filippelli, Lebensohn, and Bonakdar (2013) studied the barriers to CAM/Integrative Medicine (IM) interventions in a residency program. Barriers implementing CAM interventions included faculty training, financial resources to pay faculty, time in resident's schedules, access to experts in CAM/IM to teach residents, and lack of reimbursement for CAM/IM in clinical settings (Gardiner et al., 2013).

Upcoming CAM Approaches

Different CAM approaches have been studied in relation to the treatment of trauma in pain populations, as well as with veterans, specifically. Mind-Body practices can be highly effective in reducing symptoms of PTSD in military personnel, survivors of war and of mass disasters, and victims of abuse. These practices can be used to develop greater stress resilience (Brown, Gerbarg, & Muskin, 2009). Such approaches may be more acceptable to veterans

because they do not involve formal psychiatric diagnosis and are not associated with psychiatric treatments (Brown et al., 2009). Another benefit of CAM practices is that it can be done at any time of the day, in the home, away from people and at the patient's own pace, outside of sterile facility settings. Current multimodal programs that include yoga postures, breath practices, relaxation techniques, group processes and psychoeducation on stress reduction are particularly beneficial in today's CAM realm (Brown et al., 2009).

Yoga

Yoga has been around for centuries, and continues to excel in the research arena as a natural remedy with anxiety-reducing benefits. Seppälä et al. (2014) implemented a breathing study to observe alternative interventions for veterans with PTSD. Seppälä et al. (2014) states, "We examined the effects of a breathing-based meditation intervention, Sudarshan Kriya yoga, on PTSD outcome variables in U.S. male veterans of the Iraq or Afghanistan war," (Seppälä, 2014, p. 1), "Given the debilitating impact of PTSD on returning veterans, and the limited success of current interventions in this population, there is a need to expand the range of intervention options available, especially with respect to researching yoga" (Seppälä, 2014, p. 1). This study found that a breathing-based meditation intervention resulted in improvements on psychophysiological and symptom measures. Sudarshan Kriya yoga, a week-long intervention with longitudinal benefits, shows promise as a viable alternative or adjunct intervention for addressing PTSD and suicide in returning veterans (Seppälä et al., 2014). This study was used for this systematic review and will be dissected further.

Mindfulness

Mindfulness has been one of the more common CAM interventions that was studied in this systematic review. Mindfulness can be quick, in the moment, and directly affects the central

nervous system's response to anxiety. As the concept of 'mindfulness' comes to the forefront, John Kabat-Zinn has been a leader in expanding Mindfulness research (Raguso, 2008). Kabat-Zinn began in the early eighties studying mindfulness and its correlation with brain activity, as a measure to reduce anxiety, alleviate depression and provide an overall increase in quality of life (Raguso, 2008). In 1979, Kabat-Zinn recruited chronically-ill patients, who were not responding well to traditional treatments, to participate in his newly-formed eight-week stress-reduction program, which has now been developed into Mindfulness-Based Stress Reduction (Raguso, 2008). Since then, substantial research has mounted demonstrating how mindfulness-based interventions improve mental and physical health— as compared to other psychological interventions. "Mindfulness is awareness that arises through paying attention, on purpose, in the present moment, non-judgmentally," states Kabat-Zinn, "It's about knowing what is on your mind" (Raguso, 2008).

Meditation and the Brain

In an article release by the Harvard Press, Dr. Anne Fabiny (2014), discusses in length the stress response and the relaxation response. In short, stress quickens your heart rate, breathing and increases blood pressure. When you are constantly under stress, your adrenal glands overproduce the hormone cortisol. Overexposure to this hormone can affect the function of your brain, immune system, and other organs. Chronic stress can contribute to headaches, anxiety, depression, heart disease, and even premature death (Fabiny, 2014), common side effects associated with PTSD.

Per Fabiny (2014) and other researchers at Harvard University, one of the easiest and most achievable stress-relieving techniques is meditation - a program in which you focus your attention inward to induce a state of deep relaxation. Although the practice of meditation is

thousands of years old, research on its health benefits is relatively new, but promising. A research review published in Journal American Medical Association Internal Medicine in January 2014 found meditation helpful for relieving anxiety, pain, and depression. For depression, meditation was about as effective as an antidepressant (Fabiny, 2014).

Meditation is thought to work via its effects on the sympathetic nervous system, which increases heart rate, breathing, and blood pressure during times of stress (Fabiny, 2014). The goal of mindfulness and meditation is to defuse the stress response, which both therapies fall into the realm of CAM interventions. It is very hard to be anxious and stressed when your body is in a completely relaxed state. The autonomic nervous system is divided into two parts with opposite effects. The sympathetic nervous system revs up the body in response to perceived dangers, as described above (Fabiny, 2014). Its counterpart, the parasympathetic nervous system, calms the body after the danger has passed. If you are in a state of constant rush and stress, as a result, the sympathetic system often remains engaged long after it should have yielded to the soothing influence of the parasympathetic system (Fabiny, 2014). Again, mindfulness and meditation can clearly work ‘against the grain’ to produce a parasympathetic response and bring the body back to its normal state, or homeostasis.

Measures

Measures for CAM. A comprehensive database is The Cochrane Library, which is unique, both for its scope and for its methodological standards, and is supported through the work of the Cochrane Collaboration (National Institute of Medicine, 2005). The Cochrane Complementary Medicine Field, based at the University of Maryland Center for Integrative Medicine, coordinates all the CAM-related activities of the Cochrane Collaboration, including the development of a database with information on more than 7,000 controlled trials of CAM

therapies and modalities, and facilitates the preparation of CAM reviews and the promotion of these reviews, especially among the members of the CAM community (NIH, 2005).

Measures for PTSD. The VA (2016) has a list of various instruments, tools and questionnaires to measure PTSD. A positive response to the screen does not necessarily indicate that a patient has Posttraumatic Stress Disorder. Some of these tools include Chart Screens for PTSD, Beck Anxiety Inventory - Primary Care (BAI-PC), The Primary Care PTSD Screen (PC-PTSD), Short Form of the PTSD Checklist - Civilian Version, Short Screening Scale for PTSD, the SPAN, the SPRINT and the Trauma Screening Questionnaire (VA, 2016b).

The Potential for Harm

As with most research studies, the potential for harm can be hypothesized to be greater when asked to recall traumatic memories. It can be assumed that research, although extremely beneficial, comes with a price and a risk. In a study completed by Brown, Strauss, LaBar, Gold, McCarthy, and Morey (2014), the potential for harm among participants, whom have been diagnosed with PTSD and a control group whom has not been diagnosed, was observed. Conducting research with traumatized individuals poses an ethical challenge – such research seeks to improve the lives of trauma survivors, while simultaneously asking participants to recollect painful traumatic experiences or recount their trauma narratives. Consequently, trauma-focused research involves the risk of producing distress and possible exacerbation of symptoms among participants (Newman & Kaloupek, 2009).

As such, a comprehensive safety plan for careful assessment and intervention is an essential part of every research protocol involving traumatized populations (Brown et al., 2014). In addition, potential risks from study participation must be balanced against the need for a better understanding of PTSD (i.e., beneficence) through the conduct of ethically-informed PTSD

research (Brown et al., 2014). In sum, these findings support a favorable risk-benefit ratio in conducting research with traumatized individuals with PTSD but raise concerns about possible increased desire to use substances – perhaps related to time-of-day or test duration effects, which require further investigation (Brown et al., 2014).

Importance of Theory Informing Clinical Practice

The National Association of Social Work (NASW) defines clinical social work as “the professional application of social work theory and methods to the diagnosis, treatment, and prevention of psychosocial dysfunction, disability, or impairment, including emotional, mental, and behavioral disorders” (Barker, 2003). Drawing on knowledge of systems theory, person-in-environment orientation, psychodynamic theory, interpersonal dynamics, and family systems, clinical social workers shall be familiar with social, psychological, cultural, and health factors that influence the mental, emotional, and behavioral functioning of the client. They shall have knowledge of theories of personality and behavior and be aware of sociocultural and environmental influences, as well as conditions that have an impact on the physical and emotional state of the client (NASW, 2005). Social work practice thrives on theory established. Just as the medical field has science, testing and objective research, the social work field has theory, research and proven evidence-based practices to guide their profession. Without theory in social work, we would have little basis to understanding and conceptualizing what is effective in treating client populations. The main theories that drive clinical social work practice include systems theory, person-in-environment orientation, psychodynamic theory, interpersonal dynamics, and family systems (NASW, 2005).

Evidence-Based Practice

Evidence-based practice (hereinafter may be referred to as "EBP") is a process in which the practitioner combines well-researched interventions with clinical experience and ethics, and client preferences and culture to guide and inform the delivery of treatments and services (Social Work Policy Institute, 2010). The practitioner, researcher, and client must work together to identify what works, for whom and under what conditions. This approach ensures that the treatments and services, when used as intended, will have the most effective outcomes as demonstrated by the research. It will also ensure that programs with proven success will be more widely disseminated and will benefit a greater number of people (Social Work Policy Institute, 2010).

In social work, it is imperative that evidence-based practice is used when treating client populations. PTSD treatments have followed evidence-based practices because of their valid research results. The practice of EBP medicine means integrating individual clinical expertise with the best available external clinical evidence from systematic research.

Conceptual Framework

The purpose of conceptual framework is to provide a guide for the reader to understand the basic framework of the intervention, therefore leading to a better understanding of the overall concept. Providing a conceptual framework provides a rudimentary, ground-level understanding, to further advance knowledge, incite ideas and provide alternative perspectives to veterans experiencing trauma and PTSD. In this systematic review, Trauma-informed care is essential in dealing with veterans diagnosed with posttraumatic stress disorder, given their symptoms their posttraumatic symptoms after experiencing war.

Trauma-Informed Care

The theory used in this systematic review is stemmed from Trauma-Informed (TI) care, which also leads to a strengths-based approach. Trauma-informed practice incorporates assessment of trauma and trauma symptoms into all routine practice; it also ensures that clients have access to trauma-focused interventions, that is, interventions that treat the consequences of traumatic stress (Hopper, Bassuk, & Olivet, 2010). Recognizing that traumatic events made people feel unsafe and powerless, trauma-informed practice seeks to create programs where clients and staff feel safe and empowered. Generally, trauma-informed practice is organized around the principles of safety/trustworthiness, choice/collaboration/empowerment, and a strengths-based approach (Hopper et al., 2010).

