

Online cognitive behavioral therapy for prolonged grief after traumatic loss: a randomized waitlist-controlled trial

L.I.M. Lenferink, M.C. Eisma, M.Y. Buiters, J. de Keijser & P.A. Boelen

To cite this article: L.I.M. Lenferink, M.C. Eisma, M.Y. Buiters, J. de Keijser & P.A. Boelen (2023) Online cognitive behavioral therapy for prolonged grief after traumatic loss: a randomized waitlist-controlled trial, *Cognitive Behaviour Therapy*, 52:5, 508-522, DOI: [10.1080/16506073.2023.2225744](https://doi.org/10.1080/16506073.2023.2225744)

To link to this article: <https://doi.org/10.1080/16506073.2023.2225744>



© 2023 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group.



[View supplementary material](#)



Published online: 21 Jun 2023.



[Submit your article to this journal](#)



Article views: 1884



[View related articles](#)



[View Crossmark data](#)



Online cognitive behavioral therapy for prolonged grief after traumatic loss: a randomized waitlist-controlled trial

L.I.M. Lenferink ^{a,b,c}, M.C. Eisma ^a, M.Y. Buiters^a, J. de Keijser ^a and P.A. Boelen ^{b,d,e}

^aDepartment of Clinical Psychology and Experimental Psychopathology, Faculty of Behavioral and Social Sciences, University of Groningen, Grote Kruisstraat 2/1, Groningen 9712, The Netherlands; ^bDepartment of Clinical Psychology, Faculty of Social Sciences, Utrecht University, P.O. Box 80140, Utrecht 3508, The Netherlands; ^cDepartment of Psychology, Health, & Technology, Faculty of Behavioural, Management, and Social Sciences, University of Twente, Drienerlolaan 5, Enschede 7522, The Netherlands; ^dARQ National Psychotrauma Centre, Nienoord 5, Diemen 1112, The Netherlands; ^eFoundation Centrum '45, Nienoord 5, Diemen 1112, The Netherlands

ABSTRACT

Prolonged grief disorder, a condition characterized by severe, persistent, and disabling grief, is newly included in ICD-11 and DSM-5-TR. Prolonged grief symptoms can be effectively treated with face-to-face or internet-delivered cognitive behavioral therapy. Traumatic losses may elicit higher prevalence of severe grief reactions. While face-to-face cognitive behavioral therapy appears efficacious in treating prolonged grief symptoms in traumatically bereaved individuals, it is not yet clear if internet-based cognitive behavioral therapy is efficacious for this population. Therefore, we investigated the efficacy of a 12-week internet-delivered cognitive behavioral therapy for people bereaved through traffic accidents in a randomized waitlist-controlled trial (registration number: NL7497, Dutch Trial Register). Forty adults bereaved through a traffic accident were randomized to internet-based cognitive behavioral therapy ($n = 19$) or a waitlist control condition ($n = 21$). Prolonged grief, post-traumatic stress, and depression symptoms were assessed at baseline, post-treatment, and 8-week follow-up. Dropout in the treatment condition was relatively high (42%) compared to the control condition (19%). Nevertheless, multilevel analyses showed that internet-based cognitive behavioral therapy strongly reduced prolonged grief, post-traumatic stress, and depression symptoms relative to the control condition at post-treatment and follow-up. We conclude that internet-based cognitive behavioral therapy appears a promising treatment for traumatically bereaved adults.

ARTICLE HISTORY

Received 27 February 2023
Accepted 7 June 2023


KEYWORDS

Grief; PGD; bereavement; treatment; therapy

The death of a loved one is a potentially traumatic event that increases the risk for development a severe grief reactions that disrupt daily functioning, termed prolonged grief. Diagnoses characterized by prolonged grief have recently been included in the

CONTACT L.I.M. Lenferink  l.i.m.lenferink@utwente.nl  Department of Clinical Psychology and Experimental Psychopathology, Faculty of Behavioral and Social Sciences, University of Groningen, Grote Kruisstraat 2/1, Groningen 9712, The Netherlands

This article has been corrected with minor changes. These changes do not impact the academic content of the article.

 Supplemental data for this article can be accessed online at <https://doi.org/10.1080/16506073.2023.2225744>

© 2023 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group.

This is an Open Access article distributed under the terms of the Creative Commons Attribution-NonCommercial-NoDerivatives License (<http://creativecommons.org/licenses/by-nc-nd/4.0/>), which permits non-commercial re-use, distribution, and reproduction in any medium, provided the original work is properly cited, and is not altered, transformed, or built upon in any way. The terms on which this article has been published allow the posting of the Accepted Manuscript in a repository by the author(s) or with their consent.

