



The effects of a combination of cognitive interventions and loving-kindness meditations (C-METTA) on guilt, shame and PTSD symptoms: results from a pilot randomized controlled trial

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ABSTRACT

Background: Trauma-related guilt and shame are crucial for the development and maintenance of PTSD (posttraumatic stress disorder). We developed an intervention combining cognitive techniques with loving-kindness meditations (C-METTA) that specifically target these emotions. C-METTA is an intervention of six weekly individual treatment sessions followed by a four-week practice phase.

Objective: This study examined C-METTA in a proof-of-concept study within a randomized wait-list controlled trial.

Method: We randomly assigned 32 trauma-exposed patients with a DSM-5 diagnosis to C-METTA or a wait-list condition (WL). Primary outcomes were clinician-rated PTSD symptoms (CAPS-5) and trauma-related guilt and shame. Secondary outcomes included psychopathology, self-criticism, well-being, and self-compassion. Outcomes were assessed before the intervention phase and after the practice phase.

Results: Mixed-design analyses showed greater reductions in C-METTA versus WL in clinician-rated PTSD symptoms ($d = -1.09$), guilt ($d = -2.85$), shame ($d = -2.14$), psychopathology and self-criticism.

Conclusion: Our findings support positive outcomes of C-METTA and might contribute to improved care for patients with stress-related disorders. The study was registered in the German Clinical Trials Register (DRKS00023470).

Los efectos de la combinación de intervenciones cognitivas y meditaciones de bondad amorosa (C-METTA) sobre la culpa, vergüenza y otros síntomas del trastorno de estrés postraumático: Resultados del piloto de un ensayo clínico aleatorizado

Antecedentes: La culpa y la vergüenza asociadas al trauma son críticas para el desarrollo y mantenimiento del trastorno de estrés postraumático (TEPT). Se desarrolló una intervención combinando técnicas cognitivas y meditaciones de bondad amorosa (C-METTA) que se enfoca específicamente en estas emociones. El C-METTA es una intervención semanal individual de seis semanas seguidas de una fase de práctica de cuatro semanas.

Objetivo: El estudio evaluó el C-METTA mediante un estudio de prueba de concepto dentro de un ensayo clínico aleatorizado comparado con lista de espera.

Métodos: Se asignó aleatoriamente a 32 pacientes expuestos a trauma que tuviesen algún diagnóstico según el DSM-5 al grupo C-METTA o a la lista de espera. Los resultados primarios fueron los síntomas asociados al TEPT evaluados por un clínico (CAPS-5, por sus siglas en inglés) y la culpa y vergüenza relacionadas a trauma. Los resultados secundarios fueron la psicopatología, la autocrítica, el bienestar y la autocompasión.

Resultados: Los análisis de diseño mixto mostraron mayores reducciones en los síntomas asociados al TEPT evaluados por un clínico ($d = -1.09$), en la culpa ($d = -2.85$), la vergüenza ($d = -2.14$), la psicopatología y la autocrítica en el grupo C-METTA en comparación con el grupo control. Hubo un mayor incremento en la autocompasión con un tamaño del efecto grande. La culpa y la vergüenza se redujeron en la fase de intervención y este efecto se mantuvo estable durante la fase de práctica.

Conclusión: Los hallazgos son consistentes con resultados positivos del C-METTA y podrían contribuir a mejorar el cuidado de los pacientes con trastornos relacionados con el estrés. El estudio fue registrado en el Registro Alemán de Ensayos Clínicos (DRKS00023470).

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PALABRAS CLAVE

TEPT; culpa asociada a trauma; vergüenza asociada a trauma; meditación de bondad amorosa; Intervenciones cognitivas

HIGHLIGHTS

- C-METTA is an intervention that addresses trauma-related guilt and shame and combines cognitive interventions with loving-kindness meditations.
- A proof-of-concept study was conducted examining C-METTA in a wait-list randomized controlled trial
- C-METTA led to reductions in trauma-related guilt and shame and PTSD symptoms.

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1. Introduction

A representative survey conducted in 24 countries demonstrated that around 70% of the general population experienced at least one traumatic event during their lifetime (Kessler et al., 2017). Of these, about 4% developed clinically relevant symptoms of posttraumatic stress disorder (PTSD, Kessler et al., 2017). PTSD is characterized by intrusion, avoidance, negative alterations in cognitions, mood, arousal and reactivity (American Psychiatric Association, 2013). Fear and helplessness have long been considered as central emotions for the development and maintenance of PTSD (e.g. Foa & Kozak, 1986). However, feelings of guilt and shame might be crucial for the development and maintenance of PTSD symptoms especially after interpersonal violence (e.g. Badour et al., 2017). Accordingly, feelings of shame and guilt were included as symptoms of PTSD in the DSM-5 (American Psychiatric Association, 2013) as well as in the newly established disorder of complex PTSD in ICD-11 (World Health Organization, 2019).

Shame and guilt are social cognitive processes that refer to self-reflection and self-judgment with respect to social and moral standards and both are negative emotions that can evoke intrapsychic pain (Tangney et al., 2007). Guilt refers to self-blame with respect to one's behaviour during a traumatic event (Kubany & Ralston, 1998). It has been postulated that untreated guilt might be a 'barrier to therapeutic changes' by impeding the integration of the trauma in prior beliefs (Pugh et al., 2015, p. 139). Shame is related to a global negative self-evaluation (Tangney et al., 2007), e.g. assuming to be a bad person. Trauma-related shame can result in social withdrawal that limits the experience of social support and social connection, which positively influences the course of PTSD symptoms over time (Wang et al., 2021). Consequently, shame and guilt were found to be related to a greater severity of PTSD symptoms (Shi et al., 2021). In addition, shame and guilt are related to higher levels of depression and overall psychopathology (DeCou et al., 2023).

International guidelines for PTSD treatment recommend trauma-focused interventions (American Psychological Association, 2017) being more effective than non-trauma focused interventions (Tran & Gregor, 2016). The strongest evidence among trauma-focused CBT interventions is seen in cognitive processing therapy (CPT; Resick et al., 2016), cognitive therapy (CT; Ehlers, 1999), and prolonged exposure (PE; Foa et al., 2007). PE and other exposure-based treatments seem to be particularly effective if fear is the predominant emotion (Power & Fyvie, 2013), while shame and guilt might interfere with the therapeutic process during exposure (Lee

et al., 2001). In contrast, guilt and shame are addressed more directly in cognitive approaches like CT and CPT, which have been proven to be effective in the reduction of guilt and shame (Allard et al., 2018; Resick et al., 2008).

Despite the existing effective treatments for PTSD, clinical practice is far from treating all patients successfully. Dropout rates are high and vary between 16% (Lewis et al., 2020) and 21% (Swift & Greenberg, 2014). Also, many patients do not respond to treatment (Fonzo et al., 2020) or suffer from residual symptoms after treatment (Larsen, Bellmore, et al., 2019). A symptom that often seems to persist after treatment is trauma-related guilt (Larsen, Fleming, et al., 2019). This calls for new emotion-focused interventions that directly address shame and guilt (Shi et al., 2021), which might be especially useful for victims of interpersonal violence.

Current research suggests that a combination of *loving-kindness* (in Pali = Metta) meditations (LKM; Salzberg, 2002) and cognitive interventions might be a promising innovative approach to modify trauma-related guilt and shame. LKM aims to establish an attitude of friendliness and goodwill towards oneself and others by directing good wishes to oneself and others (Bodhi, 2010). LKM is classified as a constructive meditation practice (Dahl et al., 2015) that focuses more directly on enhancing positive emotions than cognitive interventions, that change negative trauma-related emotions by restructuring underlying dysfunctional cognitions (Schumm et al., 2015). Practicing LKM also increases wellbeing (e.g. Totzeck et al., 2020) and life-satisfaction (Gu et al., 2022). Theoretically, it was postulated that the experience of positive emotions through LKM might broaden a person's perception, enhance openness to new experiences and counteract negative emotions including shame and guilt (Kearney et al., 2014). This idea is supported by empirical research demonstrating that practicing LKM can reduce self-criticism (Shahar et al., 2015), which is a key feature of guilt and shame. Furthermore, practicing LKM was found to increase feelings of social connectedness (e.g. Aspy & Proeve, 2017), which might diminish the social distance to others that people may experience when feeling ashamed.

