

# Using Mindfulness to Manage Moral Injury in Veterans: Feasibility, Satisfaction, and Initial Evidence of a Live Web-based Randomized Controlled Trial

Michelle Kelley<sup>1</sup>, Adrian J. Bravo<sup>2</sup>, Elizabeth E. Burgin<sup>2</sup>, Susan Gaylord<sup>3</sup>, Christine Vinci<sup>4</sup>, Megan Strowger<sup>1</sup>, Jeff M. Gabelmann<sup>1</sup>, and Joseph Currier<sup>5</sup>

<sup>1</sup>Old Dominion University

<sup>2</sup>William & Mary

<sup>3</sup>The University of North Carolina at Chapel Hill School of Medicine

<sup>4</sup>Moffitt Cancer Center

<sup>5</sup>University of South Alabama

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## Abstract

**Objective:** The present study assessed initial evidence of program feasibility, satisfaction, and pre-to post-intervention changes in moral injury symptoms among recent-era veterans who participated in Mindfulness to Manage Moral Injury (MMMI), a live facilitated web-based 7-week mindfulness-based program targeting moral injury among veterans. **Method:** Of 56 recent-era veterans who met study criteria and were randomized, 40 (71.4%) completed the pre- and post-intervention survey and attended at least one treatment session. Of these 40, 21 completed MMMI and 19 completed an equally intensive educational support (ES) control intervention. Among the analytic sample ( $n = 40$ ), most participants identified as White (77.5%), were men (62.5%), and reported a service-connected disability (82.5%). **Results:** Participants attended on average 6.11 sessions. Program satisfaction was moderately high across both conditions. Several significant condition  $\times$  time interactions were found, with those in the MMMI condition reporting greater pre- to post-intervention decreases in moral injury ( $\eta^2=.121$ ), impaired functioning due to moral injury ( $\eta^2=.129$ ), shame-related experiences due to moral injury ( $\eta^2=.105$ ), and other-directed moral injury (e.g., betrayal, difficulty forgiving others;  $\eta^2=.129$ ) as compared to the ES condition. **Conclusions:** These preliminary findings suggest MMMI appears feasible and acceptable and may be able to reach veterans who may not seek traditional Veterans Affairs Medical Center care or who prefer a web-based program. Given its promise for the treatment of moral injury among veterans, MMMI warrants additional large-scale clinical-trial testing.

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*Keywords :* mindfulness; moral injury; veterans; treatment

*Public Health Statement:* Military members who violate their deeply held personal values may experience moral injury. Findings point to Mindfulness to Manage Moral Injury (MMMI) as a feasible and acceptable treatment for reducing moral injury symptoms among veterans.

## Introduction

Moral injury is theorized to be the consequence of events that are perpetration-based (e.g., injuring a noncombatant, witnessing cruel behavior but doing nothing to stop it) or betrayal-based (e.g., betrayal by peers, leadership) that transgress one’s deeply held morals and values (Flipse Vargas et al., 2013; Litz et al., 2009; Shay, 1991). When service members cannot reconcile their experiences with their moral values and beliefs, the dissonance that results may cause a range of negative emotions, cognitions, and attributions (e.g., anger, guilt, shame, loss of trust, lack of forgiveness, self-condemnation, hostility toward authority). These experiences are collectively known as moral injury (Litz et al., 2009). Moral injury symptoms are associated with depression, suicidality, and substance misuse (Bravo et al., 2020; Bryan et al., 2014; Forkus et al., 2021; Kelley, Chae et al., 2021). Consistent with ‘whole person approaches’ to care (U.S. Department of Veterans Affairs, 2020), there is growing interest in developing flexible mind-body approaches for addressing moral injury (Kopacz et al., 2016; Walser & Wharton, 2021) that address the unique experiences of veterans. In this paper, we present findings on feasibility, satisfaction, and preliminary changes in moral injury outcomes from a small, randomized controlled trial of Mindfulness to Manage Moral Injury (MMMI), a live facilitated web-based 7-week mindfulness-based program for veterans targeting moral injury symptoms.

## Moral Injury Treatments

Moral injury is not a diagnosable mental health disorder and may occur from a ‘mixed’ event that causes both a challenging moral dilemma and a life threat event (Williamson et al., 2021). Many veterans who experience traumatic warzone events seek treatment via Veterans Health Administration settings (i.e., Veterans Affairs Medical Centers, Vet Centers) and receive evidence-based treatments for PTSD, such as cognitive processing therapy (CPT) and prolonged exposure (PE). These treatments often focus on the hyperarousal and intrusion symptoms of a fear-based disorder (Held et al., 2018). However, investigators have called for mind-body programs as events that cause moral distress may require different treatment approaches (Cenkner et al., 2021; Kopacz et al., 2016; Steenkamp et al., 2015; Walser & Wharton, 2021). In addition, existing PTSD treatments might not be designed to attend to moral injury developing from certain combat or non-combat experiences including remote combat theatre (Kelley, Bravo et al., 2021), military sexual assault (Hamrick et al., 2022; Maguen et al., 2022), or acts for which no one is to blame (Fleming, 2021). Thus, moral injury might extend beyond bioneurological effects (Starnino et al., 2020) into the moral realm (Litz et al., 2009) in ways that treatments for PTSD may not address the diverse trauma needs of veterans.

