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The Effectiveness of Emotional Freedom Techniques in the Treatment of Posttraumatic Stress Disorder: A Meta-Analysis

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Abstract

Background: Over the past two decades, growing numbers of clinicians have been utilizing Emotional Freedom Techniques (EFT) in the treatment of post-traumatic stress disorder (PTSD), anxiety, and depression. Randomized controlled trials (RCTs) have shown encouraging outcomes for all three conditions.

Objective: To assess the efficacy of EFT in treating PTSD by conducting a meta-analysis of existing RCTs.

Methods: A systematic review of databases was undertaken to identify RCTs investigating EFT in the treatment of PTSD. The RCTs were evaluated for quality using evidence-based standards published by the American Psychological Association Division 12 Task Force on Empirically Validated Therapies. Those meeting the criteria were assessed using a meta-analysis that synthesized the data to determine effect sizes. While uncontrolled outcome studies were excluded, they were examined for clinical implications of treatment that can extend knowledge of this condition.

Results: Seven randomized controlled trials were found to meet the criteria and were included in the meta-analysis. A large treatment effect was found, with a weighted Cohen's $d = 2.96$ (95% CI 1.96-3.97; $p < 0.001$) for the studies that compared EFT to usual care or a wait list. No treatment effect differences were found in studies comparing EFT to other evidence-based

therapies such as Eye Movement Desensitization and Reprocessing (EMDR; 1 study) and cognitive behavior therapy (CBT; 1 study).

Conclusions: The analysis of existing studies showed that a series of four to ten EFT sessions is an efficacious treatment for PTSD with a variety of populations. The studies examined reported no adverse effects from EFT interventions and showed that it can be used both on a self-help basis and as a primary evidence-based treatment for PTSD.

Keywords: Emotional Freedom Techniques, Post-Traumatic-Stress-Disorder, Veteran

Background

Concern over post-traumatic stress disorder (PTSD) in the United States continues to grow as the Veterans Administration (VA) confronts the problems of treating the large cohort of veterans deployed in the Middle East wars. Since October 2001, approximately 2.4 million US troops have been deployed to Afghanistan and Iraq in Operation Enduring Freedom (OEF) or Operation Iraqi Freedom (OIF), and a large percentage are estimated to be PTSD positive. Over the past decade, the VA has diagnosed almost 30% of the 834,463 OEF and OIF veterans with PTSD (Veterans Health Administration, 2012).

PTSD typically interferes with daily functioning and quality of life. Relationships may be impacted, eroding emotional support. Emotional numbing can result in a loss of intimacy in the marriage and withdrawal from the parent/child relationship (Institute of Medicine, 2010). This as well as strain on relationships with friends and extended family can lead to isolation from support groups. Work life can also suffer. Flashbacks, anxiety, and sleep loss can make it difficult to complete tasks or even attend work for days at a time (Institute of Medicine, 2010). Additionally, avoidance of traumatic memories can lead to alcoholism and other substance abuse problems (Institute of Medicine, 2010), exacerbating problems in personal relationships as well as at work. Consequently, a consistent, effective treatment method for PTSD that can provide healing for veterans and their families is urgently needed.

In a recent meta-analysis (Watts et al., 2013) of 112 studies looking at psychotherapies and pharmacotherapies, psychotherapies like cognitive therapies ($g = 1.63$), exposure therapies (1.08), and EMDR (1.01) to be the most effective. Paroxetine ($g = 0.74$) Sertraline (0.41), Fluoxetine (0.43), Risperidone (0.41), Topiramate (1.20), and Venlafaxine (0.48) were found to be the most effective pharmacotherapies. Cognitive behavior therapy (CBT), considered the “treatment of choice” for PTSD by many in the field (Bryant et al., 2008), documents an average success rate of 40% to 60%, with most clients requiring 10 or more sessions (Tolin, 2010; Feinstein & Church, 2010; Monson et al., 2006). This percentage is promising because of the persistent nature of PTSD, but a more effective treatment is needed if PTSD is to be effectively remediated in hundreds of thousands of veterans.

