

# Feasibility of Emotional Freedom Techniques in Patients with Posttraumatic Stress Disorder: a pilot study

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**Objectives:** Posttraumatic stress disorder (PTSD) is a prevalent mental health condition, and techniques using sensory stimulation in processing traumatic memories have gained attention. The Emotional Freedom Techniques (EFT) is a psychotherapy that combines tapping on acupoints with exposure to cognitive reframing. This pilot study aimed to assess the feasibility of EFT as a treatment for PTSD by answering the following research questions: 1) What is the compliance and completion rate of patients with PTSD with regard to EFT protocol? Is the dropout rate reasonable? 2) Is the effect size of EFT protocol for PTSD sufficient to justify a future trial?

**Methods:** Thirty participants diagnosed with PTSD were recruited. They received weekly EFT sessions for five weeks, in which they repeated a statement acknowledging the problem and accepting themselves while tapping the SI3 acupoint on the side of their hand. PTSD symptoms were evaluated using the PTSD Checklist for DSM-5 (PCL-5) before and after the intervention.

**Results:** Of the 30 PTSD patients (mean age: 34.1 ± 9.1, 80% female), 96.7% showed over 80% compliance to the EFT sessions, and 86.7% completed the entire study process. The mean PCL-5 total score decreased significantly after the intervention, with a large effect size (change from baseline: -14.33 [95% CI: -19.79, -8.86],  $p < 0.0001$ ,  $d = 1.06$ ).

**Conclusion:** The study suggests that EFT is a feasible treatment for PTSD, with high session compliance and low dropout rates. The effect size observed in this study supports the need for a larger trial in the future to further investigate EFT as a treatment for PTSD. However, the lack of a control group and the use of a self-rated questionnaire for PTSD symptoms are limitations of this study. The findings of this pilot study can be used to plan a future trial.

**Keywords:** posttraumatic stress disorder, emotional freedom techniques, psychological techniques, feasibility studies, pilot projects

## INTRODUCTION

Posttraumatic stress disorder (PTSD) is a debilitating men-

tal disorder that can develop following exposure to traumatic events such as military combat, natural disasters, sexual assault, or the unexpected loss of a loved one. It is characterized

by symptoms such as intrusive thoughts and flashbacks of the trauma; efforts to avoid trauma-related thoughts, feelings, places, or people; persistent negative cognition and mood; and hyperarousal, such as anxiety, sleep difficulties, and irritability [1]. The prevalence of PTSD caused by infectious disease pandemics in the 21st century was estimated to be 22.6% across all populations, with 21.94% for COVID-19 [2], making it a vulnerability for the general population as well. The clinical practice guidelines strongly recommend the use of cognitive processing therapy (CPT), prolonged exposure (PE), and eye movement desensitization and reprocessing (EMDR) for the treatment of PTSD [3]. Furthermore, techniques such as EMDR, involving the use of visual, auditory, or sensory stimulation to access and process trauma memories, have gained significant attention. The underlying neural mechanism of sensory stimulation in processing traumatic memories is increasingly understood [4].

Among various PTSD psychotherapies, trauma-focused psychotherapy, such as exposure therapy, is well-studied but has high dropout rates [5]. A meta-analysis showed that 20.9% of patients dropped out during the psychological treatment for PTSD [6]. Furthermore, there is significant variability in individual responses to pharmacotherapy for PTSD, both in animal and human studies. Approximately 30-40% of the population is treatment-resistant, while only 20-30% of patients experience total remission [7]. Therefore, effective therapy with lower dropout rates is needed for PTSD patients.

Meanwhile, there have been several attempts to modulate trauma-related symptoms using acupoint stimulation, another form of sensory stimulation. Acupuncture, including body acupuncture or auricular acupuncture, has been widely used for the treatment of PTSD, as reported by the National Acupuncture Detoxification Association (NADA) protocol [8]. In a meta-analysis of acupuncture for PTSD, needle acupuncture showed potential benefit over comparators for PTSD symptoms both at post-intervention and at long-term follow-up [9]. Its underlying mechanism involves neuroendocrinological regulation of stress response, engagement of neuroprotection, neurogenesis, and synaptic plasticity in brain regions such as the prefrontal cortex, anterior cingulate cortex, amygdala, and hippocampus [10]. Assouline et al. [11] introduced “memory-directed acupuncture” to contribute to the course of memory reconsolidation in conversation-based techniques in the clinical environment of PTSD treatment. This is based on the neurological effect of acupuncture, which can balance the autonomic nerve system, regulate the activation of the amygdala and hippocampus, and

activate functional connectivity in a default-mode network.

