

# Cognitive Therapy and EMDR for Reducing Psychopathology in Bereaved People After the MH17 Plane Crash: Findings From a Randomized Controlled Trial

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Experiencing a sudden/violent loss of a significant other is a risk factor for developing persistent complex bereavement disorder (PCBD), depression, and/or posttraumatic stress disorder (PTSD). Cognitive therapy (CT) combined with eye movement desensitization and reprocessing (EMDR) might be an effective treatment for bereaved people with PCBD, depression, and/or PTSD symptoms after sudden/violent loss. We tested the effects of CT + EMDR versus waitlist controls in disaster-bereaved people. In a multicenter randomized controlled trial, changes in self-rated PCBD, depression, and PTSD levels were compared between an immediate treatment and waitlist control group in 39 Dutch people who experienced loss(es) in the disaster with flight MH17, using multilevel modeling. Associations between reductions in symptom levels and reductions in maladaptive cognitive-behavioral variables were examined using regression analyses. The immediate treatment group showed a significantly stronger decline in depression (Hedges'  $g = 0.61$ ) compared with waitlist controls (Hedges'  $g = 0.15$ ). No significant between-groups differences were found in PCBD and PTSD levels. Symptom reductions were correlated with reductions in maladaptive cognitive-behavioral variables. Although CT + EMDR coincided with symptom reductions associated with reductions in negative cognitions and avoidance behaviors, more research with larger samples is needed to further examine the effectiveness of CT + EMDR in bereaved people after sudden/violent loss.



**Keywords:** bereavement, grief, trauma, disaster, treatment

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About one in 10 persons confronted with the death of a significant other owing to natural causes will develop persistent, clinically significant levels of grief (Lundorff, Holmgren, Zachariae, Farver-Vestergaard, & O'Connor, 2017). Clinically relevant grief levels are more intense and last longer than acute grief reactions that often include yearning for and/or preoccupation with the deceased and difficulties to accept the loss. When grief reactions cause impairment in daily life, and last at least 1 year after the loss, a grief disorder may apply. Persistent

complex bereavement disorder (PCBD) was introduced in the *Diagnostic and Statistical Manual of Mental Disorder, Fifth Edition (DSM-5)* as a condition for further study and can be coded as "other trauma- and stressor-related disorder" (American Psychiatric Association, 2013). It has been shown that the risk of developing persistent grief reactions (hereafter referred to as PCBD) and also the risk of comorbid depression and posttraumatic stress disorder (PTSD) symptoms are increased following a sudden/violent loss of a loved one (see, for over-

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views, Heeke, Kampisiou, Niemeyer, & Knaevelsrud, 2019; Kristensen, Weisæth, & Heir, 2012).<sup>1</sup>

According to a cognitive-behavioral model of PCBD (Boelen, van den Hout, & van den Bout, 2006), that draws from cognitive-behavioral models of PTSD and depression (Beck, 1976; Ehlers & Clark, 2000), vulnerability for PCBD can be explained by three processes: (a) insufficient integration of memories related to the loss, (b) negative appraisal connected with the loss, and (c) avoidance behaviors. These cognitive-behavioral variables mediate the impact of violent loss on PCBD, depression, and PTSD symptom levels (Boelen, de Keijser, & Smid, 2015). Insufficient integration of loss-related memories refers to difficulties with linking the factual knowledge that the loss is irreversible with information stored in autobiographical memory. Memories related to the loss may lack context in terms of time and place and therefore the loss feels unreal (Boelen, 2010). It has been argued that this “sense of unrealness” may trigger intrusive memories and enhance feelings of shock and numbness once someone is confronted with the irreversibility of the loss (Boelen, 2010, 2017). Experiencing a violent/unexpected loss may violate basic assumptions regarding the world being a safe and honest place (Janoff-Bulman, 1992). This may strengthen negative appraisal about one’s self, life, and future since the loss. These negative appraisals may also include catastrophic misinterpretations of one’s own grief reactions, for instance, interpreting one’s grief responses as intolerable. Avoidance of loss reminders concerns both anxious avoidance and depressive avoidance strategies. Anxious avoidance refers to strategies to avoid external and external cues reminding of the permanence of the loss, driven by fear that confrontation with this permanence is unbearable. Depressive avoidance strategies include refrainment from social and occupational activities that were perceived as meaningful before the loss, out of the belief that these activities are not fulfilling anymore (Boelen et al., 2006).

Cognitive-behavioral therapy (CBT), which targets these cognitive-behavioral variables with cognitive restructuring, exposure, and behavioral activation, appears to be the most effective treatment for bereaved people with PCBD (see, for overviews, Boelen & Smid, 2017a; Currier, Holland, & Neimeyer, 2010). However, overall effect sizes of CBT for PCBD are small to moderate (Currier et al., 2010), and some of the most effective CBT treatments (Bryant et al., 2014; Shear, Frank, Houck, & Reynolds, 2005) have shown clinically relevant reductions in PCBD levels in only 40% of the participants (Boelen & Smid, 2017a).

There is evidence that using exposure techniques, to confront people with loss-related memories, is one of the key ingredients of CBT for PCBD (Bryant et al., 2014; Eisma et al., 2015). An evidence-based exposure intervention that is often used to reduce traumatic memories in PTSD after traumatic events is eye movement desensitization and reprocessing (EMDR; for a meta-analysis, see Chen et al., 2014, but note that Cusack et al. (2016) reported in their meta-analysis that the strength of evidence for EMDR is lower than that for imaginal and in-vivo exposure treatment for PTSD). EMDR includes recalling the most traumatic memory while making eye movements by following the therapist’s hand. This dual taxing of working memory, that is, retrieving memory and making eye movements, leads to incomplete retrieval of the traumatic memory, owing to limited capacity of working memory. Consequently, the incompletely retrieved memory is

stored as a blurry memory yielding less vivid and distressed memories during future recalls (Lee & Cuijpers, 2013; van den Hout & Engelhard, 2012). EMDR uses alternate bilateral stimulation (ABS) as part of the psychotherapeutic regimen. In mice, ABS has been shown to shift the balance between competing brain circuits, engaging a set of neural pathways that favor fear extinction to inhibit the influence of pathways that favor the persistence of fear (Baek et al., 2019). Specifically, ABS strengthened excitatory neural connections between the mediodorsal thalamus and the basolateral amygdala. This led to the inhibition of neurons that encode fear memories in the basolateral amygdala, which, in turn, reduced output from those neurons to fear-generating brain regions (Baek et al., 2019).