This systematic review and meta-analysis looks at a form of therapy called Emotional Freedom Techniques (EFT) which utilizes established techniques within clinical practice, such as cognitive restructuring, exposure, and systematic desensitization, but it adds the novel component of stimulating acupuncture points (acupoints) while disturbing memories or triggers are mentally activated (Feinstein, 2012).

Literature Review

Post Traumatic Stress Disorder

The National Institute of Mental Health reports that Post Traumatic Stress Disorder (PTSD) impacts an estimated 3.5% of adults in the US (National Institute of Mental Health, 2013). Diagnostic criteria for PTSD, according to the DSM-5, include a history of exposure to a traumatic event as a participant, witness, or through indirect exposure (VA, 2014). As a result of the trauma, the individual experiences symptoms from each of four symptom clusters. *Intrusion* consists of symptoms such as intrusive thoughts, flashbacks, and traumatic nightmares. A second symptom cluster that must be present for a PTSD diagnosis involves the *avoidance* of thoughts, feelings, and reminders of the traumatic event. *Negative alterations* in cognitions and mood can involve negative feelings about oneself and the world as well as feelings of isolation and they are a third symptom cluster. The fourth includes *alterations in arousal and reactivity*, as can be seen in sleep difficulties, irritability, aggressiveness, and self-destructive behaviors (VA, 2014). PTSD is consistently difficult to treat, with a median recovery time of three to five years (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995).

Veterans from OIF in Iraq and OEF in Afghanistan are of particular concern. Wilk et al. (2013) reported that as many as 24% of infantry who have seen direct combat are diagnosed with PTSD as opposed to the 3.5% of adults in the United States. These soldiers have also often been diagnosed with comorbid conditions such as major depression, traumatic brain injury, or physical injuries making treatment even more difficult (Institute of Medicine, 2010). In addition, fear of retraumatization during treatment or stigmatization for seeking help make veterans treatment-resistant (Dinter, 2009), and the addition of physical injury, called polytrauma, leads to even more complications (Institute of Medicine, 2010), making it even more crucial that powerful clinical tools be developed for treating this population.

Emotional Freedom Techniques (EFT)

Like other treatment methods for PTSD, EFT uses exposure and cognitive reprocessing (Lane, 2009). Unique to EFT, however, is the stimulation acupoints, which proponents claim, give the approach greater power than therapies that do not include a somatic component (Church et al., 2012). During an EFT treatment, the client brings to mind a traumatic memory or an emotional trigger and pairs it with a reframe of self-acceptance (Church et al., 2012). Then the client taps, massages, or holds a set of acupoints. A “subjective units of distress” (SUD) scale is used to measure the client’s anxiety level before and after each round to determine if more work needs to be done on each specific memory or trigger (Lane, 2009). Additional rounds of mental exposure and acupoint stimulation are completed until the client is able to bring the memory to mind with no or little subjective distress (Church et al., 2012).

Research on the Underlying Mechanisms of EFT

Traumatic events can overwhelm the mind’s ability to process new information accurately. As a result, a traumatic memory may be held in the limbic system indefinitely rather than being integrated into longterm memory (Solomon et al., 2009). The autonomic nervous system becomes activated when a trigger appears that is reminiscent of the traumatic event (Lane, 2009), a form of classical conditioning.

An established approach used to remediate such conditioning is called counterconditioning or desensitization. Developed by Wolpe (1958), counterconditioning links a difficult memory with relaxation techniques to create a new response in the body (Lane, 2009). Although this approach is effective, the addition of acupoint stimulation in EFT protocols breaks this cycle of sympathetic nervous system hyperarousal more rapidly than other forms of

desensitization, allowing for faster symptom reduction, and it may be beneficial for physical health as well (Lane, 2009). “The lateral nucleus of the amygdala is at once activated by memories or cues involving the traumatic event and deactivated by the acupoint-generated signal. Such reciprocal inhibition is the antecedent of extinction and may also bring about the depotentiation of neurological pathways that were sustaining the fear response” (Feinstein, 2010, p. 395). Although both systematic desensitization and acupoint stimulation produce reciprocal inhibition, the signals sent to the limbic system by acupoint stimulation seem to reduce hyperarousal at a significantly faster rate than interventions that are relaxation-focused alone (Feinstein, 2010). A randomized controlled trial (RCT) conducted by Sezgin and Özcan (2009) demonstrated this by comparing progressive muscle relaxation with self-administered exposure/acupoint stimulation. They found a significant reduction in test-taking anxiety for both techniques, but a significantly greater one for exposure/acupoint stimulation.

