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National Center for PTSD  
VA Medical Center (116D)  
215 North Main Street  
White River Junction  
Vermont 05009-0001 USA

(802) 296-5132  
FAX (802) 296-5135  
Email: [ncptsd@va.gov](mailto:ncptsd@va.gov)

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## Complementary and Alternative Treatments for PTSD

Broadly conceptualized, the term “complementary and alternative medicine” (CAM) refers to treatments not considered to be standard to the current practice of Western medicine. “Complementary” refers to the use of these techniques in combination with conventional approaches, whereas “alternative” refers to their use in lieu of conventional practices. Of course, many treatments and techniques (e.g., acupuncture) that are considered CAM within U.S. borders are elemental to conventional medicinal practices in other parts of the world. As Western practitioners and consumers increasingly adopt these approaches, the boundaries between conventional medicine and CAM continue to shift. The National Center for Complementary and Alternative Medicine (NCCAM) has proposed a five-category classification system for CAM therapies: 1) natural products (e.g., herbal dietary supplements); 2) mind-body medicine (e.g., meditation, acupuncture, yoga); 3) manipulative and body-based practices (e.g., massage, spinal manipulation); 4) other alternative practices (e.g., movement therapies, energy therapies); and 5) whole medicine systems (e.g., traditional Chinese medicine, Ayurvedic medicine). The current review does not address natural products, which fall outside our area of expertise, nor does it address whole medicine systems, as our interest is in exploring applications of CAM within conventional Western medicine.

### Overlap Between CAM and Conventional PTSD Treatments

Some conventional therapies include elements that are consistent with CAM approaches. For example, although theoretically grounded in cognitive-behavioral traditions, most trauma-focused psychotherapies include training in techniques to manage arousal, such as breathing and muscle

**Jennifer L. Strauss, Ph.D.**

Women's Mental Health Program Manager,  
Mental Health Services, Department of Veterans Affairs;  
Assistant Professor, Psychiatry and Behavioral Sciences,  
Duke University Medical Center

**Ariel J. Lang, Ph.D., MPH**

Chief, Psychotherapy Unit, Center of Excellence for Stress  
and Mental Health, VA San Diego Healthcare System;  
Professor In Residence, Department of Psychiatry,  
University of California San Diego

relaxation; these strategies are not hypothesized to be core mechanisms of change within trauma-focused therapy protocols. Similarly, stress inoculation training and other approaches that build coping skills by providing a “toolkit” of cognitive-behavioral and mind-body stress management techniques are also based on cognitive-behavioral theories of change, and hence are not considered CAM modalities.

Treatments such as Acceptance and Commitment Therapy, Dialectical Behavior Therapy, and Mindfulness-Based Cognitive Therapy include mindfulness, which Kabat-Zinn (1994) has defined as “paying attention in a particular way: on purpose, in the present moment, and non-judgmentally.” In contrast to the way in which relaxation is viewed in CBT, mindfulness is seen as an important agent of change in these approaches because it shifts the individual's perspective in a way that counteracts psychopathological processes. Mindfulness is not, however, the only mechanism of change, because behavioral and cognitive principles are also strongly incorporated. These interventions may best be considered hybrids rather than CAM, but future research will be necessary to determine the relative contribution of their components.

### Rationale for Examining Applications of CAM for PTSD

Within the U.S., CAM has broad appeal among consumers for the prevention and treatment of a range of physical and mental conditions, and to enhance overall wellness and health (Kessler et al., 2001). Mental health concerns, including PTSD, are among the most common reasons for seeking CAM. Among those with PTSD, nearly 40% report

*Continued on page 2*



use of CAM to address emotional and mental problems. Mind-body treatments, including meditation, relaxation, and exercise therapy, were the most frequently reported and used as both alternative and complementary therapies (Libby, Pilver, & Desai, 2012).

In 2010 the Department of Veterans Affairs, Office of Research and Development, requested a systematic review of CAM for PTSD to establish the state of the evidence and inform policy decisions on the need for further research. That review of peer-reviewed, English-language studies (excluding natural products and whole medicine systems) published through 2010 identified a mere seven randomized controlled trials (RCTs) (Strauss et al., 2011). Overall, identified studies were generally preliminary, underpowered, limited by significant design flaws, and often did not describe the intervention in enough detail to guide replication. One RCT examined a manipulative and body-based CAM treatment. However, meaningful conclusions could not be derived from this trial (N = 8) of an adjunctive body-oriented therapy, due to significant design limitations. For example, there may have been bias, as the principal investigator collected and analyzed all study data and was unblinded to group assignment. In addition, there was no control for additional therapies received, making it hard to know to what to attribute change (Price, 2006). The remaining six RCTs examined mind-body therapies. An expanded literature search that included published nonrandomized trials provided little additional evidence. Likewise, a supplemental analysis of recent, systematic reviews identified limited support for the efficacy of mind-body therapies for depression and anxiety disorders, and no relevant findings for manipulative and body-based, movement-based, or energy therapies (Williams, Gierisch, McDuffie, Strauss, & Nagi, 2011).

Thus, the most striking finding overall was the relative lack of empirical evidence for CAM for PTSD or related disorders. Given the nascent state of this evidence base, the authors were unable to draw firm conclusions about the relative utility of specific interventions, populations, formats, settings, recommended treatment length or “dosing,” or other refinements to the development of CAM for PTSD. Indeed, they determined that, for most CAM therapies, the most basic question “Can it work?” for PTSD has not yet been answered. In such cases, proof-of-concept studies are indicated to show that the intervention can be reliably delivered to this population, that patients will engage in it, and that there is preliminary empirical evidence of change associated with the intervention. For CAM for which there is some initial evidence, adequately-powered RCTs with meaningful comparators are indicated. With the goal of helping readers to navigate the growing literature on CAM, below we briefly review the current evidence for the most well-established mind-body therapies for PTSD: acupuncture, relaxation training, and meditation. Based on that evidence, we make recommendations as to the next appropriate steps in pursuing the development of these interventions.

