Impact of Killing in War: A Randomized, Controlled Pilot Trial

Shira Maguen,[1,2] Kristine Burkman,[1,2] Erin Madden,[1] Julie Dinh,[1] Jeane Bosch,[1] Jessica Keyser,[1,2] Martha Schmitz,[1,2] and Thomas C. Neylan[1,2,3]

[1] *San Francisco VA Medical Center*
[2] *University of California, San Francisco*
[3] *Mental Illness Research, Education & Clinical Center*

Objective: The purpose of this pilot study was to test the effectiveness of Impact of Killing (IOK), a novel, cognitive-behavioral treatment (CBT) aimed at reducing mental health symptoms and functional impairment. **Method:** Participants were 33 combat Veterans with a posttraumatic stress disorder (PTSD) diagnosis who had completed trauma-focused psychotherapy and reported distress regarding killing or feeling responsible for the deaths of others in war. Veterans were randomized to either IOK treatment or a 6-week waitlist condition, after which Veterans could receive IOK. IOK is a 6- to 8-session, weekly, individual, CBT, lasting 60–90 minutes, and focused on key themes, including physiology of killing responses, moral injury, self-forgiveness, spirituality, making amends, and improved functioning. **Results:** We found that compared to controls (N = 16), the IOK group (N = 17) experienced a significant improvement in PTSD symptoms, general psychiatric symptoms, and quality of life functional measures. Veterans who received IOK reported that the treatment was acceptable and feasible. **Conclusion:** These results provide preliminary evidence that Veterans can benefit from a treatment focused on the impact of killing after initial trauma therapy. J. Clin. Psychol. 00:1–16, 2017.

Keywords: killing; war; posttraumatic stress disorder; moral injury; treatment; veteran

There is mounting evidence that Veterans from multiple eras who kill in war are at increased risk for posttraumatic stress disorder (PTSD), alcohol abuse, suicide, and functional difficulties after returning home. Despite high rates of exposure to killing (Hoge et al., 2004) and associated maladaptive responses (Fontana & Rosenheck, 1999; Fonanta, Rosenheck, & Brett, 1992; MacNair, 2002; Maguen et al., 2009; Maguen et al., 2010; Maguen et al., 2011),Veterans are not routinely assessed for exposure to killing, which could assist with prevention and treatment efforts. Furthermore, the impact of killing is not currently addressed as an explicit component of evidence-based treatment (EBT) for PTSD. This is important given that recent studies demonstrate that even after EBT for PTSD, many patients remain symptomatic, indicating the need for expanding current treatments (Steenkamp, Litz, Hoge, & Marmar, 2015).

In current healthcare systems, a Veteran can receive PTSD evaluation and EBT without ever being asked about killing and its impact. One study found that guilt about combat actions, such as killing was the strongest predictor of suicidal ideation and attempts (Hendin & Haas, 1991).

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Please address correspondence to: Shira Maguen, San Francisco VA Medical Center, 4150 Clement Street, San Francisco, CA 94121. E-mail: Shira.Maguen@va.gov.

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We also found that Veterans who reported higher levels of killing experiences had twice the odds of suicidal ideation, compared to those with lower or no killing experiences, even after adjusting for demographic variables, PTSD, depression, substance use disorders, and general combat exposure (Maguen et al., 2012). Consequently, it is possible that failing to directly assess and treat the mental health impact of killing could result in inadequate treatment and cost lives.

While PTSD may be one of the manifestations of killing related psychological trauma, the mental health response may require a broader framework. The concept of moral injury is based on a recent framework that helps to better understand many possible outcomes of exposure to killing (Litz et al., 2009). Moral injury can be defined as "perpetrating, failing to prevent, bearing witness to, or learning about acts that transgress deeply held moral beliefs and expectations" (Litz et al., 2009, p. 700). Many individuals who struggle with having taken another life identify that killing, even in war, transgresses moral or religious beliefs, creating a sense of dissonance and internal conflict.

Maladaptive cognitions, such as ones associated with guilt, shame, and self-condemnation, act as mediators within a larger framework of psychological distress and functional impairment. Existing cognitive models propose that the relationship between a traumatic event and its mental health and functional impact is mediated by maladaptive cognitions or appraisals, defined as distorted thinking accompanied by negative and unrealistic representations of reality (Ehlers & Clark, 2000). Maladaptive cognitions are consequently critical to understand and will be a key component in symptom and functional improvement. Based on this framework, we posit that healing from trauma associated with killing in combat will involve identification of maladaptive cognitions related to killing and a focus on resolution of these maladaptive thoughts in treatment. Identification and resolution of maladaptive cognitions is coupled with an understanding that a transgression has occurred and recognition that some cognitions need to be accepted and integrated rather than challenged.

The moral injury framework also emphasizes that while PTSD symptoms are some of the outcomes that might follow experiences such as killing in the war zone, the mental health outcomes associated with killing may be more complex and include outcomes such as global psychiatric symptoms, self-harming, behaviors and alcohol abuse. This framework highlights the importance of thinking more broadly about outcomes and therefore treatment related to killing and other acts of moral injury. This framework also highlights why using PTSD treatment models is important but may not be sufficient for individuals who suffer from the complexities of moral injury. Finally, spiritual concerns associated with PTSD are not directly addressed in current PTSD treatments (e.g., feeling abandoned or punished by a deity for the act of killing), which is important given that spiritual functioning is associated with PTSD severity and suicidal behavior in Veterans (Kopacz, Currier, Drescher, & Pigeon, 2016).

Recent qualitative studies of moral injury with both combat Veterans (Vargas, Hanson, Kraus, & Foy, 2013; Purcell, Koenig, Bosch, & Maguen, 2016) and mental health clinicians (Drescher et al., 2011) found that in addition to the psychological problems commonly associated with PTSD, spiritual and social functioning is often negatively impacted after war. Combat Veterans from multiple eras, many of whom completed existing EBPs for PTSD, such as PE and CPT, reported continued moral, interpersonal, spiritual, and existential concerns related to killing in war (Purcell et al., 2016).

To better address these concerns, we incorporated elements of gestalt, existential, and relational psychotherapies into a cognitive-behavioral framework. For example, we used experiential exercises and written assignments to encourage empathy toward enemy soldiers and/or civilians, exploration of spirituality, reconciliation with aspects of self, and reconnection with loved ones or communities. Given the level of stigma associated with the topic of killing and concerns Veterans report of being judged or condemned, the therapeutic relationship can serve as a powerful tool to allow Veterans to test their beliefs with another person, and, ideally, experience acceptance and compassion mirrored back to them when processing events that they describe as unforgiveable.