Other biological explanations propose that acupoint stimulation, as used in EFT, releases serotonin in the amygdala as well as the prefrontal cortex reducing hyperarousal rapidly (Ruden, 2005). Brain mapping as well as neurobiological research support this connection (Hui et al., 2000; Napadow et al., 2009; Ruden, 2010) and demonstrate that counterconditioning takes place in the midbrain, primarily the amygdala (Lane, 2009). Studies using fMRI have shown that stimulating specific acupoints downregulates limbic system activity (Dhond, Kettner, & Napadow, 2007; Hui et al., 2000).

Additionally, acupoint stimulation releases opioids, serotonin, and gamma-aminobutyric acid (GABA), shutting off the fight/flight/freeze response, reducing pain, slowing heart rate, and decreasing anxiety (Varvogli and Darviri, 2011). Acupoint tapping also helps to regulate the stress hormone cortisol (Varvogli and Darviri, 2011). A triple-blind trial of EFT measured cortisol levels through saliva, comparing EFT to a supportive interview as well as a no treatment group (Church, Yount and Brooks, 2012). The results showed an equal reduction in cortisol (14%) for both the supportive intervention (SI) and no treatment (NT) groups but 24% for EFT after a single one-hour session.

Studies have also used electroencephalography (EEG) to demonstrate beneficial changes in brain wave activity following acupoint tapping as used in EFT. For example, theta EEG frequencies associated with relaxation have been shown to increase following tapping (Lambrou, Pratt & Chevalier, 2003). Another EEG study examined motor vehicle accident survivors at risk of PTSD and found the brain frequencies associated with fear to have been regulated after EFT (Swingle, Pulos, & Swingle, 2003).

Although this research demonstrates how and why EFT works, many proponents of conventional psychotherapies have vigorously opposed Energy Psychology in general and EFT in particular. Devilly (2005) calls such therapies “possible threats to the science of psychiatry and psychology.” Bakker (2013) dismisses the evidence for them as a “swamp,” and advocates that research into them should be halted because it is unlikely to be productive. Other critics, whose investigation revealed that the popularity of these methods has grown to the point where 42% of therapists are using them, contend that their fast-increasing adoption by the clinical community is because the therapists who use them are less rigorous and more gullible (Gaudio, Brown, & Miller, 2012). Institutional inertia, as well as opposition to new therapies, has been shown to delay their adoption by an average of 17 years, and results in the failure of 80% of all new treatments to bridge the “translational gap” from experimental evidence to clinical practice (Church, Feinstein, Tranguch, & Stein, 2014).

EFT in the Treatment of PTSD

EFT has been shown to be effective in treating PTSD in a variety of peer-reviewed papers, including case studies, observational studies, pilot protocols, and RCTs (e.g., Burke, 2010; Church, Geronilla & Dinter, 2009; Church & Brooks, 2014; Karatzias et al., 2011). These studies demonstrate EFT's potential for treating PTSD with both military (e.g., Church, Hawk, Brooks, Toukolehto, Wren, Dinter, & Stein, 2013) and non-military populations (Karatzias et al., 2011).

A benefit attributed to EFT is its ability to be used outside of clinical settings as a safe and reliable self-help method for reducing distress. This can be particularly valuable with flashbacks or nightmares. EFT can also be taught to an entire family to support the client and aid family members in decreasing their own anxiety. An outcome study that included 218 veterans and their spouses found a sharp reduction in symptoms after a seven-day retreat in which they received EFT for PTSD (Church & Brooks, 2014). Both spouses and veterans maintained their gains on six week follow-up. Social support was, however, believed to play a significant role along with the EFT in the results noted.