Two pilot studies demonstrated strong effects of LKM on the reduction of PTSD symptoms along with increased self-compassion in veterans (Kearney et al., 2013) and in survivors of interpersonal violence (Müller-Engelmann et al., 2019). A recent randomized-controlled trial evaluated veterans with PTSD and found that LKM is non-inferior to group-based CPT with respect to PTSD reduction. LKM was even superior in reducing depression (Kearney et al., 2021). Promising results have also been found in two pilot studies (Au et al., 2017; Lang et al., 2019) that

used compassion meditation (which addresses mechanisms similar to LKM) in trauma-exposed patients.

Despite these promising results, no study has yet analysed the effects of LKM to reduce trauma-related guilt and shame in a trauma-exposed clinical sample. Therefore, the aim of this study is to develop and evaluate a six-session intervention that combines well-established cognitive techniques with LKM (C-METTA). The combination of both approaches seems especially promising because cognitive restructuring, which is applied in the first step, facilitates a rational distancing from guilt and shame. Furthermore, subsequent LKM can augment the effects of these cognitive interventions by counterbalancing guilt and shame with the promotion of positive emotions and enhancing well-being.

We compared C-METTA applied in an individual treatment setting with a wait-list control condition. We hypothesized that C-METTA would be superior in reducing trauma-related guilt and shame as well as PTSD symptoms. We further expected that C-METTA would lead to a reduction in distressing post-traumatic cognitions, depression, and psychological distress as well as to an increase of well-being and self-compassion in comparison to the control condition.

2. Methods

2.1. Participants

Patients were recruited from September 2020 until October 2021 from the waiting list of our outpatient treatment centre at Goethe-University Frankfurt and via advertisements (e.g. in social media and web-based newspaper), through health centres, and medical practices. The inclusion criteria were: (a) age between 18 and 65 years; (b) experience of a traumatic event meeting the trauma criterion according to DSM-5; (c) strong feelings of trauma-related guilt and shame; (d) diagnosis of a mental disorder according to DSM-5 (except for substance use disorder, schizoaffective disorder, schizophrenia or bipolar-I disorder, see exclusion criteria); (e) sufficient German language skills; and (f) willingness to participate regularly in the treatment sessions and to practice the exercises at home. Criterion (c) used cut-off scores based on the Trauma-Related Guilt Inventory (TRGI; Kubany et al., 1996) and the Trauma-Related Shame Inventory (TRSI; Øktedalen et al., 2014). For more details, see Supplementary Material. The exclusion criteria were: (a) currently receiving psychotherapeutic treatment; (b) substance abuse or substance use disorder within the last three months; (c) suicide attempts or life-threatening self-injury within the last six months; (d) lifetime diagnosis of schizoaffective disorder, schizophrenia or bipolar-I disorder; (e)

body mass index < 17.5; (f) organic mental disorder; and (g) severe physical or mental impairments, which would interfere with practicing longer meditations. Patients receiving medication were asked not to change medication until the end of the study.

Of the 136 patients screened through a brief telephone interview, 52 were eligible and invited for intake assessments; 32 patients met the inclusion criteria and were randomly allocated to the treatment condition (C-METTA) or a wait-list control condition (WL; see Figure 1). Individuals who were not eligible for study participation received alternative treatment referrals.

2.2. Measures

The German version of the SCID-5 (First et al., 2015) was used to assess DSM-5 diagnoses. The primary outcomes of this study were clinician-rated PTSD symptoms and self-reported trauma-related feelings of guilt and shame. Secondary outcomes were self-reported psychopathology (PTSD symptoms, posttraumatic cognitions, depressive symptoms, and psychological distress), well-being, self-compassion, and self-criticism. Table 1 overviews the interviews and questionnaires applied at the different time-points.

2.2.1. Primary outcome measures

At pre-treatment, traumatic life events were assessed with the Life Events Checklist (LEC-5; Weathers et al., 2013), which is a self-report questionnaire measuring exposure to 17 different traumatic events. The LEC was used to identify the index trauma, and related PTSD symptoms were assessed by the Clinician-Administered PTSD Scale (CAPS-5; Weathers et al., 2018; German version: Müller-Engelmann et al., 2020). In addition to establishing PTSD diagnoses, the CAPS also allows to determine a total severity score of PTSD symptoms that ranges from 0 to 80. Internal consistency was good at pre-treatment ($\alpha = .88$), and the interrater reliability was excellent ($ICC_{3,1} = .94$).

Self-reported trauma-related guilt was assessed using the Trauma-Related Guilt Inventory (TRGI; Kubany et al., 1996; own translation). We used the mean scores of the subscales of 'Global Guilt' (TRGI-GG, four items) and 'Guilt Cognitions' (TRGI-GC, 22 items). Internal consistency for the TRGI-GG was good ($\alpha = .87$) and excellent for the TRGI-GC ($\alpha = .92$).

Self-reported trauma-related shame was assessed using the Trauma-Related Shame Inventory (TRSI; Øktedalen et al., 2014; own translation). The TRSI consists of 24 items measuring internal and external shame. We used the TRSI total mean score. The TRSI has good psychometric properties (Øktedalen

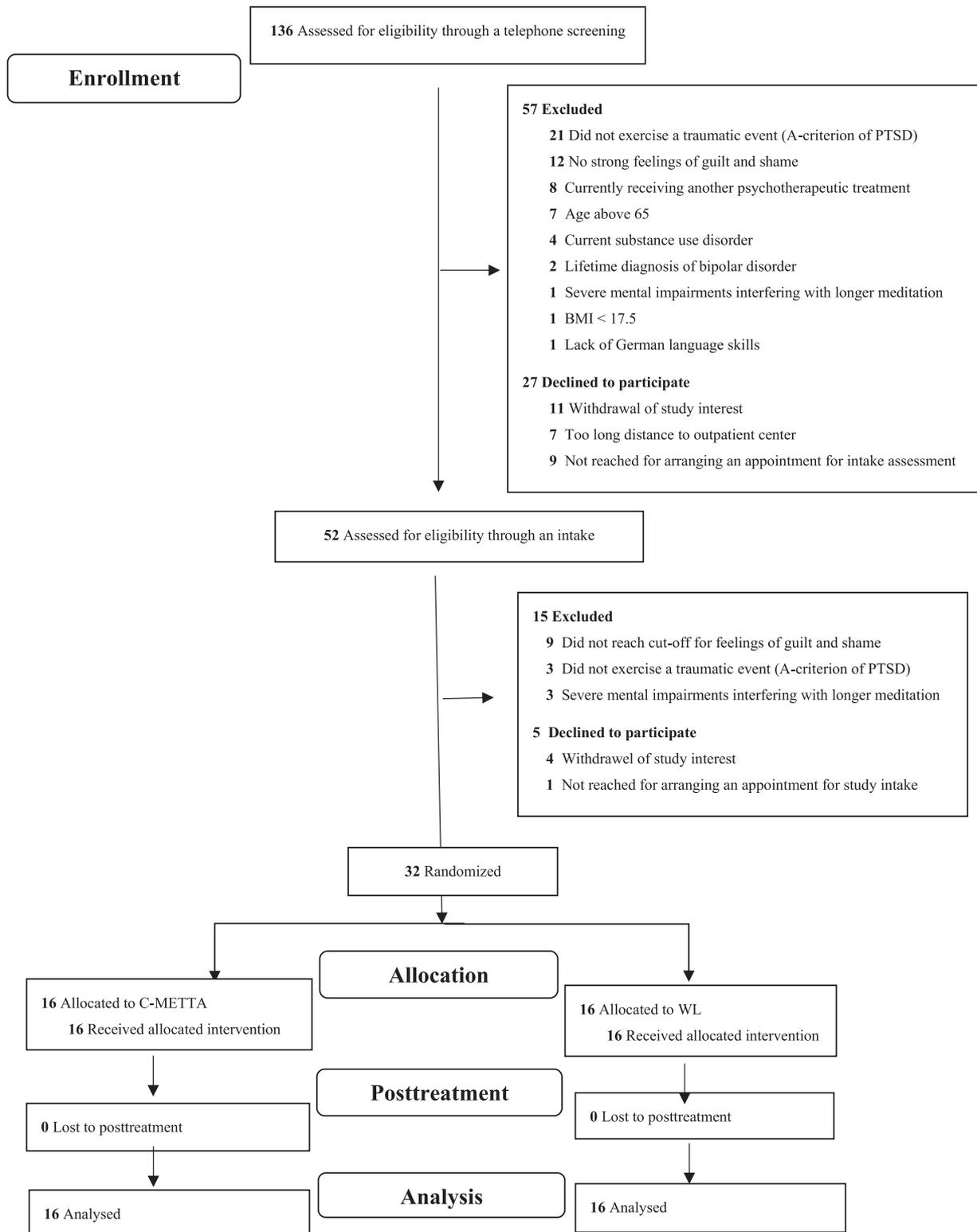


Figure 1. Patient flow.

et al., 2014) and showed good internal consistency in this study ($\alpha = .89$).