## Mindfulness, Moral Injury, Mindfulness to Manage Moral Injury (MMMI)

Kabat-Zinn (1991) defined mindfulness as “paying attention in a particular way: on purpose, in the present moment, and non-judgmentally,” (p. 4). Components of mindfulness (purposefully paying attention to present-moment experiences) may benefit those with moral injury symptoms (e.g., Lang et al., 2019; Zalta

et al., 2018). For instance, a cross-sectional study of veterans found that nonjudging of inner experience and acting with awareness moderated the association between moral injury and drug abuse symptoms (Davies et al., 2019). To develop MMMI, we adapted the Mindfulness to Manage Chronic Pain (MMCP) program. Designed by Miller and colleagues (Brintz et al., 2020), MMCP is a web-delivered, group-based, interactive, instructor-taught, six-session mindfulness training adapted from Kabat-Zinn's (1990) in-person, group-based Mindfulness-based Stress-Reduction program (MBSR). In adapting the program, we removed the emphasis on chronic pain and replaced it with a focus on the psychological pain of moral injury. We also extended the program to seven sessions to allow for an additional focus on self-compassion/compassion, and compassion-related exercises (see Author et al., 2022).

MBSR (Kabat-Zinn, 1991) is an empirically supported mindfulness training which uses a range of mindfulness practices to increase awareness, promote non-judgment and acceptance, and generate compassion. MBSR shares tenets with Monitor and Acceptance Theory (MAT; Lindsay & Creswell, 2017, 2019). In MAT, Lindsay and Creswell (2019) contend that with time and practice, attention monitoring and acceptance skills may reduce negative affectivity, stress, and stress-related health outcomes (Lindsay & Creswell, 2019). Moral injury often involves guilt and shame directed toward the self and other painful, other-directed emotions, such as anger and wish for revenge. Thus, in MMMI, our goal was to teach veterans to use mindfulness techniques to bring awareness to difficult experiences and to simultaneously manage and release judgment by bringing acceptance to psychologically painful emotions associated with moral injury, thereby cultivating an attitude of compassion and acceptance. By reducing condemnation, blame, anger, and simultaneously increasing acceptance, we would expect veterans to view themselves and others as worthwhile, despite being imperfect.

### **Purpose of Present Study**

We had several aims for this initial evaluation of MMMI. The first aim of this study was to evaluate the feasibility and acceptability of MMMI. Second, given the strong focus of MMMI for the reduction of moral injury symptoms, we explored whether there was initial evidence for the effectiveness MMMI in reducing moral injury symptoms as compared to an equally intensive intervention focusing on psychoeducation. Notwithstanding the preliminary nature of this study, we hypothesized that veterans in the MMMI group would report greater reductions in moral injury symptoms compared with veterans randomized to an equivalent seven-week, web-based live, instructor facilitated educational support (ES) condition. Given the small clinical trial, we emphasized the statistical significance and magnitude of effect size estimates (i.e., partial eta-squares) of treatment effects on outcomes.

### **Method**

#### **Transparency and Openness**

We report how the sample size was determined, all data exclusions, manipulations, and measures in the proceeding sections. A protocol of this article is available (Author et al., 2022). The study was approved by the human subjects committee at the first author's institution and was preregistered on [clinicaltrials.gov](https://clinicaltrials.gov) (blinded for review). The study code, syntax, and output will be available in a repository via link (blinded for review). The study manuals are available on request to the first author.

#### **Participants**

In total, 56 post-9/11 veterans were recruited with 28 randomized to the MMMI condition and 28 to the ES condition. All participants were post-9/11 veterans who met the following criteria: (1) at least one deployment to the regions of Iraq and/or Afghanistan and (2) endorsed (agree or strongly agree) two or more ( $M = 7.98$ ;  $SD = 4.81$ ) moral injury symptoms on the 17-item Expressions of Moral Injury Scale-Military Version (EMIS-M; Currier et al., 2018) prior to treatment. Potential participants were excluded if they: (1) had a current suicide plan, (2) had a dishonorable discharge, and/or (3) had no access to the internet. Among the 56 veterans who consented to participate, most participants identified as being White (71.4%), were men (66.1%), and reported a service-connected disability (87.5%). They reported a mean age

of 41.50 years ( $Median = 39.50$ ,  $SD = 9.26$ ) and on average served 12.13 years ( $Median = 9.00$ ,  $SD = 8.58$ ). The Army (55.4%), Navy (12.5%), and Air Force (10.7%) were the most represented branches.