Although it has been argued that EMDR might also be helpful for people who lost significant others due to traumatic circumstances (Solomon & Rando, 2012), empirical evidence is scarce. To the best of our knowledge, only one randomized controlled trial (RCT) has been conducted in traumatically bereaved individuals. This RCT, among 85 homicidally bereaved people, indicated that people who received cognitive therapy (CT) combined with EMDR reported significantly larger reductions in PCBD and PTSD levels immediately following treatment than people waiting for treatment (van Denderen, de Keijser, Stewart, & Boelen, 2018). Furthermore, this previous RCT showed that, when comparing the effects of EMDR versus CT halfway through treatment, both interventions yielded equal reductions in PCBD and PTSD levels.

The current study expands this previous work by evaluating the effectiveness of CT + EMDR compared with waiting list controls in people confronted with loss(es) due to a plane disaster in 2014. The study protocol has been published previously (Lenferink, Piersma, de Keijser, Smid, & Boelen, 2017). In keeping with that protocol, four hypotheses were tested:

*Hypothesis 1:* People who receive CT + EMDR show larger reductions in PCBD, depression, and PTSD symptom levels than people who wait for treatment.

*Hypothesis 2:* Reductions in symptom levels are associated with reductions in maladaptive cognitive-behavioral variables.

*Hypothesis 3:* PCBD, depression, and PTSD symptom levels decrease from pretreatment through 12 weeks and 24 weeks posttreatment.

*Hypothesis 4:* During treatment, grief symptoms gradually decrease from session to session.

Given that relatively few RCTs have examined the effects of psychotherapy for disturbed grief, there is still a need to further our knowledge about effective treatment for emotional distress following loss. For instance, a meta-analysis indicated that only nine RCTs have been conducted that examined treatment effects for reducing clinically relevant grief levels in people bereaved at least 6 months earlier

<sup>1</sup> We operationalized disturbed grief as PCBD in this RCT. Different operationalizations of disturbed grief have been used in research and practice (Lenferink, Boelen, Smid, & Paap, 2019), but we chose to use the term PCBD, in accord with DSM-5 (American Psychiatric Association, 2013), throughout this paper.

(Johannsen et al., 2019). None of these RCTs exclusively comprised people who experienced a sudden/violent death. It is particularly relevant to explore treatment options for people confronted with sudden/violent losses who are generally more at risk for disturbed grief as well as for suffering comorbid symptoms of depression and PTSD (Heeke et al., 2019). Specifically, the co-occurrence of separation and traumatic distress may require a different treatment approach compared with situations where separation distress dominates the symptom patterns, with more attention for interventions directly targeting intrusive memories.

## Method

### Design

A multicenter RCT was conducted throughout the Netherlands. Eligible participants were randomly allocated to the immediate intervention condition or to a waitlist control condition. People in the immediate intervention condition were able to start with CT + EMDR within 1 week after allocation. Waiting list controls started after a waiting period of 12 weeks with CT + EMDR. All participants completed questionnaires at pretreatment (T0), 1 week post treatment (T1), and at follow-up 12 weeks (FU1) and 24 weeks posttreatment (FU2). Waiting list controls completed an additional questionnaire in the last week of the waiting period (i.e., T0.1). A study protocol of this study has been approved by a local ethics committee (METc UMCG NL52722) and published (Lenferink, Piersma, et al., 2017). See Figure 1 in the online supplemental Appendix A for a graphical display of the design.

### Participants

On July 17, 2014, a plane disaster with flight MH17 (departing from Amsterdam to Kuala Lumpur) took place owing to a missile impact in Ukraine. In total, 298 people were killed, including 193 Dutch citizens (Dutch Safety Board, 2015). Between April 2016 and September 2017, Dutch people who lost a significant other in the plane disaster were solicited to sign up for this study. Bereaved people had to meet the following inclusion criteria: (a) being at least 18 years old, (b) mastering written and spoken Dutch, and (c) reporting PCBD, depression, and/or PTSD symptom levels above clinical cut-off scores on self-report questionnaires (as detailed in the following text). People interested were excluded when they suffered from a substance use disorder, psychotic disorder, or cognitive disability (e.g., Alzheimer's disease), as reported by the therapist based on the intake interview. In case a person reported the highest answer option on a suicidal ideation item of the depression measure, we referred this person to his or her general practitioner.

### Procedure

This RCT was part of a larger survey study examining risk factors and symptom profiles of psychopathology in people bereaved by the MH17 plane disaster (cf., Lenferink, Nickerson, de Keijser, Smid, & Boelen, 2019, 2020) that started in May 2015. In the first data wave of this survey study, we asked participants whether they wanted to be informed about a study in which psychological help was offered to persons experiencing emotional problems. If they answered "yes," an information letter about the

RCT was sent in April/May 2016, including the T0 questionnaires and an informed consent form. People who did not participate in the survey study, but who were interested in participating in the RCT could sign up for this study via our research website ([www.rouwnavliegrampmh17.nl](http://www.rouwnavliegrampmh17.nl)).

After receiving completed T0 questionnaires, inclusion and exclusion criteria were checked. Eligible participants were randomized to the CT + EMDR condition or waitlist control condition by using a stratified randomization procedure carried out by an independent researcher. We stratified based upon gender, single versus multiple loss, and noncomorbid symptom (i.e., PCBD, depression, or PTSD) versus comorbid symptoms (comorbidity of PCBD, depression, and PTSD). Therapy costs and travel expenses were completely reimbursed by the Victim Fund, a Dutch funding agency for trauma exposed people.