Because self-forgiveness is a critical link in the moral injury framework and was conceptualized as a key ingredient to healing that was not formally captured in other treatments, we also used

models focusing on self-forgiveness, which has a strong association with positive health and mental health outcomes (Davis et al., 2015). We drew from Hall and Fincham's (2005) model of self-forgiveness that emphasized acknowledging the wrong/harm done, processing negative feelings triggered by the offense (e.g., guilt, remorse), and achieving an internal acceptance of oneself. Severity of transgressions, guilt, conciliatory behaviors, and perceived forgiveness from others play important roles in self-forgiveness (McConnell, Dixon, & Finch, 2012). Thus, we conceptualize self-forgiveness as being able to acknowledge the wrong done, feeling the emotions of being responsible for that wrongdoing, and recognizing that the act alone does not define who a person is or will be moving forward. Concerns about the morality of self-forgiveness, such as whether individuals should grant themselves forgiveness if the victim continues to suffer (e.g., family of enemy solider killed), or is unable to forgive (e.g., enemy solider killed) are important aspects to address in the treatment.

Articulating barriers to self-forgiveness can reduce the likelihood of individuals feeling as though they have engaged in immoral or inauthentic self-forgiveness. It is not the role of the therapist to adjudicate whether Veterans should or should not be forgiven, but to help identify the reasons Veterans are unable to self-forgive and reflect the impact that this decision/stance may have on their lives. Additionally, engaging in conciliatory behaviors, which we refer to throughout as making amends, can increase the perceived morality of self-forgiveness, which appears to serve as an important prerequisite for the process (Carpenter, Carlisle, & Tsang, 2014).

Building on preliminary studies, our goal was to pilot test the effectiveness of an adjunctive treatment module to be used following existing PTSD cognitive-behavioral therapies (CBT). We developed a six- to eight-session CBT treatment module, which incorporated self-forgiveness, existential, gestalt, and relational theories. Our treatment module was informed by seven Veteran focus groups (Purcell et al., 2016), aimed at learning about ways in which Veterans have been impacted by killing, as well as consulting with expert PTSD clinicians. Participants from the focus groups highlighted some of the barriers that prevented them from focusing on killing in past EBTs for PTSD, including concerns that the killing incident was not a trauma and hesitation about discussing spirituality and moral issues in those treatments. Through focus groups, we also learned that a killing-focused treatment is feasible and acceptable to Veterans of multiple eras, and that Veterans would like providers to take a more active role in inviting the discussion. We refer to this new CBT treatment as the Impact of Killing (IOK) module.

We also developed a measure to index change in maladaptive cognitions associated with the impact of killing (Killing Cognitions Scale; KCS) for use with the IOK module. Because this measure is still being validated, we will report some item-level descriptive results of the KCS, rather than sum scores, as well as describing its contents and how it is used in conjunction with IOK treatment.

In this randomized, controlled pilot trial, we hypothesized that for Veterans endorsing killing in war who had previously participated in PTSD treatment, PTSD symptoms would continue to improve through IOK treatment. We also hypothesized that general psychiatric symptoms would improve in multiple domains, and that Veterans participating in the IOK treatment would report gains in interpersonal functioning and that treatment was helpful, acceptable, and feasible.

Method

Participants

Participants were recruited from October 2011 through September 2014 through direct referrals from clinicians treating combat Veterans for PTSD at local Veteran Health Administration (VHA) hospitals, VHA community-based outpatient clinics, and Vet Centers. Participants were also recruited through direct mailings to Veterans who participated in related research on the topic of PTSD and killing in combat, and they gave permission to be contacted in the future. All participants, regardless of referral source, were contacted by phone and informed that the study aimed to determine the acceptability and feasibility of a novel treatment intervention addressing the mental health impact of killing in war among combat Veterans with PTSD.

Participants were informed of the nature of the brief phone interview and provided permission to engage in the initial screening process.

Phone screens were comprised of the Structural Interview for the *Diagnostic and Statistical Manual of Mental Disorder Fourth Edition* (SCID for DSM-IV) screening questions for psychosis (First, Spitzer, Gibbon, & Williams, 2002), the Primary Care PTSD screen (PC-PTSD; Prins et al., 2003), and four questions about war zone exposure, including whether a participant killed in war. Participants were asked to describe past PTSD treatment to determine whether they had received prior evidence-based treatment. We also performed chart reviews and consultation with participants' primary therapists to validate prior treatment was completed as reported (e.g., successfully completed all sessions of either PE or CPT) and to determine eligibility, including documentation of PTSD diagnosis.

To be eligible for the study, participants needed to meet the following criteria: (a) at least 18 years old; (b) endorsed killing or being responsible for the death of another in a war zone and reported continued distress regarding these events; (c) met criteria for PTSD; (d) received prior exposure-based treatment for PTSD; (e) if on a prescribed medication as part of current treatment for PTSD, dosage had to be constant for 1 month before enrollment; and (f) if receiving cognitive processing therapy (CPT) or prolonged exposure (PE), must have completed and waited 2 weeks before enrollment. Participants were excluded for the following reasons: (a) current or lifetime diagnosis of a psychotic disorder, (b) recent psychiatric hospitalizations, (c) recent suicidal and/or homicidal behaviors, and (d) presence of untreated substance dependence.

During the informed consent process, the treatment protocol was described and goals for the study were verbally reviewed with potential participants. Study personnel verbally confirmed with all participants that they had been previously diagnosed with PTSD, completed an evidence-based treatment for PTSD, and continued to experience distress related to killing. There were some participants who met study eligibility criteria but were ultimately unable to participate in the study because of living extreme distances from our facility, school/work schedules, or medical/family emergencies that made active participation unfeasible. Please see Figure 1 for participant study flowchart.

The trial was registered at ClinicalTrials.gov (NCT01406834 - UCSF)/ (NCT01605799 – VA). The study protocol was approved by the University of California, San Francisco and the San Francisco VA Medical Center.