To further measure trauma-related guilt and shame, patients completed the Shame and Guilt After Trauma Scale (SGATS; Aakvaag et al., 2016, own translation). The SGATS comprises a guilt scale with five items (SGATS-G) as well as a shame scale with four items (SGATS-S). Even though the SGATS has previously shown good psychometric properties

(Aakvaag et al., 2016, 2019), the internal consistency for SGATS-G seen here was unacceptable ($\alpha = .32$) and poor for SGATS-S ($\alpha = .57$).

2.2.2. Secondary outcome measures

We used the PTSD Symptom-Checklist-Version 5 (PCL-5; Blevins et al., 2015) to measure self-reported PTSD symptomatology. The Beck Depression Inventory (BDI-II; Beck et al., 1996) was used to assess

Table 1. Overview of the interviews and questionnaires at the different time-points.

| | Intake assessment | Pre-assessment (T0) | Post-assessment (T2) |
|--|-------------------|---------------------|----------------------|
| Structured Clinical Interview for DSM-5 (SCID-5-CV) | X | | |
| Life Event Checklist (LEC-5) | X | | |
| Clinician-Administered PTSD Scale for DSM-5 (CAPS-5) | | X | X |
| Trauma-Related Shame Inventory (TRSI) | | X | X |
| Trauma-Related Guilt Inventory (TRGI) | | X | X |
| Shame and Guilt After Trauma Scale (SGATS) | | X | X |
| PTSD Checklist for DSM-5 (PCL-5) | | X | X |
| Posttraumatic Cognitions Inventory (PTCI) | | X | X |
| Beck Depression Inventory (BDI-II) | | X | X |
| Brief Symptom Inventory (BSI) | | X | X |
| WHO-Five Well-Being Index (WHO-5) | | X | X |
| Self-Compassion Scale (SCS) | | X | X |

self-reported depression. Self-reported psychological distress over the past week was measured using the Global Severity Index (GSI) of the Brief Symptom Inventory (BSI; Derogatis, 1993). Well-being was assessed using the WHO-Five Well-Being Index (WHO-5; Bech et al., 2003). Self-compassion was assessed by the Self-Compassion Scale (SCS; Neff, 2003) containing subscales of Self-Compassion (SCS-CO) and Self-Criticism (SCS-CR). For more details, German versions and psychometric properties see Supplementary Material.

2.3. Study design and procedure

We employed a single-centre, simple randomization, parallel group design (treatment condition, C-METTA vs. WL) based on a 1:1 allocation ratio. The study was preregistered in the German Clinical Trials Register (DRKS00023470). Assessments for inclusion and exclusion criteria were conducted with those who passed the telephone screening. Patients were randomized by the study coordinator after they provided written informed consent. Patients allocated to the C-METTA group received six weeks of treatment (one weekly session for 100 min). This was followed by a four-week practice phase (further details see below). The treatment was performed by seven therapists who were either at an advanced stage or had already completed CBT training. They had an average of 4.12 years ($SD = 1,26$) of experience providing CBT. To familiarize the therapists with the treatment, all therapists participated in a one-day training workshop

in C-METTA and obtained a detailed study manual. After the workshop, they practiced LKM for at least four weeks. Treatment sessions were video recorded for supervision, which was performed on a weekly basis. In supervision relevant parts of the video tapes were watched on a regularly basis. Supervision was performed by the first author of the study, who together with the last author developed the intervention. Both have valuable experience in CBT and meditation. Patients allocated to the WL received C-METTA after the waiting period.

Outcome variables were assessed before treatment (pre-assessment; T0), as well as after the intervention and the practice phase in the C-METTA group, and after the waiting period (post-assessment; T2) in the WL group. Self-reported outcome variables were assessed in an online survey using Unipark (Quest-Back GmbH). Independent and blinded clinical raters offered diagnostic assessments. Each patient was paid 15€ for completing all questionnaire-based assessments throughout the study and 30€ for participating in the post-assessments.

2.4. Treatment

C-METTA consists of six individual weekly sessions of 100 min each (for an overview see Table 2). The therapists were allowed to offer up to two additional 50-minute sessions to address severe comorbid symptoms and problems.

Sessions 1 and 2 focused on cognitive techniques to modify relevant guilt cognitions. Session 1 started with a short psychoeducation on PTSD and trauma-related feelings of guilt and shame. Patients were then asked to prepare a 'guilt chart', which is a pie chart containing all perceived influencing factors contributing to the traumatic event (consistent with Ehlers, 1999). Their most distressing guilt cognitions (e.g. 'I should have defended myself') were then identified and restructured using Socratic questioning. After session 1, patients were asked to resume arguments in a Pros & Cons List. In session 2, Socratic questioning with respect to guilt cognitions was continued. At the end of the session, the guilt chart was updated. To deepen the cognitive modification process, after session 2 patients were asked to write a plea where they defended themselves like a lawyer would do in court. In sessions 3–6, cognitive techniques were combined with LKM. Depending on the patients' symptoms, therapists could intensify the modification of guilt cognitions (e.g. by intensifying Socratic questioning or by working out the function of guilt). If patients already distanced themselves from their guilt, then therapists could also focus more directly on the modification of shame cognitions (e.g. 'I am a bad person because I was abused'). Cognitive techniques were applied in the first half of sessions 3–6.

Table 2. Overview of C-METTA.

| Session No. | Focus, aim and techniques |
|-------------|---|
| Session 1 | <p>Cognitive restructuring of guilt cognitions Exploration of the traumatic event and trauma-related-guilt and shame Psychoeducation on PTSD and trauma-related feelings of guilt and shame Preparing a 'guilt chart' Identifying the most distressing guilt cognitions and restructuring via Socratic questioning Homework: 'Pro & Cons List' with respect to the most distressing guilt cognition, reading information material about PTSD and trauma-related guilt and shame</p> |
| Session 2 | <p>Continuing and deepening of Socratic questioning including further guilt-related cognitions Updating the 'guilt chart' Homework: 'Plea against the guilt'</p> |
| Session 3 | <p>Directing metta towards oneself (LKM 1) Continuation and deepening of cognitive techniques (if suitable addressing shame cognitions additionally to guilt cognitions) Introduction to LKM Development of the compassionate self In session practice of LKM 1 with respect to the own person Homework: read the 'Plea against the guilt' and 'Pro & Cons List' with respect to individually-relevant guilt and shame cognitions; practicing LKM 1 using an audio tape</p> |
| Session 4 | <p>Directing metta towards the benefactor (LKM 2) Continuation and deepening of cognitive techniques individually adapted to the patient Introduction of the benefactor and identification of a benefactor in the patients' life In session practice of LKM 2 with respect to the benefactor Homework: cognitive assignments individually adapted to the patient; practicing LKM 2 using an audio tape</p> |
| Session 5 | <p>Directing metta towards oneself as someone who has experienced the trauma (LKM 3) Continuation and deepening of cognitive techniques individually adapted to the patient Working out how the experience of the traumatic event and the symptoms related to the trauma can be faced with a compassionate attitude In session practice of LKM 3 with respect to the trauma Homework: cognitive assignments individually adapted to the patient; practicing LKM 3 using an audio tape</p> |
| Session 6 | <p>Stepwise expansion of metta towards all living beings (LKM 4) Continuation and deepening of cognitive techniques individually adapted to the patient In session practice of LKM 4 with respect to all living beings Conclusion and planning of further self-guided exercises Homework: practicing LKM 4 using an audio tape</p> |

Note: LKM = Loving Kindness Meditation; METTA = Pali expression for benevolence and loving-kindness.