## Acupuncture

Acupuncture, a modality of Chinese medicine, encompasses a group of therapies in which needles are inserted into subcutaneous tissue in order to restore balance within body systems. For those interested, Hollifield (2011) provides an accessible summary of the conceptual rationale and proposed biological mechanisms in support of the potential efficacy of acupuncture for PTSD. One good-quality study

identified in the Strauss et al. (2011) review found that improvement in PTSD following 12 weeks of biweekly, 60-minute acupuncture sessions was comparable to a group CBT and greater than waitlist control in a predominantly male, non-Veteran sample (Hollifield, Sinclair-Lian, Warner, & Hammerschlag, 2007). Treatment gains following acupuncture were retained at the 24-month follow-up. Although the study was methodologically rigorous, strong conclusions cannot be drawn from a single RCT. This study also highlights the challenge of selecting an adequate comparison condition for these novel interventions. The control that was used, a group intervention that included psychoeducation, CBT skills (e.g., behavioral activation, activity planning, cognitive restructuring), and exposure exercises, may have been selected to provide a comparison to treatment as usual or minimal good treatment. Nonetheless, it does not control for critical features of the technique, such as application of needles. To understand whether or not study results could be driven by different expectations about the treatments, a control such as placing needles in sham sites would be necessary. Thus, we believe that proof-of-concept has been established for acupuncture, but recommend withholding judgment about its effectiveness for PTSD until additional controlled trials have been conducted.

## Relaxation

Strauss et al. (2011) identified three relatively small RCTs of relaxation techniques; they did not demonstrate significant clinical improvement relative to active comparators (Echeburúa, de Corral, Sarasua, & Zubizarreta, 1996; Vaughan et al., 1994; Watson, Tuorila, Vickers, Gearhart, & Mendez, 1997). In each case, interpretation of study findings was hampered by significant methodological flaws, including ambiguous reporting of randomization and treatment of missing data, nonblinded group assignment and/or assessments, and inadequate statistical power. In some cases, lack of clarity about differences between components of the intervention and active comparator further complicate the picture. Additionally, the Echeburúa et al. (1996) study compared a CBT intervention that included instruction in progressive muscle relaxation (PMR) to PMR alone, but the differences in “dosing” and introduction of PMR within these protocols was not specified. Of note, the Strauss et al. (2011) review of relaxation studies was limited to those in which the intervention was conceptualized as an active treatment and described in sufficient detail to understand the key components. Five additional studies, in which relaxation showed modest effects and performed less well than active comparators, were excluded from that review based on these criteria. Relaxation likely has a role to play in helping to manage the arousal associated with PTSD, but relaxation alone is unlikely to be sufficient to reduce other types of symptomatology for many people with PTSD.

## Meditation

The first studies of meditation techniques for PTSD involved mantra meditation (including transcendental meditation and mantram repetition), a type of meditation that involves intensely focusing attention on an object or word. Studies of these techniques have shown some positive effects, but are limited by small sample sizes, enrollment of exclusively male Veterans, and lack of follow-up (Bormann, Thorp, Wetherell, & Golshan, 2008; Brooks & Scarano, 1985). Thus, these studies primarily demonstrate the feasibility of enrolling and retaining Veterans in mediation group interventions.

More recently, Bormann et al. (2012) compared the addition of mantram repetition to usual care (i.e., medication and case management) to usual care alone, and found modest improvements in symptoms of depression and PTSD. Without a control for nonspecific aspects of the group meetings, however, it is difficult to definitively attribute these gains to use of the mantram approach. Work is ongoing to more definitely answer this question.

Kearney and colleagues (2012) conducted an uncontrolled study of mindfulness-based stress reduction (MBSR) as an adjunct to usual care in Veterans with PTSD. MBSR is a group intervention that incorporates mindfulness practices, including meditation and yoga. The authors reported a medium effect size in change in PTSD, depression, and functioning in those who took part in the group. Although mechanisms of change could not be determined by this uncontrolled study design, it is notable that changes were mediated by changes in mindfulness. Because MBSR is a well-established intervention with some demonstrated effectiveness for treatment of anxiety more generally, additional empirical evaluation of MBSR is indicated. A struggle for those who undertake such studies will be selection of appropriate controls. For example, it may be appropriate to compare mindfulness to relaxation, to establish that observed changes are attributable to something more than a quiet pause in one's day. Alternately, it may be important to compare a mindfulness-based approach to other commonly used coping skills, such as cognitive-behavioral anxiety management techniques.

Lang et al. (2012) recently reviewed the theoretical basis for three types of meditation as an intervention for PTSD. Based on the extant literature in this area, it appears that there could potentially be different mechanisms underlying different types of meditative practice. The literature on cognitive changes related to mindfulness suggests that through practice of shifting attention and assuming a nonjudgmental stance, patients may learn to be less reactive to intrusive or ruminative thoughts. Mantra meditation has more commonly been linked to decreasing physiological arousal. For patients with PTSD, this may be a good coping strategy for times when memories are intentionally (as in exposure-based therapy) or unintentionally triggered. Compassion meditation, which involves directing feelings of warmth and compassion towards others, has been linked to increases in positive emotion and social connectedness. Given the deficits in positive emotion and feelings of connection with others that are characteristic of PTSD, compassion meditation is a promising strategy, but is without empirical application to PTSD. It is also possible that there are nonspecific factors common to all of these types of meditation. Future research should evaluate these approaches and attempt to understand the mechanisms by which they create change.

## Conclusions

In summary, CAM is widely requested and used by consumers for a variety of complaints and conditions, and the relevant research base is rapidly evolving. The umbrella of CAM modalities includes a broad range of approaches, not all of which may hold the same level of promise for the treatment of PTSD. Preliminary findings, albeit mixed, suggest that CAM treatments merit consideration. At this point, there is very limited empirical evidence of their effectiveness, so they may be best applied as an adjunct to other PTSD treatments or as a gateway to additional services for patients who initially

refuse other approaches. Overall, the current evidence base does not support the use of CAM interventions as an alternative to current empirically-established approaches for PTSD, or as first-line interventions recommended within evidence-based clinical guidelines.