It appears that symptoms of PTSD can be improved through acupoint stimulation without needling. The Emotional Freedom Techniques (EFT) is a form of psychotherapy involving tapping on acupoints with fingers and has recently been approved as a new health technology in Korea. EFT combines exposure to traumatic memories with cognitive reframing and sensory stimulation (acupoint tapping). With a combination of cognitive and somatic elements, multi-dimensional processes of acceptance for patient-driven statements imply that EFT can be safely tailored to the severity and individual needs of PTSD patients [12]. When applied to patients with PTSD, EFT has been shown to improve symptoms of PTSD in a short period [13]; moreover, it can regulate stress-related hormones and functions of the limbic system [14]. EFT has been used in various traumatic situations, such as Hurricane Katrina, the 2004 tsunami in Thailand, the Pakistan earthquake of 2008, the Haiti earthquake of 2010, and the trauma of Iraq veterans and Rwandan genocide survivors [15]. “A Manual for Disaster Medical Support Using Korean Medicine for Disaster Survivors” [16] introduced EFT as one of the psychotherapies that can be applied to disaster survivors with PTSD.

The purpose of this pilot trial is to estimate the recruitment rate and compliance of Korean patients with PTSD in relation to EFT. This study assessed the efficacy of EFT on PTSD patients in the Republic of Korea, predominantly exposed to sexual/physical violence and accidents, in contrast to the war-related contexts primarily examined in the previous studies [17]. The study aims to evaluate the applicability of the EFT protocol for PTSD, which was developed based on previous studies [12], and to assess its potential effect size to plan for future trials. The research questions can be summarized as follows: 1) Is the recruitment rate for patients with PTSD feasible for a future large-scale trial? 2) What is the rate at which patients with PTSD comply with and complete the EFT protocol? Is the dropout rate reasonable? 3) Is the effect size of the EFT protocol for PTSD sufficient to justify a future trial?

## MATERIALS AND METHODS

### 1. Study setting

The patients with PTSD were enrolled in a university hospital located in Seoul, Korea. The participants were recruited through hospital posters and online advertisements. This fea-

sibility study was designed as an interventional before-and-after study without a control group. The study protocol was approved by the Kyung Hee University Korean Medicine Hospital Institutional Review Board (KOMCIRB2020-08-006-001). The information of this clinical study was retrospectively registered at the Clinical Research Information Service, KCT0006182.

## 2. Participants

The inclusion criteria for the study were participants aged 19 to 65 years who had received a PTSD diagnosis through the *Structured Clinical Interview for Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) (SCID-5)* and had a Primary Care PTSD Screen for *DSM-5 (PC-PTSD-5)*  $\geq 3$  [18, 19]. Additionally, eligible participants voluntarily agreed to participate. Conversely, the exclusion criteria applied to individuals with severe mental illness (including current or past delusions, hallucinations, manic episodes, or high risk of suicide), those who had participated in other clinical studies within the past month, and those deemed unsuitable for the study by the investigators. Written consent was obtained from all participants before the study.

## 3. Intervention

A total of 30 patients with PTSD were enrolled and received EFT for five weeks. The EFT sessions were conducted by Korean medical doctors from the Department of Neuropsychiatry at the academic hospital. The therapists had undergone training in exposure-based treatment and Clinical EFT protocol before the trial. The EFT sessions were conducted individually with the therapist and the patient. They were scheduled once a week, with each session lasting approximately 30 to 40 minutes. The EFT protocol used in this study followed the instructions from the EFT manual [12]. At the first session, an introduction to EFT was provided. At the initiation of every session, the target problem was defined, and the degree of emotional distress was evaluated using an 11-point Likert scale ranging from 0 to 10. Next, the therapist and patients carefully created their “setup statement” about acknowledging the problem and accepting oneself. The framework of the setup statement was “Even though I have (name of the target problem), I deeply and completely accept myself.” The setup statement was repeated three times while continuously tapping the SI3 acupoint on the side of the subjects’ hands. The first sequence of EFT tapping