In the second half of sessions 3–6, therapists introduced four different LKM practices. The core of every LKM were good wishes related to the areas of *safety*, *happiness*, *well-being*, and *fulfilment*. The addressee of the good wishes changed between the sessions. In session 3, after introducing LKM patients developed an image of a compassionate self (adapted from Gilbert, 2010). This compassionate imaginary was characterized by wisdom, inner strength, and a non-judgmental attitude. During the first LKM practice, patients were asked to direct positive wishes towards themselves from the perspective of this compassionate self, e.g. a wise old woman. The aim of the second LKM exercise (session 4) was to direct positive wishes in addition to oneself towards a benefactor (a real person for whom patients felt respect and gratitude, and

who has helped them in the past), e.g. a friendly neighbour or a good friend. In session 5 patients were asked to direct positive wishes to themselves as someone who has suffered the trauma retaking the perspective of the compassionate self. In session 6, wishes were stepwise extended to all human beings.

Patients received audio tapes to practice the respective meditation every day at home. Additionally, after session 3–5 they received cognitive assignments based on the Socratic questioning of shame and guilt in the first half of these sessions. After the six-week intervention phase, patients were asked to continue their self-guided meditation practice for four more weeks (= practice phase).

2.5. Statistical analysis

As a result of the mandatory answers to be provided in the online-based assessment, there were no missing values in the self-reports. We used Statistical Package for the Social Sciences (SPSS) for statistical analyses. We performed Chi-square tests or t-tests for independent groups to compare pre-treatment characteristics of the C-METTA and the WL group.

To evaluate treatment effects of C-METTA on the primary and secondary outcome variables in comparison to the control group, we performed mixed-design analyses of variance (in-between factor of group: C-METTA vs. WL; within-factor of time: T0 vs. T2) and focused on the group \times time interaction effects. Regarding primary outcome variables, we conducted an ANOVA for PTSD symptomatology (CAPS-5) and a MANOVA for trauma-related guilt and shame (TRGI-GG, TRGI-GC, TRSI, SGATS-G, SGATS-S). In terms of secondary outcome variables, MANOVAs were performed for the following sets of variables: (a) self-reported psychopathological symptoms including PTSD symptoms (PCL-5), posttraumatic cognitions (PTCI), depressive symptoms (BDI-II), and psychological distress (BSI); (b) wellbeing (WHO-5), self-compassion (SCS-CO), and self-criticism (SCS-CR). We chose Wilk's Lambda as the test statistic for all MANOVAs. We used partial eta square to report multivariate interaction effect sizes. Significant multivariate interaction effects in the MANOVA were followed by univariate analyses.

Cohen's d based on pooled standard deviations was applied for effect sizes of between-group differences in improvements from T0 to T2 (Morris, 2008). In the C-METTA group, we report within-group effect sizes from T0 to T2 using Cohen's d ($d = .20$ small effect, $d = .50$ medium effect, $d = .80$ large effect; Cohen, 1988).

The assumptions for performing analyses of variance were met except the following: The Shapiro-Wilk tests showed that SGATS-G and SGATS-S were not normally distributed on various time-points in

either group. However, Wilk's Lambda is relatively robust to violations of normality (Finch, 2005). The Greenhouse–Geisser correction was used if the assumption of sphericity was violated.

As outlined by Jacobson and Truax (1991), we examined clinically significant improvements and deteriorations from T0 to T2 in the CAPS-5 by computing a reliable change index (RCI). A reliable change index of 9.33 points for the CAPS-5 was determined based on the internal consistency of the CAPS-5 ($\alpha = .93$) derived from the German validation study (Müller-Engelmann et al., 2020) and the standard error of the difference between the two groups ($S_{diff} = 4.76$). Remission was defined as not meeting the DSM-5 criteria for PTSD in the CAPS-5. We applied Chi-squared tests to examine differences between the two groups with regard to reliable changes and remissions. There were no dropouts in any of the groups, and all analyses were based on complete samples. To determine the interrater reliability for the CAPS-5, an interclass correlation coefficient ($ICC_{3,1}$) was calculated based on six interviews rated by all three raters.

3. Results

3.1. Sample characteristics

The groups did not differ in terms of age (C-METTA group: $M = 33.69$ years, $SD = 13.59$, range 19-60; WL group: $M = 40.19$ years, $SD = 13.32$, range 20-61). Table 3 shows the sociodemographic, diagnostic, and trauma characteristics of the two study groups and the respective group comparisons. We found no significant pre-treatment sociodemographic differences between the C-METTA and the WL group except of the educational level with patients in the C-METTA having higher levels of education.

The average number of DSM-5 diagnoses at pre-treatment did not differ between the groups (C-METTA group: 2.31, $SD = 0.87$; range 1-4; WL group: 2.44, $SD = 1.15$; range 1-5). Fifteen patients in the C-METTA group (93.8%) and all patients in the WL group fulfilled the PTSD diagnosis. The most frequent additional diagnoses in both groups were mood disorders. In both groups 87.5% of the patients experienced interpersonal violence as the index trauma. The two groups differed with respect to the duration of the index trauma, which was noticeably longer in the WL group than in the C-METTA group. Furthermore, even though this difference did not reach statistical significance, the duration of PTSD symptoms was much longer in the WL group.

Table 4 displays means and standard deviations of the primary outcome variables at pre-assessment. We found no significant pre-treatment differences between the two groups in the CAPS-5, in the TRSI, in the SGATS-S and in the SGATS-G. In

Table 3. Sociodemographic and diagnostic/trauma characteristics.

| | C-METTA (<i>n</i> = 16) No. (%) | WL (<i>n</i> = 16) No. (%) | <i>p</i> |
|--|--|--------------------------------|-------------------|
| Sociodemographic characteristics | | | |
| Female sex | 16 (100) | 14 (87.5) | .144 ^a |
| Marital status | | | |
| Single | 12 (75.0) | 10 (62.5) | .711 ^a |
| Married | 3 (18.8) | 5 (31.3) | |
| Divorced | 1 (6.3) | 1 (6.3) | |
| Educational level | | | |
| Graduation after 10th grade | 2 (12.5) | 8 (50) | .040 ^a |
| German curricula (Abitur) | 7 (43.8) | 2 (12.5) | |
| College / University | 7 (43.8) | 6 (37.5) | |
| Employment | | | |
| Employed | 9 (56.3) | 11 (68.8) | .502 ^a |
| Unemployed due to disability | 2 (12.5) | 0 (0) | |
| Retired | 0 (0) | 1 (6.3) | |
| Student | 4 (25.0) | 3 (18.7) | |
| Homemaker | 1 (6.3) | 1 (6.3) | |
| Prior experience with meditation | 15 (93.8) | 14 (87.5) | .544 ^a |
| Prior treatment experience | | | |
| None | 3 (18.8) | 2 (12.5) | .361 ^a |
| Outpatient treatment only (≥ 1) | 5 (31.3) | 9 (56.3) | |
| Inpatient and outpatient treatment (≥ 1) | 8 (50.0) | 5 (31.3) | |
| Psychotropic medication use (pre-treatment) | | | |
| Antidepressants | 2 (12.6) | 2 (12.6) | .920 ^a |
| Benzodiazepines | 0 (0.0) | 1 (6.3) | |
| Other antianxiety medications | 1 (6.2) | 1 (6.3) | |
| None | 13 (81.2) | 12 (68.7) | |
| Diagnostic/Trauma characteristics | | | |
| DSM-5 diagnosis | | | |
| PTSD | 15 (93.8) | 16 (100.0) | .914 ^a |
| Mood disorder (acute) | 5 (31.3) | 8 (50.0) | |
| Mood disorder (remitted) | 9 (56.3) | 6 (37.5) | |
| Substance abuse (remitted) | 1 (6.3) | 1 (6.3) | |
| Anxiety disorder (e.g. phobia) | 6 (37.5) | 8 (50.0) | |
| Other | 1 (6.3) | 1 (6.3) | |
| Total number of traumatic events (LEC); mean (SD) | 6.31 (3.4) | 6.06 (2.8) | .823 ^b |
| Type of index trauma | | | |
| Childhood sexual abuse | 6 (37.5) | 4 (25.0) | .316 ^a |
| Childhood physical abuse | 0 (0) | 4 (25.0) | |
| Adulthood sexual violence | 7 (43.8) | 5 (31.3) | |
| Adulthood physical violence | 1 (6.3) | 1 (6.3) | |
| Others | 2 (12.5) | 2 (12.5) | |
| Occurrence of index trauma | | | |
| Singular | 10 (62.5) | 7 (43.8) | .288 ^a |
| Repeated | 6 (37.5) | 9 (56.3) | |
| Age at onset of index trauma; mean (SD) | 21.41 (10.9) | 17.88 (16.3) | .478 ^b |
| Duration of index trauma in months; mean (SD) | 16.00 (24.4) | 69.41 (81.34) | .022 ^b |
| Duration of PTSD symptoms in months; mean (SD) | 128.27 (138.4) | 258.40 (216.0) | .061 ^b |

Note. SD = Standard Deviation; LEC = Life Event Checklist.