## FEATURED ARTICLES

Bormann, J.E., Thorp, S., Wetherell, J.L., & Golshan, S. (2008). **A spiritually based group intervention for combat Veterans with posttraumatic stress disorder.** *Journal of Holistic Nursing*, 26, 109-116. doi: 10.1177/0898010107311276.

*Purpose:* To assess the feasibility, effect sizes, and satisfaction of mantram repetition—the spiritual practice of repeating a sacred word/phrase throughout the day—for managing symptoms of PTSD in veterans. *Design:* A two group (intervention vs. control) by two time (pre- and postintervention) experimental design was used. *Methods:* Veterans were randomly assigned to intervention ( $n = 14$ ) or delayed-treatment control ( $n = 15$ ). Measures were PTSD symptoms, psychological distress, quality of life, and patient satisfaction. Effect sizes were calculated using Cohen's  $d$ . Findings: Thirty-three male veterans were enrolled, and 29 (88%) completed the study. Large effect sizes were found for reducing PTSD symptom severity ( $d = -.72$ ), psychological distress ( $d = -.73$ ) and increasing quality of life ( $d = -.70$ ). *Conclusions:* A spiritual program was found to be feasible for veterans with PTSD. They reported moderate to high satisfaction. Effect sizes show promise for symptom improvement but more research is needed.

Bormann, J.E., Thorp, S.R., Wetherell, J.L., Golshan, S., & Lang, A.J. (2012). **Meditation-based mantram intervention for Veterans with posttraumatic stress disorder: A randomized trial.** *Psychological Trauma: Theory, Research, Practice, and Policy*. doi: 10.1037/a0027522.

Few complementary therapies for PTSD have been empirically tested. This study explored the efficacy of a portable, private meditation-based mantram (sacred word) intervention for veterans with chronic posttraumatic stress disorder. A prospective, single-blind randomized clinical trial was conducted with 146 outpatient veterans diagnosed with military-related PTSD. Subjects were randomly assigned to either (a) medication and case management alone (i.e., treatment-as-usual [TAU]), or (b) TAU augmented by a 6-week group mantram repetition program (MRP + TAU). A total of 136 veterans (66 in MRP + TAU; 70 in TAU) completed posttreatment assessments. An intent-to-treat analysis indicated significantly greater symptom reductions in self-reported and clinician-rated PTSD symptoms in the MRP + TAU compared with TAU alone. At posttreatment, 24% of MRP + TAU subjects, compared with 12% TAU subjects, had clinically meaningful improvements in PTSD symptom severity. MRP + TAU subjects also reported significant improvements in depression, mental health status, and existential spiritual well-being compared with TAU subjects. There was a 7% dropout rate in both treatment conditions. A meditation-based mantram repetition intervention shows potential when used as an adjunct to TAU for mitigating chronic PTSD symptoms in veterans. Veterans may seek this type of treatment because it is nonpharmacological and does not focus on trauma. It also has potential as a facilitator of exposure-based therapy or to enhance spiritual well-being. More research is needed using a longitudinal effectiveness design with an active comparison control group.

Brooks, J.S., & Scarano, T. (1985). **Transcendental meditation in the treatment of post-Vietnam adjustment.** *Journal of Counseling and Development*, 64, 212-215. doi: 10.1002/j.1556-6676.1985.tb01078.x.

In a randomized, prospective study at the Denver Vietnam Veterans Outreach Program, the Transcendental Meditation (TM) program was compared with psychotherapy in the treatment of post-Vietnam adjustment. Nine dependent variables were measured both before and after a 3-month treatment period. The TM treatment group improved significantly from pretest to post-test on eight variables; the therapy group showed no significant improvement on any measure. This study indicates that the TM program is a useful therapeutic modality for the treatment of post-Vietnam adjustment problems.

Echeburúa, E., De Corral, P., Sarusua, B., & Zubizarreta, I. (1996). **Treatment of acute posttraumatic stress disorder in rape victims: An experimental study.** *Journal of Anxiety Disorders, 10*, 185-199. doi: [10.1016/0887-6185\(96\)89842-2](https://doi.org/10.1016/0887-6185(96)89842-2). The aim of this study was to test the comparative effectiveness of two therapeutic modalities of 5 one-hr sessions [(a) cognitive restructuring and specific coping-skills training and (b) progressive relaxation training] in the treatment of acute posttraumatic stress disorder in victims of sexual aggression. The sample consisted of 20 patients selected according to *DSM-III-R* criteria. A two-group experimental design with repeated measures (pretreatment, posttreatment, and 1-, 3-, 6-, and 12-month follow-up) was used. Most treated patients improved in all measures immediately upon posttreatment and in follow-up. There were no differences between the two modalities in the posttreatment. However, in the 12-month follow-up the first group produced superior outcome in PTSD symptoms, but not in other measures. Implications of this study for clinical practice and future research in this field are discussed.

Hollifield, M. (2011). **Acupuncture for posttraumatic stress disorder: Conceptual, clinical, and biological data support further research.** *CNS Neuroscience & Therapeutics, 17*, 769-779. doi: [10.1111/j.1755-5949.2011.00241.x](https://doi.org/10.1111/j.1755-5949.2011.00241.x). PTSD is common, debilitating, and has highly heterogeneous clinical and biological features. With the exception of one published preliminary clinical trial, rationale in support of the efficacy of acupuncture, a modality of Chinese medicine (CM), for PTSD has not been well described. This is a focused review of conceptual and clinical features of PTSD shared by modern western medicine (MWM) and CM, and of biological mechanisms of acupuncture that parallel known PTSD pathology. MWM and CM both recognize individual developmental variables and interactions between external conditions and internal responses in the genesis of PTSD. There is one published and one unpublished clinical trial that preliminarily support the efficacy of acupuncture for PTSD. Although there have been no mechanistic studies of acupuncture in human PTSD, extant research shows that acupuncture has biological effects that are relevant to PTSD pathology. Conceptual, clinical, and biological data support possible efficacy of acupuncture for PTSD. However, further definitive research about simultaneous clinical and biological effects is needed to support the use of acupuncture for PTSD in health care systems.