Procedure

Once enrolled, participants provided demographic information and completed self-report measures of PTSD symptoms, global psychiatric symptoms, interpersonal functioning, and cognitions related to killing in war before being randomly assigned to either the IOK treatment group (TG) or the waitlist control group (CG) by block randomization, using a block size of six. After randomization, TG participants were assigned to a therapist for weekly individual psychotherapy. All study therapists were licensed psychologists with specialized training and experience in the assessment and treatment of PTSD using empirically based interventions, such as CPT and PE. Therapists received training in the IOK module and met weekly with the first author for group consultation and supervision during the duration of the study. Individual psychotherapy ranged from six to eight sessions, was 60 to 90 minutes in duration, and involved assignments to be completed by participants between visits. Treatment completion was defined as full participation in all of the content outlined in the six sessions, completion of all between-session assignments, and completion of outcome measures.

Outcome measures were readministered after completion of the treatment. Additional outcome measures at study completion included a self-report assessment of the acceptability and feasibility of the treatment and the overall impact of the treatment on various aspects of life. CG participants completed the outcome measures after a 6-week waiting period. They could continue to engage in treatment as usual during the waiting period and were offered IOK treatment following completion of post-assessment measures. Treatment as usual included medication management, brief case management visits, and supportive group psychotherapy. No participants enrolled in this study were participating in any form of individual psychotherapy or

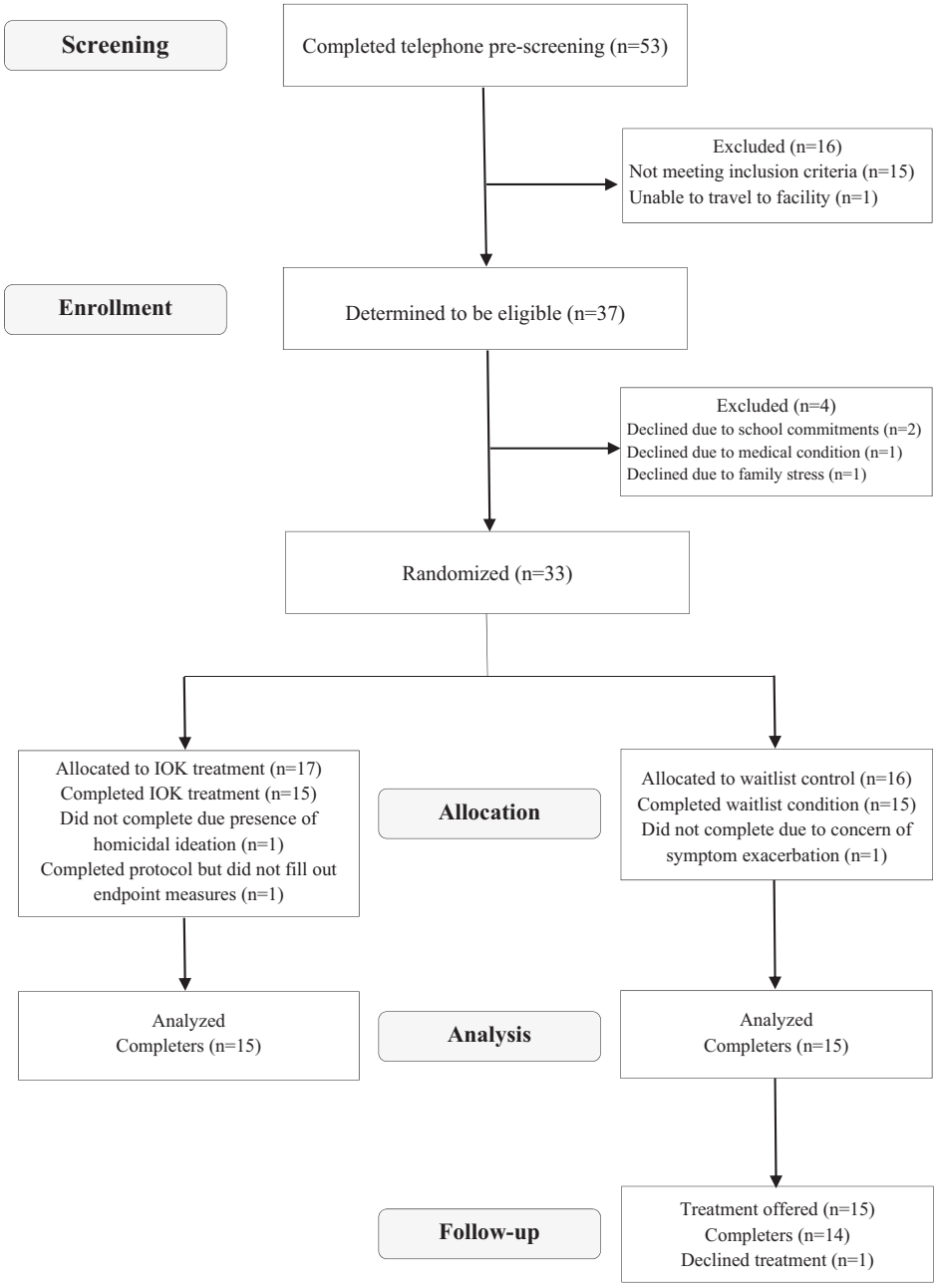

Figure 1. Figure 1. IOK trial participant flowchart.

cognitive-behaviorally based group psychotherapy. Posttreatment outcome measures were also administered to CG participants who opted to complete the IOK treatment but were not used in the analyses comparing TG to CG.

Intervention

The IOK treatment is a cognitive-behavioral intervention, designed to follow and build on completion of an evidence-based, trauma-focused treatment, such as CPT or PE (see Table 1).

Table 1
IOK Session Treatment Outline

Session 1: Pretreatment evaluation: Assessment, barriers to treatment, and coping skills.
Session 2: Common responses to killing: Physiology, emotions, and cognitions.
Session 3: Cognitive-behavioral therapy (CBT) elements: CBT framework, meaning of killing, and killing cognitions.
Session 4[a]: Becoming unstuck: CBT and maladaptive killing cognitions (continued).
Session 5[a]: Self-forgiveness: Defining self-forgiveness and barriers to self-forgiveness.
Session 6: Taking the next step: Forgiveness letter, making amends, and maintaining gains.

Note. IOK = Impact of Killing.
[a]Session 4 and 5 are often extended; IOK can be 6–8 sessions.

While IOK builds on these treatments, it is unique in its explicit focus on the act of killing and highlighting the moral struggles that an individual may face in war. There is an acknowledgement that the killing incident may have crossed personal or shared boundaries, thereby causing a moral injury, and therefore IOK has a strong focus on self-forgiveness and making amends.