Per Hopper et al. (2010), there are four principles of Trauma Informed Care; trauma awareness, safety, choice and empowerment, and strengths-based (Hopper et al., 2010).

The first, “Trauma Awareness,” will ensure those who are trauma-informed will understand the prevalence and impact of trauma among their service recipients and within the workforce. Staff training, consultation, and supervision are important aspects of organizational

change towards TIC and organizational practices should be modified to incorporate awareness of the potentially devastating impact of trauma (Hopper et al., 2010). Policy and practice reflect this awareness and may be supported with activities such as screening and assessments (Hopper et al., 2010). For service members who are in good health, trauma awareness may be relevant to them in supporting their fellow service members. For trauma awareness in serving our returning service members experiencing PTSD, understanding the prevalence and impact of trauma will only better serve mental health professionals and the service member in providing collaborating the best treatment. In relation to CAM, service members experiencing PTSD could benefit from psychoeducational tools around CAM and how it correlates with the neuroscience behind trauma in relation to mind-body complementary interventions.

Second, “Safety”, will ensure policy and practice reflect a commitment to provide physical and emotional safety for service recipients and staff, during their therapy (Hopper et al., 2010). Because trauma survivors often feel unsafe and may actually be in danger (e.g., victims of domestic violence), trauma-informed care works towards building physical and emotional safety for consumers and providers (Hopper et al., 2010). In relation to a service member in good health, providing safety and practicing safety as a universal precaution could help the service member if symptoms of PTSD do arise. Safety is an important concept when dealing with trauma affected clients, including returning service members. Veterans need to feel as if they are in a safe place during their therapy to be able to process the issues affecting them. If service members experienced trauma, they may have reduced awareness of it and could be educated on the importance of complementary medicines assisting with a safe environment. This could include utilizing CAM or mind-body relaxation techniques outside of professional supports in a moment of lapsed safety, when a client is having a flash-back or hyper arousal. Feeling safe may allow a

service member to further come in touch with their body and awareness to implement CAM in the moment.

Third, “Choice & Empowerment” are used to facilitate healing and avoid re-traumatization. Choice and empowerment are part of trauma informed service delivery, for both service recipients and staff (Hopper et al., 2010). They create predictable environments that allow consumers to rebuild a sense of efficacy and personal control over their lives. This includes involving consumers in the design and evaluation of service (Hopper et al., 2010). In service members who aren’t impacted by PTSD, choice and empowerment could be utilized to reduce any flashbacks one may experience, having a choice in handling their recovery and empowering them to deal with flashbacks to reduce potential a potential PTSD diagnosis. In relation to a service member whom is affected by PTSD, choice and empowerment used to facilitate healing and re-traumatizing the veteran population will help support them in their recovery and develop a strengths-based focus. In relation to a service member experiencing PTSD and CAM, choice and empowerment would be beneficial in allowing the service member the opportunity and empowerment to utilize CAM whenever they feel the need to do so, again, outside of professional supports.

Lastly, “Strengths-Based” with a focus on strength and resilience, service recipients and staff build skills that will help them move in a positive direction (Hopper et al. (2010). The main component of strengths-based care is that it’s strengths-based, rather than deficit-oriented. These service settings assist consumers to identify their own strengths and develop coping skills (Hopper et al., 2010). In service members whom are healthy and without a PTSD diagnosis, this topic allows the service-member the autonomy to focus on lesser need strengths, as their basic needs (safety, awareness) are already met. Strengths-based will be the ultimate tool in guiding

the treatment and success of veterans experiencing PTSD. Our returning service members are already equipped with strength and resilience, and this concept will help further build skills that will help them move in a positive direction and towards recovery. In relation to CAM, strengths-based takes focus away from pathology and diagnosis, and focuses on a service member's strengths and abilities.

According to Kranke, Gin, Saia, Heslin, and Dobalian (2016), reintegration to civilian life continues to be challenging for many veterans despite numerous programs that were developed to assist with this process. Emerging literature suggests veteran engagement in volunteer organizations promotes their reintegration as well as building upon individual strengths that allow veterans to apply their specialized skills, helped instill feelings of connectedness and contribution to their respective civilian communities (Kranke et al. 2016).

Personal Motivation

In developing the idea of doing research around veterans and alternative interventions, many key concepts came into play. I personally know, as many of us do, how impactful tours overseas can be for our returning heroes. While people close to me have done several tours and come home with a different mindset and attitude about life, it inspired me to consider all possible options in treating them and assisting in getting them back to normalcy. While many of my heroes are private and personal people, the struggle was prevalent on the surface without them knowing that their experience was showing brightly. All of them have chosen to not use traditional treatments and kept their experiences "close to the vest". Finding a way to allow them some comfort, without having to expose their trauma for the world to see, seemed like an important concept to explore.

Professional Motivation

Profession motivation fell closely into the personal motivation category. After seeing a documentary “Escape Fire” about the ever-evolving medical industry, there was a scene that inspired me to explore to use of psychopharmacological interventions for veterans (Heineman & Froemke, 2012). In the social work profession, I will see trauma exposed in people for the rest of my career. If I can provide quick, hands on tools for my clients to alleviate some anxiety and reduce their ‘fight or flight’ response in the moment, I will have done my due diligence in providing them some reprieve and support. This will continue to be something I encounter for the duration of my profession, and I want to be as helpful as I can to the people I serve.

Methods

For this study, a detailed literature review was conducted to find empirical intervention studies where veterans who experience trauma received treatment using a CAM approach. Although applicable literature was sparse, there still were some viable studies that were reviewed and analyzed (see Figure 1). The amount of literature surrounding veterans and PTSD is substantial; however, incorporating “Complementary and Alternative Interventions”, “Complementary and Alternative Medicine”, “Alternative Interventions”, or “Complementary and Integrative Medicine” as search subjects provided noticeably lesser results.

The literature was reviewed and analyzed, finding promising results towards CAM/CIM interventions. The main purpose of this study was to find and analyze CAM interventions used for veterans experiencing PTSD. Finding these studies involved scanning several databases, finding relevant studies, implementing exclusion tactics, and excluding studies that did not meet the criteria for this systematic review. These results then were put into a summarized graph, analyzed, and interpreted for readers to easily understand. Once this was completed, 10 empirical intervention studies were available that met all inclusion criteria, and provided a comprehensive grasp on literature surrounding the use of CAM for veterans experiencing PTSD.

Selection Criteria

There were three different inclusion criteria for this study. The first was to access all available databases that were available to review. This included all databases related to social work, psychology, complementary and alternative medicine (holistic medicine) and PTSD. Second, the studies identified had to meet the search criteria established to remain relevant to this study. This included search criteria related to “Complementary and Alternative Medicine” and/or “Alternative Medicine”, “Veteran” and “PTSD” and/or “Post Traumatic Stress Disorder”. Third,

the selection criteria had to meet intervention strategies related to CAM, and had to be an empirical CAM study conducted on veterans. Lastly, the study for review was not included if it involved a ‘utilization’ study, which studies other studies or reviews feedback from veterans, from the Veterans Administration, reviews all-encompassing CAM studies or does not include an empirical study on CAM interventions. Non-peer reviewed studies were excluded also. All studies that met criteria were reviewed. In the end, the studies that were most relevant and met all inclusion criteria were in the PsycINFO database and PILOTS database.

Search Strategy

The timeline of the literature search was from October 2016 to April 2017. There were multiple data bases used for this literature search, however two databases exclusively met standards for all inclusion criteria for this study. Data bases used exclusively included PsycINFO (PsycNET) and PILOTS. Some broad terms were utilized to get a sense of the material available in the databases. “Complementary and Alternative Medicine” and “Veterans” yielded 128 articles via PsycINFO, and 21 articles via PILOTS.

The preliminary search of key terms resulted in a total of 61 articles identified. The terms used for this search which were most relevant to this study were “Complementary and Alternative Medicine” and/or “Alternative Medicine”, “Veteran” and “PTSD” and/or “Post Traumatic Stress Disorder”.

Of these 61 results, each study was reviewed in full to ensure it did not meet criteria for the study. The inclusion criteria for this study included collective search terms of “Complementary and Alternative Medicine” and/or “Alternative Medicine”, “Veteran” and “PTSD” and/or “Post Traumatic Stress Disorder”, an empirical, CAM intervention was

conducted, and it could not be a study on utilization of CAM. Strict guidelines enforced the inclusion of an empirical study and intervention conducted.

Of the 61 articles identified, 27 could not be used for this study. Reasons for this included non-conclusive and non-exclusive search terms, non-CAM studies and non-relevant topics associated with the studies. Of the remaining 34 articles assessed, 24 again did not meet inclusion criteria for this study. During this round, more intricate critiquing was conducted. Of these 24, the titles and abstracts made it appear as if these articles met the criteria. However, after further analyzing and reading articles, it was determined that they did not meet the inclusion criteria, due mostly to the including of non-relevant topics and populations associated with study. Some examples include being veterans, however currently on active duty, and participating in CAM interventions, however not meeting specific CAM standards relevant to treatment of PTSD in veterans. Ten (10) empirical intervention studies met criteria for this study. The outcome of the systematic search and selection process is summarized below in Figure 1.