EFT has also been shown to be effective over the phone. Hartung and Stein (2012) found that PTSD symptoms significantly improved in veterans after 6 one-hour phone sessions. Although in-office treatment was found to be more effective, 67% of those treated by phone no longer met the diagnostic criteria for PTSD at a six month follow up. This study shows EFT's potential for helping veterans who cannot participate in in-person therapy because of physical limitations, residence in areas where in-person treatment is not available, or reluctance to enter a treatment facility.

EFT has been shown to simultaneously reduce anxiety and depression in addition to PTSD symptomology (Church, 2013a; Church, 2010a; Church, Geronilla, & Dinter, 2009). Furthermore, EFT's treatment effects impact both physical and psychological symptoms. A recent analysis demonstrated that traumatic brain injury (TBI) symptoms were significantly reduced following EFT treatments for PTSD and continued to diminish through the follow-up period, ultimately decreasing 41% from pretest scores ($p < .0021$; Church & Palmer-Hoffman, 2013). Physical pain was reduced by 41% ($p < .0001$; Church, 2013a). These studies suggest that EFT is effective in addressing multiple symptom domains, making it extremely useful in treating combat veterans.

Additionally, three meta-analyses have been conducted on the effectiveness of EFT. The first meta-analysis of EFT and allied methods examined all studies published up till 2012 and comprised 18 RCTs including 921 participants. It found a moderate treatment effect for psychological conditions (Hedge's $g = -0.66$; Gilomen & Lee, 2015). A meta-analysis of 21 studies of EFT for depression found a moderate treatment effect size, with a Cohen's d of .37 (Nelms & Castel, 2015). Another meta-analysis, this time of 14 randomized controlled trials of EFT for anxiety, also found a moderately strong treatment effect for this condition (Cohen's $d = .61$; Clond, 2015). The current study is the first meta-analysis focusing specifically on the use of EFT in treating PTSD.

A recent meta-analysis (Ehring et al., 2014) including sixteen randomized controlled trials, looked at PTSD treatment (psychological interventions) for adult survivors of childhood sexual and/or physical abuse. Results showed an aggregated uncontrolled effect size of $g=1.24$ (pre- vs. post-treatment), an aggregated controlled effect sizes of $g=0.72$ (post-treatment, comparison to waitlist control conditions) and $g=0.50$ (post-treatment, comparison with TAU/placebo control conditions). These studies were also subdivided into trauma-focused cognitive behavior therapy (CBT) and non-trauma-focused interventions. The results showed

that trauma-focused interventions were more effective than non-trauma-focused treatments. Although EFT was not one of the interventions included in the meta-analysis, these findings would support the use of EFT for use as a PTSD intervention because of its trauma-focused approach.

Randomized Controlled Trials of EFT

Given the intransigence of PTSD, its prevalence, and its impact on returning veterans, their families, and their communities, treatments are urgently needed that reduce symptoms quickly and have long-lasting effects. Our literature review identified seven RCTs in which EFT was used to treat PTSD. Each study reported rapid and significant improvement, and those that did follow-up assessments found that effects were lasting.

Church, Hawk, Brooks, Toukolehto, Wren, Dinter, and Stein (2013) conducted a RCT in which 59 veterans with clinical levels of PTSD symptoms were treated using EFT in addition to standard care. After six one-hour sessions, 90% of the participants no longer qualified for clinical diagnosis of PTSD (>50 on the PCL-M) compared to only 4% of the waitlist, which received standard care without EFT. After six months, 80% of the EFT group was still below the clinical PTSD symptom threshold. After the wait period, the SOC/WL group received EFT sessions with similar reductions in PTSD symptoms. Of the combined group of 49 subjects, 80% maintained the positive effects of EFT and no longer met the PTSD clinical criteria after six months.

In 2014, Geronilla, McWilliams, Clond, and Palmer-Hoffman performed a replication of Church et al. (2013), obtaining similar results. After six one-hour phone or in office sessions of EFT, they found PCL-M symptom reductions using Cohen's d to be $d = 3.44$ indicating a very large treatment effect. Veteran's gains were maintained three and six months after treatment. At 6 months, 95% no longer met clinical criteria for PTSD based on PCL-M score >50.