Hollifield, M., Sinclair-Lian, N., Warner, T.D., & Hammerschlag, R. (2007). **Acupuncture for posttraumatic stress disorder: A randomized controlled pilot trial.** *Journal of Nervous and Mental Diseases, 195*, 504-513. doi: [10.1097/NMD.0b013e31803044f8](https://doi.org/10.1097/NMD.0b013e31803044f8). The purpose of the study was to evaluate the potential efficacy and acceptability of acupuncture for PTSD. People diagnosed with PTSD were randomized to either an empirically developed acupuncture treatment (ACU), a group cognitive-behavioral therapy (CBT), or a wait-list control (WLC). The primary outcome measure was self-reported PTSD symptoms at baseline, end treatment, and 3-month follow-up. Repeated measures MANOVA was used to detect predicted Group X Time effects in both intent-to-treat (ITT) and treatment completion models. Compared with the WLC condition in the ITT model, acupuncture provided large treatment effects for PTSD ( $F[1, 46] = 12.60$ ;  $p < 0.01$ ; Cohen's  $d = 1.29$ ), similar in magnitude to group CBT ( $F[1, 47] = 12.45$ ;  $p < 0.01$ ;  $d = 1.42$ ) (ACU vs. CBT,  $d = 0.29$ ). Symptom reductions at end treatment were maintained at 3-month follow-up for both interventions. Acupuncture may be an efficacious and acceptable nonexposure treatment option for PTSD. Larger trials with additional controls and methods are warranted to replicate and extend these findings.

Kearney, D.J., McDermott, K., Malte, C., Martinez, M., & Simpson, T.L. (2012). **Association of participation in a mindfulness program with measures of PTSD, depression and quality of life in a veteran sample.** *Journal of Clinical Psychology, 68*, 101-116. doi: [10.1002/jclp.20853](https://doi.org/10.1002/jclp.20853). **Objectives:** To assess outcomes of veterans who participated in mindfulness-based stress reduction (MBSR). **Design:** PTSD symptoms, depression, functional status, behavioral activation, experiential avoidance, and mindfulness were assessed at baseline, and 2 and 6 months after enrollment. **Results:** At 6 months, there were significant improvements in PTSD symptoms (standardized effect size,  $d = -0.64$ ,  $p < 0.001$ ); depression ( $d = -0.70$ ,  $p < 0.001$ ); behavioral activation ( $d = 0.62$ ,  $p < 0.001$ );

mental component summary score of the Short Form-8 ( $d = 0.72$ ,  $p < 0.001$ ); acceptance ( $d = 0.67$ ,  $p < 0.001$ ); and mindfulness ( $d = 0.78$ ,  $p < 0.001$ ), and 47.7% of veterans had clinically significant improvements in PTSD symptoms. **Conclusions:** MBSR shows promise as an intervention for PTSD and warrants further study in randomized controlled trials.

Lang, A.J., Strauss, J.L., Bomyea, J., Bormann, J.E., Hickman, S.D., Good, R.C., & Essex, M. (2012). **The theoretical and empirical basis for meditation as an intervention for PTSD.** *Behavioral Modification, doi: 10.1177/0145445512441200*. In spite of the existence of good empirically supported treatments for PTSD, consumers and providers continue to ask for more options for managing this common and often chronic condition. Meditation-based approaches are being widely implemented, but there is minimal research rigorously assessing their effectiveness. This article reviews meditation as an intervention for PTSD, considering three major types of meditative practices: mindfulness, mantra, and compassion meditation. The mechanisms by which these approaches may effectively reduce PTSD symptoms and improve quality of life are presented. Empirical evidence of the efficacy of meditation for PTSD is very limited but holds some promise. Additional evaluation of meditation-based treatment appears to be warranted.

Libby, D.J., Pilver, C.E., Desai, R. (2012). **Complementary and alternative medicine use among individuals with posttraumatic stress disorder.** *Psychological Trauma: Theory, Research, Practice, and Policy, doi: 10.1037/a0027082*. The purpose of the current study is to describe the patterns of complementary and alternative medicine (CAM) use for the treatment of mental and emotional problems among individuals with PTSD. Data from 599 individuals with past-year PTSD were obtained from the Collaborative Psychiatric Epidemiology Surveys. Descriptive analyses described the extent to which each of 15 CAM treatments were used. Multivariate analyses identified correlates of CAM use, organized according to a sociobehavioral model of health care utilization. Results demonstrated that 39% of individuals with PTSD reported using a CAM treatment to address their self-reported emotional and mental problems in the past year. Only 13% of CAM users saw a CAM practitioner for their CAM treatment. The most common types of CAM used were mind-body treatments, specifically relaxation or meditation techniques and exercise therapy. Correlates of CAM use in the past year included the predisposing factors of gender, race, and education, as well as the health need factor of comorbid psychiatric disorders. Individuals with PTSD were just as likely to use CAM as an alternative to conventional mental health care as they were to use CAM as a complement to conventional mental health care. Clinicians should discuss CAM use with their patients in order to avoid possible adverse interactions with conventional forms of care, to educate patients about the risks and benefits of CAM treatments, and to maximize the potential benefits of patients' various treatment approaches.