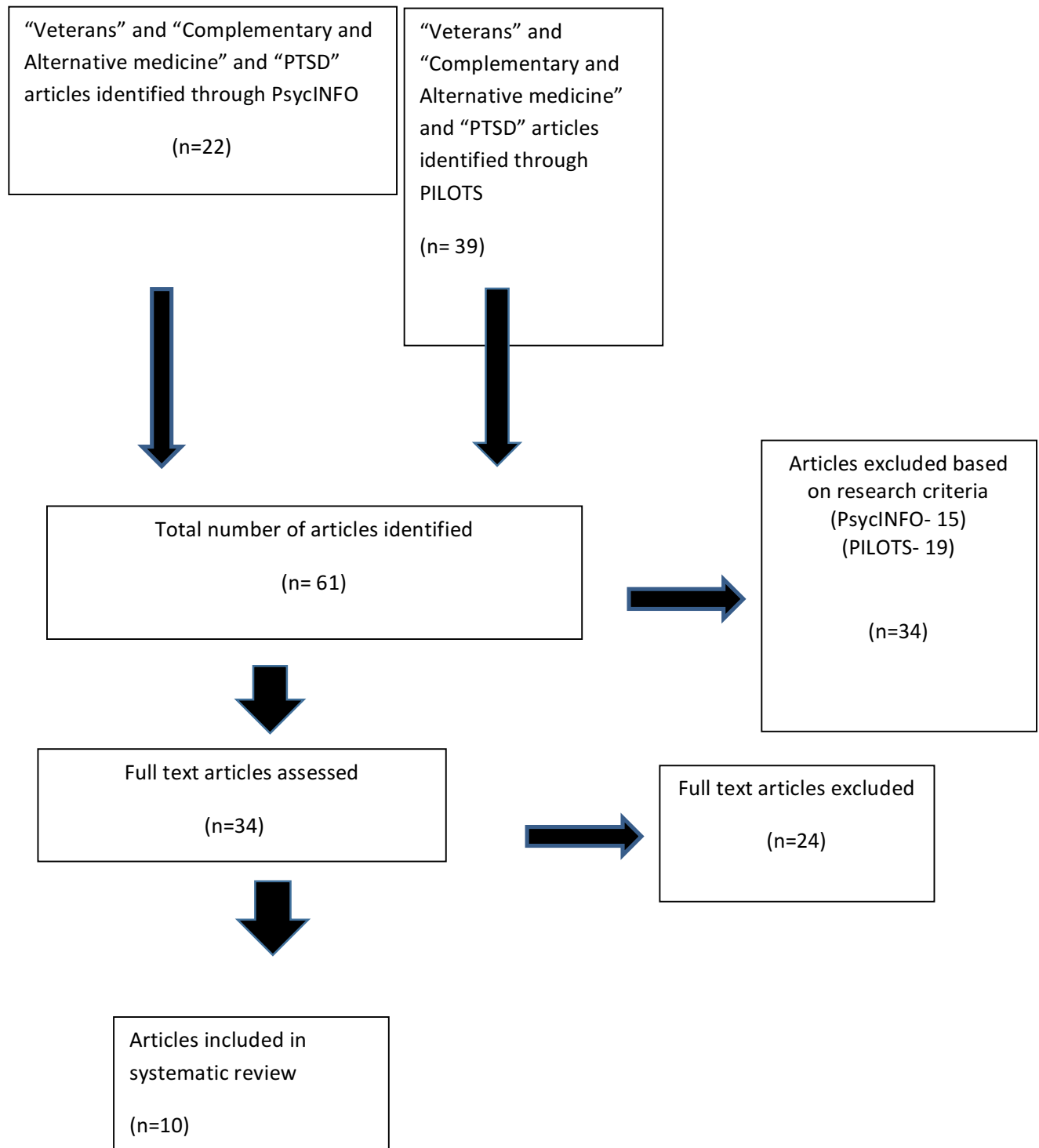


Figure 1. Flow diagram of studies throughout the selection process

Table 2. CAM Empirical Studies Table Abbreviated

	Author	Year	Title
1	Seppälä, E. M., Nitschke, J. B., Tudorascu, D. L., Hayes, A., Goldstein, M. R., Nguyen, D. H., & Davidson, R. J.	2014	Breathing-Based Meditation Decreases Posttraumatic Stress Disorder Symptoms in U.S. Military Veterans: A Randomized Controlled Longitudinal Study.
2	Bhatnagar, R., Phelps, L., Rietz, K., Juergens, T., Russell, D., Miller, N., & Ahearn, E.	2013	The effects of mindfulness training on post-traumatic stress disorder symptoms and heart rate variability in combat veterans.
3	Dahm, K. A., Meyer, E. C., Neff, K. D., Kimbrel, N. A., Gulliver, S. B., & Morissette, S. B.	2015	Mindfulness, Self-Compassion, Posttraumatic Stress Disorder Symptoms, and Functional Disability in U.S. Iraq and Afghanistan War Veterans.
4	Polusny, M.A., Erbes, C.R., Thuras, P., Moran, A., Lamberty, G. J., Collins, R. C., Rodman, J. L., & Lim, K. O.	2015	Mindfulness-Based Stress Reduction for Posttraumatic Stress Disorder Among Veterans: A Randomized Clinical Trial
5	Bormann, J. E., Thorp, S. R., Wetherell, J. L., Golshan, S., & Lang, A. J.	2013	Meditation-based Mantram intervention for veterans with posttraumatic stress disorder: A randomized trial.
6	Kearney, D., Simpson, T., Malte C., Felleman, B., & Martinez, M.	2016	Mindfulness-based stress reduction in addition to usual care is associated with improvements in pain, fatigue and cognitive failures among veterans with Gulf War illness.
7	Rosenthal, J., Grosswald, S., Ross, R., & Rosenthal, N.	2011	Effects of transcendental meditation in veterans of Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF) with posttraumatic stress disorder: A pilot study.
8	Barnes, V.A., Rigg, J. L., & Williams, J. J.	2013	Clinical case series: Treatment of PTSD with transcendental meditation in active duty military personnel.
9	Dharmakaya-Colgan, D., Christopher, M., Michael, P., & Wahbeh, H.	2015	The body scan and mindful breathing among veterans with PTSD: Type of intervention moderates the relationship between changes in mindfulness and post-treatment depression.
10	Kearney, D., McDermott K., Malte, C., Martinez, M., & Simpson, T.	2012	Effects of Participation in a Mindfulness Program for Veterans with Posttraumatic Stress Disorder: A Randomized Controlled Pilot Study.

Data Abstraction and Analysis

Data Abstraction and Analysis were utilized during this study. The 10 articles were read and reviewed in full, to ensure they met criteria for this systematic review. There were 4 articles that initially made the review, resulting in 14 relevant articles. After further review, it was determined that articles were not relevant due to time study was conducted, being active duty military personnel and not veterans, and appearing to be an empirical intervention that was later determined not an empirical intervention. These articles were taken from the list of potential relevant articles. During the 2nd critical review, it was determined that all 10 studies met criteria for this systematic review. During the 3rd critical review, data was extracted and placed into the summarized 10 articles grid. During the 4th and final critical review, articles were read in full, data was extracted that involved empirical interventions involving CAM and veterans, taking place after 2011. Once completed, the data was put into two tables, Table 1 and Table 2.

Findings

Ten clinical intervention studies met selection criteria for this systematic review. This findings chapter both summarizes the studies and breaks down the clinical interventions into two categories of Mindfulness Based/Self Compassion (6 studies), and Non-mindfulness-based interventions (4 studies). A summary of the 10 clinical interventions explored can be found below in Table 1.

Table 1. Summary of CAM Empirical Studies

CAM Interventions Treating Trauma in Veterans	Yoga and Veterans 1	MBSR, Yoga and Veterans 2	Mindfulness and Veterans 3
Study	Seppälä et al.	Bhatnagar et al.	Dahm et al.
Year	2014	2013	2015
Study Question	Does effects of Sudarshan Kriya yoga, on veterans experiencing PTSD reduce symptoms?	What are the effects and outcomes of mindfulness training on PTSD symptoms in veterans, using Hatha Yoga and MBSR?	What is the association of mindfulness and self-compassion with PTSD symptom severity and functional disability in veterans?
Evaluation Aim	Reduce post traumatic symptoms in veterans via Sudarshan Kriya yoga breathing meditation.	explore the effects of mindfulness training on PTSD symptoms in combat veterans	evaluate relationship of mindfulness and self-compassion practice in relation to PTSD symptom severity and functional disability.
Location	Iraq and Afghanistan	Madison, WI, USA,	Austin, Texas, USA
Sample Size	N=21	N=8	N=115
Age	Average age 28.09 years	Over 18 years old, 59.5 years (range, 42–71 years)	18 years and older, mean was 37.41 years
Inclusion Criteria	Diagnosed with PTSD, veteran	Diagnosed with PTSD, total score of 50 or higher on CAPS at least one other psychiatric illness	PTSD diagnosis trauma-exposed US Iraq and Afghanistan war veteran
Intervention (IV)	breathing-based meditation intervention, Sudarshan Kriya yoga	Mindfulness-based stress reduction (MBSR) and Hatha Yoga	Mindfulness and self-compassion based therapy.
Treatment	All subjective and objective laboratory assessments for the active group were conducted pre/post	Data collected was by interview and 24-hour Holter monitoring pre/mid/post	Participants completed a structured clinical interview and self-report measures.
Design	pre/mid/post	pre/mid/post	pre/mid/post
Selection	randomized control	random	convenience
Measures	PTSD Checklist-Military The Mood and Anxiety Symptoms Questionnaire (MASQ)	CAPS scales pNN50 measure of HRV	PTSD Scale, Mindfulness Attention Awareness Scale, WHO Disability Assessment Schedule 2, Symptom Severity Scale, Self-Compassion Scale
Statistical Analysis	Linear mixed-effects models were used for all variables to test main effects of time and group-by-time interactions as well as to account for within-subject's correlation	No statistical measures revealed. Repeated CAPS and HRV	t-tests ANOVAS (SPSS Version 17)
Fidelity	Not specifically discussed	Not specifically discussed	Not specifically discussed
Findings	Decreases in startle response due to intervention effects (Time 2 – Time 1) predicted decreases in PTSD Hyperarousal.	One month after course completion, PTSD symptoms had decreased from baseline by an overall CAPS score of 14.8 points; this reduction was clinically significant per prior studies.	Mindfulness and self-compassion were each uniquely, negatively associated with PTSD symptom severity,
Limitations	Small sample size	Small cohort size Short duration Only male No control group	Use of self-report measures, Generalizability of the findings, Cross-sectional study design.
Recommend	There is a need to expand the range of intervention options available to veterans diagnosed with PTSD.	HRV might be a potential marker for treatment and response for MBSR in PTSD, but larger studies are needed.	Future research should examine whether mindfulness and self-compassion predict mental health and functional outcomes over time.