The initial IOK session was designed to gather information about participants' killing experiences, reinforce previous therapeutic gains, revisit rationale for trauma focused work, and invite discussion about potential barriers to treatment given level of stigma and shame related to the topic of killing in war. Responses on the Killing Cognition Scale (KCS) helped guide the therapist to identify potentially maladaptive cognitions related to killing in war and areas for acceptance, grief, and self-forgiveness work. Participants were informed how the KCS was developed (focus groups of fellow combat Veterans), and the second session focused on common responses to killing, including physiological reactions, emotions, and thoughts. The goal of this session was to destigmatize/normalize a wide range of reactions that many Veterans believe may be unique and/or shameful (e.g., high levels of rage during killing after loss of fellow solider or "revenge killing").

In between-session assignments were a critical component of this treatment (see Table 2). Participants' first assignment was a meaning statement about how beliefs about the self, others, and the world were changed after killing. We used beliefs generated from this assignment as well as the responses on the KCS to tailor which areas to challenge with cognitive restructuring and which areas to earmark for acceptance, grief, and self-forgiveness work. The treatment was designed to be flexible and allowed therapists to focus the work on the most important areas, which were collaboratively identified.

The next few sessions reviewed the cognitive-behavioral framework, which most participants were familiar with given their experience with CPT or PE, and honed in on beliefs about killing that are most problematic. Participants worked with therapists in session and completed thought records related to killing cognitions in between sessions to gain perspective, recognize the importance of context, and more fully integrate aspects of self that were often distorted or dismissed. While many beliefs related to killing could be challenged, there were some beliefs that were accurate and needed to be acknowledged, (i.e., appropriate guilt) and addressed. Work at this point shifted away from cognitive restructuring and focused on acceptance, self-forgiveness, and making amends.

The next phase of the treatment specifically focused on self-forgiveness. Participants completed an assignment asking them to define self-forgiveness, share where they learned about self-forgiveness, and indicate whether they apply standards of forgiveness toward themselves as they do to others. The next session focused on understanding and typically expanding the definition of self-forgiveness and reviewing barriers toward self-forgiveness. Therapists and participants collaboratively determined what types of assignments might help address barriers to self-forgiveness (i.e., forgiveness plan). Assignments often included writing a letter to an enemy

Table 2
Assignments Corresponding to IOK Sessions

Session	Completed work reviewed	Assignment
1		Self-care plan
2	Self-care plan	Meaning statement
3	Meaning statement	Breathing handout & practice ABCD blank sheets (daily)
4[a]	ABCD sheets (daily examples)	ABCD sheets (KCS items)[b] Self-forgiveness statement
5[a]	ABCD sheets (KCS items) Self-forgiveness statement	ABCD sheets (KCS items) Forgiveness plan Pros/cons of self-forgiveness Nine steps to self-forgiveness sheet Amends plan
6	ABCD sheets (KCS items) Pros/cons of self-forgiveness Nine steps to self-forgiveness handout Forgiveness plan Amends plan	Plan for continued work

Note. IOK = Impact of Killing.
[a]Sessions 4 and 5 are often extended.
[b]KCS = Killing Cognition Scale, a measure developed to identify cognitions related to killing in war.

solider or civilian who was killed or a younger version of the self. Behavioral changes were emphasized in developing an amends plan. Participants thought through what they could do to honor their values (especially those that were compromised or transgressed during combat) in their daily lives. Activities like spending time with children and grandchildren, visiting the gravesite of a fallen soldier, volunteering, and reconnecting with their spiritual community were all examples that have been included in the amends plan.

Session four and five were most frequently extended to two sessions each given how much conflict individuals had regarding acts they felt were unforgiveable. To more fully facilitate acceptance, enough time and space was needed to thoroughly explore both the definition of and barriers to self-forgiveness. Facilitating affective expression of guilt and remorse for those harmed and sadness and compassion for self and others was essential in developing meaningful and authentic forgiveness and amends plans. Finally, the last session focused on reviewing gains and emphasized how this treatment was designed to be a catalyst for ongoing work toward self-forgiveness, acceptance, and making amends.

Participants were offered booster sessions after completion of treatment and outcome assessments to help facilitate successful implementation of the individualized plans developed during the protocol. Booster sessions ranged from one to two visits, and generally occurred within 3 months after completion of the protocol. Approximately half of the participants who completed the treatment protocol opted for at least one booster session. Content of booster sessions frequently included reviewing barriers to self-forgiveness and facilitating follow-through with individualized plans (e.g., connecting with a chaplain, joining a psychotherapy group, participating in volunteer work).

Outcomes Measures

Our primary outcome measure was the PTSD Checklist—Military Version (PCL-M; Forbes, Creamer, & Biddle, 2001; Weathers, Litz, Herman, Huska, & Keane, 1993), a 17-item self-report

questionnaire that assesses the 17 *DSM-IV* symptoms of PTSD specifically for military populations. Items are scored on a 5-point Likert scale and the total score ranges from 17 to 85, with a score of 50 or higher indicating clinically significant levels of distress and presence of PTSD.

Our secondary outcome measures included the Brief Symptom Inventory (BSI; Derogatis & Savitz, 2000) and the Military to Civilian Questionnaire (M2C; Sayer et al., 2011). The BSI is a 53-item self-report measure that assesses global psychopathology. Participants indicated on a 5-point Likert scale the extent of distress caused by various symptoms in the past week. The BSI measures global psychological distress and includes nine subscales that assess symptom groups: somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism.

The M2C is a 16-item self-report measure of challenges in postdeployment community reintegration. Participants indicated on a 5-point Likert scale the level of difficulty in performing common tasks or interacting with others in civilian settings (e.g., "keeping or finding a job"; "getting along with people you do not know well, such as strangers or acquaintances"; and "enjoying or making good use of free time").

We included several additional measures to help better capture how Veterans were impacted by and heal from killing in war. The Killing Cognition Scale, (KCS; unpublished measure), will be described here because it was used clinically, but not as an outcome measure given that it is still being validated. The KCS is a 55-item self-report measure assessing endorsement of maladaptive beliefs about killing. Participants indicated on a 5-point Likert scale the extent to which each cognition is true for a given individual (e.g., "I deserve to suffer for killing"; "nothing seems important after killing"; and "I'm afraid of what I learned about myself after killing"). Some items include "not applicable" response options because they are predicated on exposure to specific types of combat stressors and/or precombat beliefs.