Price, C. (2006). **Body-oriented therapy in sexual abuse recovery: A pilot-test comparison.** *Journal of Bodywork and Movement Therapies, 10*, 58-64. doi: [10.1016/j.jbmt.2005.03.001](https://doi.org/10.1016/j.jbmt.2005.03.001). The purpose of this study was to examine the effects of body-oriented therapy, as an adjunct to psychotherapy, for women in recovery from childhood sexual abuse. A two-group randomized design was employed. Eight women were recruited from a community sample and randomly assigned to an experimental group or wait-list control group. The experimental condition involved eight 1-h weekly sessions of body-oriented therapy, a combination of bodywork and the emotional processing of psychotherapy. The study examined changes in somatic and psychological symptoms, and the subjective experience of the intervention using a mixed method approach. Methods included interview, written questionnaire, and self-report outcome measures of psychological symptoms, dissociation, post-traumatic stress, and physical symptoms. Pre-post comparison of the two groups revealed remarkable decreases on SCL-90 global score, PTSD, number and severity of physical symptoms, and a trend toward decreased dissociation for the experimental compared to the control group. Qualitative results revealed the positive impact of body-oriented therapy on sense of inner security and psychotherapeutic progress.

Strauss, J.L., Coeytaux, R., McDuffie, J., Nagi, A., & Williams, J.W. (2011). **Efficacy of complementary and alternative therapies for posttraumatic stress disorder.** VA-ESP Project #09.010. Posttraumatic stress disorder (PTSD) is the emotional disorder most frequently associated with combat and other potentially traumatic experiences that may occur during military service. It is often chronic and may be associated with significant comorbidities and functional impairments. Current first-line PTSD therapies include trauma-focused cognitive behavioral psychotherapies, stress inoculation training, and pharmacotherapies. Complementary and alternative medicine (CAM) interventions include a range of therapies that are not considered standard to the practice of medicine in the U.S. CAM therapies are widely used by mental health consumers, including Veterans, and numerous stakeholders have expressed strong interest in fostering the evidence base for these approaches in PTSD. Thus, this evidence synthesis was requested by VA Research and Development to inform decisions on the need for research in this area.

Vaughan, K., Armstrong, M.S., Gold, R., O'Connor, N., Jenneke, W., & Tarrier, N. (1994). **A trial of eye movement desensitization compared to image habituation training and applied muscle relaxation in post-traumatic stress disorder.** *Journal of Behavior Therapy and Experimental Psychiatry*, 25, 283-291. doi: 10.1016/0005-7916(94)90036-1. Thirty-six patients with PTSD were randomly allocated to individual treatment with imaginal exposure (image habituation training—IHT), or applied muscle relaxation (AMR) or eye movement desensitization (EMD). Assessment by a blind independent rater and self-report instruments applied pre and posttreatment and at 3-month follow-up indicated that all groups improved significantly compared with a waiting list and that treatment benefits were maintained at follow-up. Despite a failure to demonstrate differences among groups, there was some suggestion that immediately after treatment EMD was superior for intrusive memories.

Watson, C.G., Tuorila, J.R., Vickers, K.S., Gearhart, L.P., & Mendez, C.M. (1997). **The efficacies of three relaxation regimens in the treatment of PTSD in Vietnam War Veterans.** *Journal of Clinical Psychology*, 53, 917-923. doi: 10.1002/(SICI)1097-4679(199712)53:8<917::AID-JCLP17>3.0.CO;2-N. Ninety male Vietnam Veterans with PTSD were administered relaxation instructions, relaxation instruction with deep breathing exercises, or relaxation instructions with deep breathing training and thermal biofeedback. Improvement appeared on only 4 of the 21 PTSD and physiological dependent variables studied. All 21 Treatment X Time interactions were nonsignificant. This suggests that the treatments were mildly therapeutic, but that the additions of training in deep breathing and thermal biofeedback did not produce improvement beyond that associated with simple instructions to relax in a comfortable chair.

Williams, J.W., Jr., Gierisch, J.M., McDuffie, J., Strauss, J.L., Nagi, A. **An overview of complementary and alternative medicine therapies for anxiety and depressive disorders: Supplement to Efficacy of complementary and alternative medicine therapies for posttraumatic stress disorder.** VA-ESP Project #09-010; 2011. *Background:* VA is committed to expanding the breadth of PTSD-related services available to Veterans. Since depressive and anxiety disorders share common features with PTSD, this report was commissioned to examine the efficacy of complementary and alternative medicine (CAM) therapies for the treatment of depressive and anxiety disorders as a means to detect treatments that might be applicable to PTSD. *Methods:* The key questions (KQs) were adapted from the parent report, Efficacy of Complementary and Alternative Medicine Therapies for PTSD. We searched MEDLINE® (via PubMed®) and the Cochrane Database of Systematic Reviews for recent English-language systematic reviews (SRs) that examined the literature on mind-body medicine, manipulative and body-based practices, and movement or energy therapies, excluding nutritional, herbal remedies and other supplements. To be included, SRs had to be published within the past five years and be evaluated as a “fair” or “good” quality. Titles, abstracts, and articles were reviewed in duplicate, and relevant data were abstracted by authors trained in the critical analysis of literature.

*Key Findings:* We identified five relevant SRs on mind-body CAM therapies, but none on manipulative and body-based, movement-based, or energy therapies. Most primary studies were small trials that did not provide descriptions of CAM strategies adequate to permit replication. Dose, duration, and frequency of interventions sometimes varied widely. Key findings were: For anxiety disorders, there is limited evidence on the effectiveness of meditation ( $n = 2$  studies). Studies reported high rates of dropout, suggesting that adherence to meditation may be problematic in a clinical setting; therefore, it is difficult to draw conclusions about the efficacy of meditation for the treatment of anxiety disorders. Relaxation and/or breathing retraining show promise as a CAM therapy for panic disorders. Evidence, however, is limited. Acupuncture shows some promise as a CAM therapy for depression, but results were mixed. For major depressive disorder (MDD), acupuncture showed greater effects than sham control on depressive symptoms but did not improve response or remission rates. It did not differ significantly from short-term use of antidepressants. However, for patients with post-stroke depression, acupuncture was more effective than short-term use of antidepressants. Mindfulness-based stress reduction has shown positive effects on anxiety and depressive symptoms. However, studies are poor to fair quality. No included SRs reported effects on health-related quality of life. Reported results provided limited data on adverse effects or retention rates. The limitations of the current evidence preclude strong conclusions about specific CAM interventions for the treatment of depressive and anxiety disorders. However, limited evidence supports the use of meditation, relaxation training and/or breathing retraining, and mindfulness-based stress reduction for anxiety, as well as acupuncture for depression. This evidence should be considered together with the direct data on CAM treatments for PTSD when planning further treatment studies.