Cam and Veterans	MBSR and Veterans 4	Mantram and Veterans 5	MBSR and Veterans 6
Study	Polusny et al.	Bormann et al.	Kearney et al.
Year	2015	2013	2016
Study Question	Are mindfulness-based interventions acceptable to veterans who have poor adherence to existing evidence-based treatments for PTSD?	What is the efficacy of a portable, private meditation-based mantram intervention for veterans with chronic PTSD?	Is MBSR in addition to treatment as usual associated with significant improvements in self-reported symptoms of Gulf War Illness?
Evaluation Aim	To compare mindfulness-based stress reduction with present-centered group therapy for treatment of PTSD.	Veterans in the experimental group, compared with TAU controls, would have significantly greater reductions in self-reported and clinician-assessed PTSD.	To conduct a pilot study of MBSR for veterans with Gulf War Illness.
Location	Minneapolis, MN, USA	Southern California, USA	Seattle, Washington, USA
Sample Size	N= 116	N=146	N=55
Age	18 and older	18 and older	18 and older, average around 50
Inclusion Criteria	Diagnosed with PTSD, At the Minneapolis Veteran Affairs Center	PTSD diagnosis and having achieved sobriety for at least two months per self-report that was confirmed by PTSD clinicians	PTSD cognitive failures, Gulf War illness, 2 symptoms that lasted at least 6 months, and were present at the time of the interview; fatigue, musculoskeletal pain, cognitive symptoms
Intervention (IV)	Mindfulness-based stress reduction therapy, present-centered group therapy	Mantram Repetition Program, Treatment as Usual (TAU)	MBSR (mindfulness-based stress reduction therapy)
Treatment	MBSR consisting of 9 sessions (8 weekly 2.5-hour group sessions and a daylong retreat); or present-centered group therapy, an active-control condition consisting of 9 weekly 1.5-hour group sessions	Subjects in the MRP + TAU were asked to record the number of days per week they practiced repeating mantrams (0–7 days) and number of times per day that mantram repetition was initiated. Subjects completed 3-7 times per week for 6 weeks.	MBSR or treatment as usual only. MBSR was delivered in 8 weekly 2.5 hour sessions plus a single 7-hour weekend session.
Design	Randomized clinical trial	Pre/post	Pre/post
Selection	Randomized	Convenience sample	Random assigned
Measures	Credibility/Expectancy Questionnaire, Five Facet Mindfulness Questionnaire, CAPS, PTSD Checklist, Patient Health Questionnaire-9, World Health Organization Quality of Life–BREF	BSI-18 SF-12 version 2 FACIT-Sp CAPS PCL, BSI-18	McGill Pain Questionnaire General Fatigue, Cognitive Failures Questionnaire Posttraumatic Stress Disorder Symptom Scale-Interview, Patient Health Questionnaire, The Total Five Facet Mindfulness Questionnaire
Statistical Analysis	Nquery Advisor 4 Cohen <i>d</i> , the standardized mean difference, SPSS	Descriptive Statistics, ANOVA Results, Effect Sizes for Clinical Outcomes	t-tests chi square tests Stata
Fidelity	All treatment sessions were videotaped.	Audiotapes were reviewed for 11 of the 12 cohorts, as recordings from one cohort were missing due to equipment failure.	Not specifically discussed
Findings	The primary outcome, change over time, PTSD Checklist (range, 17-85; higher scores indicate greater severity).	Demonstrated some improvement in PTSD symptoms, depression, and mental-health-related quality of life. MRP showed improvement	MBSR in addition to treatment as usual is associated with significant improvements in self-reported symptoms of Gulf War illness, including pain, fatigue, cognitive failures, and depression.
Limitations	Short follow up period The 2 groups differed in baseline PTSD symptom severity The two groups varied in time allotted for contact with primary clinician.	The TAU group did not meet weekly during the 6-week intervention period., Subjects were self-selected and knew the study was about “mantram repetition.”	Pilot study did not track change in medication over study Multidimensional Fatigue Inventory general fatigue subscale was suboptimal in our data.
Recommend	Results were encouraging but average/modest improvements.	More research is needed using a longitudinal effectiveness design with an active comparison control group.	Future research warrants larger randomized controlled trials of mindfulness-based stress reduction for Gulf War illness.

CAM and Veterans	TM and Veterans 7	TM and Veterans 8	Mindfulness and Veterans 9
Study	Rosenthal et al.	Barnes et al.	Dharmakaya-Colgan et al.
Year	2011	2013	2015
Study Question	To determine whether the Transcendental meditation technique might be helpful in relieving symptoms of PTSD among OEF and OIF veterans with the disorder.	Does transcendental meditation reduce symptoms of PTSD among 3 veterans in study?	What information is needed determine relationship between changes in mindfulness and post treatment depression?
Evaluation Aim	To see improvements of symptoms of PTSD among OEF and OIF veterans with the disorder while doing TM.	Impact of this report is expected to expand the complementary and alternative evidence base for clinical care of PTSD.	to assess if the mindfulness interventions would moderate the relationship between pre- to post-treatment change in mindfulness facets and post-Treatment depression and PTSD outcomes.
Location	Westport, CT, USA	Augusta, Georgia, USA	Hillsboro, Oregon, USA
Sample Size	N=7	N=3	N= 102
Age	18 and over	18-65 years	Over 18 years, average age 52 years
Inclusion Criteria	Served in Iraq and/or Afghanistan from 10 months to 2 years and seen moderate or moderate-heavy combat, as reflected in their CES, Diagnoses PTSD	18 -65 years old Clinically stable Diagnoses of PTSD	Participants were combat veterans diagnosis of chronic PTSD, in good general medical health, if prescribed medication, reported a consistent dose for stable medical conditions.
Intervention (IV)	Transcendental Meditation (TM)	Transcendental Meditation (TM)	Mindfulness-based stress reduction (MBSR)
Treatment	TM 20 minutes per time, 2x day for 3 months.	TM technique for 20 minutes twice a day for the duration of a 2-month follow-up period.	The groups met weekly in the laboratory (60-min sessions for six consecutive weeks). Practiced for 20 min. Utilized MB, RESPeRATE, MBSR, BS
Design	Pre/post	Pre/post	Pre/post
Selection	Pilot randomized	randomized controlled trials	Randomized controlled
Measures	CAPS, QLES-Q, PCL-M, and CGI-S.	The Outcome Questionnaire 45 (OQ-45) The 17-item PTSD checklist (PCL).	The Five Facet Mindfulness Questionnaire (FFMQ) PTSD Checklist- Civilian (PCL-C) Beck Depression Inventory (BDI-II)
Statistical Analysis	Paired t-test	No statistical analysis used. The Outcome Questionnaire 45 (OQ-45) The 17-item PTSD checklist (PCL) implemented again after 2 months.	ANOVAs and Reliable Change Index, <i>d</i> statistic partial eta-square Cohen, (All in SPSS-22)
Fidelity	Not specifically discussed	Not specifically discussed	Not specifically discussed
Findings	The results of this small, uncontrolled pilot study found that TM may have helped to alleviate symptoms of PTSD and improve quality of life in veterans.	Reduction in PTSD and distress and improvement in social role performance symptomatology seen in these cases are like previously published findings.	Simple slope analyses revealed that type of mindfulness intervention moderated the relationship among changes in facets of mindfulness and post-treatment depression.
Limitations	None explicitly reported.	Treatment success may be limited by complicated comorbidities.	Small sample size, Mostly white men, Measures were self-reported questionnaires; Adherence data was not analyzed.
Recommend	Larger, placebo-controlled studies should be undertaken to further determine the efficacy of TM in this population.	Further investigation is suggested to determine if a TM program could be used as an adjunct for treatment of PTSD.	A more detailed examination of Mindfulness-based stress reduction (MBSR) of the different elements of MBSR and various facets of mindfulness to determine what works.

CAM Interventions Treating Trauma in Veterans	MBSR and Veterans 10
Study	Kearney et al.
Year	2012
Study Question	What is the effect of participation in MBSR on veterans with PTSD?
Evaluation Aim	To assess mindfulness training as an adjunct to usual care for veterans with PTSD to gather pilot data on the safety, feasibility, and effect of this group intervention.
Location	Seattle, Washington, USA
Sample Size	N=47
Age	18 and older
Inclusion Criteria	Diagnosis of PTSD No exclusion (other severe SPMI) criteria. (Inclusion criteria were broad).
Intervention (IV)	Mindfulness-Based Stress Reduction (MBSR)
Treatment	Met once per week (2.5 hours per session) for 8 weeks, plus a 7-hour session. All participants continued to receive usual care (TAU) for PTSD within the same VHA health care system.
Design	Pilot study, designed as a practical clinical trial with broad inclusion criteria
Selection	Randomized controlled
Measures	The PTSD Checklist-Civilian version Life Events Checklist The Patient Health Questionnaire-9 The Short Form-8 The Five Facet Mindfulness Questionnaire The Behavioral Activation for Depression Scale
Statistical Analysis	Independent sample <i>t</i> tests and chi square tests
Fidelity	Not specifically discussed
Findings	Intention-to-treat analyses found no reliable effects of MBSR on PTSD or depression. Mental HRQOL improved posttreatment but there was no reliable effect at 4 months. At 4-month follow-up, more veterans randomized to MBSR had clinically meaningful change in mental HRQOL, and in both mental HRQOL and PTSD symptoms.
Limitations	Lack of a formal assessment of PTSD diagnostic status at baseline.
Recommend.	Additional studies are warranted to assess MBSR for veterans with PTSD.

Summary of Intervention Studies Used in Systematic Review

Demographics. All 10 clinical intervention studies were conducted between the years of 2011 to 2016. All interventions met the selection criteria of involving veterans experiencing PTSD, aside from the Gulf War study focusing on ‘cognitive failures and depression’. All studies included participants over the age of 18, and up to the age of 65. Sample sizes ranged anywhere from 3 to 146 participants. Geographically, all studies were conducted in the United States, and all were either at a VA facility or on an university campus.

