

# Effects of Transcendental Meditation in Veterans of Operation Enduring Freedom and Operation Iraqi Freedom With Posttraumatic Stress Disorder: A Pilot Study

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**ABSTRACT** 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 post-traumatic stress disorder (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.

## INTRODUCTION

Posttraumatic stress disorder (PTSD) is a potentially debilitating condition among returning veterans of Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF), affecting 14% of those deployed<sup>1</sup> and nearly 44% of deployed individuals who have experienced mild traumatic brain injury and a high level of combat.<sup>2</sup> Apart from the psychological suffering caused by combat-related PTSD, its cost to society is substantial, ranging from \$4.0 to 6.2 billion over 2 years.<sup>1</sup>

Although numerous treatments for combat-related PTSD are used,<sup>3–5</sup> only 1, prolonged exposure therapy, has been deemed effective by a National Academy of Sciences report.<sup>6</sup> Furthermore, most veterans with PTSD either do not seek help or receive inadequate treatment,<sup>7,8</sup> possibly because of the stigma of mental illness and its potential impact on career advancement,<sup>1</sup> a shortage of trained specialists,<sup>9</sup> or limited access to care.<sup>1</sup> For these reasons, additional effective treatments that are easily accessible and perceived as non-stigmatizing are needed.

Because PTSD is associated with persistent symptoms of increased arousal<sup>10</sup> and an exaggerated sympathetic response to stimuli,<sup>11</sup> we have explored an intervention that might counteract this response through improved relaxation. Transcendental meditation (a registered trademark, also abbreviated as TM) is a form of mantra meditation that uses a specific methodology,<sup>12,13</sup> classified as “automatic self-transcending.”<sup>14</sup>

Regular practice of the technique leads to long-term changes in sympathetic drive, as evidenced by decreases in blood pressure, metabolism, and stress reactivity.<sup>15–19</sup> Various meditation techniques have already shown promising results in improving stress, health outcomes, and quality of life in small samples of outpatient veterans.<sup>20,21</sup> A small controlled study found that the TM technique was superior to conventional psychotherapy in improving symptoms of PTSD in Vietnam War Veterans.<sup>22</sup> Potential advantages of TM as a treatment for combat-related PTSD are that it is simple to learn and can be practiced almost anywhere at any time without the stigma that may be associated with seeing a mental health provider. The objective of this study was to obtain pilot data to determine whether the TM technique might be helpful in relieving symptoms of PTSD among OEF and OIF veterans with the disorder.

## METHODS

Approval for the study was obtained from the Institutional Review Board (Quorum Review IRB), and written informed consent was obtained from each patient before enrollment in the study. The study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. Subjects were recruited via the media, using IRB-approved advertising.

## Population

Eligible subjects were veterans of OEF or OIF from 18 to 65 years of age with a history of moderately severe combat-related PTSD for the past month as judged by the investigator. Subjects agreed to practice the TM technique for 20 minutes twice a day for the duration of the study and not to start ancillary treatment for PTSD without first consulting a study clinician. If subjects were already receiving such

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treatment, e.g., psychotropic medication, they were allowed to continue as long as they were willing to not change their regimen. Exclusion criteria before screening were noncombat-related PTSD, other principal Axis I diagnoses within the past 6 months, substance abuse or dependence within the past month, significant suicide or homicide risk, unstable medical conditions, or history of greater than mild traumatic brain injury. Patients were also excluded if there was any reason, such as planned deployment or surgery, that they might be unable to commit to practicing TM twice a day for 3 months.

### Efficacy Assessments

Efficacy of treatment was assessed using the Clinician Administered PTSD Scale (CAPS)<sup>23</sup> as the primary outcome measure. According to the Department of Veterans Affairs, the CAPS is the “gold standard” for PTSD assessment and diagnosis for both military veteran and civilian trauma survivors.<sup>24</sup> Secondary outcome measures were the PTSD Checklist—Military Version (PCL-M),<sup>25</sup> the Quality of Life Enjoyment and Satisfaction Questionnaire (Q-LES-Q),<sup>26</sup> the Beck Depression Inventory (BDI),<sup>27</sup> the Clinical Global Impression-Severity (CGI-S), and Clinical Global Impression—Improvement (CGI-I) scales.<sup>28</sup> Except for the CGI-I and CGI-S, all other secondary scales were self-rated. Degree of combat exposure was measured using the Combat Exposure Scale (CES).<sup>29</sup>

### Study Design

The study was divided into a screening/baseline visit, TM instruction, an 8-week assessment and data collection period, and a final check-up at week 12 for clinical purposes. At the screening/baseline visit, patients signed consent, underwent a clinical assessment, including a physical examination and urine drug screening, and completed the self-rated questionnaires mentioned above. A board-certified psychiatrist also evaluated the patient at this visit using the CAPS and the CGI-S.