### Treatment CT + EMDR

The CT + EMDR treatment consisted of eight sessions (of each 60 min, with an exception of the EMDR sessions that lasted 90 min) offered in a 12-week period. In Session 1, the therapist and client introduced themselves and shared treatment expectations, and the client told about the impact of the loss(es). In Session 2, a close relative of the client joined the session, and the importance of social support in the grief process was discussed. In Sessions 3 to 5, EMDR was offered, targeting the most distressing memories related to the loss(es). In Sessions 6 to 8, CT was offered. During the CT sessions, cognitive restructuring procedures were used. Specifically, the rationale of CT was explained (highlighting the connection between maladaptive cognitions, unhelpful coping behaviors, and negative emotions), maladaptive cognitions were identified both in and between sessions (using cognitive homework sheets), and maladaptive cognitions were altered using Socratic questioning (about the utility and validity of cognitions) and behavioral experiments (activities to test cognitions). All therapists were licensed EMDR and CBT practitioners who had experience in treating bereaved people after sudden/violent loss. The treatment was conducted in the clinic of the therapist. Therapists received (upon request) supervision from the last three authors. The therapists received a 1-day training about the treatment protocol and were asked to keep a diary about the therapy progress to monitor treatment fidelity. Clients received a therapy manual including psycho-education and homework exercises focused on identifying and challenging negative thoughts.

### Measures

**Primary outcomes.** PCBD symptom levels were assessed with the Traumatic Grief Inventory-Self Report (TGI-SR; Boelen & Smid, 2017b). The 17 items that represent PCBD criteria as per *DSM-5* were summed to obtain a total score. Participants rated how often they experienced each symptom (e.g., "I felt numb over the loss") during the past month on 5-point scales (1 = *never*; 5 = *always*). Based on the diagnostic scoring rule for PCBD as per *DSM-5* (American Psychiatric Association, 2013), people were eligible to participate when they scored at least 3 ("sometimes") on at least one Criterion B symptom (Items 1–3, and Item 14), and at least six Criterion C symptoms (Items 4–11 and Items 15–18), and the Criterion D symptom (Item 13). Two Dutch validation studies

have shown that the TGI-SR is a valid and reliable screening tool. Cronbach's  $\alpha$  of the 17 PCBD items of the TGI-SR in previous studies was  $\geq .90$  (Boelen, Djelantik, de Keijser, Lenferink, & Smid, 2019; Boelen & Smid, 2017b); in the current study it was .90 for T0.

Depression levels were assessed with the Quick Inventory of Depressive Symptomatology-Self Report (QIDS-SR; Rush et al., 2003). The QIDS-SR consists of 16 items (e.g., "falling asleep") representing the nine symptom domains of a major depressive disorder as per *DSM-5*. Items are rated on 4-point scores ranging from 0 (e.g., "I never take longer than 30 minutes to fall asleep") to 3 (e.g., "I take more than 60 minutes to fall asleep, more than half the time"). People reporting a total score of 6 or higher were eligible to participate (Rush et al., 2003). In previous research (Rush et al., 2003), internal consistency ( $\alpha = .86$ ) and concurrent validity of the QIDS-SR were found to be adequate. In this study, Cronbach's  $\alpha$  was .76 for T0.

PTSD symptoms were assessed with the PTSD Checklist for *DSM-5* (Blevins, Weathers, Davis, Witte, & Domino, 2015). Participants rated how often they were bothered by each symptom related to the death of their loved one (s; e.g., "Feeling jumpy or easily startled") on 5-point Likert scales (0 = *not at all*, 4 = *extremely*). Based on the diagnostic scoring rule for PTSD as per *DSM-5* (American Psychiatric Association, 2013), people were eligible to participate when they scored at least 2 ("moderate") on at least one Criterion B item (Items 1–5), one Criterion C item (Items 6–7), two Criterion D items (Items 8–14), and two Criterion E items (Items 15–20). The PTSD Checklist for *DSM-5*'s psychometric properties are adequate based on high internal consistency ( $\alpha \geq .90$ ), concurrent and divergent validity, and its sensitivity to clinical change (Wortmann et al., 2016). In this study, the internal consistency was .92 for T0.

**Correlates of change.** A sense of unrealness was assessed with the 5-item Experienced Unrealness Scale (Boelen, 2010). Participants rated their agreement with each item (e.g., "Sometimes it feels as if [-] is just temporarily gone and will return again soon") on 8-point scales (1 = *not at all true for me*, 8 = *completely true for me*). Previous research has shown that this measure has sound psychometric properties as evidenced by among others adequate reliability index ( $\alpha = .89$ ; Boelen, 2010). Reliability was high ( $\alpha = .91$ ) for T0 in the current study.

Intrusive memories were assessed with the eight-item Intrusion subscale of the Trauma Memory Questionnaire (Halligan, Michael, Clark, & Ehlers, 2003, Dutch version by Boelen, 2012). Participants rated their agreement with each item (e.g., "Many different things trigger memories of the event") on 5-point scales (0 = *not at all* and 4 = *very strongly*). The instruction of the instrument was adapted to refer to the loss of significant other(s) due to the plane disaster. Psychometric properties of the Trauma Memory Questionnaire are adequate as shown by among others high internal consistency in previous research ( $\alpha = .90$ ; Halligan et al., 2003) and this research ( $\alpha = .94$  for T0).

Negative grief cognitions were assessed with four subscales of the Grief Cognitions Questionnaire (GCQ; Boelen & Lensvelt-Mulders, 2005) commonly used in previous research (cf. Boelen et al., 2015; Lenferink, De Keijser, Wessel, & Boelen, 2018). These subscales tap (a) global negative beliefs about one's own life (four items, e.g., "Life has got nothing to offer me anymore"), (b) about the self (six items, "Ever since [-] died, I think negatively about

myself"), (c) the future (five items, "In the future I will never become really happy anymore"), and (d) catastrophic misinterpretations of one's own grief reactions (four items, "If I allow my feelings to come, I will lose control"). Participants rated their agreement with each item on a 6-point scale (0 = *disagree strongly*, 5 = *agree strongly*). Previous factor analytic research supports the dimensionality of the GCQ, and the reliability estimates of the four scales were high ( $\alpha \geq .89$ ; Boelen & Lensvelt-Mulders, 2005). Cronbach's  $\alpha$  for T0 was .92, .89, .81, and .89 for the subscales Life, Self, Future, and Catastrophic Misinterpretations, respectively.