Interventions. The clinical interventions tested in this systematic review were Transcendental Meditation, Mindfulness-based stress reduction (MBSR), present-centered group therapy, Mantram Repetition Program, Treatment as Usual (TAU), Breathing-Based Meditation Intervention, Sudarshan Kriya yoga, Hatha Yoga, Mindfulness and Self-Compassion based therapy. The three main interventions utilized to promote CAM treatment were Mindfulness Based Stress Reduction, Yoga-based treatments and Mindfulness. In more detail, two studies included yoga as CAM intervention, one study included “mindfulness and self-compassion”, four studies included Mindfulness Based Stress Reduction (MBSR), one included Mantram Mindfulness, and two included Transcendental Meditation. All treatments studied included either weekly CAM based sessions, group sessions, surveys and pre-post measures.

Evaluation aims. Evaluation aims, from the clinical interventions studied, focused on decreasing the symptoms of PTSD in veterans via former CAM interventions provided. Some of these aims included desire to see improvements of symptoms of PTSD, to expand the complementary and alternative evidence base for clinical care of PTSD, to assess if the mindfulness interventions would moderate the relationship between pre- to post-treatment change, and to compare mindfulness-based stress reduction with present-centered group therapy.

Methods. Nine of the ten intervention studies were quantitative in nature, while one was qualitative. Inclusion criteria for these studies included being a veteran, over the age of 18, and some form of post traumatic symptom diagnosis or diagnoses with PTSD. Eight of the ten studies used a random or randomized controlled sample, and two used convenience samples. Nine studies did not mention fidelity in the study, one did mention fidelity. All 10 interventions had a pre/posttest modality. Four of the ten studies had follow-up periods, including a 6-month, a less than 6-month, a 2-month and a 4-month. All the studies had measures that were related to PTSD symptoms, and four of the studies implemented the CAPS scale. The statistical analyses used were Independent sample *t* tests and chi square tests, Paired *t*-test) Nquery Advisor 4, Cohen *d*, the standardized mean difference, Stata (Release 11; StataCorp LP) and Linear mixed-effects models.

Intervention studies by category. Throughout the 10 clinical interventions studied, five different CAM interventions were identified. The five areas of CAM interventions were found and analyzed based on the relevance and purpose of this study. This included CAM interventions only, pertaining to veterans experiencing PTSD. The outcome of the systematic findings is summarized in the table below.

The 5 CAM Interventions identified were:

- Yoga Based (2)
- Mindfulness and Self Compassion (1)
- Mantram Meditation (1)
- Mindfulness Based Stress Reduction (MBSR) (4)
- Transcendental Meditation (2)

All 10 clinical interventions on veterans experiencing PTSD ranged from having 1 to 5 focus areas, all which fell into two categories. These categories include Mindfulness based interventions, and Non-mindfulness based interventions. Over half (6) of the interventions fell

into the “Mindfulness” based interventions categories, with the others falling into “Non-mindfulness” (4) (Mantram, meditation, yoga) based intervention categories.

When analyzing primary CAM interventions in the clinical interventions, the five focus CAM areas were consolidated to two primary focus areas of CAM interventions:

-Mindfulness Based CAM interventions (6)

-Non-Mindfulness Based CAM interventions (4)

Findings Summarized

Non-mindfulness based interventions. The first study to fall into the “Non-mindfulness” based category was completed by Seppälä et al. (2014) and was a quantitative study. The aim of this study was to study the effects of a breathing-based meditation intervention, Sudarshan Kriya yoga, on PTSD outcome variables in U.S. male veterans of the Iraq or Afghanistan war. The aim was to reduce PTSD symptoms in these veterans by utilizing Sudarshan Kriya yoga breathing meditation. This study took place in Iraq and Afghanistan and the sample size was 21, with an age range of over 18 with the average age 28.09 years. Inclusion criteria for this study involved being diagnosed with PTSD and a veteran. The intervention utilized was breathing-based meditation intervention, Sudarshan Kriya yoga. For their treatment using Sudarshan Kriya Yoga, all subjective and objective laboratory assessments for the active group were conducted within 1 week before (Time 1) and 1 week after (Time 2) the 7-day intervention. This was a pre/post model.

In Seppälä et al. (2014)’s research, randomized control measures used for this study. Two standardized measurements—specifically the PTSD Checklist-Military version and the Mood and Anxiety Symptoms Questionnaire (MASQ)—were utilized. Linear mixed-effects models were used for all variables to test main effects of time and group-by-time interactions as well as

to account for within-subjects correlation. The fidelity was not specifically discussed. Findings of this study conclude that decreases in startle response due to intervention effects (Time 2 – Time 1) predicted decreases in PTSD Hyperarousal. Limitations of this study were the small sample size, and recommendations include the need to expand the range of intervention options available to veterans diagnosed with PTSD.

The second study in this category was conducted by Bormann et al. (2013) and was exploring the efficacy of a portable, private meditation-based mantram (sacred word) intervention for veterans with chronic posttraumatic stress disorder. This was a quantitative study. The aim and the primary hypothesis (H1) was that veterans in the experimental (MRP + TAU) group, compared with TAU controls, would have significantly greater reductions in self-reported and clinician-assessed PTSD. This study was conducted in Southern California, and had a sample size of 146. The age range for this study was 18 years and older. The inclusion criteria included having a PTSD diagnosis, and having achieved sobriety for at least two months per self-report that was confirmed by PTSD clinicians. The interventions used were Mantram Repetition Program, Treatment as Usual (TAU). The treatment involved Subjects in the MRP + TAU (Treatment as usual) being asked to record the number of days per week they practiced repeating mantrams (0–7 days) and number of times per day that Mantram repetition was initiated. Subjects completed 3-7 times per week for 6 weeks.

In this study conducted by Bormann et al. (2013), a pre/post data collection method was used, and a convenience sample was used to obtain respondents for this study. Measures for this intervention were BSI-18, SF-12 version 2, FACIT-Sp, CAPS and PCL. Descriptive statistics utilized were ANOVA Results, Effect Sizes for Clinical Outcomes. The MRP classes were delivered by two co-facilitators, who followed written guidelines. Two of every six classes

within each cohort were randomly selected and reviewed by two quality-control experts who were master's-level nurses with MRP experience. Audiotapes were reviewed for 11 of the 12 cohorts, as recordings from one cohort were missing due to equipment failure.

Demonstrated some improvement in PTSD symptoms, depression, and mental-health-related quality of life in veterans when delivered as an adjunct to TAU (medication and case management). Most importantly, MRP showed improvement in levels of spiritual well-being. The TAU group did not meet weekly during the 6-week intervention period. Subjects were self-selected and knew the study was about “mantram repetition.” Majority of subjects were men. The presence or absence of Axis II diagnoses was not assessed (Bormann et al., 2013). For future studies, more research is needed using a longitudinal effectiveness design with an active comparison control group.

The third study to fall into this category was by Barnes et al. (2013) and was a quantitative study. The question posed was “Does transcendental meditation reduce symptoms of PTSD among 3 veterans in study?” The aim and impact of this report is expected to expand the complementary and alternative evidence base for clinical care of PTSD. This study was completed in Augusta, Georgia, USA and had a small sample size of 3. Ages ranged from 18-65 years. Inclusion criteria included being clinically stable and a Diagnoses of PTSD. Transcendental Meditation was the intervention utilized, with a treatment plan of using the Transcendental Meditation (TM) technique for 20 minutes twice a day for the duration of a 2-month follow-up period.

In their study, Barnes et al. (2013) employed a pre-/post-test data collection design and randomized controlled trials were used. Measurements included The Outcome Questionnaire 45 (OQ-45), The 17-item PTSD checklist (PCL) was used to measure symptoms of PTSD including

sleep disturbance, hypervigilance, estrangement, and foreshortened future ban), statistical analysis was not specifically utilized for this study. Fidelity was not specifically discussed. Findings found a Reduction in PTSD and distress and improvement in social role performance symptomatology seen in these cases are like previously published findings. Limitations concluded that treatment success may be limited by complicated comorbidities (e.g., traumatic brain injury, substance abuse, sleep and mood disorders). Further investigation is suggested to determine if a TM program could be used as an adjunct for treatment of PTSD. Impact of this report is expected to expand the evidence base for clinical care of PTSD and CAM.

The fourth and final study to fall into the “Non-mindfulness” based category was completed by Rosenthal et al. (2011). This was a quantitative study wanted to determine whether the Transcendental meditation (TM) technique might be helpful in relieving symptoms of PTSD among OEF and OIF (Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF) with posttraumatic stress disorder. This was a quantitative pilot study.

The focus was to see improvements of symptoms of PTSD among OEF and OIF veterans with the disorder while doing Transcendental meditation. This study was completed in Westport, Connecticut and had a small sample size of 7. The age was 18 and over. The inclusion criteria included serving in Iraq and/or Afghanistan from 10 months to 2 years and saw moderate or moderate-heavy combat, as reflected in their CES, also with a diagnosis of PTSD.

In their study, Rosenthal and colleagues’ (2011) used was Transcendental Meditation intervention. This treatment included using it 20 minutes per time, 2x day for 3 months. This was a pre/posttest design and was pilot randomized. Measurements included CAPS, QLES-Q, PCL-M, and CGI-S. Statistical measurements included Paired t-test. Fidelity was not specifically discussed. The results of this small, uncontrolled pilot study found that TM may have helped to

alleviate symptoms of PTSD and improve quality of life in veterans of OEF/OIF with combat-related PTSD. Limitations included co-morbidity with prescriptions and ability to leave study, due to being deployed/reassigned, were mentioned. Larger, placebo-controlled studies should be undertaken to further determine the efficacy of TM in this population.