## ADDITIONAL CITATIONS

Baer, R.A. (2003). **Mindfulness training as a clinical intervention: a conceptual and empirical review.** *Clinical Psychology: Science and Practice*, 10, 125-143. doi: 10.1093/clipsy.bpg015. Interventions based on training in mindfulness skills are becoming increasingly popular. Mindfulness involves intentionally bringing one's attention to the internal and external experiences occurring in the present moment, and is often taught through a variety of meditation exercises. This review summarizes conceptual approaches to mindfulness and empirical research on the utility of mindfulness-based interventions. Meta-analytic techniques were incorporated to facilitate quantification of findings and comparison across studies. Although the current empirical literature includes many methodological flaws, findings suggest that mindfulness-based interventions may be helpful in the treatment of several disorders. Methodologically sound investigations are recommended in order to clarify the utility of these interventions.

Bernstein, A., Tanay, G., & Vujanovic, A.A. (2011). **Concurrent relations between mindful attention and awareness and psychopathology among trauma-exposed adults: Preliminary evidence of transdiagnostic resilience.** *Journal of Cognitive Psychotherapy*, 25, 99-113. doi: 10.1891/0889-8391.25.2.99. This study evaluated the concurrent associations between mindful attention and awareness and psychopathology symptoms among adults exposed to trauma. Participants included 76 adults (35 women;  $M_{age} = 30.0$  years,  $SD = 12.5$ ) who reported experiencing one or more traumatic events. As hypothesized, levels of mindful attention and awareness were significantly negatively associated with levels of posttraumatic stress symptom severity, psychiatric multimorbidity, anxious arousal, and anhedonic depression symptoms, beyond the large, positive effect of number of traumatic event types. In addition, statistical evaluation of the phenomenological pattern of these associations showed that high levels of mindfulness exclusively co-occurred with low levels of psychopathology symptoms or high rates of mental health; whereas low levels of mindfulness did not similarly exclusively co-occur with either low or high levels of psychopathology symptoms but rather co-occurred with a broad range of symptom levels. Findings are conceptualized in terms of transdiagnostic resilience and discussed in regard to extant empirical and theoretical work.

Hoffman, S.G., Sawyer, A.T., Witt, A.A., & Oh, D. (2010). **The effects of mindfulness-based therapy on anxiety and depression: A meta-analytic review.** *Journal of Consulting and Clinical Psychology, 78*, 169-183. doi: 10.1037/a0018555. *Objective:* Although mindfulness-based therapy has become a popular treatment, little is known about its efficacy. Therefore, our objective was to conduct an effect size analysis of this popular intervention for anxiety and mood symptoms in clinical samples. *Method:* We conducted a literature search using PubMed, PsycINFO, the Cochrane Library, and manual searches. Our meta-analysis was based on 39 studies totaling 1,140 participants receiving mindfulness-based therapy for a range of conditions, including cancer, generalized anxiety disorder, depression, and other psychiatric or medical conditions. *Results:* Effect size estimates suggest that mindfulness-based therapy was moderately effective for improving anxiety (Hedges's  $g = 0.63$ ) and mood symptoms (Hedges's  $g = 0.59$ ) from pre- to posttreatment in the overall sample. In patients with anxiety and mood disorders, this intervention was associated with effect sizes (Hedges's  $g$ ) of 0.97 and 0.95 for improving anxiety and mood symptoms, respectively. These effect sizes were robust, were unrelated to publication year or number of treatment sessions, and were maintained over follow-up. *Conclusions:* These results suggest that mindfulness-based therapy is a promising intervention for treating anxiety and mood problems in clinical populations.

Hou, W.-H., Chiang, P.-T., Hsu, T.-Y., Chiu, S.-Y., & Yen, Y.-C. (2010). **Treatment effects of massage therapy in depressed people: A meta-analysis.** *Journal of Clinical Psychiatry, 71*, 894-901. doi: 10.4088/JCP.09r05009blu. *Objective:* To systematically investigate the treatment effects of massage therapy in depressed people by incorporating data from recent studies. *Data Sources:* A meta-analysis of randomized controlled trials (RCTs) of massage therapy in depressed people was conducted using published studies from PubMed, EMBASE, PsycINFO, and CINAHL electronic database from inception until July 2008. The terms used for the search were derived from medical subheading term (MeSH) massage combined with MeSH depression. Hand searching was also checked for bibliographies of relevant articles. Retrieval articles were constrained to RCTs/clinical trials and human subjects. No language restrictions were imposed. *Study Selection:* We included 17 studies containing 786 persons from 246 retrieved references. Trials with other intervention, combined therapy, and massage on infants or pregnant women were excluded. *Data Extraction:* Two reviewers independently performed initial screen and assessed quality indicators by Jadad scale. Data were extracted on publication year, participant characteristics, and outcomes by another single reviewer. *Data Synthesis:* All trials showed positive effect of massage therapy on depressed people. Seventeen RCTs were of moderate quality, with a mean quality score of 6.4 ( $SD = 0.85$ ). The pooled standardized mean difference in fixed- and random-effects models were 0.76 (95% CI, 0.61-0.91) and 0.73 (95% CI, 0.52-0.93), respectively. Both indicated significant effectiveness in the treatment group compared with the control group. The variance between these studies revealed possible heterogeneity ( $\tau^2 = 0.06$ , Cochran  $\chi^2_{16} = 25.77$ ,  $P = .06$ ). *Conclusions:* Massage therapy is significantly associated with alleviated depressive symptoms. However, standardized protocols of massage therapy, various depression rating scales, and target populations in further studies are suggested.