## Procedure

Potential participants were recruited via a marketing firm that specializes in recruitment for clinical health research ( $n = 41$ ), student announcements at two universities ( $n = 15$ ), and word of mouth ( $n = 7$ ). See Figure 1 for the CONSORT flowchart. After completing an online screening survey, potential participants met with a research assistant in an online platform meeting during which the participant was verbally screened, the study focus and random assignment were explained, veteran status was verified via display of their veteran identification card, and consent was obtained. Next, the research assistant collected demographic information (e.g., age, service branch) and ensured the participant’s understanding of basic platform functions. Given that military specialty may differ for women (e.g., infantry) and gender differences in prevalence of exposure to potentially morally injurious events and outcomes (Maguen et al., 2020), we matched on gender and then randomly assigned to conditions.

## Interventions

A total of four intervention groups (2 MMMI; 2 ES) were conducted over the course of the trial between May and August of 2022. Weekly MMMI and ES group sessions took place in the evening and were approximately 75 to 90 minutes. Both interventions were manualized, and sessions were structured similarly, including an ice breaker, session objectives, discussion of home practice/exercises, didactic content about moral injury and the session topic, and group discussion. Didactic content was presented with multimedia tools that frequently included pictures, videos, cartoons, role-plays, and figures. At the end of the session, the facilitator reviewed the cumulative ‘toolkit’, assigned home practice/exercises, and each group member checked out by responding to the prompt, “I am feeling...”. To optimize participant engagement and relational support, facilitators were trained to be non-judgmental and flexible.

With the consent of all participants, sessions were recorded using the online platform and stored on a secured server. The recordings were used to facilitate make-up sessions for participants who were unable to attend a live session and assess facilitator adherence to both MMMI and ES manualized weekly program objectives. Participants who missed a session were sent a study link to the session, which was available for two weeks. A study investigator or research assistant reviewed all sessions for adherence to session objectives. Adherence to program objectives was 100% and 92.7% across the two MMMI and ES groups, respectively.

All study facilitators were licensed doctoral-level mental health professionals with considerable knowledge of moral injury and extensive experience working with trauma-exposed veterans. In addition, the MMMI facilitator worked at a VA hospital and had training and experience facilitating mindfulness programs for veterans. There were two ES facilitators; one conducted the first ES intervention; the second conducted the second intervention. The first ES facilitator was a study investigator and participated in MMMI and ES development; the second facilitator was experienced in delivering programs to military veterans.

**MMMI.** We introduced mindfulness and instructed participants through a series of brief exercises and home practice to help veterans notice what is happening in their body and mind in the moment, gently redirecting the mind to the breath or chosen object as necessary, and bringing awareness to how they typically respond to thoughts and experiences. Initial exercises focused on what mindfulness is, applied mindfulness in everyday activities (e.g., mindful walking), and encouraged participants to become aware of thoughts, emotions, and sensations, without trying to avoid or change them. We alternated mindfulness exercises with moral injury discussion, progressively making veterans aware of how thoughts/emotions/sensations are related to moral injury experiences and how related symptoms can be managed in a nonjudging, compassionate manner. Beginning in session three, instruction and activities focused on compassion toward others/self, reducing blame, condemnation, and increasing acceptance.

**ES.** Moral injury content was identical in both groups (e.g., explanation of moral injury, discussion of how moral injury may be related to mental health and substance use). In place of mindfulness exercises,

themes were relevant to moral injury and included management of stress and moral emotions, exercise, self-care, peer support, boundaries, sleep, and implementing and maintaining new wellness practices. The facilitator led the discussion of didactic material designed to encourage peer support and self-awareness as group members reflected on their strengths and existing supports, and challenges and barriers to engaging in wellness practices. For a detailed description of program development, and session objectives, and content, see Author (2022).

## Survey Measures

After completing the online meeting, four weeks prior to the start of the programs, participants received a unique secure survey link (i.e., baseline survey) that lasted approximately 25 minutes to complete. Following the last session, participants were sent a survey link and had four weeks to complete a final survey (i.e., post-intervention survey). Participants received \$30 for completing the baseline survey and \$50 for completing the post intervention survey. An in-depth description of the program development, study methodology, and a full list of the measures can be found in Author et al. (2022).

**Program Satisfaction.** Based on Kirkpatrick’s model (Kirkpatrick & Kirkpatrick, 2016), we evaluated four aspects of program satisfaction: reactions (“How satisfied are you with the training program you attended”; 3 items), attitudes/learning/knowledge (“How well do you feel you understand moral injury?”; 3 items), behavior (“How much have you put what you learned into practice?”; 3 items) and return on investment (“How much has this program benefitted you?”; 1 item). Items were rated on a 5-point scale (1-5; unique response options to each item) and higher scores indicate greater satisfaction.