followed. Subsequently, the brief phrase of the target problem was repeated seven times while tapping with fingers and following the acupoints. The areas involved were the face and upper body; notably, the top of the head, eyebrows, side of the eye, under the eye, nose, chin, beginning of the collarbone, and under the arm were tapped. After this session, the 9 Gamut Procedure was conducted, including the following nine steps: closing eyes, opening eyes, keeping the head fixed and looking down to the right and down to the left, rolling eyes in a clockwise direction, rolling eyes in a counter-clockwise direction, humming a short song such as “Happy Birthday,” counting one to five quickly, and humming the short song again. During the 9 Gamut procedure, the TE3 acupoint on the back of the hand was continuously tapped. Finally, the second sequence of EFT tapping was conducted by repeating the brief phrase of the problem while tapping the acupoints. The change in the degree of emotional distress was re-evaluated after the sequence (Table 1).

## 4. Feasibility and clinical outcomes

Recruitment, compliance, and completion rates were calculated to evaluate the feasibility of the clinical trial. The recruitment rate was calculated as the average number of enrolled participants per month over the entire recruitment period. The compliance rate was calculated as the proportion of participants receiving more than 80% of the sessions. The completion rate

**Table 1.** Procedures of emotional freedom techniques used in this study

Step	Procedures
Evaluation of emotional distress	<ul style="list-style-type: none"> <li>• Define the target problem</li> <li>• Evaluate subjective units of distress</li> </ul>
The setup	<ul style="list-style-type: none"> <li>• Create “setup statement”</li> <li>• Repeat setup statement while tapping SI3 acupoint</li> </ul>
The sequence	<ul style="list-style-type: none"> <li>• First sequence of tapping on face and upper body</li> <li>• Briefly repeat target problem phrase during the sequence</li> </ul>
The 9 Gamut	<ul style="list-style-type: none"> <li>• 9 Gamut procedure</li> <li>• Tap TE3 acupoint during 9 Gamut</li> </ul>
Repeat the sequence	<ul style="list-style-type: none"> <li>• Second sequence of tapping on acupoints</li> <li>• Briefly repeat target problem phrase during the sequence</li> </ul>
Re-evaluation of emotional distress	<ul style="list-style-type: none"> <li>• Re-evaluate subjective units of distress</li> </ul>

was calculated as the proportion of participants who completed the study without dropping out. The criteria for determining the justification of a larger trial were pre-established as follows: when the effect size measured by the PTSD Checklist for DSM-5 (PCL-5) is medium or greater.

The PCL-5 was measured at Visit 1 (baseline), Visit 3, and Visit 5 (post-treatment) to assess PTSD symptoms [20]. To evaluate their depression and anxiety, Patient Health Questionnaire-9 (PHQ-9) [21] and Generalized Anxiety Disorder Screener (GAD-7) [22] were measured before and after the intervention. To assess the somatic symptoms and insomnia severity, the Patient Health Questionnaire 15 (PHQ-15) [23] and Insomnia Severity Index (ISI) [24] were measured. The short form of the Posttraumatic Growth Inventory (PTGI-SF) was also used [25]. Further, the short form of the Core Seven-Emotions Inventory (CSEI-s) was used [26] to measure emotions of joy, anger, thought, depression, sorrow, fear, and fright. Furthermore, an emotional stimulus test was carried out for exploratory purposes, involving the recording of facial expressions while participants watched two types of video clips designed to evoke joy and sadness, respectively. The specifics of the methods and results of the emotional stimulus test conducted in this study will be reported in a subsequent manuscript. During each visit, meticulous documentation of adverse events was undertaken, and an evaluation of suicide risks was conducted using the P4 screener [27].

## 5. Data analysis

Considering the feasibility of participant recruitment at one clinical site, 30 participants were planned to be included. The Wilson method for binominal probabilities was used to estimate the confidence intervals (CIs) of the compliance and completion rates. To analyze the change of PCL-5, which was measured three times for each participant, a multilevel linear model for repeated measures was used. Subsequently, post hoc pairwise comparisons between baseline and Visit 3 and between baseline and Visit 5 were performed using Dunnett's method. The estimated mean differences and 95% CIs were calculated compared to the baseline values. Moreover, to analyze other clinical outcomes, which were measured two times for each participant, a paired t-test was used. Finally, to evaluate the effect size of EFT intervention in one sample, Cohen's  $d_z$  was calculated based on the difference between baseline and post-treatment (Visit 5). All analyses were conducted using R version 4.1.3.