Mindfulness-Based Interventions

The first study in the “Mindfulness” based interventions category is by Bhatnagar et al. (2013) and is a qualitative study. In their study, the aim focused upon “The effects of mindfulness training on Post-Traumatic Stress Disorder Symptoms and Heart Variability in Combat Veterans” and aims to explore the effects of mindfulness training on PTSD symptoms in combat veterans. This study took place in Madison, Wisconsin, and was a small sample size of 8. The participants were veterans Over 18 years old, with an average age of 59.5 years (range, 42–71 years). Inclusion criteria including being diagnosed with PTSD, total score of 50 or higher on CAPS (trauma inventory), at least one other psychiatric illness. The intervention utilized was Mindfulness-based stress reduction (MBSR) and Hatha Yoga. The treatment included data collection by interview and 24-hour Holter monitoring at baseline (week 0), upon completion of the course (week 8), and 1 month after completion (week 12). This was a Pre/post study design. Measures utilized included CAPS scales. PNN50 measure of HRV. No statistical measures were utilized, the CAPS and PNN50 measure of HRV were utilized again. Fidelity was not specifically discussed in this study.

In their study findings, Bhatnagar et al. (2013) revealed that one month after course completion, PTSD symptoms had decreased from baseline by an overall CAPS score of 14.8 points; this reduction was clinically significant. Some limitations included having a small sample

size and it being a small study. Future recommendations stated that HRV might be a potential marker for treatment and response for MBSR in PTSD, and larger studies are needed.

The second study in this category is by Dahm et al. (2015) and is a quantitative study. The aim of this study was to explore the association of mindfulness and self-compassion with PTSD symptom severity and functional disability in veterans. This study took place in Austin, Texas, and had a sample size of 115. The age of these veterans was 18 and older, mean age was 37.41 years. Inclusion criteria included a PTSD diagnosis and trauma-exposed US Iraq and Afghanistan war veterans, and they could not meet criteria for bipolar or a psychotic disorder. The intervention used was mindfulness and self-compassion based therapy. For the treatment modality, participants completed a structured clinical interview and self-report measures. Diagnostic consensus was reached for each interview, via weekly diagnostic review groups.

Dahm et al. (2015) employed a cross sectional research study design with a convenience sample. The measures used were the Posttraumatic Stress Disorder Scale (CAPS), Mindfulness Attention Awareness Scale (MAAS), World Health Organization Disability Assessment Schedule 2, and the Self-Compassion Scale (SCS). Regression Analysis were conducted in SPSS Version 17 and used to test the study hypothesis. Fidelity was not specifically discussed.

With regard to results, Dahm et al. (2015) found that mindfulness and self-compassion were each uniquely, negatively associated with PTSD symptom severity, findings suggest that interventions aimed at increasing mindfulness and self-compassion could potentially decrease functional disability. Several limitations were identified by the authors, including the use of self-report measures, generalizability of the findings, and the cross-sectional study design. Future research should expand on these findings and examine whether mindfulness and self-

compassion, including pre-trauma measures of these traits, predict mental health and functional outcomes over time (Dahm et al., 2015).

The third study in this category was conducted by Polusny et al. (2015). This was a quantitative study exploring if mindfulness-based interventions are acceptable to veterans who have poor adherence to existing evidence-based treatments for PTSD. The aim was to compare mindfulness-based stress reduction (MBSR) with present-centered group therapy for treatment of PTSD. This study took place in Minneapolis, Minnesota, and had a sample size of 116. These veterans were 18 and older, and inclusion criteria included being diagnosed with PTSD and at the Minneapolis Veteran Affairs Center. The interventions used were Mindfulness-based stress reduction (MBSR) and present-centered group therapy. The treatment intervention included MBSR consisting of 9 sessions (8 weekly 2.5-hour group sessions and a daylong retreat); or present-centered group therapy, an active-control condition consisting of 9 weekly 1.5-hour group sessions. All treatment sessions were videotaped. Two senior clinicians independent of treatment delivery rated 10% of sessions from each condition using a rating tool adapted from other trials of PTSD group treatment. This was a randomized clinical trial design.

The measures used included the Credibility/Expectancy Questionnaire, Five Facet Mindfulness Questionnaire, CAPS, PTSD Checklist, Patient Health Questionnaire-9, World Health Organization Quality of Life–BREF and the Nquery Advisor 4 (Polusny et al., 2015). Statistical measures included the Cohen *d*, the standardized mean difference via SPSS. The findings found that the primary outcome, change in PTSD symptom severity over time, was assessed using the PTSD Checklist (range, 17-85; higher scores indicate greater severity; reduction of 10 or more considered a minimal clinically important difference. Limitations of this study included a short follow up period, the two groups differed in baseline PTSD symptom

severity and the two groups varied in time allotted for contact with primary clinician. Due to nature of short follow-up, future trials with longer-term follow-up (≥ 6 months) are recommended to evaluate the durability of treatment benefits over time. Results were encouraging overall showed average/modest improvements.

The fourth study in this category was conducted by Dharmakaya-Colgan et al. (2015) and was a quantitative study. The question asked was “What information is needed determine relationship between changes in mindfulness and post treatment depression?” The aim was to assess if the mindfulness interventions would moderate the relationship between pre- to post-treatment change in mindfulness facets and post-Treatment depression and PTSD outcomes. This study took place in Hillsboro, Oregon, USA, and had a sample size of 102. The age was over 18 years, and the average age was 52 years. Inclusion criteria included participants that were combat veterans with a diagnosis of chronic PTSD, in good general medical health, if prescribed medication, reported a consistent dose for stable medical conditions. The intervention was Mindfulness-based stress reduction (MBSR). The treatment included the groups meeting weekly in the laboratory (60-min sessions for six consecutive weeks). While in the laboratory, participants practiced the intervention for 20 min. They utilized Mindful Breathing (MB), RESPeRATE, MBSR, and a Body Scan (BS). This was a pre/posttest design. And Selection criteria included Randomized controlled. Measurements included the Five Facet Mindfulness Questionnaire (FFMQ), PTSD Checklist- Civilian (PCL-C), Beck Depression Inventory (BDI-II). Statistical Measures included ANOVAs and Reliable Change Index, *d* statistic, partial eta-square and Cohen (All in SPSS-22). This study was found in PsycINFO.

Fidelity in Dharmakaya-Colgan et al. (2015)’s study was not specifically discussed. Findings found that veterans in mindfulness group, 23% of unique variance in the prediction of

post-treatment depression scores. Simple slope analyses revealed that type of mindfulness intervention moderated the relationship among changes in facets of mindfulness and post-treatment depression. Limitations included a small sample size, mostly white men, Measures were self-reported questionnaires, Adherence data was not analyzed, and what was thought to be an inactive control group, SQ, was an active control for this population. Future research encourages a more detailed examination of Mindfulness-based stress reduction (MBSR) of the different elements of MBSR and various facets of mindfulness to determine what works best for whom is warranted. Future research should also replicate these findings with a larger sample size.

The fifth study conducted was by Kearney et al. (2012) and aimed to determine the effect of participation in Mindfulness Based Stress Reduction (MBSR) on veterans with PTSD. This study was to assess mindfulness training as an adjunct to usual care for veterans with PTSD to gather pilot data on the safety, feasibility, and effect of this group intervention. This study took place in Seattle, Washington, USA and had a sample size of 47. Age range was 18 and over. Inclusion criteria included a diagnosis of PTSD, no exclusion (other severe SPMI) criteria were established. Inclusion criteria were broad. The intervention used was Mindfulness-Based Stress Reduction (MBSR). The treatment was MBSR groups met once per week (2.5 hours per session) for 8 weeks, plus a 7-hour session on a Saturday. All participants continued to receive usual care (TAU) for PTSD within the same VHA health care system. This was a pilot study, designed as a practical clinical trial with broad inclusion criteria. Selection criteria was Randomized Controlled Study measures included The PTSD Checklist-Civilian version, Life Events Checklist, The Patient Health Questionnaire-9, The Short Form-8, The Five Facet

Mindfulness Questionnaire, and The Behavioral Activation for Depression Scale. Statistical analysis included independent sample t tests and chi square tests.

In Kearney et al. (2012)'s study, fidelity was not specifically discussed. Findings included that intention-to-treat analyses found no reliable effects of MBSR on PTSD or depression. Mental HRQOL improved posttreatment but there was no reliable effect at 4 months. At 4-month follow-up, more veterans randomized to MBSR had clinically meaningful change in mental HRQOL, and in both mental HRQOL and PTSD symptoms. Completer analyses (≥ 4 classes attended) showed medium to large between group effect sizes for depression, mental HRQOL, and mindfulness skills. Limitations included lack of a formal assessment of PTSD diagnostic status at baseline. Future studies should evaluate whether a modified MBSR course is more effective at affecting the core symptoms of PTSD than the standard course.

The sixth and final study in the "Mindfulness" category was by Kearney et al. (2016) and aimed to find if MBSR in addition to treatment as usual is associated with significant improvements in self-reported symptoms of Gulf War Illness. This was a quantitative study. This study took place in Seattle Washington, and had a sample size of 55. The age range was 18 and older, with an average age around 50 years. Inclusion criteria included having a Gulf War illness, defined as deployment to the Gulf War theater of operations between August 1990 and August 1991. At least 2 of the following symptoms that began after August 1990, lasted at least 6 months, and were present at the time of the interview: (1) fatigue that limits usual activity; (2) musculoskeletal pain involving 2 or more regions of the body; and (3) cognitive symptoms (memory, concentration, or attention difficulties) and PTSD cognitive failures. The interventions utilized were MBSR (mindfulness-based stress reduction therapy) or treatment as usual only

(TAU). The treatment was MBSR delivered in 8 weekly 2.5 hour sessions plus a single 7-hour weekend session.

With Kearney et al. (2016)'s study, a pre/post design was employed. Subjects for the study were randomly assigned. Initial measures used were McGill Pain Questionnaire General Fatigue subscale of the Multidimensional Fatigue Inventory, Cognitive Failures Questionnaire Posttraumatic Stress Disorder Symptom Scale-Interview, Patient Health Questionnaire and The Total Five Facet Mindfulness Questionnaire. Statistical measures included t-tests, chi square tests via Stata (Release 11; StataCorp LP). Fidelity was not specifically discussed. In the findings, veterans experienced significantly greater reductions in symptoms of posttraumatic stress disorder post-MBSR ($f = 0.44$; $P = 0.005$) but not at 6-months follow-up ($f = 0.31$; $P = 0.082$). MBSR in addition to treatment as usual is associated with significant improvements in self-reported symptoms of Gulf War illness, including pain, fatigue, cognitive failures, and depression. Limitations included this being a pilot study, and the team did not track change in medication over study. Also, Multidimensional Fatigue Inventory general fatigue subscale was suboptimal in Kearney et al. (2016) data. Future research warrants larger randomized controlled trials of mindfulness-based stress reduction for Gulf War illness.