Avoidance behaviors were assessed with the nine-item Depressive and Anxious Avoidance in Prolonged Grief Questionnaire (DAAPGQ; Boelen & van den Bout, 2010). The DAAPGQ consists of two subscales: five items tapping depressive avoidance (e.g., "Since [-] died, there are several activities, hobby's, and acquaintances that I pay much less attention to") and four items tapping anxious avoidance (e.g., "I avoid to dwell on painful thoughts and memories connected to his/her death"). Participants rated their agreement with each item on 6-point scales (0 = *not at all true for me*, 5 = *completely true for me*). The two-factor structure of the DAAPGQ has been supported by previous research (Boelen & van den Bout, 2010). Cronbach's  $\alpha$  was .90 for depressive avoidance and .74 for anxious avoidance in previous research (Boelen & van den Bout, 2010); these estimates were .85 and .79 at T0 in this study, respectively.

**Grief symptoms during treatment.** A five-item Brief-Traumatic Grief (B-TG) measure was administered at each treatment session to assess grief symptom levels during treatment. Participants rated their agreement with each item (e.g., "I feel sad") on 5-point scales (1 = *not at all*, 5 = *very strongly*). The B-TG has been developed by the authors and has not yet been validated. Cronbach's  $\alpha$  for the B-TG at T0 was .59.

## Statistical Analyses

**Differences in PCBD, depression, and PTSD between the treatment condition and waiting list controls.** To examine differences in PCBD, depression, and PTSD between the treatment condition and waiting list controls (Hypothesis 1), three multilevel models were built for each outcome separately. For the multilevel models, linear mixed models were used in the Statistical Package for Social Sciences Version 25 (IBM Corp., 2017). Two-level models were constructed with repeated measures (Level 1) nested within individuals (Level 2). First, intraclass coefficients (ICCs) were calculated based on random intercept-only models with PCBD, depression, or PTSD symptom levels as dependent variable. An ICC represents the proportion of the variance in the outcome variable that is between the Level 2 units (i.e., individuals). Second, time (coded as T0 = 0, T1 = 1 for the intervention group, and T0.1 = 1 for the waiting list controls) was entered as fixed effect.<sup>2</sup> Third, condition (coded as waiting list controls = 0 and intervention group = 1) and an interaction term (Time  $\times$  condition) were added as fixed effects. We used multilevel analyses to test Hypothesis 1, instead of analyses of covariance as reported in our initial analytic plan (Lenferink, Piersma, et al.,

<sup>2</sup> Because of the small sample size, we did not include a random slope for time in our model.

2017) because of a violation of the assumption of analyses of covariance. More specifically, an independent  $t$  test showed that the intervention group reported significantly higher baseline depression scores than the waiting list controls,  $t(37) = -2.34$ ,  $p = .03$ , and including baseline depression levels as covariate could lead to biased results (Miller & Chapman, 2001). For reasons of consistency, we used multilevel analyses for all outcome measures. Assumptions for multilevel modeling were checked; based on nonsignificant Levene's tests ( $p > .05$ ), there was no concern for heteroscedasticity. Visual inspections of the histograms and normal P-P plots indicated that the errors were normally distributed.

**Associations between symptom reductions from pre- to post-treatment and correlates of change.** To examine associations between symptom reductions from pre- to posttreatment and correlates thereof (Hypothesis 2) residual gain scores were calculated for PCBD, depression, and PTSD on the one hand and possible mechanisms of change (i.e., a sense of unrealness, intrusive memories, negative grief cognitions, and avoidance behavior) on the other hand. To compute residual gain scores, we first converted raw scores on each measure to  $z$  scores, followed by subtracting the standardized pretreatment scores (T0 for the immediate intervention group and T0.1 for the waiting list controls) multiplied by the correlation between pretreatment and posttreatment (or follow-up) scores from standardized posttreatment (or follow-up) scores (Steketee & Chambless, 1992). Following previous research (Boelen, de Keijser, van den Hout, & van den Bout, 2011; Van Minnen, Arntz, & Keijsers, 2002), multiple regression analyses were performed to examine the associations between the residual gain scores of the possible mechanisms of change (entered to the regression equation separately) and residual gain scores of PCBD, depression, and PTSD, while controlling for condition (0 = *waiting list controls*, 1 = *immediate intervention group*).

**Treatment effects at 12 and 24 weeks posttreatment on symptom levels.** To examine the treatment effects at 12 and 24 weeks posttreatment on symptom levels (Hypothesis 3), three multilevel models were built with PCBD, depression, or PTSD symptom levels, respectively, as outcome variables and time (dummy coded with T0 as reference category) as fixed effect. To test Hypotheses 2 and 3, we combined the T0 data of the intervention group with T0.1 data of the waiting list controls.

Reliable change indices (RCIs) were computed for changes in individual PCBD, depression, and PTSD symptom levels at all time points using the observed scores. We used a formula from Jacobson and Truax (1991, p. 14). An RCI over 1.96 indicates that the change in symptom levels is unlikely due to chance ( $p < .05$ ). Within-group differences were examined using paired  $t$  tests. Hedges'  $g$  effect sizes for small samples were computed for differences in observed means of symptom levels between all time points. Effect sizes around 0.2 are considered as small, around 0.5 as moderate, and around 0.8 as large (Cohen, 1988).

**Changes in grief symptoms from session to session.** To evaluate changes in grief symptoms from session to session (Hypothesis 4), we built multilevel models with repeated measures (Level 1) nested within individuals (Level 2). The total scores on the B-TG for each session were included as dependent variable and time (coded from 0 through 7) was included as fixed independent variable.

## Results

### Preliminary Analyses

In total, 97 people completed a screening questionnaire for participation in the current study. Twenty-eight people were excluded because they did not meet the inclusion criteria, and nine people stated that they did not want to receive further information about the study. Sixty people received the invitation to participate in the current treatment trial. In total, 21 declined, and 39 people were randomized. Twenty-two people were allocated to the intervention group, and 17 people were allocated to the waiting list control group. See Figure 1 for a flowchart.