## RESULTS

### 1. Study flow and baseline characteristics

In all, 34 participants were screened for eligibility, and four did not meet the eligibility criteria. The reasons for the screening failure included one participant who did not meet PTSD diagnostic criteria, two participants with a history of delusion, hallucinations, or manic episodes, and one participant with a high risk of suicide. A total of 30 participants with PTSD were enrolled, and their demographics are presented in Table 2. The mean age of the enrolled participants was  $34.1 \pm 9.1$ , and 24 participants (80%) were female. Among them, 7 participants were currently using antidepressants and anxiolytics, while 7 to

**Table 2.** Demographic and baseline characteristics of patients (n = 30)

Demographics		
Age	Mean (SD)	34.1 (9.1)
Sex	Female	24 (80.0%)
	Male	6 (20.0%)
Education level	12 years	2 (6.7%)
	> 12 years	28 (93.3%)
Work status	Full-time	11 (36.7%)
	Part-time	4 (13.3%)
	Student	2 (6.7%)
	Unemployed	9 (30.0%)
Marital status	Other	4 (13.3%)
	Never married	22 (73.3%)
	Married	7 (23.3%)
	Divorced	1 (3.3%)
Medications		
Antidepressants	Current use	7 (23.3%)
	Past use	7 (23.3%)
	Never use	16 (53.3%)
Anxiolytics	Current use	7 (23.3%)
	Past use	8 (26.7%)
	Never use	15 (50.0%)
Traumatic event		
Index traumatic event	Sexual violence	10 (33.3%)
	Physical violence	13 (43.3%)
	Accident	5 (16.7%)
	Death of a loved one	2 (6.7%)
Age at trauma (years)	Mean (SD)	22.7 (11.1)
Single/multiple trauma	Single trauma	10 (33.3%)
	Multiple trauma	20 (66.7%)

8 participants reported past use of these medications. Regarding the index trauma event, physical violence was predominant (43.3%), followed by sexual violence (33.3%). Additionally, 20 participants reported multiple traumatic events, while 10 participants experienced a single traumatic event.

## 2. Recruitment, compliance, and completion rate

From November 2020 to October 2021, 30 participants were enrolled. On average, 2.5 participants per month were recruited, and 95% CIs were 1.0 to 4.0. Among the 30 participants, 26

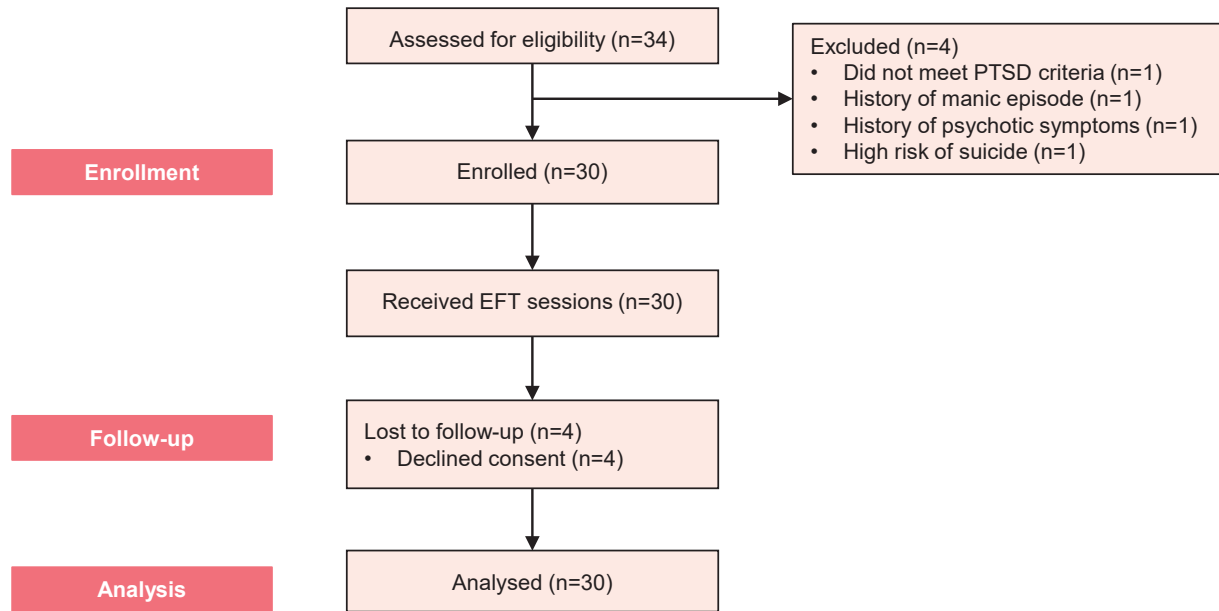


Figure 1. Flow diagram.