Kabat-Zinn, J. (1994). *Wherever you go, there you are: Mindfulness meditation in everyday life (1st ed.)*. New York, NY: Hyperion. This book provides a comprehensive, but accessible, discussion of the practice of meditation. Kabat-Zinn posits that meditation is important because it brings about a state of "mindfulness," a condition of "being" rather than "doing" during which you pay attention, without judgment, in the moment. Within the text, he presents a broad rationale for cultivating a meditation practice, and also describes different types of meditative practices and their potential benefits.

Keng, S.-L., Smoski, M.J., & Robins, C.J. (2011). **Effects of mindfulness on psychological health: A review of empirical studies.** *Clinical Psychology Review, 31*, 1041-1056. doi: 10.1016/j.cpr.2011.04.006. Within the past few decades, there has been a surge of interest in the investigation of mindfulness as a psychological construct and as a form of clinical intervention. This article

reviews the empirical literature on the effects of mindfulness on psychological health. We begin with a discussion of the construct of mindfulness, differences between Buddhist and Western psychological conceptualizations of mindfulness, and how mindfulness has been integrated into Western medicine and psychology, before reviewing three areas of empirical research: cross-sectional, correlational research on the associations between mindfulness and various indicators of psychological health; intervention research on the effects of mindfulness-oriented interventions on psychological health; and laboratory-based, experimental research on the immediate effects of mindfulness inductions on emotional and behavioral functioning. We conclude that mindfulness brings about various positive psychological effects, including increased subjective well-being, reduced psychological symptoms and emotional reactivity, and improved behavioral regulation. The review ends with a discussion on mechanisms of change of mindfulness interventions and suggested directions for future research.

Kessler, R.C., Davis, R.B., Foster, D.F., Van Rompay, M.I., Walters, E.E., Wilkey, S.A., Kaptchuk, T.J., et al. (2001). **Long-term trends in the use of complementary and alternative medical therapies in the United States.** *Annals of Internal Medicine, 135*, 262-268. [annals.org](http://annals.org). *Background:* Although recent research has shown that many people in the United States use complementary and alternative medical (CAM) therapies, little is known about time trends in use. *Objective:* To present data on time trends in CAM therapy use in the United States over the past half-century. *Design:* Nationally representative telephone survey of 2055 respondents that obtained information on current use, lifetime use, and age at first use for 20 CAM therapies. *Setting:* The 48 contiguous U.S. states. *Participants:* Household residents 18 years of age and older. *Measurement:* Retrospective self-reports of age at first use for each of 20 CAM therapies. *Results:* Previously reported analyses of these data showed that more than one third of the U.S. population was currently using CAM therapy in the year of the interview (1997). Subsequent analyses of lifetime use and age at onset showed that 67.6% of respondents had used at least one CAM therapy in their lifetime. Lifetime use steadily increased with age across three age cohorts: Approximately 3 of every 10 respondents in the pre-baby boom cohort, 5 of 10 in the baby boom cohort, and 7 of 10 in the post-baby boom cohort reported using some type of CAM therapy by age 33 years. Of respondents who ever used a CAM therapy, nearly half continued to use many years later. A wide range of individual CAM therapies increased in use over time, and the growth was similar across all major sociodemographic sectors of the study sample. *Conclusions:* Use of CAM therapies by a large proportion of the study sample is the result of a secular trend that began at least a half century ago. This trend suggests a continuing demand for CAM therapies that will affect health care delivery for the foreseeable future.

Kimbrough, E., Magyari, T., Langenberg, P., Chesney, M., & Berman, B. (2010). **Mindfulness intervention for child abuse survivors.** *Journal of Clinical Psychology, 66*, 17-33. doi: 10.1002/jclp.20624. Twenty-seven adult survivors of childhood sexual abuse participated in a pilot study comprising an 8-week mindfulness meditation-based stress reduction (MBSR) program and daily home practice of mindfulness skills. Three refresher classes were provided through final follow-up at 24 weeks. Assessments of depressive symptoms, PTSD anxiety, and mindfulness were conducted at baseline, 4, 8, and 24 weeks. At 8 weeks, depressive symptoms were reduced by 65%. Statistically significant improvements were observed in all outcomes post-MBSR, with effect sizes above 1.0. Improvements were largely sustained until 24 weeks. Of three PTSD symptom criteria, symptoms of avoidance/numbing were most greatly reduced. Compliance to class attendance and home practice was high, with the intervention proving safe and acceptable to participants. These results warrant further investigation of the MBSR approach in a randomized, controlled trial in this patient population.

Rosenthal, J.Z., 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*, 626-630. [effects-of-transcendental-meditation-in-veterans-with-ptsd.pdf](http://effects-of-transcendental-meditation-in-veterans-with-ptsd.pdf). We conducted an uncontrolled pilot study to determine whether

transcendental meditation (TM) might be helpful in treating Veterans from Operation Enduring Freedom or Operation Iraqi Freedom with combat-related PTSD. Five Veterans were trained in the technique and followed for 12 weeks. All subjects improved on the primary outcome measure, the Clinician Administered PTSD Scale (mean change score, 31.4;  $p = 0.02$ ;  $df = 4$ ). Significant improvements were also observed for 3 secondary outcome measures: Clinician's Global Inventory-Severity (mean change score, 1.60;  $p < 0.04$ ;  $df = 4$ ), Quality of Life Enjoyment and Satisfaction Questionnaire (mean change score, -13.00;  $p < 0.01$ ;  $df = 4$ ), and the PTSD Checklist-Military Version (mean change score, 24.00;  $p < 0.02$ ;  $df = 4$ ). TM may have helped to alleviate symptoms of PTSD and improve quality of life in this small group of Veterans. Larger, placebo-controlled studies should be undertaken to further determine the efficacy of TM in this population.