Discussion

While reviewing all 10 articles pertaining to clinical interventions among veterans experiencing PTSD, all had similarities, differences as well as recommendations for future research. These 10 interventions all expressed the importance of exploring CAM among veterans experiencing PTSD, and the need to conduct further research around CAM. Almost all articles expressed the lack of progress in traditional treatment pertaining to PTSD, and encouraged more advanced research around CAM.

This systematic review study examined current literature on interventions among veterans experiencing PTSD to connect any consistent interventions from past to present studies. This systematic research study analyzed what CAM interventions veterans experiencing PTSD have resources to; as well as to add to the growing amount of research concerning veterans' PTSD. When reviewing the 10 clinical interventions most findings were found to be successful in improving PTSD symptoms. Only one clinical intervention had findings that did not result in progress of treatment, and this was a small study.

Some common findings included; decreased sense of hyperarousal, improvement in PTSD symptoms, improvement in spiritual well-being, and an increase in mindfulness and self-compassion. This research supports the need for a stronger development of interventions that encourages CAM interventions with veterans experiencing PTSD, more acutely focusing on those who choose to not participate in traditional Exposure Therapy or psychotherapy. While reviewing the previous research, and conducting this study, it is obvious that CAM research is well on its way to developing more systematic interventions for veterans experiencing PTSD, whom either choose to not fully participate in Treatment as Usual (TAU) or choose to participate in both interventions and how to incorporate them.

Strengths and Limitations

Strengths. One major strength of this systematic review study was the amount of information related to veterans and PTSD. Because there was so much information around these two topic areas, it was easy to ‘search within results’ of those topics to find subtopics could have been associated with veterans and PTSD. Due to this strength, it was easy to find rudimentary information and studies involving veterans, PTSD and CAM.

Another strength of this study was the promising, reoccurring statement of needing further research. Although it initially seems irrelevant, it was encouraging to find that multiple researchers, studies and groups found it necessary to research CAM as an alternative intervention in treating PTSD among veterans. Because of this, this study was not the only systematic review around this specific topic. Another study was completed prior to 2011, and all studies in this systematic review are post 2011. This shows that further research is well on its way and getting noticed as a viable option for treatment. Another strength was the “Findings” section of the 10 articles studied. All studies showed improvement in resided symptoms and decreased hyperarousal in veterans, which also may increase chances that this is a promising intervention that could use additional research.

Limitations. The major limitations to this systematic review was the lack of information in several databases that were scanned. Of all the databases, available, only three provided studies that met the inclusion criteria, and one database, the Alt HealthWatch had the same study in the PILOTS database. For this reason, that database was excluded. The sample size available to researcher was small.

In relation to the social work theme of this systematic review, none of the databases related to social work, such as Encyclopedia of Social Work, Social Work Abstracts, or

SocINDEX with Full Text, could meet the inclusion criteria for this study. Although some articles used for this systematic review were in one of the three databases, they were also in PsycINFO, and were utilized in that database due to the number of articles available and relevancy. The search results for this specific topic in those specific databases was minimal. The small study was also a limitation of this study. Given more resources, money, and time, a further, in depth look at all avenues could result in different, more detailed results.

Implications for Further Social Work Practice

There is still much work to do in exploring the issue of veterans experiencing PTSD. This is a topic that social workers should continue to explore as a tribute to our veteran population. It is suggested and encouraged that research and review does not stop at ‘CAM interventions,’ and that the topic of veterans experiencing PTSD continues to make headway in the healing direction. The way veterans are handled upon return from tours or duty, as well as how they are treated past their clinical treatment should also continue to be observed.

Another area for further social work practice is considering the populations of veterans that are accepting invitations to participate in CAM interventions. Considering what makes CAM intriguing to them, and marketing CAM based on veterans’ responses to the interventions.

Implications for Clinical Social Work Practice

Suggestions for clinical social work practice are to continue to research CAM interventions for veterans. It is encouraged that this clinical intervention not be used as ancillary, and to be promoted as a ‘front-runner’ intervention for treating PTSD among veterans. The idea behind using CAM interventions is to steer away from medications and traditional talk therapies, to study whether ‘rewiring’ the traumatic experience via relaxation and alternative modalities would be beneficial in treating PTST and post traumatic symptoms.

Many different recommendations in current literature overall recommend the same idea; To further explore CAM interventions for veterans, using larger sample sizes, more sophisticated criteria selection processes, and to determine if various interventions (TM, MBSR, Yoga, Meditation) could be used as a primary means to treat PTSD. As mentioned before, it would be interesting to explore in detail the populations of veterans that are accepting invitations to participate in CAM interventions. Clinically, if these interventions worked, would more veterans consider using them instead of medications and traditional talk therapies? It is suggested to consider what makes CAM a viable treatment option for veterans, and marketing CAM based on veterans' responses to specific CAM interventions.

Conclusion

This systematic review focused on reviewing 10 relevant empirical intervention studies related to Complementary and Alternative Medicine treating PTSD and trauma in veterans. This was done by selecting and analyzing 10 relevant articles, to see what is available for CAM research and what more needs to be implemented. Interventions varied, however were all related to CAM and were provided promising results in their findings. Veterans experiencing PTSD has immeasurable amounts of research, however research around veterans experiencing PTSD and utilizing CAM interventions is still in its infancy stages. PTSD and Veterans often goes together when discussing the risks of combat related illnesses. However, if veterans experiencing PTSD have ‘tools’ available to them outside of the clinic, they may have an increased chance of overcoming acute and unpredictable PTSD related symptoms. The purpose of this study was to review CAM interventions for veterans, outside of psychopharmacological and traditional talk therapy interventions. The purpose also was to provide comprehensive material available to researchers looking to CAM as a viable option treating PTSD.

In positive regards to results of the study, all studies showed improvements in PTSD symptoms and a reduction in hyperarousal due to anxiety stress response. Educating and providing tangible material for researchers to access may increase likelihood of further research, which in return may provide alternative and easily accessible options for veterans in recovery.

References

- Barnes, V. A., Rigg, J. L., & Williams, J. J. (2013). Clinical case series: Treatment of PTSD with transcendental meditation in active duty military personnel. *Military Medicine*, 178(7), 836-840. Retrieved from <http://dx.doi.org.ezproxy.stthomas.edu/10.7205/MILMED-D-12-00426>.
- Barker, R. L. (2003). *The social work dictionary*. Washington, D.C.: NASW Press.
- Bhatnagar, R., Phelps, L., Rietz, K., Juergens, T., Russell, D., Miller, N., & Ahearn, E. (2013). The effects of mindfulness training on post-traumatic stress disorder symptoms and heart rate variability in combat veterans. *The Journal of Alternative and Complementary Medicine*, 19(11), 860-861. Retrieved from <http://dx.doi.org.ezproxy.stthomas.edu/10.1089/acm.2012.0602>.
- Bormann, J. E., Thorp, S. R., Wetherell, J. L., Golshan, S., & Lang, A. J. (2013). Meditation-based mantram intervention for veterans with posttraumatic stress disorder: A randomized trial. *Psychological Trauma: Theory, Research, Practice, and Policy*, 5(3), 259-267. doi:<http://dx.doi.org/10.1037/a0027522>.
- Brown, R., Gerbarg, P., & Muskin, P. (2009). How to use herbs, nutrients & yoga in mental health. New York: Norton Paperback.
- Brown, V. M., Strauss, J. L., LaBar, K. S., Gold, A. L., McCarthy, G., & Morey, R. A. (2014). Acute effects of trauma-focused research procedures on participant safety and distress. *Psychiatry Research*, 215(1), 154–158. Retrieved from <http://doi.org/10.1016/j.psychres.2013.10.038>.
- Caplan, P. (2013). When Johnny and Jane come marching home: How all of us can help veterans. *Political and Military Sociology: An Annual Review*, 41, 173-175.
- Cohen B. E., Li Y., & Chesney, M. (2013). Use of complementary alternative medicine and conventional therapies for PTSD in a Veterans Administration population: Data from the Mind Your Heart study. *Psychosomatic Medicine*, 75(3), 134.
- Dahm, K. A., Meyer, E. C., Neff, K. D., Kimbrel, N. A., Gulliver, S. B., & Morissette, S. B. (2015). Mindfulness, self-compassion, posttraumatic stress disorder symptoms, and functional disability in U.S. Iraq and Afghanistan war veterans. *Journal of Traumatic Stress*, 28(5), 460-464. doi:10.1002/jts.22045.
- Dharmakaya-Colgan, D., Christopher, M., Michael, P., Wahbeh, H. (2016). The body scan and mindful breathing among veterans with PTSD: Types of intervention moderates the relationship between changes in mindfulness and post-treatment depression. *Mindfulness*, 7(2). 372–383. doi:10.1007/s12671-015-0453-0.
- Eisenberg D. M., Kessler R. C. & Foster C. (1993). Unconventional medicine in the United States: Prevalence, costs, and patterns of use. *The New England Journal of Medicine*, 328, 246-252.