A measure assessing the participants' perspective of the intervention was developed and administered after completion of the treatment protocol and included a self-report assessment of the acceptability and feasibility of the treatment and the overall impact of the treatment on various aspects of life. In the Acceptability and Feasibility Questionnaire, participants indicated on a 5-point Likert scale their level of agreement on how much they felt the treatment length and content met their needs. Additional questions about overall knowledge gained, skills built, and level of burden to participate were included.

Data Analysis

Descriptive statistics of baseline characteristics were computed and compared in the TG and CG groups using t-tests for continuous variables and chi-squared tests for categorical variables. Within-group means at baseline and follow-up and mean change were calculated and paired t-tests were performed.

Analyses to estimate treatment effects were conducted by linear regression models (analysis of covariance using maximum likelihood estimation) of the follow-up score for each of the outcomes with independent variables of baseline score and group (Vickers & Altman, 2001). The resulting coefficient for group is the estimated difference between mean change score in TG and mean change score in CG; for example, a negative coefficient means that the reduction in score was greater (more negative) in TG than CG.

We calculated ω^2 (omega-squared) for the analysis of covariance models described above. ω^2 is an unbiased effect size index for treatment adjusted for baseline that ranges in value from 0 to 1, and it is interpreted as the proportion of variance of the dependent variable (follow-up score) related to the treatment (independent variable), holding constant (partialling out) the baseline score. In other words, the proportion of total variance in the follow-up score accounted for by the treatment, controlling for the effect of baseline score. According to one rule of thumb, an ω^2 of 0.01 is small, .06 is medium, and.14 is a large effect size (Murphy & Myors, 2004). In a separate analysis of all participants who completed the treatment protocol ($N = 28$), descriptive statistics were calculated for baseline, follow-up, and change scores for each outcome measure; paired t-tests were used to test for significant changes from baseline. All analyses were performed using SAS (version 9.4).

Results

A total of 33 participants enrolled in the study: 17 in the TG and 16 in the CG. Two participants dropped out of treatment, one from each group, and a third participant from the TG completed the protocol but was unable to complete endpoint measures. Mean age was 61.2 years (SD = 13), 100% were male, and racial or ethnic compositions was 60.6% White, 21.2% Black, and 18.2% other. The TG and CG were similar with regards to all other demographic and military characteristics (see Table 3). All participants had completed a full course of trauma-focused psychotherapy before participation in the study.

The within-group mean change for each of the primary outcomes is presented in Table 4. The TG experienced a mean improvement for all total scores of the primary outcomes.

The between-group differences in mean change scores for each of the primary (PCL) and secondary (BSI and M2C) outcomes are also shown in Table 4. PCL, BSI, and M2C total scores improved more on average in the TG compared to the CG, although the greater improvement in TG versus CG on M2C total score did not reach statistical significance. We observed large treatment effects on obsessive compulsive, phobic anxiety, and BSI total ($\omega^2 \geq 0.14$); and medium-large treatment effects on PCL total, PCL numbing subscale, interpersonal sensitivity, depression, and anxiety ($\omega^2 \geq .06$). Improvement on specific PCL items (results not shown at the item level) and total score was significantly greater in TG compared to CG. While the emotional numbing PCL subscale approached significance (TG vs. CG; p = .077), none of the other PCL subscales were significantly different.

The TG improved significantly more on specific BSI subscales (i.e., had a larger negative change than CG): obsession compulsion, interpersonal sensitivity, depression, anxiety, and phobia. The TG had significant greater reduction in symptom levels compared to CG on specific items of the M2C (results not shown at the item level), such as "Taking part in community events or celebrations" (Q13; difference between mean change score in TG vs. CG = −1.07, 95% confidence interval (CI) [−1.83, −0.31], $p = 0.0074$) and "Confiding or sharing personal thoughts and feelings" (Q15; treatment vs. waitlist mean difference = −0.67, 95% CI [−1.33, −0.003], $p = 0.049$.

The TG had significantly greater reductions in distress levels compared to CG on several important cognitions in the KCS (results not shown in full given measure is still be validated): "I deserve to suffer for killing" (difference between mean change score in TG vs. CG = −0.77, 95% CI [−1.34, −0.21], $p = 0.0093$); "I can no longer be intimate with a partner after killing" (difference between mean change score in TG vs. CG = −0.69, 95% CI [−1.29, −0.094], $p = 0.025$); "I have trouble getting close to people" (difference between mean change score in TG vs. CG = −0.78, 95% CI [−1.54, −0.027], $p = 0.043$); "I believe I was justified in killing" (difference between mean change score in TG vs. CG = −0.88, 95% CI [−1.64, −0.11], $p = 0.026$); "I wish that I did not have to kill as many people as I did" (difference between mean change score in TG vs. CG = –0.99, 95% CI [−1.85, −0.13], $p = 0.026$); and "I feel betrayed by my superiors who ordered me to kill against my own beliefs" (difference between mean change score in TG vs. CG = –0.87, 95% CI [−1.50, −0.23], $p = 0.0096$).

All participants who completed the treatment protocol (n = 28) were included in an analysis of change from baseline as presented in Table 5. Participants who completed treatment significantly improved on all outcomes except for somatization.

Acceptability and feasibility questions are listed in Table 6. Participants reported that most the study's components were acceptable and feasible. Participants did express that they had wished the treatment was somewhat longer.

Discussion

We determined that Veterans who kill in war and continue to experience PTSD and general psychiatric symptoms after trauma-focused treatment can improve even further through a brief, cognitive-behavioral treatment module called IOK. Veterans demonstrated improvements in PTSD as well as general psychiatric symptoms (such as depression, anxiety, phobia, obsessive-compulsive, and interpersonal sensitivity symptoms). Veterans also reported improvements in

Table 3
Demographic Characteristics of Participants in Impact of Killing Treatment Study