Table 3. Changes in PCL-5 after the EFT sessions

		Baseline (n = 30)	Visit 3 (n = 26)	Post-treatment (n = 26)	Cohen's $d_z$ (magnitude)
PCL-5 total score (0-80)	Mean (SD)	50.73 (12.46)	40.46 (15.37)	36.88 (17.26)	
	Difference (95% CI)		-10.81 (-16.49, -5.13)	-14.33 (-19.79, -8.86)	1.06
	p value		0.0001	< 0.0001	(large)
PCL-5 subscales					
Intrusion (0-20)	Mean (SD)	13.10 (3.66)	9.92 (4.52)	9.42 (4.39)	
	Difference (95% CI)		-3.08 (-4.96, -1.19)	-3.68 (-5.50, -1.86)	0.82
	p value		0.0006	< 0.0001	(large)
Avoidance (0-8)	Mean (SD)	5.17 (2.24)	4.77 (2.08)	4.15 (2.51)	
	Difference (95% CI)		-0.54 (-1.59, 0.51)	-1.04 (-2.05, -0.03)	0.41
	p value		0.4151	0.0433	(small)
Negative alterations in cognitions and mood (0-28)	Mean (SD)	17.90 (5.57)	14.54 (6.57)	12.85 (6.94)	
	Difference (95% CI)		-3.50 (-5.86, -1.14)	-5.21 (-7.45, -2.97)	0.94
	p value		0.0020	< 0.0001	(large)
Alterations in arousal and reactivity (0-24)	Mean (SD)	14.57 (4.64)	11.23 (5.58)	10.46 (5.58)	
	Difference (95% CI)		-3.69 (-5.87, -1.52)	-4.36 (-6.51, -2.21)	0.82
	p value		0.0003	< 0.0001	(large)

Cohen's  $d_z$  was calculated based on the difference between baseline and post-treatment. PCL-5, PTSD checklist for DSM-5; EFT, emotional freedom techniques.

## DISCUSSION

received all five EFT sessions, 3 received four EFT sessions, and 1 received three EFT sessions. A total of 29 participants completed more than 80% of the sessions, and the compliance rate was 96.7% (95% CIs: 83.3% to 99.8%). A total of 26 participants completed the whole study process, including the post-treatment assessment; as such, the completion rate for the study was 86.7% (95% CI: 70.3% to 94.7%). Four participants withdrew from the study due to declined consent (Fig. 1).

### 3. Changes in clinical outcomes

The baseline PCL-5 total score was  $50.73 \pm 12.46$ , decreasing to  $39.73 \pm 14.74$  at Visit 3 and  $36.88 \pm 17.26$  at Visit 5. The changes from the baseline of the PCL-5 at Visit 3 and Visit 5 were  $-11.00$  (95% CI:  $-16.19$ ,  $-5.81$ ) and  $-14.33$  (95% CI:  $-19.79$ ,  $-8.86$ ) (Table 3, Fig. 2). Also, the depression, anxiety, somatic symptoms, and insomnia scores measured by PHQ-9, GAD-7, PHQ-15, and ISI were improved after the interventions. The PTGI-SF score tended to increase but was not statistically significant. In CSEI-s, thought, depression, sorrow, and fright subscale scores decreased with a moderate effect size (Table 4). The calculated Cohen's  $d_z$  for the PCL-5 total score was 1.06, indicating a large effect size.

No adverse events occurred during the study period. The risks of suicide were assessed every time (Table 5), and no participant was considered to be at high risk of suicide.

This pilot study enrolled 30 patients with PTSD. It examined the feasibility of using EFT—a psychotherapy incorporating acupoint stimulation—as a treatment for PTSD in a future large-scale randomized controlled trial. Five sessions of EFT reduced PTSD symptoms, depression, anxiety, as well as somatic symptoms in patients with PTSD. The recruitment rate of patients with PTSD, compliance with the EFT protocol, and overall completion rate of this study appear promising. Additionally, the observed effect size in PCL-5, coupled with positive changes in various psychological outcomes, suggest the potential efficacy of EFT as a therapeutic approach for patients with PTSD.