The participants ranged in age from 23 to 78 ( $M = 55.41$ ,  $SD = 13.02$ ) years. Most of the participants (74.4%) were women, completed university (53.8%), and suffered multiple losses due to the plane disaster (71.8%). Table 1 shows the sample characteristics. Those who attended less than six treatment sessions and/or did not receive CT and EMDR were considered dropouts. Four out of 22 people (18.2%) dropped out of the intervention condition. All people allocated to the waiting list control condition filled in a postwaiting assessment (T0.1). Five out of 17 people (29.4%) dropped out of the waiting list control condition once they started treatment. Reasons for dropout are presented in Figure 1. The treatment dropouts did not significantly differ from the treatment completers in terms of socio demographic and loss-related characteristics and psychopathology levels assessed at baseline (T0).

### Hypothesis 1: Differences in Psychopathology Symptom Levels Between Intervention Group and Waiting List Controls

The random intercept-only models showed that 55.1%, 64.9%, and 68.2% of the variance in PCBD, depression, and PTSD, respectively, was at the individual level (i.e., Level 2). This means that differences in psychopathology levels are relatively larger between individuals than within individuals. Table 2 shows the parameter estimates for multilevel models including time as only predictor and multilevel models including time, condition, and a Time  $\times$  Condition interaction term as predictors. Intention-to-treat analyses showed that from the first to the second measurement (i.e., pretreatment to posttreatment in the immediate treatment condition, and prewaiting vs. end of waiting period in waiting group) symptom levels of PCBD, depression, and PTSD decreased significantly. The immediate treatment group showed a significantly stronger decline in depression levels (Hedges'  $g = 0.61$ ) compared with the waiting list controls (Hedges'  $g = 0.15$ ). The decline in PCBD and PTSD symptom levels for the immediate treatment group compared with waiting list controls was not significantly different. The completers analyses revealed a similar pattern of results. Table 3 shows the observed means, standard deviations, and  $d_{\text{effect}}$  sizes for all outcomes.

The estimated RCIs indicated that 44.4% of the people in the intervention condition reported clinically significant improvements in PCBD, depression, and/or PTSD symptom levels from T0 through T1. In the waiting list control condition, 29.4% of the people reported this change from T0 through T0.1. Zero people in the intervention condition reported clinically significant worsening of symptom levels versus 11.9% in the waiting list controls. See

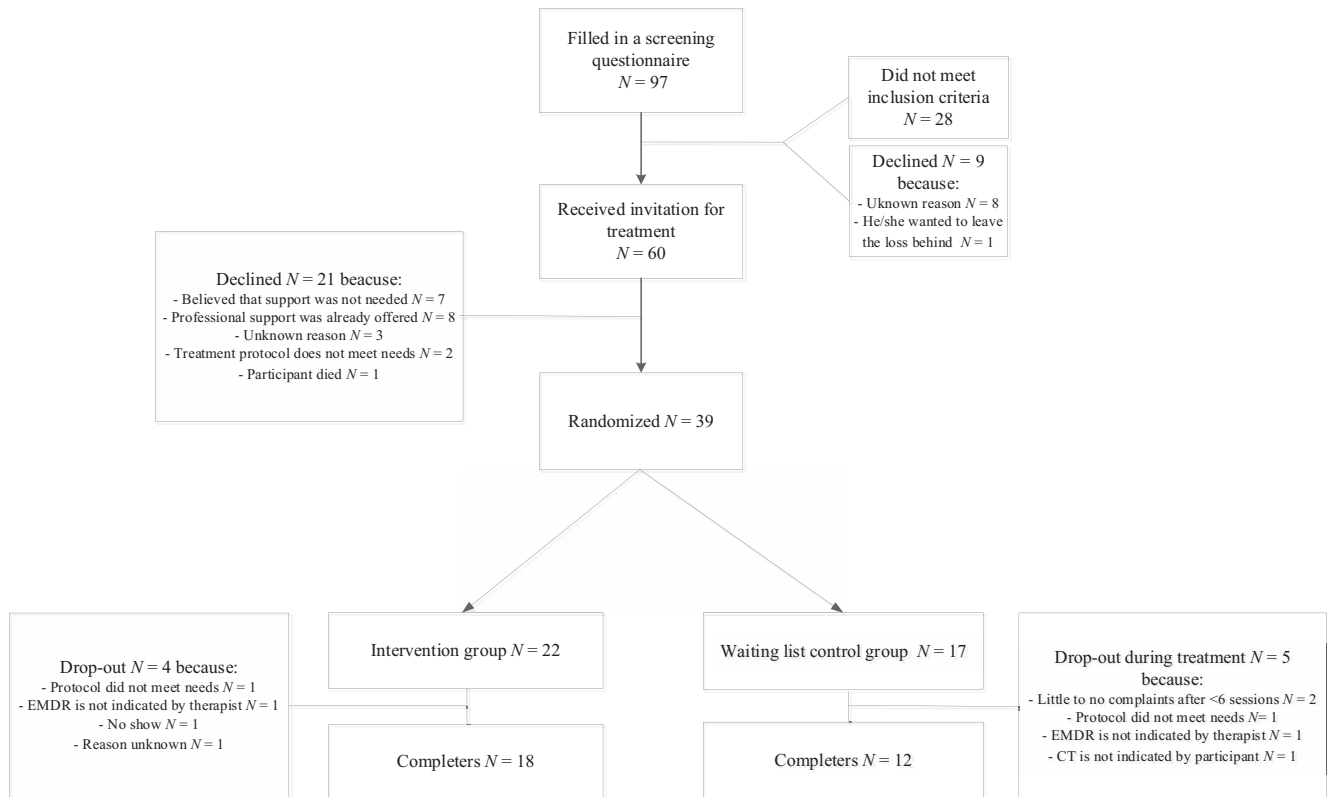


Figure 1. Flowchart.

Table 1 in the online supplemental Appendix A for an overview of the RCIs calculated for each outcome for people in the intervention condition and waiting list controls.