Karatzias, Power, Brown, McGoldrick, Begum, Young, and Adams (2011) compared Eye Movement Desensitization and Reprocessing (EMDR) to EFT in a group of PTSD-positive patients in a hospital in the UK's National Health Service (NHS). The mean time frame for successful treatment was four sessions for both therapies, with gains maintained on eight-week follow-up. From pretreatment to posttreatment, a large effect size on the Clinician Administered PTSD Scale (CAPS) was found ($d = 1.0$). On the PTSD Check List (PCL), the effect size was $d = 1.1$. At follow up, the EFT group retained a large effect size on both the CAPS and PCL.

Church, Yount, Fox, and Nelms (2015) found that after 10 sessions of EFT, veteran PCL-M scores decreased by 25.63 points on average bringing PTSD scores down from a clinical level to a nonclinical one. This decrease in PTSD symptoms held at both 3 and 6 month follow up. According to the Department of Veteran Affairs, "Evidence for the PCL for DSM-IV suggests that a 5-10 point change represents reliable change (i.e., change not due to chance) and a 10-20 point change represents clinically significant change. Therefore, it was recommended to use 5 points as a minimum threshold for determining whether an individual has responded to treatment and 10 points as a minimum threshold for determining whether the improvement is clinically meaningful using the PCL for DSM-IV." (PTSD: National Center for PTSD, 2014). Anxiety and depression were also measured using the Hospital Anxiety and Depression Scale (HADS) and the Symptom Assessment-45 (SA-45) was used to measure multiple symptoms. After 10 sessions, symptoms were reduced at a highly statistically significant level ($p < .001$) for anxiety and depression as measured by the HADS as well as both general scales of the SA-45.

Church, Sparks, and Clond (in press) found a significant reduction on the PCL-M when assessing veterans who scored below the clinical cutoff but were still considered to be at risk for delayed-onset PTSD. Scores declined from a mean of 41 to a mean of 25 (-64%, $p < 0.0001$) and

held at six month follow up. These changes were similar to the values noted in studies of veterans with full-blown PTSD. Similar reductions were found on psychological conditions such as anxiety as measured by the SA-45. A Cohen's d of 1.99 indicated a large treatment effect. Reductions in traumatic brain injury symptoms ($p = 0.045$) and insomnia ($p = 0.004$) were also found.

Nemiro, Papworth, and Palmer-Hoffman (2015) used the Harvard Trauma Questionnaire (HTQ) and the Hopkins Symptom Checklist-25 (HSCL), which measures general mental health, to analyze the effectiveness of EFT and cognitive behavioral therapy (CBT) in treating PTSD symptoms. Participants were women who had been victims of sexual violence in the Congo. They received two 2-1/2 hour treatment sessions for four consecutive weeks. After treatment, participants showed a significant reduction ($p < 0.0001$) in symptoms on both the HTQ and HSCL in both the CBT and EFT groups. The reduced symptomology held at six month follow up.

Church, Piña, Reategui, and Brooks (2012), working with traumatized male adolescents, found a reduction in PTSD symptoms to a nonclinical level following a single session of EFT. Using the subjective distress (SUD), and the Impact of Events Scale (IES), they found no improvement for the wait list group (IES total mean pre = 32 $SD \pm 4.82$, post = 31 $SD \pm 3.84$), but for all experimental-group participants, post-test scores were reduced to a nonclinical level on the total score as well as the intrusive and avoidant symptom subscales of the IES (IES total mean pre = 36 $SD \pm 4.74$, post = 3 $SD \pm 2.60$, $p < .001$).

The Current Study

Each of these investigations reported positive clinical outcomes. The current study performs a meta-analysis, a statistical overview that examines the results of independent RCTs for the purpose of identifying areas of consistency across studies and to explain variations in study results (Cornell & Mulrow, 1999). Combining findings from multiple studies increases the confidence in the conclusions that can be drawn from the data and the statistical power of effect size estimates.