The first research question addressed the feasibility of recruiting patients with PTSD. The calculated recruitment rate in this study was 2.5 participants per month; accordingly, to recruit 120 patients with PTSD for a future trial, approximately 48 months would be required to enroll all participants. Exploring the option of conducting a multi-site clinical trial could be considered to expedite participant recruitment, and implementing effective strategies for recruiting participants is crucial. In previous studies, online and media advertising was the most frequent recruiting source in a trial involving adolescents with PTSD [28]. Additionally, clinician referral was the most effective method for identifying eligible and willing participants in a trial enrolling veterans with PTSD [29]. Recognizing potential

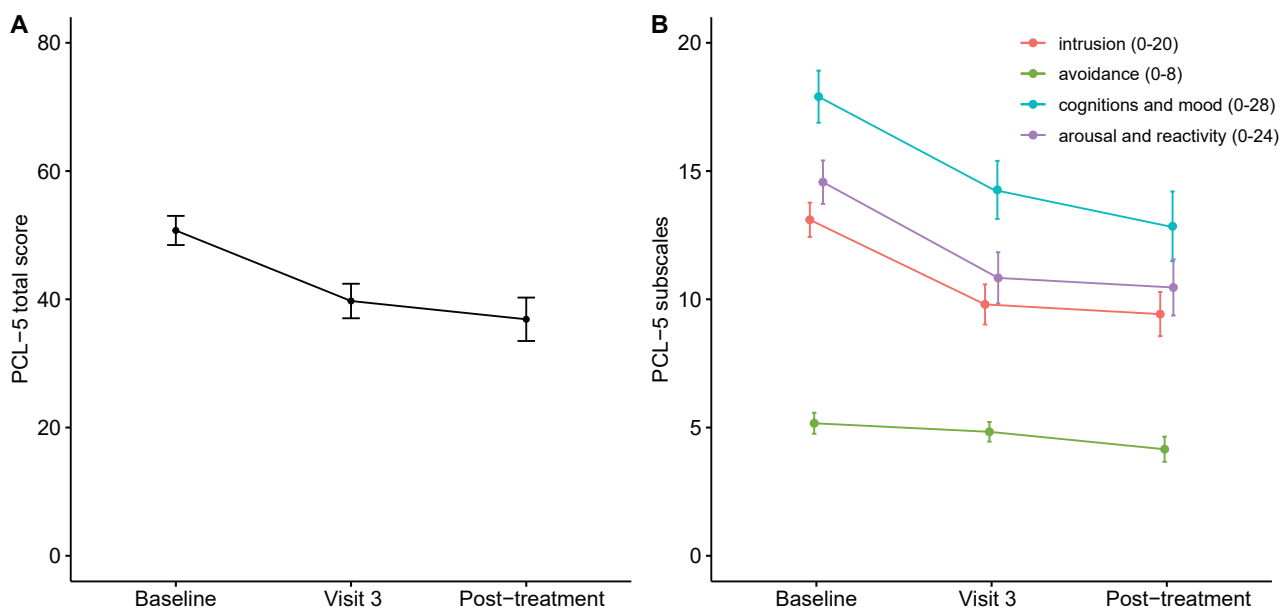


Figure 2. Changes in PCL-5 after the EFT sessions: (A) PCL-5 total score, (B) PCL-5 subscales.