**Moral Injury.** Given discrepancies in the literature regarding an operational definition of moral injury, moral injury was assessed using four distinct measures of moral injury. Participants completed the 17-item Expressions of Moral Injury Scale – Military Version (EMIS-M; Currier et al. 2018, 2020). Measured on a 5-point response scale (1 = *strongly disagree*, 5 = *strongly agree*, items are divided into two domains: 1) self-directed symptoms (9 items, e.g., “I am an unforgiveable person”) and 2) other-directed symptoms (8 items, e.g., “I feel anger over being betrayed”). Participants also completed the 10-item Moral Injury Symptom Scale – Military Version Short Form (MISS-M-SF; Koenig et al., 2018). Measured on a 10-point response scale (1 = *strongly disagree*, 10 = *strongly agree*), a total score was calculated by summing up responses across the items (e.g., “I feel guilt over failing to save the life of someone in war”). Participants also completed the 8-item Moral Paradox Scale (MP; Fleming, 2021). Measured on a 5-point scale (1 = *strongly disagree*, 5 = *strongly agree*), a total score was calculated by summing up responses across the items (e.g., “The world makes much less sense to me since my military experience”). Finally, participants also completed the 14-item Moral Injury Outcome Scale (MIOS; Litz et al. 2022). Measured on a 5-point scale (1 = *strongly disagree*, 5 = *strongly agree*), the MIOS assesses moral injury broadly (i.e., a total score) and two specific domains: shame-related experiences (“I blame myself”) and trust-violation-related outcomes (e.g., “I lost trust in others”). Moreover, the MIOS includes 7 additional items (summed for a total score) adapted from the Brief Inventory of Psychosocial Functioning (Kleiman et al., 2020) to assess impaired functioning due to moral injury across differing life domains (e.g., family relationships, work, friendships).

## Data Analytic Plan

To determine program feasibility, we report attendance for all consented participants. We then report attendance and program satisfaction by group for the analytic sample (MMMI  $n = 21$ ; ES  $n = 19$ ). Next, we report results of a series of repeated measures ANCOVA models in SPSS 28 for the analytic sample, to determine if there were significant pre-to-post intervention changes as determined by effect sizes in moral injury outcomes and whether these changes differed by group (i.e., condition x time interaction effects). Given the pilot nature of the project and sample size, the main focus was on effect size estimates (i.e., partial eta squares). The magnitude of effects was interpreted based on guidelines for small ( $\eta^2 = .01$ ), medium ( $\eta^2 = .06$ ), and large ( $\eta^2 = .14$ ) effects (Richardson, 2011).

## Results

## Attendance and Program Satisfaction

Of the 56 participants who consented to participate across both treatment conditions, 82.1% of veterans attended at least one treatment session and 44.6% completed all seven sessions, with the average being 4.73 sessions attended across conditions. Regarding surveys, 3 (5.4%) veterans did not complete the baseline survey and 15 did not complete the follow-up survey (26.8%). Of the 56 who consented, 40 (71.43%) completed all study components (i.e., completed both baseline and follow-up surveys and attended at least one treatment session) and were considered the analytic sample for analyses (MMMI  $n = 21$ ; ES  $n = 19$ ). There were no significant statistical differences on demographic characteristics (e.g., age, years in military, gender) and baseline scores on outcome variables between the analytic group ( $n = 40$ ) and those not in the analytic group ( $n = 16$ ).

Among the 40 veterans in the analytic sample, most participants identified as being White (77.5%), were men (62.5%), and reported a service-connected disability (82.5%). They reported a mean age of 42.70 years (*Median* = 41.00, *SD* = 10.07) and on average served 13.01 years in the military (*Median* = 8.00, *SD* = 9.57). The Army (55.0%) and Navy (12.5%) were the most represented branches. Within our analytic sample, there were no significant differences in the average number of sessions attended between the MMMI ( $M = 6.10, SD = 1.48$ ) and the ES ( $M = 6.11, SD = 1.37$ ) groups.

In Table 1, we provide information on treatment satisfaction (i.e., reactions, attitudes/learning/knowledge, behavior, return on investment, and total score on satisfaction) by treatment condition (MMMI  $n = 21$ ; ES  $n = 19$ ). Regarding specific satisfaction questions, the MMMI condition reported significantly higher confidence in their ability to apply the program content to their daily live since the training (Cohen's  $D = 1.19$ ), reported more often having put the things they have learned into practice (Cohen's  $D = 0.83$ ), and reported that they benefitted more from the program (Cohen's  $D = 0.78$ ). Regarding subscales, the MMMI condition reported higher satisfaction in behavior (Cohen's  $D = 0.67$ ) and return on investment (Cohen's  $D = 0.78$ ). No other statistically significant program satisfaction differences were noted.

## Exploratory Testing of Treatment Effects on Moral Injury

Bivariate correlations and descriptive statistics of all study variables across time points are presented in Table 2. There were no statistically significant differences on demographic characteristics (except for age, participants were significantly older in the MMMI condition [ $M = 45.81$  years;  $SD = 10.51$ ] than the ES condition [ $M = 39.26$  years;  $SD = 8.57$ ]) and baseline scores on all outcomes across treatment conditions, thus ensuring the two analytic treatment groups (MMMI and ES) were largely similar. All results of our repeated measures ANCOVA models are found in Table 3.