Methodology

Study Selection

The studies selected for this meta-analysis met the inclusion criteria for methodology and used a comparison or waitlist group. A systematic review of the literature was undertaken to identify PTSD symptomology before and after EFT treatment. Studies meeting the search criteria were peer-reviewed, randomized, compared the experimental treatment (EFT) with an established therapy or wait-list group, and the treatment targeted PTSD or vulnerability to PTSD. Sources included APA PsychINFO, Google Scholar, MEDLINE/PubMed, and references from the papers that were retrieved. Online forums and the research directors of professional organizations were queried for pending research as well as unpublished "file drawer" studies. Only English-language papers were considered. The search terms employed were "EFT," "Emotional Freedom Techniques," (plural) "Emotional Freedom Technique," (singular), and "Clinical EFT." The search is current as of February 2015. Studies were examined to determine if they met the evidence-based criteria that conform to those of Division 12 of the American Psychological Association (Chambless et al. 1996). These criteria (as reported in Church, 2013) include:

- 1) **Randomized controlled trials** (RCTs)—subjects were randomly assigned to the treatment of interest condition or to one or more comparison conditions.
- 2) **Adequate sample size** to detect statistically significant ($p < .05$ or better) differences between the treatment of interest and the comparison condition(s) were used.
- 3) **The population for which the treatment was designed and tested must be clearly defined** through the use of diagnosis by qualified clinicians, through cutoff scores on questionnaires that are reliable and valid, through interviews identifying the focus of the study's interest, or through some combination of these.
- 4) Assessment tools must have demonstrated **reliability and validity** in previous research.
- 5) Any interview assessments were made by interviewers who were **blind to group assignment**.
- 6) **Treatment manuals** that make clear the nature of the treatment being tested were used. If the treatment was relatively simple, it could be described in the procedure section of the journal article presenting the experiment, in lieu of a treatment manual.
- 7) The paper reporting the study **provided enough data** that the study's conclusions can be reviewed for appropriateness, including sample sizes, use of instruments that detect changes targeted by the study's design, and **magnitude of statistical significance**.

Study Eligibility.

Nine studies were identified which fulfilled the inclusion criteria. Two studies, Hartung and Stein (2012) and Stein and Brooks (2011) were re-analyses of data published in Church, Hawk, Brooks, Toukolehto, Wren, Dinter, and Stein (2013) and so were excluded to prevent duplication. The remaining seven studies (table 1) used a variety of scales to measure the efficacy of treatments for PTSD. Although some of these were relatively comparable (for example, PCL-M and PCL-C were used by four of the studies), other scales attempted to measure symptoms not considered in other studies (for example, Karatzias et al. (2011) used the Satisfaction with Life Scale). Two measures were included in the final analysis to try and ensure comparability between studies: PCL and 'anxiety and depression' (from either SA-45, HADS or HSCL). Two of the included studies have only 8 subjects in each treatment group (Church, Piña, Reategui, and Brooks 2012 and Church, Yount, Fox, and Nelms (2015) . While this number is very small, treatment effects were nonetheless highly significant. The APA criteria advocate sample size sufficient to obtain a statistical significance of $p < .05$ or greater, which both studies achieved. While it is not one of the criteria, studies with at least 30 in each group are preferred.

Table 1: RCTs Included in this Meta-analysis evaluated on the APA Division 12's 7 Evidence-based Criteria