**Table 4.** Changes in other clinical outcomes after the EFT sessions

		Baseline (n = 26)	Post-treatment (n = 26)	Cohen's $d_z$ (magnitude)
PHQ-9 (0-27)	Mean (SD)	16.46 (5.66)	11.04 (6.29)	
	Difference (95% CI)		-5.42 (-7.83, -3.01)	0.91
	p value		0.0001	(large)
GAD-7 (0-21)	Mean (SD)	11.58 (4.71)	8.46 (5.08)	
	Difference (95% CI)		-3.12 (-5.61, -0.62)	0.51
	p value		0.0163	(moderate)
PHQ-15 (0-30)	Mean (SD)	15.50 (6.40)	12.00 (6.66)	
	Difference (95% CI)		-3.50 (-4.82, -2.18)	1.07
	p value		<0.0001	(large)
ISI (0-28)	Mean (SD)	18.23 (6.55)	14.00 (8.02)	
	Difference (95% CI)		-4.00 (-6.50, -1.50)	0.68
	p value		0.0014	(moderate)
PTGI-SF (0-50)	Mean (SD)	18.00 (12.00)	21.35 (11.08)	
	Difference (95% CI)		3.35 (-0.02, 6.72)	0.4
	p value		0.0515	(small)
CSEI-s: joy	Mean (SD)	8.81 (3.31)	9.88 (3.25)	
	Difference (95% CI)		1.08 (-0.26, 2.41)	-0.33
	p value		0.1100	(small)
CSEI-s: anger	Mean (SD)	10.23 (4.26)	8.92 (4.37)	
	Difference (95% CI)		-1.31 (-2.69, 0.08)	0.38
	p value		0.0630	(small)
CSEI-s: thought	Mean (SD)	16.11 (2.76)	14.12 (3.24)	
	Difference (95% CI)		-2.00 (-3.40, -0.60)	0.58
	p value		0.0069	(moderate)
CSEI-s: depression	Mean (SD)	13.92 (4.62)	10.81 (4.46)	
	Difference (95% CI)		-3.12 (-5.11, -1.12)	0.63
	p value		0.0036	(moderate)
CSEI-s: sorrow	Mean (SD)	15.19 (3.37)	12.85 (4.70)	
	Difference (95% CI)		-2.35 (-4.19, -0.50)	0.51
	p value		0.0148	(moderate)
CSEI-s: fear	Mean (SD)	12.88 (3.49)	11.38 (4.03)	
	Difference (95% CI)		-1.50 (-2.84, -0.16)	0.45
	p value		0.0295	(small)
CSEI-s: fright	Mean (SD)	13.08 (4.46)	10.46 (4.92)	
	Difference (95% CI)		-2.62 (-4.33, -0.91)	0.62
	p value		0.0042	(moderate)

EFT, emotional freedom techniques; PHQ-9, patient health questionnaire-9; GAD-7, generalized anxiety disorder screener; PHQ-15, patient health questionnaire 15; ISI, insomnia severity index; CSEI-s, core seven-emotions inventory-short form.

participant pathways into the study enrollment is also essential to enhance the recruitment rate and address barriers [30].

The second research question centered on the acceptability of the target intervention, EFT, for patients with PTSD. Of the 30 patients with PTSD, 96.7% showed more than 80% compliance with the EFT sessions, and 86.7% completed the entire

study process. In a previous meta-analysis, the overall dropout rate of guideline-recommended psychological treatment for PTSD was reported to be 20.9% [6]. Moreover, trauma-focused treatment was associated with a higher dropout rate [5]. Compared to the dropout rate of other treatments reported in previous studies, the compliance with EFT sessions in this study was

**Table 5.** Changes in safety outcome (suicide risk assessment) following the EFT sessions

	Baseline (n = 30)	Visit 2 (n = 30)	Visit 3 (n = 30)	Visit 4 (n = 29)	Post-treatment (n = 26)
Minimal risk	13 (43.3%)	29 (96.7%)	30 (100.0%)	29 (100.0%)	26 (100.0%)
Lower risk	17 (56.7%)	1 (3.3%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Higher risk	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)

EFT, emotional freedom techniques.

relatively high. Higher compliance and lower dropout rates are reported as strengths of EFT. According to a systematic review of EFT for patients with PTSD, the mean dropout rate of included studies was lower than 10% [12].

The third research question focused on the effect size of the EFT for patients with PTSD. However, this study did not include a control group, so the effect size was estimated by comparing scores measured before and after the intervention. As shown in this study, the PCL-5 (range: 0-80), a commonly used self-rated scale for PTSD, decreased by an average of 14.33 points (95% CI: 8.86, 19.79) after the completion of five EFT sessions. This result is consistent with previous reports of EFT for patients with PTSD. In an earlier trial, the PCL-C (range: 17-85) decreased by an average of 17.7 points after EFT sessions [31], and in another trial of veterans at risk for PTSD, the PCL-M (range: 17-85) decreased by an average of 16 points after EFT sessions [13]. According to Cohen's  $d$ , the magnitude of effect size seems to be large. This aligns with the pre-established criteria for justifying a larger trial, where the effect size measured by the PCL-5 is medium or greater. Despite the limitation of this pilot study without a control group, the observed effect size supports the consideration of planning a larger trial in the future.