Characteristic (N (%))	*Waitlist (N = 16)*	*Treatment (N = 17)*	*Total (N = 33)*	*P-Value*
Age (Mean ± SD)	61.1 ± 14.0	61.2 ± 12.3	61.2 ± 13.0	0.99[a]
Male	16 (100.0%)	17 (100.0%)	33 (100.0%)	
Race/Ethnicity				
Asian	0 (0.0%)	1 (5.9%)	1 (3.0%)	0.42[b]
Black	3 (18.8%)	4 (23.5%)	7 (21.2%)	
Caucasian	12 (75.0%)	8 (47.1%)	20 (60.6%)	
Latino	0 (0.0%)	1 (5.9%)	1 (3.0%)	
Multiracial	1 (6.3%)	3 (17.6%)	4 (12.1%)	
Education				
High school graduate	1 (6.3%)	1 (5.9%)	2 (6.1%)	0.49[b]
Some college	5 (31.3%)	9 (52.9%)	13 (42.4%)	
College graduate	5 (31.3%)	2 (11.8%)	7 (21.2%)	
Graduate school/prof	5 (31.3%)	5 (29.4%)	9 (30.3%)	
Employment				
Employed full-time	5 (31.3%)	0 (0.0%)	5 (15.2%)	0.09[b]
Employed part-time	2 (12.5%)	1 (5.9%)	3 (9.1%)	
VA service-connection	3 (18.8%)	8 (47.1%)	11 (33.3%)	
In school	1 (6.3%)	2 (11.8%)	3 (9.1%)	
Retired	5 (31.3%)	6 (35.3%)	11 (33.3%)	
Relationship				
Single	4 (25.0%)	3 (17.6%)	7 (21.2%)	0.18[b]
Married	10 (62.5%)	7 (41.2%)	17 (51.5%)	
Separated/divorced	2 (12.5%)	7 (41.2%)	9 (27.3%)	
Any children	12 (75.0%)	15 (88.2%)	27 (81.8%)	0.32[b]
Service branch				
Army	9 (56.3%)	8 (47.1%)	17 (51.5%)	0.51[b]
Marine corps	4 (25.0%)	4 (23.5%)	8 (24.2%)	
Navy	2 (12.5%)	5 (29.4%)	6 (21.2%)	
Air force	1 (6.3%)	0 (0.0%)	1 (3.0%)	
Service component				
Active duty	15 (93.8%)	12 (70.6%)	27 (81.8%)	0.32[b]
National guard	0 (0.0%)	1 (5.9%)	1 (3.0%)	
Reserves	0 (0.0%)	1 (5.9%)	1 (3.0%)	
Unknown	1 (6.3%)	3 (17.6%)	4 (12.1%)	
Service rank				
Junior enlisted (E1)	5 (31.3%)	4 (23.5%)	9 (27.3%)	0.91[b]
Noncommissioned officer	6 (37.5%)	7 (41.2%)	13 (39.4%)	
Officers (O1 and higher)	3 (18.8%)	4 (23.5%)	6 (18.2%)	
Unknown	2 (12.5%)	3 (17.6%)	5 (15.2%)	
Operation (not mutually exclusive)				
Gulf War	1 (6.3%)	0 (0.0%)	1 (3.0%)	0.30[b]
OEF	0 (0.0%)	2 (11.8%)	2 (6.1%)	0.16[b]
OIF	2 (12.5%)	3 (17.6%)	5 (15.2%)	0.68[b]
Vietnam	12 (75.0%)	14 (82.4%)	26 (78.8%)	0.61[b]
Other	2 (12.5%)	1 (5.9%)	3 (9.1%)	0.51[b]
Number of service tours				
Single	11 (68.8%)	11 (64.7%)	22 (66.7%)	0.81[b]
Multiple	5 (31.3%)	6 (35.3%)	11 (33.3%)	

Note. SD = standard deviation; OEF = Operation Enduring Freedom; OIF = Operation Iraqi Freedom.
[a]Based on pooled variances t-test.
[b]Based on chi-square test.

Table 4
Within-Group Means and Between Group Differences on Primary Outcomes

		Waitlist [N = 15]						Treatment [N = 15]						Treatment vs. waitlist		
Scale	Outcome variable	BL mean	BL SD	FU mean	FU SD	Mean change [95% CI]	Paired t-test P-value	BL mean	BL SD	FU mean	FU SD	Mean change [95% CI]	Paired t-test P-value	Between-group difference[a]	Between-group P-value	Partial omega-squared[b] [95% CI]
PCL	Reexperience	3.53	1.64	2.8	1.61	−0.73 [−1.31, −0.16]	0.0156	3.07	1.62	2.13	1.68	−0.93 [−1.93, −0.06]	0.0632	−0.38 (−1.40, −0.63)	0.45	−0.014 [0.000, −0.163]
	Avoidance	1.27	0.884	1.13	0.64	−0.13 [−0.49, −0.22]	0.4332	1.4	0.828	0.8	0.862	−0.6 [−1.18, −0.02]	0.045	−0.38 (−0.91, −0.14)	0.15	0.039 [0.000, −0.249]
	Numbing	3.2	1.37	2.87	1.64	−0.33 [−0.83, −0.16]	0.1733	2.4	2.06	1.47	1.68	−0.93 [−1.95, −0.08]	0.0684	−0.91 (−1.91, −0.086)	0.072	0.077 [0.000, −0.296]
	Hypervigilance	3.53	1.41	3.47	1.19	−0.07 [−0.68, −0.54]	0.8178	3.07	1.71	2.53	1.64	−0.53 [−1.58, −0.51]	0.2916	−0.73 (−1.71, −0.24)	0.14	0.044 [0.000, −0.255]
	Total score	52.9	11.3	50.7	10.6	−2.13 [−5.97, −1.71]	0.2534	48.6	14.5	41.3	11.2	−7.33 [−14.71, −0.05]	0.0512	−7.27 (−13.89, −0.64)	0.033	0.119 [0.007, −0.342]
BSI	Somatization	0.733	0.898	0.88	0.617	0.15 [−0.36, −0.65]	0.5457	0.66	0.696	0.587	0.568	−0.07 [−0.5, −0.36]	0.7192	−0.28 (−0.71, −0.16)	0.2	0.024 [0.000, −0.023]
	Obsessive compulsive	1.69	1.01	1.76	1.16	0.07 [−0.36, −0.5]	0.7192	1.81	1.11	1.18	0.803	−0.63 [−1.04, −0.22]	0.0057	−0.67 (−1.19, −0.14)	0.015	0.166 [0.023, −0.392]
	Interpersonal sensitivity	1.03	0.972	1.17	0.774	0.15 [−0.24, −0.54]	0.4332	1.1	0.965	0.786	0.672	−0.31 [−0.7, −0.07]	0.1039	−0.43 (−0.83, −0.024)	0.038	0.115 [0.004, −0.342]
	Depression	1.1	0.832	1.47	1.22	0.37 [−0.13, −0.86]	0.1362	1.34	1.23	0.864	0.982	−0.47 [−1.01, −0.07]	0.0823	−0.76 (−1.43, −0.093)	0.027	0.134 [0.011, −0.361]
	Anxiety	0.953	0.917	1.1	0.832	0.15 [−0.31, −0.6]	0.4985	1.1	0.965	0.707	0.697	−0.39 [−0.71, −0.08]	0.0186	−0.47 (−0.91, −0.035)	0.036	0.119 [0.006, −0.346]
	Hostility	1.1	1.02	1.1	0.832	0 [−0.33, −0.33]	> .999	1.1	0.965	0.786	0.672	−0.31 [−0.84, −0.21]	0.2178	−0.31 (−0.76, −0.13)	0.16	0.036 [0.000, −0.250]
	Phobia	1.1	0.588	1.32	0.617	0.22 [−0.12, −0.56]	0.1887	1.34	1.16	0.786	0.672	−0.55 [−1.03, −0.07]	0.0285	−0.64 (−1.04, −0.23)	0.0033	0.246 [0.064, −0.464]
	Paranoia	0.953	0.818	0.953	0.818	0 [−0.46, −0.46]	> .999	0.88	0.948	0.587	0.568	−0.29 [−0.78, −0.19]	0.217	−0.34 (−0.82, −0.14)	0.16	0.035 [0.000, −0.244]
	Psychoticism	0.953	0.818	0.953	0.917	0 [−0.4, −0.4]	> .999	1.25	0.917	0.88	0.852	−0.37 [−0.86, −0.13]	0.1362	−0.24 (−0.81, −0.32)	0.38	−0.007 [0.000, −0.176]
	Grand total score	58.7	30.9	63.2	34.6	4.53 [−6.65, −15.71]	0.3991	59.6	39.8	41.9	24.9	−17.73 [−32.87, 2.6]	0.0248	−21.92 (−37.27, −6.57)	0.0068	0.202 [0.041, −0.422]
M2C	Total score	46.2	12.1	44.6	14.1	−1.6 [−5.42, −2.22]	0.3847	44.2	14.2	38.2	13.8	−6 [−12.03, -0.03]	0.0509	−4.76 (−11.49, −1.97)	0.16	−0.018 [0.000, −0.151]