^aPearson Chi-Square Tests for equality of means between C-METTA and WL.

^bIndependent t-test for equality of means between C-METTA and WL (two-tailed).

terms of trauma-related guilt assessed with the TRGI, patients in the C-METTA group had significantly higher scores in the TRGI-GG ($t(30) = 2.082$, $p = .046$) and the TRGI-GC ($t(30) = 2.422$, $p = .011$) than patients in the WL.

Table 4. Treatment effects on primary and secondary outcome variables in the C-METTA group ($n = 16$) and the WL Group ($n = 16$).

| | Pre-assessment (T0) | | Post-assessment (T2) | | Group \times Time | | Effect sizes | |
|---------|------------------------|----------------|------------------------|----------------|---------------------|----------|----------------------------|---------------------------|
| | <i>M</i> (<i>SD</i>) | | <i>M</i> (<i>SD</i>) | | <i>F</i> (2, 60) | <i>p</i> | Between-group (<i>d</i>) | Within-group (<i>d</i>) |
| | C-METTA | WL | C-METTA | WL | | | | |
| CAPS-5 | 41.63 (13.15) | 38.75 (12.56) | 26.31 (11.36) | 37.81 (8.73) | 21.484 | <.001 | -1.090 | -1.247 |
| TRGI-GG | 3.22 (0.60) | 2.78 (0.58) | 1.45 (1.12) | 2.70 (0.87) | 30.857 | <.001 | -2.850 | -1.985 |
| TRGI-GC | 2.71 (0.67) | 2.15 (0.64) | 1.14 (0.81) | 2.24 (0.80) | 41.002 | <.001 | -2.470 | -2.112 |
| TRSI | 1.72 (0.45) | 1.47 (0.54) | 0.66 (0.54) | 1.50 (0.69) | 36.448 | <.001 | -2.138 | -2.133 |
| SGATS-G | 1.75 (0.24) | 1.59 (0.30) | 1.61 (0.60) | 1.53 (0.46) | 0.189 | .667 | -0.287 | -0.306 |
| SGATS-S | 1.81 (0.27) | 1.73 (0.35) | 1.58 (0.47) | 1.78 (0.30) | 5.691 | .024 | -0.873 | -0.600 |
| PCL-5 | 46.81 (15.20) | 45.13 (17.52) | 28.44 (15.24) | 41.50 (16.42) | 12.511 | <.001 | -0.877 | -1.208 |
| PTCI | 162.81 (20.30) | 150.94 (32.17) | 112.50 (31.21) | 149.88 (33.46) | 23.656 | <.001 | -1.785 | -1.911 |
| BDI-II | 29.50 (9.81) | 30.38 (13.43) | 17.69 (9.34) | 28.69 (12.99) | 18.473 | <.001 | -0.839 | -1.233 |
| BSI-GSI | 1.56 (0.65) | 1.55 (0.78) | 0.95 (0.50) | 1.44 (0.80) | 7.943 | .008 | -0.679 | -1.052 |
| WHO-5 | 5.31 (2.80) | 5.56 (4.07) | 8.25 (6.27) | 7.88 (5.24) | 0.052 | .821 | 0.173 | 0.605 |
| SCS-CO | 28.19 (5.41) | 32.94 (5.92) | 36.44 (8.31) | 30.56 (7.20) | 16.275 | <.001 | 1.827 | 1.177 |
| SCS-CR | 52.00 (7.11) | 51.25 (6.51) | 43.13 (7.97) | 51.56 (6.02) | 18.565 | <.001 | -1.313 | -1.174 |

Notes: CAPS-5 = Clinician Administered PTSD Scale; TRGI-GG = Trauma-Related Guilt Inventory – Global Guilt Scale; TRGI-GC = Trauma-Related Guilt Inventory – Guilt Cognition Scale; TRSI = Trauma-Related Shame Inventory; SGATS-G = Shame and Guilt After Trauma Scale – Guilt Scale; SGATS-S = Shame and Guilt After Trauma Scale – Shame Scale; PCL-5 = PTSD Symptom-Checklist-Version 5; PTCI = Posttraumatic Cognitions Inventory; BDI-II = Beck Depression Inventory; BSI-GSI = Brief Symptom Inventory – Global Severity Index; WHO-5 = WHO-Five Well-Being Index; SCS-CO = Self-Compassion Scale – Self Compassion; SCS-CR = Self-Compassion Scale – Self Criticism.

3.2. Treatment characteristics: changes in medication, extra sessions, and treatment attrition

Of the three patients (18.8%) in the C-METTA group that were taking psychotropic medication at pre-assessment (see Table 3), one discontinued medication at post-assessment. In the WL group, one of the four patients (31.3%) that reported taking psychotropic medication at pre-assessment discontinued medication after the waiting period. Furthermore, one patient started a new medication (6.3%) during the waiting period. We found no significant difference between the two groups regarding the change of medication.

Half of the patients received additional sessions. In most patients, the content of these sessions was dealing with dissociative symptoms and trauma-related tension to enable them to focus on C-METTA interventions properly. We applied skill-orientated stabilization techniques, which means that patients were instructed to recognize strong internal tension and then to reduce these symptoms by strong sensory stimuli or physiological activity (e.g. by using a massage ball, mint oil, or running up and down stairs). To deal with strong trauma-related triggers, they were taught discrimination and reorientation techniques.

No patient showed serious aggravation in symptoms or any acute suicidal crises during participation in C-METTA. Regarding attrition rate, all patients of the C-METTA group attended all six treatment sessions and completed the four-week practice phase as well as the subsequent posttreatment assessments.

3.3. Treatment effects

Table 4 displays means and standard deviations of the primary and secondary outcome variables for both groups (C-METTA vs. WL).

3.3.1. Primary outcome variables

In terms of CAPS-5, mixed-design ANOVA showed a significant interaction effect of group \times time ($F(1, 30) = 21.484, p < .001, \eta^2 = .417$), thus indicating a significantly larger reduction in the CAPS-5 from T0 to T2 in the C-METTA group compared to the WL with a large between-group effect size. In the C-METTA group the within-group effect size from T0 to T2 was large (see Table 4). Of the 15 patients who fulfilled PTSD diagnosis at T0, eight patients (53.3%) showed remission in the C-METTA group at T2 compared to two patients (12.5%) in the WL group ($\chi^2(1) = 5.907, p = .015$). According to the reliable change index, 15 patients (93.8%) of the C-METTA group displayed reliable improvements from T0 to T2 in the CAPS-5 versus four patients (25.0%) in the WL group. No patient of the C-METTA group displayed deterioration in the CAPS-5; two patients in the WL group showed reliable deterioration (12.5%). Reliable changes significantly differed between the two groups ($\chi^2(2) = 15.732, p < .001$).

We performed a mixed-design MANOVA for trauma-related feelings of guilt and shame (TRGI-GG, TRGI-GC, TRSI, SGATS-G, SGATS-S). Analysis showed a significant multivariate interaction effect of group \times time ($\Lambda = .358, F(5, 26) = 9.329, p < .001, \eta^2 = .642$). The results of the univariate analyses are shown in Table 4. We found significant univariate interaction effects of group \times time for TRGI-GG, TRGI-GC, TRSI, and SGATS-S. The results indicate stronger reductions of trauma-related feelings of guilt and shame from T0 to T2 in the C-METTA group than in the WL group. According to Cohen's *d*, between-group effect sizes were large for all significant variables. In the C-METTA group, we found large within-group effect sizes from T0 to T2 for TRGI-GG, TRGI-GC, and TRSI as well as a medium effect size for SGATS-S (see Table 4). No significant univariate interaction effects emerged for SGATS-G.