The mechanism of EFT involves the attenuation of stress-related responses. Previous research indicates that compared to supportive interviews or psychoeducation, EFT reduces salivary cortisol levels [32]. Another study utilizing functional magnetic resonance imaging, focusing on chronic pain sufferers, suggested that EFT influences brain areas associated with the modulating and catastrophizing of pain, thereby improving both pain intensity and related psychological symptoms [33]. Meta-analyses have identified EFT, which combines cognitive therapies from cognitive processing therapy (CPT) and prolonged exposure (PE) with acupoint tapping, with acupoint tapping being recognized as the active ingredient contributing to its effectiveness [34]. Acupoint tapping may serve as a form of sensory stimulation, and recent reports highlighting the role of sensory

stimulation in processing traumatic memories [4] suggest that acupoint tapping in EFT could facilitate the cognitive reframing process. Although EFT has shown its clinical effectiveness in alleviating PTSD symptoms in various studies [17], further research is needed to explore the underlying mechanisms of its therapeutic action.

Previous research on PTSD in adults predominantly addressed war-related trauma, with limited studies exploring sexual violence, accidents, and assault [35]. According to WHO World Mental Health Surveys, direct traumas predominantly include accidents, followed by intimate partner sexual violence and physical violence as other major types, with war-related and other traumas being less common when excluding indirect traumas. War-related trauma shows slower recovery initially, but beyond approximately five years, symptoms from physical violence and intimate partner or sexual violence tend to persist longer than other types [36]. It is reported that the presentation of PTSD varies across different trauma types [37]. Thus, this study would provide evidence for the prevalent trauma types and serve as the foundation for the future RCT for this population.

However, it is important to note the main limitation of this pilot study is the lack of a control group, which makes it impossible to calculate the sample size for a definitive controlled trial based on the results of this study. Additionally, the study only used a self-rated questionnaire (PCL-5) to assess PTSD symptoms, rather than the Clinician-Administered PTSD Scale for *DSM-5* (CAPS-5), which is rated by clinicians [38]. Furthermore, given that this preliminary study was conducted at a single institution with a small sample size, substantial constraints exist on generalizing the results. The lack of follow-up observations limited the assessment of participants' clinical status to only before and after EFT, and the insufficient duration of the observation period is another critical limitation.

Despite these limitations, the results of this pilot study provide valuable information that can be used to plan a future trial. Several considerations should be considered to improve the



design of a future trial. For example, the proportion of female participants was higher in this pilot study, and the recruitment of female participants can be considered solely to reduce the heterogeneity among participants. Additionally, strategies to increase and control the quality of EFT and training of therapists should be implemented. Regular supervision or monitoring is recommended to ensure treatment fidelity [39]. Furthermore, future studies should incorporate a control group. For active control, psychotherapies with strong support for PTSD include CPT, PE, and EMDR [3]. CPT typically involves 12 weekly sessions, PE ranges from 8 to 15, and EMDR consists of 4 to 12 weekly sessions. There are also other psychotherapies with some research support, such as written exposure therapy (WET), which includes five sessions [40]. CPT, PE, or EMDR, which have the most research support for PTSD [3], would be the ideal choice for an active control. However, depending on the frequency of EFT sessions, the capabilities of the institutions conducting the clinical studies, and other factors, brief treatments with evidence-based effectiveness could be considered alternative options. Lastly, it would be beneficial to use both a clinical evaluation tool and a patient self-report tool to capture changes in PTSD severity, incorporating CAPS-5 [38] and PCL-5 [20], respectively [3].

## CONCLUSION

The present pilot study examined the feasibility of EFT, a psychotherapy that combines acupoint stimulation with cognitive reframing, as a possible treatment strategy for patients with PTSD. The results indicate that EFT improved symptoms of depression, anxiety, somatic symptoms, and sleep as well as PTSD symptoms. Based on the findings, the recruitment rate of patients with PTSD was deemed feasible, the EFT sessions were acceptable with a low dropout rate, and the effect size of EFT was reasonable, justifying consideration for a future trial. To increase the quality of a future trial, it would be essential to elaborate on the trial design, considering the information provided by this pilot study.

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## AUTHORS' CONTRIBUTIONS

Conceptualization: YC, YK, SC, S-HC, and HK; Data curation: EKA; Formal analysis: YC; Funding acquisition: HK; Investigation: D-HK, and YEC; Supervision: S-HC, and HK; Writing–original draft: YC and YK; Writing–review and editing: SC, D-HK, YEC, EKA, S-HC, and HK.

## CONFLICT OF INTEREST

The authors declare no conflicts of interest in this work.

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