Note. BL = baseline; FU = follow-up; CI = confidence interval; PCL = PTSD Checklist; BSI = Brief Symptom Inventory; M2C = Military to Civilian Questionnaire.
[a]Estimated between-group difference in follow-up score adjusted for baseline.
[b]Effect size for treatment adjusted for baseline.

Table 5
Change in Symptoms among All Treatment Initiators

Scale[a]	Outcome variable	Mean change [95% CI]	*p*-value
PCL	Reexperiencing	−1.14 [−1.75, −0.54]	0.0006
	Avoidance	−0.43 [−0.83, −0.03]	0.0371
	Numbing	−0.86 [−1.48, −0.24]	0.0087
	Hypervigilance	−0.89 [−1.55, −0.23]	0.0101
	Total score	−8.54 [−13.27, −3.8]	0.001
BSI	Somatization	−0.24 [−0.53, −0.06]	0.11
	Obsessive compulsive	−0.61 [−0.86, −0.36]	< 0.0001
	Interpersonal Sensitivity	−0.53 [−0.81, −0.25]	0.0006
	Depression	−0.45 [−0.77, −0.12]	0.0088
	Anxiety	−0.41 [−0.62, −0.19]	0.0006
	Hostility	−0.41 [−0.73, −0.08]	0.0153
	Phobia	−0.49 [−0.79, −0.19]	0.0027
	Paranoia	−0.39 [−0.68, −0.1]	0.0097
	Psychoticism	−0.43 [−0.75, −0.12]	0.0089
	Grand total score	−20.71 [−30.1, −11.33]	0.0001
M2C	Total score	−6.57 [−10.41, −2.74]	0.0016

Note. CI = confidence interval; PCL = PTSD Checklist; BSI = Brief Symptom Inventory; M2C = Military to Civilian Questionnaire.
[a]Number of observations was 28 for all measures.

Table 6
Descriptive Statistics of AFQ

Question	*Mean ± SD (N = 27)*[a]
1. The six-session treatment was just the right length.	3.33 ± 1.33
2. I wish the treatment had been longer.	4.3 ± 1.17
3. The content areas covered were just right.	4.3 ± 0.953
4. There were other content areas I wish had been included.	2.89 ± 1.12
5. We spent the right amount of time on each content area.	4.19 ± 0.921
6. I would recommend this treatment to a friend who was dealing with similar issues.	4.89 ± 0.32
7. I feel like I benefitted from this treatment.	4.89 ± 0.32
8. This treatment provided new information.	4.78 ± 0.424
9. This treatment taught me new skills.	4.59 ± 0.694
10. This treatment provided new ways of approaching problems or struggles.	4.48 ± 0.753
11. This treatment did not seem like too big of a burden.	4 ± 1.33 (N = 26)
12. I was able to tolerate this treatment well.	4.48 ± 0.802

Note. AFQ = Acceptability and Feasibility Questionnaire; SD = standard deviation.
[a]N = 27 except where otherwise noted. Not all patients answered every question.

specific functional outcomes, such as greater participation in community events and higher rates of confiding personal thoughts and feelings to others.

Finally, Veterans who completed treatment also demonstrated improvement in cognitions associated with killing that were conceptualized to be important in healing. For example, Veterans who completed the treatment reported a decrease in cognitions related to deserving to suffer due to killing and an improvement in cognitions related to ability to be close to others and being intimate with a partner. Veterans reported recognizing that healing was an ongoing process and that there were specific things that they could continue to do to heal. They also reported being more self-accepting and more understanding of the process of self-forgiveness and the circumstances surrounding their killing experience.

Veterans reported that the treatment was helpful, acceptable, and feasible. In fact, most Veterans also indicated that they would like the treatment to be longer. Based on anecdotal feedback from our colleagues at the medical center where we conducted this trial, several of the participants brought assignments or reactions from the study into their psychotherapy process groups or back to their referring provider for continued individual psychotherapy. Not only did we learn that our participants were continuing to wrestle with and work through issues of grief, acceptance, and self-forgiveness, but they also prompted a larger discussion about moral injury and forgiveness in their communities.