Division 12 Criteria	Karatzias, Power, Brown, McGoldrick, Begum, Young, and Adams (2011)	Church, Piña, Reategui, and Brooks (2012)	Church, Hawk, Brooks, Toukolehto, Wren, Dinter, and Stein (2013)	Geronilla, McWilliams, Clond, and Palmer-Hoffman (2014)	Church, Yount, Fox, and Nelms (2015)	Church, Sparks, and Clond (in press)	Nemiro, Papworth, and Palmer-Hoffman (2015)
RCTs	EFT group randomly assigned and compared to an EMDR group	EFT group randomly assigned and compared to a waitlisted control group	EFT group randomly assigned and compared to an SOC waitlisted group	EFT group randomly assigned and compared to TAU waitlisted group	EFT group randomly assigned and compared to TAU waitlisted group	EFT group randomly assigned and compared to TAU waitlisted group	EFT group randomly assigned and compared to a CBT group
Adequate Sample Size	14 EFT vs. 13 EMDR	8 EFT vs. 8 WL	30 EFT vs. 29 WL	32 EFT vs. 26 WL	8 EFT vs. 8 WL	12 EFT vs. 9 WL	25 EFT vs. 25 CBT
Defined Population	Individuals on the waitlist of a National Health Service (NHS) Psychotherapy Service in Scotland who satisfied the DSM-IV criteria for PTSD	Institutionalized juveniles found to be physically or psychologically abused	Veterans who met the clinical criterion for PTSD (≥ 50) on the PTSD Checklist-Military (PCL-M)	Veterans who met the clinical criterion for PTSD (≥ 50) on the PTSD Checklist-Military (PCL-M)	Veterans who met the clinical criterion for PTSD (≥ 50) on the PTSD Checklist-Military (PCL-M)	Veterans who scored below the 50 cutoff on the PTSD Checklist-Military (PCL-M)	Female Refugees from the Democratic Republic of Congo who were victims of sexual gender based violence
Reliable and Valid Assessment Tools	Clinician Administered PTSD Scale (CAPS) PTSD Checklist (PCL-C) Hospital Anxiety and Depression Scale (HADS)	Subjective Units of Distress Scale (SUDS) Impact of Events Scale (IES)	Symptom Assessment-45 (SA-45) PTSD Checklist-Military (PCL-M)	Symptom Assessment-45 (SA-45) Insomnia Severity Scale (ISI) PTSD Checklist-Military (PCL-M)	Symptom Assessment-45 (SA-45) Hospital Anxiety and Depression Scale (HADS) Insomnia Severity Scale (ISI) Brief Pain	Symptom Assessment-45 (SA-45) Insomnia Severity Scale (ISI) PTSD Checklist-Military (PCL-M)	Harvard Trauma Questionnaire (HTQ) Hopkins Symptom Checklist-25 (HSCL)

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	Satisfaction with Life Scale (SWLS)				Inventory (BPI)		
					PTSD Checklist-Military (PCL-M)		
Blind Interviews	Yes	N/A	N/A	N/A	N/A	N/A	N/A
Clear Treatment Procedures	<i>The EFT Manual</i> (Craig & Fowlie, 1995, Church, 2013)	<i>The EFT Manual</i> (Craig & Fowlie, 1995, Church, 2013)	<i>The EFT Manual</i> (Craig & Fowlie, 1995, Church, 2013)	<i>The EFT Manual</i> (Craig & Fowlie, 1995, Church, 2013)	<i>The EFT Manual</i> (Craig & Fowlie, 1995, Church, 2013)	<i>The EFT Manual</i> (Craig & Fowlie, 1995, Church, 2013)	<i>The EFT Manual</i> (Craig & Fowlie, 1995, Church, 2013)
Provided sufficient data for calculation of effect sizes.	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Data Coding

Information was extracted from the remaining papers on the study population, number of treatment sessions, control conditions. Sample sizes, means and standard deviations of the selected measures were extracted for the treatment and control groups before and after treatment. Sample sizes, means and standard deviations of the selected measures before treatment and after 6 months were also extracted for individuals who received EFT.

Calculation of the Effect Size

To measure the effectiveness of EFT in treating PTSD, the difference (and standard deviation of the difference) in means between the EFT and control treatments were compared to calculate effect sizes (Cohen's d). The analysis used Cohen's d rather than Hedge's g because most meta-analyses use the former, and this allows EFTs treatment effects to be compared directly to those of other methods such as psychopharmacology and psychotherapy. Mean differences were calculated from the reported means before and after treatment. As the studies compared patients before and after treatment but did not report the correlation (r) in scores at different time points, the correlation between scores was assumed to be 1, thus the standard deviation of the mean difference was calculated using the mean of the two reported standard deviations. A correlation of 1 is likely to be an overestimate, thus giving conservative estimates for effect size (Borenstein et al., 2009).