**Exploratory testing of effects on MMMI on moral injury outcomes.** We generally found medium-large effect sizes ( $.08 < \eta^2 > .26$ ). Regarding those that were statistically significant, we found significant decreases in EMIS-M other-directed (betrayal-based) moral injury collapsing across conditions ( $\eta^2 = .195$ ); however, this finding was qualified by a significant interaction ( $p = .023$ ;  $\eta^2 = .129$ ), such that there was a larger decrease in the MMMI condition (T1:  $M = 28.57$ ,  $SE = 1.53$ ; T2:  $M = 24.71$ ,  $SE = 1.41$ ;  $M$  difference =  $-3.86$ ,  $SE = 0.98$ ,  $p < .001$ ) compared to the ES condition (T1:  $M = 28.37$ ,  $SE = 1.61$ ; T2:  $M = 27.90$ ,  $SE = 1.48$ ;  $M$  difference =  $-0.47$ ,  $SE = 1.04$ ,  $p = .650$ ). While no significant interaction was found for EMIS-M self-directed scores ( $p = .071$ ,  $\eta^2 = .083$ ), significant decreases in EMIS-M self-directed scores emerged when collapsing across the MMMI and ES conditions ( $\eta^2 = .100$ ; T1:  $M = 25.17$ ,  $SE = 1.29$ ; T2:  $M = 23.04$ ,  $SE = 1.10$ ;  $M$  difference =  $-2.13$ ,  $SE = 1.03$ ,  $p = .046$ ). Similarly, while no significant interaction was found for MISS scores ( $p = .061$ ,  $\eta^2 = .089$ ), we found significant decreases in MISS total scores collapsing across the MMMI and ES conditions ( $\eta^2 = .216$ ; T1:  $M = 54.83$ ,  $SE = 2.35$ ; T2:  $M = 48.69$ ,  $SE = 2.01$ ;  $M$  difference =  $-6.14$ ,  $SE = 1.90$ ,  $p = .003$ ).

Regarding the MIOS measure, we found significant decreases in MIOS total scores collapsing across the MMMI and ES conditions ( $\eta^2 = .132$ ); however, this outcome was also qualified by a significant interaction ( $p = .028$ ;  $\eta^2 = .121$ ), such that there was a larger decrease in the MMMI condition (T1:  $M = 26.86$ ,  $SE = 2.15$ ; T2:  $M = 20.29$ ,  $SE = 2.10$ ;  $M$  difference =  $-6.57$ ,  $SE = 1.93$ ,  $p = .002$ ) compared to the ES condition

(T1:  $M = 28.68$ ,  $SE = 2.26$ ; T2:  $M = 28.53$ ,  $SE = 2.21$ ;  $M$  difference =  $-0.16$ ,  $SE = 2.03$ ,  $p = .938$ ). We also found a significant interaction for MIOS – shame-related experiences ( $p = .042$ ;  $\eta^2 = .105$ ), such that there was a significant decrease in the MMMI condition (T1:  $M = 12.24$ ,  $SE = 1.41$ ; T2:  $M = 9.57$ ,  $SE = 1.29$ ;  $M$  difference =  $-2.67$ ,  $SE = 1.18$ ,  $p = .030$ ) compared to a marginal increase in the ES condition (T1:  $M = 12.84$ ,  $SE = 1.48$ ; T2:  $M = 13.79$ ,  $SE = 1.36$ ;  $M$  difference =  $0.95$ ,  $SE = 1.24$ ,  $p = .451$ ).

While no significant interaction was found for MIOS – trust-violation-related scores ( $p = .050$ ,  $\eta^2 = .097$ ), significant decreases in MIOS – trust-violation-related scores emerged when collapsing across the MMMI and ES conditions ( $\eta^2 = .256$ ; T1:  $M = 15.23$ ,  $SE = 0.82$ ; T2:  $M = 12.73$ ,  $SE = 0.79$ ;  $M$  difference =  $-2.51$ ,  $SE = 0.69$ ,  $p < .001$ ). Finally, we also found significant decreases in MIOS impaired functioning due to moral injury scores collapsing across conditions ( $\eta^2 = .167$ ); however, this was qualified by a significant interaction ( $p = .023$ ;  $\eta^2 = .129$ ), such that there was a larger decrease in the MMMI condition (T1:  $M = 42.94$ ,  $SE = 3.74$ ; T2:  $M = 28.96$ ,  $SE = 3.53$ ;  $M$  difference =  $-13.98$ ,  $SE = 3.76$ ,  $p < .001$ ) compared to the ES condition (T1:  $M = 40.45$ ,  $SE = 3.74$ ; T2:  $M = 39.40$ ,  $SE = 3.72$ ;  $M$  difference =  $-1.05$ ,  $SE = 3.95$ ,  $p = .791$ ).