3.3.2. Secondary outcome variables

For the secondary outcome variables, we performed two separate mixed-design MANOVAs with two different sets of dependent variables: (a) psychopathological symptoms (PCL-5, PTCI, BDI-II, BSI) and (b) well-being and self-compassion/self-criticism (WHO-5, SCS-CO, SCS-CR). Both MANOVAs showed a significant multivariate interaction effect of group \times time (a: $\Lambda = .484$, $F(4, 27) = 7.197$, $p < .001$, $\eta^2 = .516$; and b: $\Lambda = .559$, $F(3, 28) = 7.355$, $p < .001$, $\eta^2 = .441$). Subsequent analyses showed significant univariate interaction effects of group \times time for all secondary outcome variables except for the WHO-5. The between-group effect sizes for the significant outcomes were large except for BSI-GSI, which showed a medium effect. In the C-METTA group, we found large within-group effect sizes for all secondary outcome variables except for the WHO-5, which showed a medium effect (see Table 4).

4. Discussion

This randomized controlled trial supports the effectiveness of a combination of cognitive interventions and LKM (C-METTA) to reduce trauma-related guilt and shame as well as PTSD symptoms. Effects of C-METTA were superior to the WL group with respect to all primary outcome variables (except for the SGATS), which means that there were significant reductions in PTSD symptoms as well as in trauma-related guilt and shame (measured with the TGRI und TRSI) in the C-METTA group compared to the WL group. Effect sizes for the group comparison were large as well as pre-post effect sizes within the treatment group. In the C-METTA group, 15 patients (93.8%) showed reliable improvements with respect to the CAPS-5 scores. Remission rates for PTSD were also high (53.3%). Contrary to our expectations, we found no relevant group difference in the SGATS. This might be explained by the poor psychometric properties in our study using a German translation compared to former applications (e.g. Aakvaag et al., 2016, 2019). In addition, the SGATS has not yet been used as an outcome measure before and might not be suitable for this application due to the restricted answering format (only three possible answers to choose from), thus allowing less sensitivity to therapeutic changes.

With respect to secondary outcomes, we found large group differences regarding the reduction of clinical symptoms including self-rated PTSD symptoms, distressing posttraumatic cognitions, depression, psychological distress, and self-criticism. With respect to self-compassion, we found a greater augmentation in the C-METTA group than in the WL group. Against expectations, the groups did not differ with respect to the increase in wellbeing that augmented with medium

effect sizes in both groups ($d = .61$ in the intervention group and $d = .49$ in the control group). One explanation might be that patients in the WL group experienced positive changes in their well-being due to positive expectations regarding the upcoming intervention.

The fact that there were no dropouts in the C-METTA group suggests that patients' treatment acceptance and tolerability was very good. There was also no symptom deterioration in the C-METTA group and no severe crisis, thus indicating that C-METTA is safe for patients who suffer from clinically relevant PTSD symptoms.

Our results are consistent with studies indicating that practicing LKM is suitable to reduce PTSD symptoms (Kearney et al., 2021). Effect sizes on PTSD in our study were even larger than in studies using LKM as a stand-alone intervention (Kearney et al., 2013, 2021), which might indicate that the effectiveness of LKM can be augmented by preceding cognitive interventions. However, the higher effect sizes in our study might also be explained by the individual treatment setting compared to the group setting used in prior studies.

Furthermore, effect sizes within the C-METTA group on guilt and shame were impressively high ($d = -2.02$ for guilt and $d = -2.13$ for shame) and higher than those found for CPT ($d = -1.08$ for guilt and $d = -.94$ for shame; Resick et al., 2008) and other CBT interventions like Trauma-informed Guilt Reduction Therapy (TriGR) with an explicit focus on shame and guilt ($d = 0.92$; Norman et al., 2022). TriGR addresses guilt and shame by cognitive interventions combined with a focus on values that were violated during the traumatic event. In contrast to TriGR, which includes making a plan to live more in line with important personal values, C-METTA includes LKM to establish positive emotionality. The result indicates that LKM might be a valuable addition to cognitive interventions because of its potential to reduce self-criticism and enhance self-compassion.

The still existing high dropout (Lewis et al., 2020; Swift & Greenberg, 2014) and nonresponse rates (Fonzo et al., 2020) for PTSD patients indicate that not every treatment is suitable for every patient. Thus, having more options to choose from might help to tailor interventions more specifically to the patients' needs (Cloitre, 2015). In line with former studies, our data suggest that LKM might be a good intervention option especially when guilt and shame are the predominant emotions. A possible advantage of LKM compared to other interventions for trauma related guilt and shame is the easy application of LKM by therapists without long training periods. In addition, LKM as a stand-alone intervention might be a non-trauma-focused alternative for those patients who are not willing to directly address the traumatic

event. However, when combined with cognitive techniques as in C-METTA, the intervention is trauma-focused to some extent even though it does not require a direct confrontation with the traumatic memories. An additional advantage of LKM is that practicing kindness and goodwill towards oneself and others addresses mechanisms not only relevant to PTSD but also to other psychological problems and disorders. Therefore, LKM could be classified as a transdiagnostic approach with a broad area of application (Dalglish et al., 2020).

4.1. Limitations

This study has some important limitations worth mentioning. First, the sample size was small and consequently, the conducted ANOVAS and MANOVAs were underpowered. Furthermore, the small sample size limits the generalizability of the results in addition to the exclusion of patients aged over 65 years as well as patients with acute substance abuse, life-threatening self-injury, or severe psychiatric disorders (e.g. schizophrenia). Additionally, most of the patients included in our study were well-educated young women with PTSD, which also limits the generalizability of the results. However, our study sample might be quite representative because research suggests that female patients are more often affected by trauma-related feelings of shame and guilt (Aakvaag et al., 2016). Furthermore, our recruiting strategy might have led to a self-selection of patients that were highly motivated to participate in the study and to practice meditation, which is also reflected by the high percentage of patients with prior experiences in meditation (>85%), which might have influenced attrition rates and treatment effects and limits the generalizability of the results.

Another limitation is that we had a non-active control group. Thus, differences may also be ascribed to the mere fact of being in treatment and receiving attention by a therapist. Additionally, our study lacks a follow-up assessment. The last assessments in the intervention group were obtained after a four-week self-guided meditation practice and thus we cannot make statements regarding the long-term stability of the effects.

With respect to the two major components of C-METTA (cognitive interventions and LKM) it remains unclear which of them was the driving factor in symptom reduction. Even though in C-METTA the dosage of cognitive interventions is higher than such of LKM a further open question is whether it is necessary for cognitive interventions to precede LKM or if LKM could also be used as a stand-alone intervention for trauma-related feelings of shame and guilt. Thus, dismantling studies could provide further insights. In addition, more studies and especially randomized controlled trials with active control groups and longer follow-up periods are needed to further analyse the

usefulness of C-METTA to reduce trauma-related guilt and shame in the clinical context. Such studies could also focus more on the assessment of positive outcome measures reflecting the potential of LKM to evoke positive emotions.

5. Conclusion

This study indicates that C-METTA – a combination of cognitive interventions and LKM – might be effective at reducing trauma-related guilt and shame as well as PTSD symptoms. C-METTA could be used as a stand-alone intervention when there is only a short time available. It can also be combined with longer CBT treatments. In the latter, C-METTA could be a good starting point due to its effectiveness to reduce trauma-related guilt and shame. It might also improve the effectiveness of subsequent exposure-based treatment, which otherwise could be impeded by trauma-related guilt and shame. Overall, LKM and, specifically C-METTA, might improve the care for patients suffering from stress-related disorders by enhancing the treatment options to choose from. This might allow their preferences to be considered and to reduce dropout and nonresponse rates. However, more studies are needed to analyse the effectiveness of LKM and interventions like C-METTA before drawing further conclusions.

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Disclosure statement

Meike Müller-Engelmann receive honoraria for supervision, workshops and presentations on PTSD treatments. The authors declare that they have no further conflicts of interest.

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Ethics declaration

This study approval was obtained from the independent ethics committee of Goethe-University (Reference number: Reference Number: 2020-50). All subjects gave written informed consent in accordance with the Declaration of Helsinki.

Data availability statement

The data that support the findings of this study is available from the corresponding author, Meike Müller-Engelmann, upon reasonable request.