## Hypothesis 2: Correlates of Change

For PCBD, regression analyses on the completers sample ( $N = 30$ ) showed that greater symptom reduction from T0 to T1 was significantly associated with greater reductions in intrusive memories ( $\beta = .41, t = 2.24, p = .026$ ), negative cognitions about life ( $\beta = .42, t = 2.31, p = .029$ ) and one's self ( $\beta = .53, t = 3.20, p = .004$ ), and depressive avoidance ( $\beta = .43, t = 2.44, p = .022$ ), but not with a sense of unreality and anxious avoidance. For depression, greater symptom reduction from T0 to T1 was significantly associated with reductions in intrusive memories ( $\beta = .60, t = 3.91, p = .001$ ), negative cognitions about the self ( $\beta = .42, t = 2.40, p = .024$ ), depressive avoidance ( $\beta = .61, t = 3.94, p = .001$ ), and anxious avoidance ( $\beta = .39, t = 2.15, p = .041$ ). A sense of unreality and intrusive memories were not significantly related to symptom reduction in depression levels. For PTSD, greater symptom reduction from T0 to T1 was significantly associated with reductions in negative cognitions about the self ( $\beta = .40, t = 2.23, p = .035$ ) and the future ( $\beta = .59, t = 3.58, p = .001$ ), catastrophic misinterpretations ( $\beta = .59, t = 3.74, p = .001$ ), and depressive avoidance ( $\beta = .52, t = 3.10, p = .005$ ). PTSD symptom reduction was not significantly associated with a sense of unreality and intrusive memories. We also examined to what extent greater symptom reductions in

PCBD, depression, and PTSD levels from T0 to FU1 and from T0 to FU2 were associated with greater reductions in possible correlates of change. See Table 2 in the online supplemental Appendix A for an overview of these outcomes.

## Hypothesis 3: Changes in PCBD, Depression, and PTSD at 1, 12, and 24 Weeks Posttreatment

Intention-to-treat analyses showed that compared with pretreatment symptom levels of PCBD, depression, and PTSD, these symptom levels were significantly reduced at 1 week, 12 weeks, and 24 weeks posttreatment (Table 4). The completers analyses revealed a similar pattern of results and are therefore not reported here.

Effect sizes for differences between pretreatment levels and 1-week posttreatment levels were moderate for PCBD (Hedges'  $g = 0.60$ ) and depression (Hedges'  $g = 0.51$ ), and small for PTSD (Hedges'  $g = 0.45$ ). For the differences between pretreatment levels and 12-week posttreatment levels, the effect sizes were moderate for PCBD (Hedges'  $g = 0.75$ ) and PTSD (Hedges'  $g = 0.58$ ), and small for depression (Hedges'  $g = 0.43$ ). Moderate effect sizes were found for the differences between pretreatment and 24 weeks posttreatment PCBD (Hedges'  $g = 0.71$ ), depression (Hedges'  $g = 0.61$ ), and PTSD (Hedges'  $g = 0.55$ ) symptom levels. Table 3 in the online supplemental Appendix A shows the observed means, standard deviations, and effect sizes for all outcomes.

Table 1  
 Characteristics of Participants ( $N = 39$ )

Sample characteristics	Total	Intervention group ( $N = 22$ )	Waitlist control group ( $N = 17$ )
Gender, $N$ (%)			
Men	10 (25.6)	6 (27.3)	4 (23.5)
Women	29 (74.4)	16 (72.7)	13 (76.5)
Age in years, $M$ ( $SD$ )	53.49 (13.01)	53.09 (13.37)	54.00 (12.92)
Educational level, $N$ (%)			
Lower than university	18 (46.2)	15 (68.2)	3 (17.6)
University	21 (53.8)	7 (31.8)	14 (82.4)
Closest related deceased person was, $N$ (%)			
Spouse	1 (2.6)	0 (0.0)	1 (5.9)
Child	17 (43.6)	7 (31.8)	10 (58.8)
Parent	3 (7.7)	3 (13.6)	0 (0.0)
Sibling	9 (23.1)	5 (22.7)	4 (23.5)
Other	9 (23.1)	7 (31.8)	2 (11.8)
Time since loss(es) in months, $M$ ( $SD$ )	22.59 (2.41)	22.64 (2.13)	22.53 (2.81)
Number of relatives lost, $N$ (%)			
One	11 (28.2)	7 (31.8)	4 (23.5)
Two	15 (38.5)	8 (36.4)	7 (41.5)
Three	5 (12.8)	4 (18.2)	1 (5.9)
Four	5 (12.8)	2 (9.1)	3 (17.6)
Five	2 (5.1)	1 (4.5)	1 (5.9)
Six	1 (2.6)	0 (0.0)	1 (5.9)
Recruited via, $N$ (%)			
Previous longitudinal study	35 (89.7)	20 (90.9)	15 (88.2)
Website	4 (10.3)	2 (9.1)	2 (11.8)

The estimated RCIs indicated that 12 people (40.0%) reported clinically significant improvements in PCBD, depression, and/or PTSD symptom levels from T0 through T1, 10 people (34.5%) from T0 through FU1, and 13 (46.4%) from T0 through FU2. See Table 1 in the online supplemental Appendix A for an overview of the RCIs.

#### Hypothesis 4: Change in Grief Symptoms From Session to Session

Intention-to-treat analyses revealed that, over time, the severity of grief symptoms, as assessed with the B-TG during each treatment session, significantly declined ( $B = -0.32$  [ $-0.42, -0.22$ ],  $SE = .05$ ,  $p < .001$ ). Adding a quadratic effect of time did not significantly improve the model,  $\chi^2\Delta = 0.15$  (1),  $p > .05$ , indi-

cating that declines in grief symptoms followed a linear trend. Findings for completers were similar and are therefore not reported here. Figure 2 shows the mean scores and 95% confidence intervals for the average grief levels per session.