## Discussion

The present study assessed program feasibility, satisfaction, and changes from pre- to post-intervention in moral injury outcomes among recent-era veterans who participated in a mindfulness versus educational support program for moral injury. Both programs were well received, particularly for the MMMI condition in which participants reported significantly more use of what they had learned, perceived more confidence in using what they had learned, and reported greater return on investment. During MMMI sessions, participants had a chance to practice mindfulness exercises which might have contributed to higher use and confidence scores. Also, results of our initial testing found MMMI treatment had a larger impact in decreasing moral injury symptoms than the ES treatment. Taken together, we found effect sizes consistent with change in moral injury symptoms within the time frame examined in this study. In general, effect sizes for condition x time effects were in the medium to large range, whereas after collapsing across conditions, our findings showed mostly large effect sizes (Richardson, 2011) on moral injury from pre- to post-treatment.

More specifically, when we examined pre-post changes by condition on effects sizes, we found four interactions for the treatment conditions over time. As compared to the ES condition, participants in the MMMI condition reported greater reductions in total MIOS scores, shame-related experiences due to moral injury, and impaired functioning due to moral injury on the MIOS domain (Litz et al., 2022). Results from the EMIS-M other-directed domain (Currier et al., 2018) showed veterans in the MMMI condition had reductions in moral injury symptoms associated with betrayal (e.g., betrayal, feelings of revenge, hostility toward authority). Shame-related moral injury (e.g., guilt, shame, self-condemnation) is theorized to result from acts for which the veteran experiences personal responsibility (e.g., injuring a non-combatant) or accidental, inappropriate, or prohibited behaviors the veteran witnessed but did not counter (e.g., watching peers treat civilians with disrespect but doing anything; Litz et al., 2009). Shame-related moral injury had been examined in Marines or soldiers who were directly attached to a combat arms unit (e.g., infantry, artillery) (e.g., Drescher et al., 2011; Flispe Vargas et al., 2013). We did not restrict our sample to veterans who were directly attached to a combat arms unit.

The condition x time effect for shame-related moral injury may reflect that sessions in the MMMI program focused on helping veterans use mindfulness to cultivate and practice extending compassion and acceptance toward themselves. Service members often have high standards regarding self-sacrifice, duty, and honor, which may increase guilt and shame from behaviors they perceive as unethical. In fact, a purported hallmark of moral injury entails difficulty with self-forgiveness for perceived or actual wrongdoing. This finding is important as veterans often have difficulty extending compassion and acceptance toward themselves particularly for events they perceive as their responsibility (see Purcell et al., 2018 for a discussion). Further, self-condemnation, self-harm, and self-sabotage are features of moral injury in which some veterans feel the need to punish themselves for self-perpetrated acts that took place in combat (Litz et al., 2009). Researchers have argued that fostering self-empathy and forgiveness are key to healing from moral injury (Evans et al., 2020; ter Heide, 2020).

We also found changes in other-directed (i.e., betrayal-based) moral injury as measured by the EMIS-M (Currier et al., 2018). MMMI focused on cultivating and practicing acts that would help veterans extend compassion and empathy toward others for actions that were transgressed against them. The distinction between self-directed (shame-related moral injury) and other-directed (betrayal-based) moral injury is important. Much of the existing literature has focused on self-directed moral injury, which stems from commission or omission of violence (e.g., Purcell et al., 2018). However, there is growing evidence that moral injury also comes from victimization, such as in the case of military sexual assault (Hamrick et al., 2022; Maguen et al., 2022) or acts for which no one is to blame (Fleming, 2021) and the moral injury symptoms may differ as a function of the type of events experienced (Currier et al., 2018).

After collapsing across conditions, significant pre-post effect size changes were found on all moral injury domains except the MP scale (Fleming, 2021). The lack of significant changes from pre-to post on the MP (Fleming, 2021) may reflect that most moral injury scales (e.g., EMIS-M, MISS, MIOS) focus on effects, symptoms, and moral emotions associated with moral injury (e.g., guilt, anger), whereas the MP scale assesses core views that are discrepant and disrupt underlying moral assumptions. These beliefs are not necessarily responses to acts of perpetration, omission, or betrayal (i.e., “I often think that life is absurd since my experience in the military”).

### Strengths and Limitations

Favorable study outcomes should be interpreted while considering the study limitations. The study was a small RCT, whose primary focus was examining feasibility and intervention satisfaction. Given our the primary focus of MMMI is to reduce moral injury symptoms we explored whether MMMI may have greater benefit for moral injury symptoms. Our initial evidence points to MMMI as having benefits for the reduction of moral injury. Taken together, these findings are promising, but clearly a fully powered clinical trial is needed to make convincing conclusions regarding the benefits of MMMI for moral injury. With this important caveat, several strengths should be noted. We compared MMMI to a comparable ES program, strengthening the design by providing an active comparison group (Byrd-Bredbenner et al., 2017). Also, talking with other veterans was a “top resource for coping with stress” (Franklin et al., 2015); thus, an ES program that addressed moral injury and coping strategies could benefit veterans and ES did have some equivalent benefits for moral injury. Also, by developing the active control in a similar way, we were able to structure, manualize, and deliver the programs similarly. Perhaps most importantly, both the MMMI and the ES programs presented identical moral injury content. However, other group treatments or other mind-body programs may benefit those with moral injury.