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References

- Aakvaag, H. F., Thoresen, S., Strøm, I. F., Myhre, M., & Hjemdal, O. K. (2019). Shame predicts revictimization in victims of childhood violence: A prospective study of a general Norwegian population sample. *Psychological Trauma: Theory, Research, Practice, and Policy*, 11(1), 43–50. <https://doi.org/10.1037/tra0000373>
- Aakvaag, H. F., Thoresen, S., Wentzel-Larsen, T., Dyb, G., Røysamb, E., & Olf, M. (2016). Broken and guilty since it happened: A population study of trauma-related shame and guilt after violence and sexual abuse. *Journal of Affective Disorders*, 204, 16–23. <https://doi.org/10.1016/j.jad.2016.06.004>
- Allard, C. B., Norman, S. B., Thorp, S. R., Browne, K. C., & Stein, M. B. (2018). Mid-treatment reduction in trauma-related guilt predicts PTSD and functioning following cognitive trauma therapy for survivors of intimate partner violence. *Journal of Interpersonal Violence*, 33(23), 3610–3629. <https://doi.org/10.1177/0886260516636068>
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). American Psychiatric Pub. <https://doi.org/10.1176/appi.books.9780890425596>
- American Psychological Association. (2017). *Clinical practice guideline for the treatment of PTSD*.
- Aspy, D. J., & Proeve, M. (2017). Mindfulness and loving-kindness meditation: Effects on connectedness to humanity and to the natural world. *Psychological Reports*, 120(1), 102–117. <https://doi.org/10.1177/0033294116685867>
- Au, T. M., Sauer-Zavala, S., King, M. W., Petrocchi, N., Barlow, D. H., & Litz, B. T. (2017). Compassion-based therapy for trauma-related shame and posttraumatic stress: Initial evaluation using a multiple baseline design. *Behavior Therapy*, 48(2), 207–221. <https://doi.org/10.1016/j.beth.2016.11.012>
- Badour, C. L., Resnick, H. S., & Kilpatrick, D. G. (2017). Associations between specific negative emotions and DSM-5 PTSD among a national sample of interpersonal trauma survivors. *Journal of Interpersonal Violence*, 32(11), 1620–1641. <https://doi.org/10.1177/0886260515589930>
- Bech, P., Olsen, L. R., Kjoller, M., & Rasmussen, N. K. (2003). Measuring well-being rather than the absence of distress symptoms: A comparison of the SF-36 mental health subscale and the WHO-five well-being scale. *International Journal of Methods in Psychiatric Research*, 12(2), 85–91. <https://doi.org/10.1002/mpr.145>
- Beck, A. T., Steer, R. A., & Brown, G. K. (1996). *BDI-II: Beck depression inventory: Manual* (2nd ed.). Psychological Corporation; Harcourt Brace.
- Blevins, C. A., Weathers, F. W., Davis, M. T., Witte, T. K., & Domino, J. L. (2015). The posttraumatic stress disorder checklist for DSM-5 (PCL-5): development and initial psychometric evaluation. *Journal of Traumatic Stress*, 28(6), 489–498. <https://doi.org/10.1002/jts.22059>
- Bodhi, B. (2010). *The noble eightfold path: The way to the end of suffering*. Buddhist Publication Society. <https://doi.org/10.1080/14639947.2011.564813>
- Cloitre, M. (2015). The “one size fits all” approach to trauma treatment: Should we be satisfied? *European Journal of Psychotraumatology*, 6(1), Article 27344. <https://doi.org/10.3402/ejpt.v6.27344>
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. Lawrence Erlbaum Associates.
- Dahl, C. J., Lutz, A., & Davidson, R. J. (2015). Reconstructing and deconstructing the self: Cognitive mechanisms in meditation practice. *Trends in Cognitive Sciences*, 19(9), 515–523. <https://doi.org/10.1016/j.tics.2015.07.001>
- Dalglish, T., Black, M., Johnston, D., & Bevan, A. (2020). Transdiagnostic approaches to mental health problems: Current status and future directions. *Journal of Consulting and Clinical Psychology*, 88(3), 179–195. <https://doi.org/10.1037/ccp0000482>
- DeCou, C. R., Lynch, S. M., Weber, S., Richner, D., Mozafari, A., Huggins, H., & Perschon, B. (2023). On the association between trauma-related shame and symptoms of psychopathology: A meta-analysis. *Trauma, Violence, & Abuse*, 24(3), 1193–1201. <https://doi.org/10.1177/15248380211053617>
- Derogatis, L. R. (1993). *Brief symptom inventory: BSI; administration, scoring, and procedures manual*. Pearson.
- Ehlers, A. (1999). *Posttraumatische belastungsstörung*. Hogrefe.
- Finch, H. (2005). Comparison of the performance of non-parametric and parametric MANOVA test statistics when assumptions are violated. *Methodology*, 1(1), 27–38. <https://doi.org/10.1027/1614-1881.1.1.27>
- First, M. B., Williams, J. B., Karg, R. S., & Spitzer, R. L. (2015). *Structured clinical interview for DSM-5 disorders, clinician version (SCID-5-CV)*. American Psychiatric Association.
- Foa, E. B., Hembree, E. A., & Rothbaum, B. O. (2007). *Prolonged exposure therapy for PTSD* (2nd ed.). Oxford University Press.
- Foa, E. B., & Kozak, M. J. (1986). Emotional processing of fear: Exposure to corrective information. *Psychological Bulletin*, 99(1), 20–35. <https://doi.org/10.1037/0033-2909.99.1.20>
- Fonzo, G. A., Federchenco, V., & Lara, A. (2020). Predicting and managing treatment non-response in posttraumatic stress disorder. *Current Treatment Options in Psychiatry*, 7(2), 70–87. <https://doi.org/10.1007/s40501-020-00203-1>
- Gilbert, P. (2010). *Compassion focused therapy. The CBT distinctive features series*. Routledge.
- Gu, X., Luo, W., Zhao, X., Chen, Y., Zheng, Y., Zhou, J., Zeng, X., Yan, L., Chen, Y., Zhang, X., Lv, J., Lang, Y., Wang, Z., Gao, C., Jiang, Y., & Li, R. (2022). The effects of loving-kindness and compassion meditation on life satisfaction: A systematic review and meta-analysis. *Applied Psychology: Health and Well-Being*, 14(3), 1081–1101. <https://doi.org/10.1111/aphw.12367>
- Jacobson, N. S., & Truax, P. (1991). Clinical significance: A statistical approach to defining meaningful change in psychotherapy research. *Journal of Consulting and Clinical Psychology*, 59(1), 12–19. <https://doi.org/10.1037/0022-006X.59.1.12>
- Kearney, D. J., Malte, C. A., McManus, C., Martinez, M. E., Felleman, B., & Simpson, T. L. (2013). Loving-kindness meditation for posttraumatic stress disorder: A pilot