- Ernst E. (1995). Complementary medicine: Common misconceptions. *Journal of the Royal Society of Medicine*, 88(5), 244-247.
- Fabiny, A. (2014). *What meditation can do for your mind, mood, and health*. Harvard Health Publications. Retrieved from <https://hms.harvard.edu/sites/default/files/assets/Harvard%20Now%20and%20Zen%20Reading%20Materials.pdf>.
- Foa, E. B., Keane, T. M., Friedman, M. J., & Cohen, J. A. (2009). *Effective treatments for PTSD* (2nd ed.). New York: Guilford.
- Friedman, M. J. (2016). *PTSD History and Overview*. US Department of Veteran Affairs. Retrieved from <https://www.ptsd.va.gov/professional/PTSD-overview/ptsd-overview.asp>.
- Friedman, M. J. (2016). *Clinician's Guide to Medications for PTSD*. Retrieved from <https://www.ptsd.va.gov/professional/treatment/overview/clinicians-guide-to-medications-for-ptsd.asp>.
- Friedman, M. J. (2013). *Finalizing PTSD in DSM-5: Getting here from there and where to go next* (PDF). *Journal of Traumatic Stress*, 26, 548-556. doi: 10.1002/jts.21840 PILOTS ID: 87751.
- Friedman, M. J. (2013). *History of PTSD in veterans: Civil War to DSM-5*. National Center for PTSD. Retrieved from: <https://www.ptsd.va.gov/public/ptsd-overview/basics/history-of-ptsd-vets.asp>.
- Furnham A., & Smith, C. (1988). Choosing alternative medicine: A comparison of the beliefs of patients visiting a general practitioner and a homeopath. *Social Science and Medicine*; 26(7), 685-689.
- Gardiner, P., Filippelli, A. C., Lebensohn, P., & Bonakdar, R. (2013). Family Medicine Residency Program Directors Attitudes and Knowledge of Family Medicine CAM Competencies. *Explore (New York)*, 9(5), 299–307. Doi: <http://doi.org/10.1016/j.explore.2013.06.002>.
- Goetter, E., Bui, E., Ojserkis, R., Zakarian, R., Brendel, R., & Simon, N. (2015). A Systematic Review of Dropout From Psychotherapy for Posttraumatic Stress Disorder Among Iraq and Afghanistan Combat Veterans. *Journal of Traumatic Stress*, 28(5), 401-409.
- Gorman, J. (2007). *The essential guide to psychiatric drugs*. New York: St. Martin's Press.
- Herman, J. (1992). *Trauma and recovery*. New York: Basic Books.
- Heineman, M., & Froemke, S. (2012). *Escape fire: The fight to rescue American healthcare* [Documentary]. United States: Lionsgate.

- Hopper, E. K., Bassuk, E. L., & Olivet, J. (2010). *Shelter from the storm: Trauma-informed care in homelessness services settings*. Retrieved from file:///C:/Users/S40239/Downloads/shelter_from_storm%20(1).pdf.
- Institute of Medicine (2005). *Institute of Medicine (US) Committee on the Use of Complementary and Alternative Medicine by the American public*. Washington (DC): National Academies Press (US).
- Joyce C. R. (1994). Placebo and complementary medicine. *Lancet*, 344(8932), 1279-1281.
- Kearney, D., Simpson, T., Malte C., Felleman, B., & Martinez, M. (2016). Mindfulness-based stress reduction in addition to usual care is associated with improvements in pain, fatigue and cognitive failures among veterans with Gulf War illness. *The American Journal of Medicine*, 129(2), 204-214. doi: 10.1016/j.amjmed.2015.09.015.
- Kearney, D., McDermott K., Malte, C., Martinez, M., & Simpson, T. (2012). Effects of participation in a mindfulness program for veterans with posttraumatic stress disorder: A randomized controlled pilot study. *Journal of Clinical Psychology*, 69(1),14–27.
- Kim, P. Y., Thomas, J. L., Wilk, J. E., Castro, C. A., & Hoge, C. W. (2010). Stigma, barriers to care, and use of mental health services among active duty and National Guard soldiers after combat. *Psychiatric Services*, 61(6), 582-588.
- Kranke, D., Gin, J., Saia, R., Heslin, K., & Dobalian, A. (2016). Ecological strengths-based perspective to veterans experience of reintegration into civilian life. *Military Behavioral Health*, 4 (1) 75–81.
- Lerner I. J, & Kennedy B. J. (1992). The prevalence of questionable methods of cancer treatment in the United States. *A Cancer Journal for Clinicians*, 42(3), 181-191.
- Libby D. J., Pilver C. E, & Desai, R. (2012). Complementary and alternative medicine in VA specialized PTSD treatment programs. *Psychiatric Services*, 63(11), 1134–1136.
- Moore, B. A. & Barnett, J. E. (2013). *Military Psychologists Desk Reference*. New York: Oxford Press.
- National Association of Social Workers (2005). *NASW Standards for Clinical Social Work in Social Work Practice*. Retrieved from <https://www.socialworkers.org/practice/standards/naswclinicalswstandards.pdf>.
- National Association of Social Workers (1997-2002). *Social Work profession*. Retrieved from <http://www.socialworkers.org/profession/factsheet.htm>.
- National Center for Complementary and Alternative Medicine. (2008). *The use of Complementary and Alternative Medicine in the United States*. Retrieved from http://nccam.nih.gov/news/camstats/2007/camsurvey_fs1.htm.

- National Institute of Health. (2013). *Complementary and Alternative Medicine*. Retrieved from <https://report.nih.gov/NIHfactsheets/ViewFactSheet.aspx?csid=85>.
- National Institute of Health. (2005). *Complementary and Alternative Medicine in the United States*. Retrieved from: <https://www.ncbi.nlm.nih.gov/books/NBK83804/>.
- Newman, E. & Kaloupek, D. (2009). Overview of research addressing ethical dimensions of participation in traumatic stress studies: Autonomy and beneficence. *Journal of Trauma Stress*, 22, 595–602.
- Polusny M. A., Erbes C. R., Thuras, P., Moran, A., Lamberty, G. J., Collins, R. C., Rodman, J. L., & Lim, K. O. (2015). Mindfulness-Based Stress Reduction for Posttraumatic Stress Disorder Among Veterans: A Randomized Clinical Trial. *Journal of the American Medical Association*, 314(5), 456-465. doi:10.1001/jama.2015.836.
- Raguso, E. (2008). The mindful birth. *Greater Good*, 5(1), 30-33.
- Reardon, C. (2009). Complementary and Alternative Therapies in Behavioral Health. *Social Work Today*, 9(6), 8. Retrieved from <http://www.socialworktoday.com/archive/112309p8.shtml>.
- Rosenthal, J., Grosswald, S., Ross, R., & Rosenthal, N. (2011) Effects of transcendental meditation in veterans of Operation Enduring Freedom and Operation Iraqi Freedom with Posttraumatic Stress Disorder: A Pilot Study. *Military Medicine*, 176(6), 626.
- Seppälä, E. M., Nitschke, J. B., Tudorascu, D. L., Hayes, A., Goldstein, M. R., Nguyen, D. H., & Davidson, R. J. (2014). Breathing-Based Meditation Decreases Posttraumatic Stress Disorder Symptoms in U.S. Military Veterans: A Randomized Controlled Longitudinal Study. *Journal of Traumatic Stress*, 27(4), 397-405. doi:10.1002/jts.21936.
- Social Work Policy Institute. (2010). *Evidence Based Practices*. Retrieved from <http://www.socialworkpolicy.org/research/evidence-based-practice-2.html#resources>.
- Steenkamp, M. M., & Litz, B. T. (2013). Psychotherapy for military-related posttraumatic stress disorder: Review of the evidence. *Clinical Psychology Review*, 33, 45–53. doi:10.1016/j.cpr.2012.10. 002.
- Strauss, J., Lang, A., & Schnurr, P. (2017). *Complementary and Alternative Medicine (CAM) for PTSD*. Retrieved from http://www.ptsd.va.gov/professional/treatment/overview/complementary_alternative_for_ptsd.asp.
- Strauss J. L., Coeytaux R., McDuffie, J., Nagi, A., & Williams J. W. (2011). *Efficacy of Complementary and Alternative Therapies for Posttraumatic Stress Disorder*. Washington, DC: Department of Veterans Affairs (US). Retrieved from <https://www.ncbi.nlm.nih.gov/books/NBK82774/>

- Tanielian, T., Jaycox, L., Schell, T., Marshall, G. N. Burnam, M.A., Eibner, C., Karney, B., Meredith L., Ringel, J., & Vaiana, M. (2008). *Invisible Wounds of War: Psychological and Cognitive Injuries, Their Consequences, and Services to Assist Recovery*. Rand Research Institute.
- The Complete Herbal Guide. (2016). *History of alternative medicine*. Retrieved from <http://thecompleteherbalguide.com/history-alternative-medicine/>.
- Tilton, S., & Tilton, D. (2015). *Psychopharmacology; Medications for the mind*. Retrieved from <https://ceufast.com/course/psychopharmacology-medications-for-the-mind>.
- United States Government Accountability Office. (2011). VA mental health: Number of veterans receiving care, barriers faced, and efforts to increase access: Report to the Ranking Member, Committee on Veterans' Affairs, House of Representatives. Retrieved from [file:///C:/Users/S40239/Downloads/585743%20\(1\).pdf](file:///C:/Users/S40239/Downloads/585743%20(1).pdf).
- U.S. Department of Veteran Affairs. (2015a). *Mental health effects of serving in Afghanistan and Iraq*. Retrieved from <http://www.ptsd.va.gov/public/PTSD-overview/reintegration/overview-mental-health-effects.asp>
<http://www.ptsd.va.gov/PTSD/professional/assessment/screens/index.asp>.
- U.S. Department of Veterans Affairs. (2015b). *What's stopping you? Overcome barriers to care*. Retrieved from http://www.ptsd.va.gov/public/treatment/therapy-med/Stigma_Barriers_to_Care.asp.
- U.S. Department of Veteran Affairs. (2016a). *Clinician's guide to medications for PTSD*. Retrieved from <http://www.ptsd.va.gov/professional/treatment/overview/clinicians-guide-to-medications-for-ptsd.asp#top>.
- U.S. Department of Veteran Affairs. (2016b). *PTSD screening instruments*. Retrieved from <http://www.ptsd.va.gov/PTSD/professional/assessment/screens/index.asp>.
- U.S States Department of Veteran Affairs and Department of Defense. (2010). *VA clinical practice guideline for management of posttraumatic stress*. Washington, DC: Author.
- Veterans Administration. (2014). *Suicide among veterans and other americans 2001–2014*. Retrieved from <https://www.va.gov/opa/pressrel/pressrelease.cfm?id=2807>.
- Veterans Administration. (2016). *PTSD and substance use disorders in veterans*. Retrieved from https://www.ptsd.va.gov/professional/co-occurring/ptsd_sud_veterans.asp.