Immediately following the screening/baseline visit, the TM technique was taught to the subject by a certified instructor. The course of instruction included 2 informational lectures, a brief personal interview, individual instruction, and 3 follow-up sessions that took place on 3 consecutive days. Each step took approximately 60 to 90 minutes. Subjects were asked to meditate at home for 20 minutes twice a day throughout the 12 weeks of treatment, during which time the TM teacher monitored experiences and ease of practice by way of a standard procedure for verification of correct practice. The instructors met with each subject biweekly and made phone/email/text contact between face-to-face meetings. They routinely asked subjects, both verbally and in questionnaire form, about their experiences during and after meditation, about compliance with the technique, and about ease of practice. They also kept a report on each subject to document their findings.

Seven to ten days following completion of TM training, patients were evaluated for their first assessment of treatment (week 1) and then again at weeks 2, 4, 6, 8, and 12. At these times they completed all self-rated scales, and a clinician assessed the degree of clinical severity and improvement using the CGI-I and CGI-S. The CAPS was also administered at weeks 4 and 8.

### Statistical Methods

Paired *t* tests were used to assess the mean change score between baseline and week 8 for the following dependent variables: CAPS, QLES-Q, PCL-M, and CGI-S. Because of the hypothesis-generating nature of this pilot study, no corrections were made for multiple comparisons.

### RESULTS

Eleven subjects were screened, 7 were enrolled, and 5 completed the trial. One subject withdrew before starting TM training because he was redeployed. Another failed to return after the first assessment and could not be reached to determine his reason for dropping out. Neither subject was included in our analysis. Basic demographic clinical information for the 5 remaining subjects is presented in Table I. All subjects were men between the ages of 25 and 40 who had served in Iraq and/or Afghanistan from 10 months to 2 years and seen moderate or moderate-heavy combat, as reflected in their CES scores (see Table II).

Compliance with the protocol was generally very good. At baseline, 2 of the subjects were on psychotropic medications that remained consistent throughout treatment, except for 1 subject's sedative/hypnotic medication (temazepam), which was stopped by his psychiatrist after week 4. No subject started any new psychotropic medication or other therapy during the study. Based on weekly meditation checks, instructors noted that the subjects were greater than 90% compliant with twice daily meditation practice and that they found no difficulties with the technique.

All subjects showed improvement on the CAPS (Fig. 1) (mean change score, 31.4; 95% confidence interval [CI], 7.75–55.05;  $p = 0.02$ ;  $df = 4$ ). Changes in each outcome measure from baseline to week 8 can be seen in Table II. All subjects also reported improvements on the QLES-Q (mean change score, –13.00; 95% CI, –20.50 to –5.50;  $p < 0.01$ ;  $df = 4$ ), and PCL-M (mean change score, 24.00; 95% CI, 6.35–41.65;  $p < 0.02$ ;  $df = 4$ ). On the BDI, 3 subjects improved considerably, 1 minimally, and 1 was slightly worse at week 8 relative to baseline (mean change score, 11.2; 95% CI, –5.47 to 27.87;  $p = 0.14$ ;  $df = 4$ ). Four subjects were rated as either much or very much improved on the CGI-I at week 8, and 1 was rated as unchanged (mean change score, 1.60; 95% CI, 0.18–3.02;  $p < 0.04$ ;  $df = 4$ ). This latter subject had demonstrated noticeable improvement at week 4 but relapsed after stopping his temazepam (see above). His symptoms were also likely exacerbated by increasingly frequent reminders of his trauma during the latter half of the study.

**TABLE I.** Basic Demographic and Clinical Information

Patient*	Age	Length of Service in OEF/OIF	Duration of Symptoms (Years)	Type of Trauma	Most Prominent Symptoms	Psychotropic Medications at Baseline
02	25	1 Year	3	Witnessed Military/Civilian Casualties, Experienced Life-threatening Explosion	Nightmares, Insomnia, Decreased Concentration, Physiological Arousal, Amnesia, Anger Outbursts	None
08	29	2 Years	5	Involved in Torture of Prisoners, Witnessed Fellow Soldiers Killed in Combat	Distressing Memories, Insomnia, Nightmares, Flashbacks, Irritability, Hypervigilance, Physiological Arousal, Avoidance of Reminders of Trauma	Trazodone 100 mg qhs; Topamax 50 mg qd; Buspirone 60 mg qd; Temazepam 7.5 mg qhs; Prazosin 6 mg qhs; Fluoxetine 60 mg qd
09	40	1 Year	2	Trapped, and Likely Killed, Iraqi Men in Tunnel, Lived Under Constant Threat of Attack	Distressing Memories, Flashbacks, Physiological Arousal, Avoidance of Thoughts/Feelings Related to Trauma, Hypervigilance	None
10	25	10 Months	5	Witnessed Soldiers Killed in Car Bomb	Distressing Memories, Physiological Arousal, Avoidance of Reminders of Trauma, Emotional Detachment, Insomnia, Anger Outbursts, Decreased Concentration, Hypervigilance	Adderall 15–45 mg 1–3× per week; Seroquel 12.5 mg qhs prn insomnia
11	31	2 Years	6	Sent Soldiers Into Harm's Way, Witnessed Videos of Civilians Beheaded, Saw Fellow Troops Killed in Combat	Nightmares, Upset by Reminders of Trauma, Avoidance of Reminders of Trauma, Amnesia of Parts of Events, Detachment From Others, Insomnia, Anger Outbursts, Decreased Concentration, Hypervigilance	None