- study. *Journal of Traumatic Stress*, 26(4), 426–434. <https://doi.org/10.1002/jts.21832>
- Kearney, D. J., Malte, C. A., Storms, M., & Simpson, T. L. (2021). Loving-kindness meditation vs cognitive processing therapy for posttraumatic stress disorder among veterans: A randomized clinical trial. *JAMA Network Open*, 4(4), Article e216604. <https://doi.org/10.1001/jamanetworkopen.2021.6604>
- Kearney, D. J., McManus, C., Malte, C. A., Martinez, M. E., Felleman, B., & Simpson, T. L. (2014). Loving-kindness meditation and the broaden-and-build theory of positive emotions among veterans with posttraumatic stress disorder. *Medical Care*, 52(Suppl 5), S32–S38. <https://doi.org/10.1097/MLR.0000000000000221>
- Kessler, R. C., Aguilar-Gaxiola, S., Alonso, J., Benjet, C., Bromet, E. J., Cardoso, G., Degenhardt, L., de Girolamo, G., Dinolova, R. V., Ferry, F., Florescu, S., Gureje, O., Haro, J. M., Huang, Y., Karam, E. G., Kawakami, N., Lee, S., Lepine, J.-P., Levinson, D., ... Koenen, K. C. (2017). Trauma and PTSD in the WHO world mental health surveys. *European Journal of Psychotraumatology*, 8(Sup5), 1353383. <https://doi.org/10.1080/20008198.2017.1353383>
- Kubany, E. S., Haynes, S. N., Abueg, F. R., Manke, F. P., Brennan, J. M., & Stahura, C. (1996). Development and validation of the trauma-related guilt inventory (TRGI). *Psychological Assessment*, 8(4), 428–444. <https://doi.org/10.1037/1040-3590.8.4.428>
- Kubany, E. S., & Ralston, T. C. (1998). Cognitive therapy for trauma-related guilt. In V. M. Follette, & J. I. Ruzek (Eds.), *Cognitive-behavioral therapies for trauma* (2nd ed., pp. 124–161). Guilford.
- Lang, A. J., Malaktaris, A. L., Casmar, P., Baca, S. A., Golshan, S., Harrison, T., & Negi, L. (2019). Compassion meditation for posttraumatic stress disorder in veterans: A randomized proof of concept study. *Journal of Traumatic Stress*, 32(2), 299–309. <https://doi.org/10.1002/jts.22397>
- Larsen, S. E., Bellmore, A., Gobin, R. L., Holens, P., Lawrence, K. A., & Pacella-LaBarbara, M. L. (2019). An initial review of residual symptoms after empirically supported trauma-focused cognitive behavioral psychological treatment. *Journal of Anxiety Disorders*, 63, 26–35. <https://doi.org/10.1016/j.janxdis.2019.01.008>
- Larsen, S. E., Fleming, C. J., & Resick, P. A. (2019). Residual symptoms following empirically supported treatment for PTSD. *Psychological Trauma: Theory, Research, Practice, and Policy*, 11(2), 207–215. <https://doi.org/10.1037/tra0000384>
- Lee, D. A., Scragg, P., & Turner, S. (2001). The role of shame and guilt in traumatic events: A clinical model of shame-based and guilt-based PTSD. *British Journal of Medical Psychology*, 74(4), 451–466. <https://doi.org/10.1348/000711201161109>
- Lewis, C., Roberts, N. P., Gibson, S., & Bisson, J. I. (2020). Dropout from psychological therapies for post-traumatic stress disorder (PTSD) in adults: Systematic review and meta-analysis. *European Journal of Psychotraumatology*, 11(1), Article 1709709. <https://doi.org/10.1080/20008198.2019.1709709>
- Morris, S. B. (2008). Estimating effect sizes from pretest-posttest-control group designs. *Organizational Research Methods*, 11(2), 364–386. <https://doi.org/10.1177/1094428106291059>
- Müller-Engelmann, M., Schnyder, U., Dittmann, C., Priebe, K., Bohus, M., Thome, J., Fydrich, T., Pfaltz, M. C., & Steil, R. (2020). Psychometric properties and factor structure of the German version of the clinician-administered PTSD scale for DSM-5. *Assessment*, 27(6), 1128–1138. <https://doi.org/10.1177/1073191118774840>
- Müller-Engelmann, M., Schreiber, C., Kümmerle, S., Heidenreich, T., Stangier, U., & Steil, R. (2019). A trauma-adapted mindfulness and loving-kindness intervention for patients with PTSD after interpersonal violence: A multiple-baseline study. *Mindfulness*, 10(6), 1105–1123. <https://doi.org/10.1007/s12671-018-1068-z>
- Neff, K. D. (2003). The development and validation of a scale to measure self-compassion. *Self and Identity*, 2(3), 223–250. <https://doi.org/10.1080/15298860309027>
- Norman, S. B., Capone, C., Panza, K. E., Haller, M., Davis, B. C., Schnurr, P. P., Shea, M. T., Browne, K., Norman, G. J., & Lang, A. J. (2022). A clinical trial comparing trauma-informed guilt reduction therapy (TrIGR), a brief intervention for trauma-related guilt, to supportive care therapy. *Depression and Anxiety*, 39(4), 262–273. <https://doi.org/10.1002/da.23244>
- Øktedalen, T., Hagtvet, K. A., Hoffart, A., Langkaas, T. F., & Smucker, M. (2014). The trauma-related shame inventory: Measuring trauma-related shame among patients with PTSD. *Journal of Psychopathology and Behavioral Assessment*, 36(4), 600–615. <https://doi.org/10.1007/s10862-014-9422-5>
- Power, M. J., & Fyvie, C. (2013). The role of emotion in PTSD: Two preliminary studies. *Behavioural and Cognitive Psychotherapy*, 41(2), 162–172. <https://doi.org/10.1017/S1352465812000148>
- Pugh, L. R., Taylor, P. J., & Berry, K. (2015). The role of guilt in the development of post-traumatic stress disorder: A systematic review. *Journal of Affective Disorders*, 182, 138–150. <https://doi.org/10.1016/j.jad.2015.04.026>
- Resick, P. A., Galovski, T. E., Uhlmansiek, M. O., Scher, C. D., Clum, G. A., & Young-Xu, Y. (2008). A randomized clinical trial to dismantle components of cognitive processing therapy for posttraumatic stress disorder in female victims of interpersonal violence. *Journal of Consulting and Clinical Psychology*, 76(2), 243–258. <https://doi.org/10.1037/0022-006X.76.2.243>
- Resick, P. A., Monson, C. M., & Chard, K. M. (2016). *Cognitive processing therapy for PTSD: A comprehensive manual*. Guilford.
- Salzberg, S. (2002). *Lovingkindness: The revolutionary art of happiness*. Shambhala Publications.
- Schumm, J. A., Dickstein, B. D., Walter, K. H., Owens, G. P., & Chard, K. M. (2015). Changes in posttraumatic cognitions predict changes in posttraumatic stress disorder symptoms during cognitive processing therapy. *Journal of Consulting and Clinical Psychology*, 83(6), 1161–1166. <https://doi.org/10.1037/ccp0000040>
- Shahar, B., Szepeswol, O., Zilcha-Mano, S., Haim, N., Zamir, O., Levi-Yeshuvi, S., & Levit-Binnun, N. (2015). A wait-list randomized controlled trial of loving-kindness meditation programme for self-criticism. *Clinical Psychology & Psychotherapy*, 22(4), 346–356. <https://doi.org/10.1002/cpp.1893>
- Shi, C., Ren, Z., Zhao, C., Zhang, T., & Chan, SH-W. (2021). Shame, guilt, and posttraumatic stress symptoms: A three-level meta-analysis. *Journal of Anxiety Disorders*, 82, Article 102443. <https://doi.org/10.1016/j.janxdis.2021.102443>
- Swift, J. K., & Greenberg, R. P. (2014). A treatment by disorder meta-analysis of dropout from psychotherapy. *Journal of Psychotherapy Integration*, 24(3), 193–207. <https://doi.org/10.1037/a0037512>
- Tangney, J. P., Stuewig, J., & Mashek, D. J. (2007). Moral emotions and moral behavior. *Annual Review of*

- Psychology.*, 58(1), 345–372. <https://doi.org/10.1146/annurev.psych.56.091103.070145>
- Totzeck, C., Teismann, T., Hofmann, S. G., von Brachel, R., Pflug, V., Wannemüller, A., & Margraf, J. (2020). Loving-kindness meditation promotes mental health in university students. *Mindfulness*, 11(7), 1623–1631. <https://doi.org/10.1007/s12671-020-01375-w>
- Tran, U. S., & Gregor, B. (2016). The relative efficacy of bona fide psychotherapies for post-traumatic stress disorder: A meta-analytical evaluation of randomized controlled trials. *BMC Psychiatry*, 16(1), Article 266. <https://doi.org/10.1186/s12888-016-0979-2>
- Wang, Y [Yabing], Chung, M. C., Wang, N., Yu, X., & Kenardy, J. (2021). Social support and posttraumatic stress disorder: A meta-analysis of longitudinal studies. *Clinical Psychology Review*, 85, Article 101998. <https://doi.org/10.1016/j.cpr.2021.101998>
- Weathers, F. W., Blake, D. D., Schnurr, P. P., Kaloupek, D. G., Marx, B. P., & Keane, T. M. (2013). *The life events checklist for DSM-5 (LEC-5)*. <http://www.ptsd.va.gov/>
- Weathers, F. W., Bovin, M. J., Lee, D. J., Sloan, D. M., Schnurr, P. P., Kaloupek, D. G., Keane, T. M., & Marx, B. P. (2018). The Clinician-Administered PTSD Scale for DSM-5 (CAPS-5): development and initial psychometric evaluation in military veterans. *Psychological Assessment*, 30(3), 383–395. <https://doi.org/10.1037/pas0000486>
- World Health Organization. (2019). *International statistical classification of diseases and related health problems* (11th ed.). <https://icd.who.int/>