#### Discussion

The number of RCTs examining treatment effects for reducing grief levels in bereaved people (irrespective of baseline severity of symptom levels) is growing. Yet, there is still relatively limited knowledge about effective treatments for bereaved people with clinically relevant grief levels (Johannsen et al., 2019). Evaluating treatments for people confronted with sudden/violent losses seems particularly germane because these people are most strongly at risk for PCBD and comorbid depression and PTSD (Heeke et al.,

Table 2  
 Estimated Parameters for Multilevel Regression Intention-to-Treat Analyses Comparing Intervention Group ( $N = 22$ ) With Waiting List Controls ( $N = 17$ )

Predictors	PCBD		Depression		PTSD	
	B	SE	B	SE	B	SE
Model including time as predictor						
Intercept	46.83***	1.60	10.14***	0.73	23.40***	2.11
Time	-6.14***	1.21	-1.83**	0.55	-3.94*	1.57
Model including time, condition, and Time $\times$ Condition as predictors						
Intercept	46.53***	2.29	8.24***	1.00	21.12***	3.00
Time	-5.47**	1.72	-0.53	0.73	-1.65	2.18
Condition	0.58	3.19	3.71*	1.39	4.44	4.19
Time $\times$ Condition	-1.31	2.40	-2.53*	1.01	-4.46	3.04

Note. PCBD = persistent complex bereavement disorder; PTSD = posttraumatic stress disorder.  
 \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

Table 3  
Observed Means and Standard Deviations for Intervention Group ( $N = 18$ ) and Waiting List Controls ( $N = 17$ )

Primary outcomes	Baseline		Posttreatment or post waiting		Hedges' $g$ Within groups
	$M$	$SD$	$M$	$SD$	
PCBD, $M$ ( $SD$ )					
Intervention	47.11	11.44	40.33	11.15	0.59**
Waiting list control	46.53	8.37	41.06	6.98	0.69**
Depression, $M$ ( $SD$ )					
Intervention	11.94	4.30	8.89	5.44	0.61**
Waiting list control	8.24	3.25	7.71	3.53	0.15
PTSD, $M$ ( $SD$ )					
Intervention	25.56	16.43	19.44	13.38	0.40*
Waiting list control	21.12	10.20	19.47	9.45	0.16

Note. PCBD = persistent complex bereavement disorder; PTSD = post-traumatic stress disorder.

\*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

2019). It has been argued that treatment including CT + EMDR targeted at PCBD and comorbid depression and PTSD symptoms after sudden/violent losses might be beneficial (Solomon & Rando, 2012). However, knowledge on treatment effects for a sample exclusively comprised people with clinically relevant PCBD levels after sudden/violent loss is lacking, with one notable exception (cf. van Denderen et al., 2018) showing that CT + EMDR (vs. waitlist controls) alleviated disturbed grief (operationalized as complicated grief) and PTSD symptom levels in homicidally bereaved people. Accordingly, this study further examined the effectiveness of CT + EMDR for reducing PCBD, depression, and PTSD levels in an RCT among people who lost significant other(s) in a plane disaster that took place in 2014. It should be noted that this study suffered from a small sample size, including only 39 participants, which precluded us to draw firm conclusions.

The main finding of our study was that participants who received CT + EMDR showed statistically significant small-to-moderate improvements in PCBD, depression, and PTSD levels from pretreatment to 1 week posttreatment. This finding accords with a meta-analysis that found similar within-group treatment effects of grief treatment in bereaved people (Johannsen et al.,

Table 4  
Estimated Parameters for Multilevel Regression Intention-to-Treat Analyses Comparing Baseline Levels With 1 Week, 12 Weeks, and 24 Weeks Posttreatment Symptom Levels ( $N = 39$ )

Predictors	PCBD		Depression		PTSD	
	B	SE	B	SE	B	SE
Intercept	44.33***	1.76	10.27***	0.86	23.57***	2.08
T0 vs. T1	-6.13***	1.42	-2.43**	0.63	-6.01**	1.71
T0 vs. FU1	-6.92***	1.43	-2.19***	0.64	-6.74***	1.73
T0 vs. FU2	-7.46***	1.45	-2.71***	0.64	-6.74***	1.73

Note. PCBD = persistent complex bereavement disorder; PTSD = post-traumatic stress disorder; T0 = pretreatment assessment; T1 = one week posttreatment assessment; FU1 = follow-up 12 weeks posttreatment assessment; FU2 = follow-up 24 weeks posttreatment assessment.

\*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

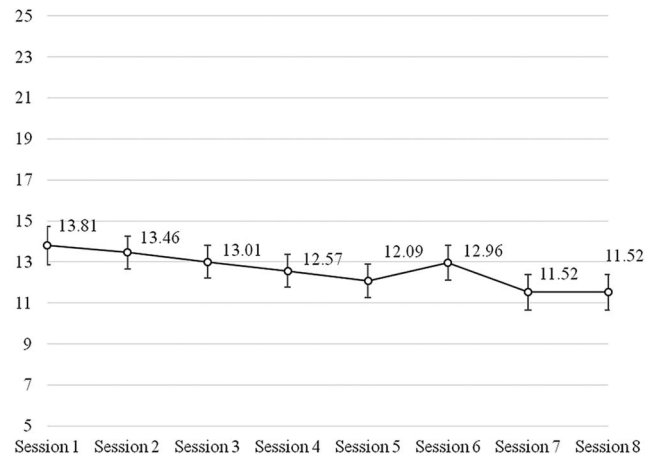


Figure 2. Average grief levels for each treatment session for the intention-to-treat sample ( $N = 39$ ).

2019). Compared with the waitlist control condition, the treatment was more effective in reducing depression levels. However, due to higher depression levels at baseline assessment for people allocated to the immediate intervention group (vs. waitlist control group), we cannot rule out that this reflects a regression to the mean effect.