Of the 56 participants who consented, 40 (71.43%) completed the pre- and post- surveys and attended at least one session. Across 20 studies involving routine or clinical trials for PTSD, the pooled rate of drop-out was 36% (Goetter et al., 2015). Across frontline trauma treatments, results of a meta-analysis found a 28.2% dropout rate among military personnel (Varker et al., 2021). Although drop-out in the present study was a concern, more globally, attrition from mental health treatment is a significant challenge among military populations. Future research should address why some veterans did not complete any or all study aspects, especially given the study convenience.

### Conclusions

Overall, MMMI appeared to be feasible and acceptable for addressing issues related to moral injury among veterans in our sample. Initial evidence based on changes in effect sizes from the small RCT indicated MMMI is a promising strategy for reducing moral injury symptoms and impaired functioning related to moral injury in veterans. Moral injury has been associated with a host of problems including depression, suicidality, substance misuse, interpersonal conflicts, and stress-related illness (Bravo et al., 2020; Dennis et al., 2017; Evans et al., 2018; Forkus et al., 2021; Kelley, Chae et al., 2021). Whole person approaches that target integrated primary prevention for service members (Cabrera, 2023) and improve global functioning among veterans (U.S. Department of Veterans Affairs, 2020) are now key to service members and veteran health. These findings warrant large-scale randomized trials and follow-up testing to determine whether

MMMI can be used as a first-line treatment or complementary treatment for veterans with moral injury.

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Table 1. *Mean Scores on*

*Treatment Satisfaction Reports by Treatment Condition (n = 40)*

Treatment Satisfaction Question	ES (n = 19)	MMMI (n = 21)	Cohen's d
How valuable did you find the training <sup>1</sup>	3.47	3.90	0.45
How satisfied are you with the training program you attended <sup>1</sup>	4.00	4.29	0.36
How difficult/easy was the program content to understand <sup>1</sup>	4.37	4.29	0.13
How well do you feel you understand the topics covered overall <sup>2</sup>	4.05	4.05	0.01
How well do you feel you understand moral injury <sup>2</sup>	3.89	4.10	0.27
How confident are you in your ability to apply the content covered in your daily life since the training <sup>2</sup>	3.58	4.33	1.19*
How much have you put what you learned into practice <sup>3</sup>	3.16	3.76	0.83*

How much do you feel like the training and practices you have learned have helped with your stress and moral injury symptoms <sup>3</sup>	3.05	3.52	0.57
How much do you agree with this statement: I intend to use the knowledge I acquired from this program in the future <sup>3</sup>	4.05	4.29	0.28
How much has this program benefitted you <sup>4</sup>	3.26	4.05	0.78*
Reactions Subscale	3.95	4.16	0.32
Attitudes/Learning/Knowledge Subscale	3.84	4.16	0.62
Behavior Subscale	3.42	3.86	0.67*
Return on Investment Subscale	3.23	4.05	0.78*
Total Score	3.74	4.06	0.62

*Note.* Item subscripts refer to each subscale: <sup>1</sup>= Reactions; <sup>2</sup> = Attitudes/Learning/Knowledge, <sup>3</sup> = Behavior, and <sup>4</sup> = Return on Investment. Responses for each item ranged from 1 – 5 and higher scores indicate higher satisfaction. \* Indicates significant mean differences based on independent *t*-test at  $p < .05$ .