These findings provide support for provision of moral injury related treatment, particularly among Veterans who have killed in war, suggesting that additional gains can be made by Veterans who are open to pursuing this avenue of treatment. Despite the intense content area, Veterans found the treatment acceptable and feasible, challenging some of the barriers and concerns articulated by some clinicians. As an important caveat, this treatment is particularly geared toward Veterans who continue to be bothered by their experiences killing in war, rather than those who were never bothered by these experiences, accepted them as part of their duties or made peace with these experiences. What we do know, however, is that those who kill in war often have the highest level of PTSD symptoms (Maguen et al., 2013), so even those who improve via PTSD treatment may be able to improve even further if topics such as killing and/or self-forgiveness are addressed directly.

Importantly, topics such as killing in war, moral injury, spirituality, and self-forgiveness are not always explicitly addressed in PTSD treatment, so IOK adds an additional treatment component that can promote further healing. Treatments like PE and CPT provide invaluable groundwork for this module, and a few of our participants made significant gains on a killing trauma using existing treatments before participating in the study. However, we found that specifically addressing killing-related cognitions opened the work up to deeply held beliefs about morality, the self, self-forgiveness, and spirituality that existing EBTs for PTSD did not address. Providing a common language for the topic through completing the KCS measure and the initial IOK psychoeducation session facilitated a conversation that may be unaddressed in other treatments.

Limitations

Limitations of the current study include a small sample size, lack of female participants, relatively modest number of Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF) participants (21.3%), and difficulty capturing the clinical changes described through participant feedback with existing validated outcome measures. Recruitment was challenging in the sense that of those Veterans who had received EBT for PTSD, it was unclear to some treatment providers whether or not they had killed, and there was some reluctance on the part of the provider to inquire, in some instances, years after completing a prior treatment. For many of the Veterans who we attempted to recruit through our mailings based on previous experience in focus groups on the impact of killing, many had not yet completed an EBT for PTSD. Despite efforts to include women and additional Veterans from the OEF/OIF era, we struggled to find individuals who had both completed an EBT for PTSD and endorsed distress related to killing. It is unclear whether there are meaningful differences between gender or era of service related to the impact of killing or moral injury, and we believe this is an important area for future research.

Finally, there were some limitations regarding the measures we used and developed to capture clinical changes as a result of this treatment. The PCL, our main outcome measure for PTSD, was helpful in examining whether there was further reduction in PTSD symptoms. However, many of our participants already had reductions in several PTSD symptoms after completion of previous evidence-based treatment. Also, the KCS has yet to be validated, so while we believe the changes in response on this questionnaire reflect meaningful change and improvement in symptoms related to moral injury, we are cautious with interpreting the findings. Future studies may also want to use measures indexing moral injury, such as the moral injury events scale (Nash et al., 2013).

Directions for Future Research

Based on our initial findings and experience delivering this treatment, there are several ways we would like to consider expanding this work. While all participants identified distress around killing or feeling responsible for the death of others in war, many also reported significant distress regarding nonkilling acts. Acts generally considered atrocities of war (e.g., mistreatment or assault of civilians or prisoners of war, conduct around handling human remains) and behaviors that followed military service (e.g., substance dependence, violence, isolation and separation from family) were also disclosed during treatment. Many of the items on the KCS lent themselves to these other acts or patterns of behavior, and it was critical that treatment providers included them in the discussion of self-forgiveness and making amends. Moving forward, we believe the framework of IOK treatment can be expanded to include additional acts outside of killing that have resulted in moral injury.

Another possible expansion of this work may be to use IOK with individuals diagnosed with depression or other disorders that may reflect presence of moral injury (e.g., substance use disorders, anxiety). However, if expanding to other disorders, we would still recommend some familiarity with cognitive-behavioral treatment (i.e., CBT or interpersonal therapy for depression) before completing IOK.

One of the biggest barriers to getting IOK treatment to those who can benefit from it was that Veterans may find their killing experiences too shameful to disclose or feel that they differ from other war-related traumas. For example, several Veterans have disclosed that although they have spoken in depth about other traumas, they felt that killing was part of their war experience that should be kept secret. Veterans also disclosed that they did not feel the act of killing matched the life threat or witnessing-based traumas that were addressed by existing treatments and thus were unsure whether it was an appropriate topic for treatment.

Another barrier was fear of legal persecution for killing events. Consequently, it is important that providers inquire about killing trauma similarly to other traumas. We recommend adding a question about killing in war to a host of other exposure variables to normalize that killing happens in war and is an expected and important part of a Veteran's experience. Creating a culture in which killing is asked about explicitly allows for nonstigmatizing discussions about how Veterans may be impacted by their killing experiences. The first part of being able to refer patients to a treatment like IOK is knowing whether a Veteran continues to be bothered by these experiences. We have found that Veterans are more likely to be open to discussing the topic if it is first broached by a clinician. It is unclear whether Veterans would be more or less willing to disclose acts of killing or morally injurious events to other Veterans. Additional research exploring this question would be helpful.

Broaching the topic of killing also carries with it a certain responsibility to be open to what the Veteran will share. Similar to other topics, if clinicians know that this topic is emotionally charged for them, it is best to prepare by examining potential countertransference and consulting with colleagues. Similarly, discussion of killing might bring about discussion about faith/spirituality or loss of faith/spirituality. Being able to openly discuss these topics is important, as is knowledge of resources in various spiritual communities in case the Veteran wants to explore this issue further.

Related, healing from the impact of killing often goes beyond the therapy room and expands into the family and community, and this is a necessary part of the work. Significant behavioral

changes, such as returning to a spiritual community after 40 years, reconnecting with estranged adult children and starting a conversation around amends, ending abusive or dysfunctional relationships, or engaging in a pilgrimage to a specific site to honor the dead are all examples of treatment outcomes not captured by the measures used in this study. Veterans who completed the treatment indicated awareness that healing takes time and that they can have an active role in the healing process. In turn, aftercare and making sure Veterans have access to needed resources and support is essential to sustaining gains. Knowing these components upfront often makes the process easier for providers in facilitating this healing.

Conclusion

This study provides evidence that Veterans with PTSD who kill in war can benefit from a six- to eight-session intervention that specifically targets the impact of killing, after trauma-focused treatment. Veterans receiving IOK treatment improved on multiple mental health symptoms, cognitions, and functioning domains. Given that Veterans found the treatment helpful, acceptable, and feasible, we recommend this treatment for Veterans who killed in war and continue to be bothered by these experiences after completing EBT for PTSD.

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