Sears, S., & Kraus, S. (2009). **I think therefore I am: Cognitive distortions and coping style as mediators for the effects of mindfulness meditation on anxiety, positive and negative affect, and hope.** *Journal of Clinical Psychology, 65*, 561-573. doi: 10.1002/jclp.20543. This study examined cognitive distortions and coping styles as potential mediators for the effects of mindfulness meditation on anxiety, negative affect, positive affect, and hope in college students. Our pre- and postintervention design had four conditions: control, brief meditation focused on attention, brief meditation focused on loving kindness, and longer meditation combining both attentional and loving kindness aspects of mindfulness. Each group met weekly over the course of a semester. Longer combined meditation significantly reduced anxiety and negative affect and increased hope. Changes in cognitive distortions mediated intervention effects for anxiety, negative affect, and hope. Further research is needed to determine differential effects of types of meditation.

Smeeding, S.J., Bradshaw, D.H., Kumpfer, K., Trevithick, S., & Stoddard, G.J., (2010) **Outcome evaluation of the Veterans Affairs Salt Lake City Integrative Health Clinic for chronic pain and stress-related depression, anxiety, and post-traumatic stress disorder.** *Journal of Alternative and Complementary Medicine, 16*, 823-835. doi: 10.1089/acm.2009.0510. **Objectives:** The purpose of this longitudinal outcome research study was to determine the effectiveness of the Integrative Health Clinic and Program (IHCP) and to perform a subgroup analysis investigating patient benefit. The IHCP is an innovative clinical service within the Veterans Affairs Health Care System designed for nonpharmacologic biopsychosocial management of chronic nonmalignant pain and stress-related depression, anxiety, and symptoms of PTSD utilizing complementary and alternative medicine and mind-body skills. **Methods:** A post-hoc quasi-experimental design was used and combined with subgroup analysis to determine who benefited the most from the program. Data were collected at intake and up to four follow-up visits over a 2-year time period. Hierarchical linear modeling was used for the statistical analysis. The outcome measures included: Health-Related Quality of Life (SF-36), the Beck Depression Inventory (BDI), and Beck Anxiety Inventory (BAI). Subgroup comparisons included low anxiety (BAI < 19,  $n = 82$ ), low depression (BDI < 19,  $n = 93$ ), and absence of PTSD ( $n = 102$ ) compared to veterans with high anxiety (BAI  $\geq 19$ ,  $n = 77$ ), high depression (BDI > 19,  $n = 67$ ), and presence of PTSD ( $n = 63$ ). **Results:** All of the comparison groups demonstrated an improvement in depression and anxiety scores, as well as in some SF-36 categories. The subgroups with the greatest improvement, seen at 6 months, were found in the high anxiety group (Cohen's  $d = 0.52$ ), the high-depression group (Cohen's  $d = 0.46$ ), and the PTSD group (Cohen's  $d = 0.41$ ). **Conclusions:** The results suggest IHCP is an effective program, improving chronic pain and stress-related depression, anxiety, and health-related quality of life. Of particular interest was a significant improvement in anxiety in the PTSD group. The IHCP model offers innovative treatment options that are low risk, low cost, and acceptable to patients and providers.

Treanor, M. (2011). **The potential impact of mindfulness on exposure and extinction learning in anxiety disorders.** *Clinical Psychology Review, 31*, 617-625. doi: 10.1016/j.cpr.2011.02.003. Mindfulness-based approaches have shown promise in the treatment of various anxiety disorders. However, further research is needed to more precisely elucidate mechanisms of action through

which mindfulness practice may enhance treatment for anxiety. Given centrality of exposure-based procedures in the treatment of anxiety, it is important to consider ways in which mindfulness may affect exposure and extinction processes. In fact, numerous findings in the basic science of extinction point to the possible ways in which mindfulness may facilitate extinction learning. The present paper aims to critically review the literature surrounding mindfulness and extinction learning in order to more fully explore the ways in which mindfulness-based treatments may positively impact exposure and extinction processes in the treatment of anxiety disorders. This will provide a unique synthesis of newer, acceptance-based behavior therapies with established principles of effective behavioral treatments.

Vujanovic, A.A., Niles, B., Pietrefesa, A., Schmertz, S.K., & Potter, C.M. (2011). **Mindfulness in the treatment of posttraumatic stress disorder among military veterans.** *Professional Psychology: Research and Practice, 42*, 24-31. doi: 10.1037/a0022272. How might a practice that has its roots in contemplative traditions, seeking heightened awareness through meditation, apply to trauma-related mental health struggles among military Veterans? In recent years, clinicians and researchers have observed the increasing presence of mindfulness in Western mental health treatment programs. Mindfulness is about bringing an attitude of curiosity and compassion to present experience. This review addresses the above question in a detailed manner with an emphasis on the treatment of military Veterans suffering from PTSD and related psychopathology. In addition, the integration of mindfulness with current empirically supported treatments for PTSD is discussed with specific attention to directions for future research in this area.

Vujanovic, A.A., Youngwirth, N.E., Johnson, K.A., & Zvolensky, M.J. (2009). **Mindfulness-based acceptance and posttraumatic stress symptoms among trauma-exposed adults without axis I psychopathology.** *Journal of Anxiety Disorder, 23*, 297-303. doi: 10.1016/j.janxdis.2008.08.005. The present investigation examined the incremental predictive validity of mindfulness-based processes, indexed by the Kentucky Inventory of Mindfulness Skills, in relation to posttraumatic stress symptom severity among individuals without any axis I psychopathology. Participants included 239 adults who endorsed exposure to traumatic life events. Results indicated that the Accepting without Judgment subscale was significantly incrementally associated with posttraumatic stress symptoms; effects were above and beyond the variance accounted for by negative affectivity and number of trauma types experienced. The Acting with Awareness subscale was incrementally associated with only posttraumatic stress-relevant re-experiencing symptoms; and no other mindfulness factors were related to the dependent measures. Findings are discussed in relation to extant empirical and theoretical work relevant to mindfulness and posttraumatic stress.