Table 2. *Bivariate correlations among study variables among analytic sample (n = 40)*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	M
1. EMIS–Self T1	<u>.91</u>																25
2. EMIS–Self T2	<b>.61</b>	<u>.90</u>															22
3. EMIS–Other T1	<b>.49</b>	<b>.55</b>	<u>.88</u>														28
4. EMIS–Other T2	.15	<b>.64</b>	<b>.75</b>	<u>.89</u>													26
5. MP T1	<b>.82</b>	<b>.60</b>	<b>.54</b>	<b>.33</b>	<u>.86</u>												23
6. MP T2	<b>.49</b>	<b>.85</b>	<b>.61</b>	<b>.72</b>	<b>.64</b>	<u>.90</u>											22
7. MISS T1	<b>.72</b>	<b>.55</b>	<b>.40</b>	.21	<b>.71</b>	<b>.44</b>	<u>.73</u>										54
8. MISS T2	<b>.47</b>	<b>.78</b>	<b>.41</b>	<b>.56</b>	<b>.53</b>	<b>.72</b>	<b>.63</b>	<u>.70</u>									48
9. MIOS–Total T1	<b>.72</b>	<b>.63</b>	<b>.57</b>	<b>.36</b>	<b>.78</b>	<b>.53</b>	<b>.76</b>	<b>.53</b>	<u>.87</u>								27
10. MIOS–Total T2	<b>.40</b>	<b>.74</b>	<b>.47</b>	<b>.69</b>	<b>.52</b>	<b>.73</b>	<b>.37</b>	<b>.71</b>	<b>.58</b>	<u>.90</u>							24
11. MIOS–Shame T1	<b>.79</b>	<b>.57</b>	<b>.36</b>	.13	<b>.75</b>	<b>.43</b>	<b>.78</b>	<b>.50</b>	<b>.88</b>	<b>.43</b>	<u>.89</u>						12
12. MIOS–Shame T2	<b>.50</b>	<b>.75</b>	<b>.40</b>	<b>.54</b>	<b>.56</b>	<b>.72</b>	<b>.46</b>	<b>.70</b>	<b>.60</b>	<b>.92</b>	<b>.60</b>	<u>.90</u>					11
13. MIOS–Trust T1	<b>.38</b>	<b>.50</b>	<b>.64</b>	<b>.52</b>	<b>.54</b>	<b>.47</b>	<b>.47</b>	<b>.39</b>	<b>.81</b>	<b>.55</b>	<b>.42</b>	<b>.39</b>	<u>.80</u>				15
14. MIOS–Trust T2	.23	<b>.57</b>	<b>.45</b>	<b>.72</b>	<b>.35</b>	<b>.59</b>	.17	<b>.58</b>	<b>.42</b>	<b>.88</b>	.14	<b>.62</b>	<b>.63</b>	<u>.81</u>			12
15. MIOS–Funct T1	<b>.46</b>	<b>.48</b>	<b>.37</b>	.25	<b>.36</b>	<b>.44</b>	<b>.49</b>	.25	<b>.55</b>	<b>.38</b>	<b>.54</b>	<b>.51</b>	<b>.38</b>	.14	<u>.90</u>		41
16. MIOS–Funct T2	.28	<b>.39</b>	<b>.32</b>	<b>.37</b>	.27	<b>.35</b>	<b>.46</b>	<b>.47</b>	.27	<b>.45</b>	.22	<b>.43</b>	.23	<b>.39</b>	<b>.39</b>	<u>.89</u>	33

*Note.* Significant correlations are in bold typeface for emphasis and were determined  $p < .05$ . Cronbach’s alphas are underlined and shown on the diagonals. T1 = Baseline survey, T2 = Post-intervention survey.

EMIS = Expressions of Moral Injury Scale – Military Version; MP = Moral Paradox Scale; MISS = Moral Injury Symptom Scale – Military Version Short Form; MIOS = Moral Injury Outcome Scale; MIOS–Shame = Shame-related experiences; MIOS–Trust = MIOS Trust-violation-related Outcomes; MIOS-Funct = MIOS Impaired Functioning Subscale.

Table 3. *Initial Evidence of Effects on Moral Injury Outcomes (n = 40; MIMI = 21; ES = 19)*

<i>Predictor</i>	<i>F</i>	<i>p-value</i>	$\eta^2$	<i>Observed Power</i>
EMIS – Self Directed (across time)	<b>4.24</b>	<b>.046</b>	<b>.100</b>	<b>.518</b>
EMIS – Self Directed X Treatment Condition	3.44	.071	.083	.440
EMIS – Other Directed (across time)	<b>9.19</b>	<b>.004</b>	<b>.195</b>	<b>.840</b>
EMIS – Other Directed X Treatment Condition	<b>5.61</b>	<b>.023</b>	<b>.129</b>	<b>.636</b>
MP (across time)	3.05	.089	.074	.398
MP X Treatment Condition	1.07	.308	.027	.172
MISS (across time)	<b>10.44</b>	<b>.003</b>	<b>.216</b>	<b>.883</b>
MISS X Treatment Condition	3.72	.061	.089	.469
MIOS – Total (across time)	<b>5.78</b>	<b>.021</b>	<b>.132</b>	<b>.649</b>
MIOS – Total X Treatment Condition	<b>5.25</b>	<b>.028</b>	<b>.121</b>	<b>.607</b>
MIOS – Shame-related Experiences (across time)	1.00	.323	.026	.164
MIOS – Shame-related Experiences X Treatment Condition	<b>4.44</b>	<b>.042</b>	<b>.105</b>	<b>.537</b>
MIOS – Trust-violation-related Outcomes (across time)	<b>13.08</b>	<b>&lt;.001</b>	<b>.256</b>	<b>.941</b>
MIOS – Trust-violation-related Outcomes X Treatment Condition	4.08	.050	.097	.504
MIOS – Impaired Functioning (across time)	<b>7.61</b>	<b>.009</b>	<b>.167</b>	<b>.767</b>
MIOS – Impaired Functioning X Treatment Condition	<b>5.63</b>	<b>.023</b>	<b>.129</b>	<b>.638</b>

*Note.* Statistically significant effects ( $p < .05$ ) are bolded for emphasis. EMIS = Expressions of Moral Injury Scale – Military Version; MPDOX = Moral Paradox Scale; MISS = Moral Injury Symptom Scale – Military Version Short Form; MIOS = Moral Injury Outcome Scale.

Figure 1.

*CONSORT Flowchart of Participants*