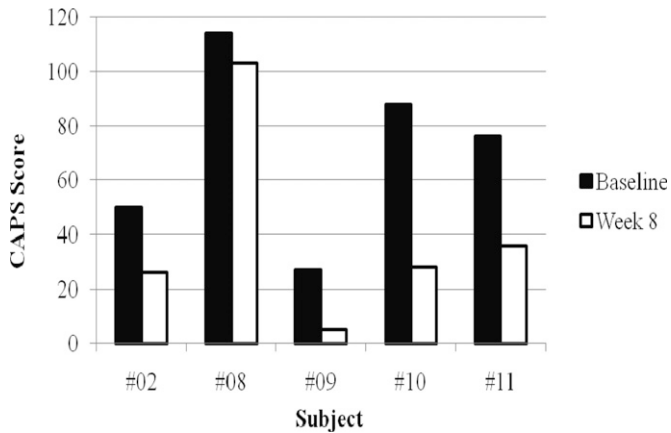
**TABLE II.** Change in Scores on Primary and Secondary Outcomes Between Baseline and Week 8

Patient <sup>a</sup>	CAPS <sup>b</sup>		PCL-M <sup>b</sup>		BDI <sup>b</sup>		QLES-Q <sup>c</sup>	
	Baseline	Week 8	Baseline	Week 8	Baseline	Week 8	Baseline	Week 8
02	50	26	42	28	15	3	48	61
08	114	103	78	57	39	34	29	43
09	27	5	36	19	9	0	67	80
10	88	28	76	27	38	5	34	55
11	76	36	57	38	19	22	45	49
Patient	CGI-S		CGI-I		CES			
	Baseline	Week 8	Baseline	Week 8	Baseline	Week 8		
02	4	3	—	2	25	—		
08	6	6	—	3	29	—		
09	4	1	—	1	19	—		
10	5	3	—	1	28	—		
11	4	2	—	2	22	—		

Efficacy measurements at baseline and at week 8. The CES measures degree of combat exposure at baseline. The CGI-S scores severity of illness: 1 = normal, 2 = borderline ill, 3 = mildly ill, 4 = moderately ill, 5 = markedly ill, 6 = severely ill, and 7 = among the most severely ill. The CGI-I scores improvement: 1 = very much improved, 2 = much improved, 3 = minimally improved, 4 = no improvement, 5 = minimally worse, 6 = much worse, and 7 = very much worse. <sup>a</sup>Patient numbers refer to the order in which subjects were screened. Out of 11 total subjects screened, 5 were included for analysis. <sup>b</sup>Higher scores reflect greater severity of symptoms. <sup>c</sup>Lower scores reflect greater severity of symptoms.

At week 12 check-up, no specific ratings were performed, but all subjects confirmed that they were continuing to practice TM regularly and experiencing sustained benefits. All subjects reported feeling calmer, less stressed, and less anxious. Some

also reported improvements in their sleep. Subjective reports included feeling “more alive,” “happier,” “more focused,” “deeply rested,” “having a big weight lifted from my shoulders,” “having clarity,” and “having more peace in my life.”



**FIGURE 1.** Change in Clinician Administered PTSD Scale (CAPS) Score From Baseline to Week 8

Subjects also described getting along with and communicating better with family, friends, and coworkers and being more engaged in their daily lives.

## DISCUSSION

The results of this small, uncontrolled pilot study found that TM may have helped to alleviate symptoms of PTSD and improve quality of life in veterans of OEF/OIF with combat-related PTSD. Based on the weekly compliance checks, instructors also found that TM was easy to perform and well accepted by the subjects. Given the absence of a control in our study, a placebo effect cannot be ruled out. However, our results are similar to those found in an earlier randomized controlled trial of the TM technique as a treatment for combat-related PTSD among Vietnam War Veterans.<sup>23</sup> In that study, 18 Vietnam Veterans presenting for treatment at a Veteran's treatment center were randomly assigned to TM or psychotherapy for 3 months. At the end of this period, subjects who practiced TM experienced significant improvement in symptoms of PTSD, anxiety, depression, and insomnia, as well as measures of quality of life, such as employment, family problems, and stress reactivity. In contrast, the group assigned to psychotherapy did not improve significantly across those measures. Together the results of this and the earlier study support the potential role of TM in improving symptoms of PTSD and quality of life in combat veterans and support the value of conducting larger, controlled studies to further explore the efficacy of this technique in this population.

## ACKNOWLEDGMENT

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