Although our findings indicated that PCBD and PTSD levels decreased from baseline to posttreatment, decreases did not differ significantly between the intervention and waitlist control group. This contrasts with previous RCTs showing that undergoing grief-specific treatments coincides with significantly larger reductions in disturbed grief, depression, and PTSD levels compared with waiting for treatment (Barbosa, Sá, & Carlos Rocha, 2014; Eisma et al., 2015; Papa, Sewell, Garrison-Diehn, & Rummel, 2013; Rosner, Pfoh, Kotoučová, & Hagl, 2014; van Denderen et al., 2018). At least two explanations might account for this unexpected finding. A first explanation is related to the fact that participants in the waitlist control condition also showed significant declines in PCBD levels. Previous research in clinically distressed bereaved people did not show that waiting for treatment coincided with declines in grief (Barbosa et al., 2014; Eisma et al., 2015; Rosner et al., 2014; van Denderen et al., 2018). The reductions in PCBD symptom levels in the waitlist control condition might be owing to natural remission, which has shown to occur in disaster-bereaved people (Sveen, Bergh Johannesson, Cernvall, & Arnberg, 2018). Alternatively, the effect of additional forms of support that people may have received in the waiting period may (partly) explain this finding. One may also argue that the relatively few treatment sessions (i.e., eight sessions) may (partly) account for the nonsignificant differences between conditions. For instance, "complicated grief treatment" consists of 16 sessions (Shear et al., 2005). However, previous research using a similar treatment protocol including eight sessions (van Denderen et al., 2018) yielded beneficial effects in comparison with waitlist controls. Moreover, a meta-analysis of 31 RCTs suggested that the number of treatment sessions for reducing grief is not related to outcomes (Johannsen et al., 2019). Based on that, it seems unlikely that the limited effects in our study were completely owing to the relatively low number of sessions.



The second possible explanation for the lack of differences between conditions in symptom reductions is that our study included a relatively small number of participants, which may have prevented us from detecting differences between groups. In general, small-to-moderate treatment effects have been found on grief, depression, and PTSD levels in previous research (Johannsen et al., 2019). A potentially superior effect of the intervention compared with waiting is suggested by the fact that we found significant *within-group* reductions from pre- to posttreatment for PCBD, depression, and PTSD, whereas we did not find significant *within-group* reductions in depression and PTSD in waiting list controls pre-to-post waiting.

A second main finding was that when combining pretreatment data (T0 and T0.1) from the immediate treatment and waitlist group, CT + EMDR seemed to coincide with both statistically and clinically significant improvements in PCBD, depression, and PTSD levels. Moreover, these effects were stable at 12-week and 24-week follow-ups. This indicates that, irrespective of the extent to which symptom reduction was owing to the treatment, it was maintained after the treatment. A third main finding was that symptom reduction was related to reductions in negative cognitions about oneself and depressive avoidance. These findings are broadly in accord with cognitive-behavioral models suggesting that emotional distress following loss is associated with cognitive-behavioral variables and that changing these variables is an effective means to reduce distress (Boelen et al., 2006). A sense of unrealness was not significantly related to symptom reductions. A previous study showed that this sense of unrealness distinguished best between bereaved people with and without complaints after the MH17 disaster (Lenferink, de Keijser, Smid, Djelantik, & Boelen, 2017). In theoretical and empirical work, this factor has been described as one of the key processes maintaining grief reactions. It has been argued that a stronger sense of unrealness reflects poorer integration of the losses in autobiographical knowledge (Boelen, 2010, 2017; Boelen et al., 2006). The lack of associations we found between this factor and symptom levels may (partly) explain the lack of significant treatment effects for PCBD and PTSD in this RCT.

Several limitations of this study should be considered. As mentioned earlier, this study suffered from a small sample size of 39 participants and, therefore, lacks sufficient statistical power that was needed to test our hypotheses. As reported in our study-protocol (Lenferink, Piersma, et al., 2017), at least 158 were needed to detect a medium effect size difference between the two conditions. Furthermore, an outreach recruitment method was applied, in which we actively offered treatment to people with clinically relevant distress levels, instead of including people who requested treatment by themselves. The latter has been related to better treatment outcomes for bereaved people (Schut & Stroebe, 2005; Schut, Stroebe, van den Bout, & Terheggen, 2001). Our design precluded examining the additional effect of EMDR to CT in treating distress among disaster-bereaved people. Comparing CT only to CT + EMDR could enhance our understanding of the potential effectiveness of adopting EMDR to reduce traumatic memories in bereaved people. In line with previous research questioning the effectiveness of EMDR for treating disorders other than PTSD (Cuijpers, van Veen, Sijbrandij, Yoder, & Cristea, 2020), research evidence supporting the effectiveness of EMDR for treating PCBD is needed to justify its application in clinical practice. In

addition, we tailored the treatment protocol to the study population and applied EMDR and CT in different session, using different protocols. Cognitions were addressed in EMDR session to some extent, in accord with EMDR protocols. However, in the EMDR sessions the focus was on desensitizing negative and sensitizing positive cognitions, connected with specific memories, whereas the CT sessions focused on systematically identifying, challenging and changing different cognitions (not only those connected with specific memories). Our findings may therefore not generalize to studies using different treatment protocols. Another limitation is concerned with the fact that we examined changes in grief levels at a microlevel by assessing grief levels at each treatment session; because we did not examine weekly grief levels in waitlist controls, we cannot rule out that the observed changes reflect natural remission over time. Lastly, self-report data were used to examine participants' symptom levels, instead of clinical interviews. Symptom levels in our sample may therefore be overestimated (Griffin, Uhlmansiek, Resick, & Mechanic, 2004; Lim et al., 2018).

Notwithstanding these limitations, this is one of the first studies that examined treatment effects in people with clinically relevant PCBD, depression, and/or PTSD levels after a sudden/violent loss. Because the participants in this study were all bereaved at the same time owing to the same event, confounding effects of characteristics of the loss that have shown to be related to symptom levels post loss (e.g., time since loss and type of loss) were ruled out. Although CT + EMDR coincided with (a) reductions in PCBD, depression, and PTSD levels from prior to treatment to 1 week, 12 weeks, and 24 weeks after treatment, and (b) these reductions in symptom levels were related to reductions in negative cognitions and avoidance behaviors, decreases in PCBD and PTSD did not differ significantly between the intervention group and waitlist controls. More research with larger sample sizes is needed to further examine the potential effectiveness of CT + EMDR in reducing emotional distress following sudden/violent deaths of a significant other.

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