Results

The five studies with treatment as usual as a control group showed a large positive effect ($d > 0.78$) of EFT treatment on PCL scores, anxiety and depression (Table 2). The pre and posttreatment effect size for the two studies without a TAU control group was also calculated. For PTSD, anxiety and depression we found an effect size of greater than 0.69 (0.02-1.32). For HSCL and HTQ the effect sizes are all greater than 1.2. The weighted effect size for PTSD among all seven studies is 2.96 (95% CI 1.96-3.97, $p < 0.001$). Comparisons using other evidence-based treatments (EMDR and CBT) showed no clear advantage of using one method over another for PTSD, anxiety and depression. For PTSD the variance with CBT was $d = 0.14$ (-

							(1.51-2.99)
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^a PCL-M ^b PCL-C ^c SA-45 ^d HADS ^e IES

Statistical tests of heterogeneity were undertaken across the seven samples. The between study variance τ^2 was 1.42. The percentage of variation due to heterogeneity is measured by I^2

(87.5%). A random-effects model was used in the meta-analysis. Since there is general agreement that meta-analyses should be performed by multiple raters (Bullock & Sysvyantek, 1985; Stroup et al., 2000), the entire data set was re-analyzed by two independent bio-statisticians who found similar results.

Discussion

The findings from the current analysis hold strong clinical and social implications with PTSD becoming an epidemic in both the civilian and military populations (NIH Medline Plus, 2009). The VA diagnosed almost 30% of the 834,463 OEF and OIF veterans as having PTSD (Veterans Health Administration, 2012). With continued conflict and deployments, those numbers are expected to rise.

Delayed onset PTSD is another concern. The APA defines Delayed onset PTSD as the onset of symptoms 6 months or more after exposure to traumatic events (American Psychiatric Association, 2013). In a longitudinal study of 5,656 World Trade Center disaster fire fighters, 45% of PTSD cases presented as the delayed-onset type, with onset occurring a mean of 3 years after the event. (Berninger et al., 2010). With so many veterans already diagnosed with PTSD, ongoing deployments, and the potential for delayed onset PTSD, finding an effective treatment method is a critical task. For our returning OIF and OEF veterans who have been diagnosed with PTSD, daily life can be difficult. With a median recovery time of three to five years (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995) and symptoms that interfere with interpersonal relationships at both home and work, finding help can be the difference between returning as a contributing member of society or living a tormented and ineffectual life.

The current analysis demonstrates EFT's effectiveness in treating PTSD with relatively few treatment sessions. Both randomized controlled trials as well as uncontrolled outcome studies demonstrate that EFT reduces PTSD symptomology to below clinical levels. Benefits were sustained on 6-month follow-up for 80-95% of the participants in the EFT studies (Church et al., 2013; Geronilla et al., 2014). The studies examined reported no adverse effects from EFT interventions and showed that it can be used both on a self-help basis and as a primary treatment for PTSD. Additionally, the studies show EFT to be effective with a range of populations – from combat veterans and refugees to juveniles who had experienced physical and psychological trauma.

Limitations

Although we included every RCT available on the treatment of PTSD using EFT, only seven studies met our inclusion criteria, and several of them did not utilize stringent designs (e.g., only self-inventories for measuring outcome) or had relatively low Ns.

A limitation for interpreting the findings is that all but two of the studies used a wait list or TAU as the comparison condition. While the effect sizes for EFT in treating PTSD found in this study did outperform those reported in the literature for other treatments (Tolin, 2010), head-to-head studies comparing it with established treatments are needed before conclusions can be drawn about the relative benefits of each modality.

Additionally, we were not able to measure the long-term effectiveness of EFT against TAU because the TAU groups went through EFT treatment immediately after the wait period. However, there is little evidence that PTSD is remediated by the passage of time (Benedek, Friedman, Zatzick, Ursano, 2009).

Conclusion

The purpose of this meta-analysis was to analyze EFT's effectiveness in treating PTSD. The analysis of the seven studies that met the inclusion criteria showed that EFT is a safe and efficacious treatment within ten or fewer sessions and with a variety of populations, yielding both large effect sizes and lasting benefits. While additional comparison studies are needed to determine whether EFT is more effective than other PTSD treatments, the findings of the current analysis are encouraging. EFT's demonstrated speed, safety, and effectiveness with a variety of populations establish it as an evidence-based treatment for PTSD.

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