International Classification of Diseases (ICD-11) (World Health Organization, 2018) and the text revision of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5-TR) (American Psychiatric Association, 2022). PGD is characterized by separation distress and reactive distress. Prolonged grief symptoms have been shown to often co-occur with, yet are distinct from other mental health problems, such as PTSD and depression (Boelen et al., 2010; Eisma et al., 2019; Heeke et al., 2022; Komischke-Konnerup et al., 2021; Lenferink et al., 2017; Lenferink, van den Munckhof, et al., 2021; O'Connor et al., 2010). While about 1 in 10 people is estimated to develop PGD following natural deaths (Lundorff et al., 2017), 1 in 2 is estimated to develop this condition following unnatural deaths, such as traffic accidents, murder, and suicides (Djelantik et al., 2020). Reviews have shown that prolonged grief symptoms and related mental health problems can be effectively treated with face-to-face psychotherapy (Johannsen et al., 2019) and that cognitive behavioral therapy (CBT) may be a particularly efficacious treatment for prolonged grief symptoms in bereaved adults (Doering & Eisma, 2016). CBT typically consists of creating a coherent, meaningful autobiographical narrative about the loss; challenging negative beliefs and catastrophic misinterpretations through cognitive restructuring; gradually confronting persons with avoided aspects of the loss (e.g. places, objects, memories) through exposure techniques; and helping people to set new life-goals and engage in new, meaningful activities to counter social withdrawal. Randomized controlled trials comparing CBT for prolonged grief against waitlist or active control conditions (e.g. supportive counselling) support the superior effect of CBT on reducing prolonged grief and related mental health problems among individuals bereaved due to natural and unnatural deaths (Boelen, Lenferink, et al., 2021; Boelen et al., 2007; Rosner et al., 2014; Shear et al., 2005; Shear et al., 2014).

Recently, evidence has begun to accumulate that interventions for prolonged grief can also be effectively administered via the internet (for a review, see Wagner et al., 2020). This is encouraging, because internet-based treatments may offer several advantages over face-to-face treatments, in terms of efficiency, cost-effectiveness and accessibility (e.g. in remote areas, for people with reduced mobility, during lockdowns) (Andersson & Titov, 2014; Wind et al., 2020). Research into online grief interventions started with a randomized controlled trial showing that email delivered therapeutic writing exercises based on cognitive-behavioral principles (versus a waitlist control) reduced post-traumatic stress, anxiety, and depression symptoms (Wagner et al., 2006). More recent trials have demonstrated that these writing exercises are effective in treating prolonged grief, post-traumatic stress, and depression symptoms in people who experienced losses due to a variety of causes, including cancer, child loss during pregnancy, and suicide (Kaiser et al., 2022; Kersting et al., 2013; Treml et al., 2021). Other randomized controlled trials have demonstrated that internet-delivered therapist-guided therapies with a limited focus on particular CBT components directly derived from face-to-face CBT (e.g. in-vivo exposure, goal setting, behavioral activation) also yielded promising effects on (prolonged) grief, post-traumatic stress, and depression symptoms in bereaved adults (Eisma et al., 2015; Litz et al., 2014).

Interestingly, few randomized controlled trials on internet-based therapy for prolonged grief have included participants bereaved due to unnatural losses and none have focused on treating mental health problems in people bereaved due to traffic accidents. This is surprising, given that traffic accidents are the most common type of unnatural death worldwide (World Health Organization, 2018). Moreover, just like other unnatural deaths,

accidental deaths are linked with increased risk of mental health problems (Lenferink, de Keijser, et al., 2021). Yet, it is still unclear if internet-based CBT successfully mitigates mental health problems in this vulnerable group.

Within the present study, we set out to fill this gap in knowledge, by evaluating the efficacy of a comprehensive internet-based CBT (containing all key components, i.e. exposure, cognitive restructuring, and behavioral activation) for adults bereaved due to traffic accidents experiencing elevated prolonged grief, post-traumatic stress or depression symptom levels. As stated in our study-protocol (Lenferink, de Keijser, Eisma, et al., 2020), our main hypotheses were that people bereaved due to a traffic accident would show stronger reductions in prolonged grief, post-traumatic stress, and depression levels following online CBT compared to a waitlist control condition.

Methods

Design

This study was part of the TrafVic project, examining correlates and treatment of emotional consequences of deaths in traffic accidents (Lenferink, Eisma, et al., 2022; Lenferink, de Keijser, et al., 2021; Lenferink, Nickerson, et al., 2022; Lenferink, van den Munckhof, et al., 2021). A two-arm (online CBT vs. waiting list) multicentre open-label parallel randomised controlled trial (RCT) was conducted throughout the Netherlands. People who met the inclusion criteria were randomly allocated to the immediate intervention condition or waitlist condition using block randomization. This method is used to ensure a balance in sample size across groups. Randomization was performed by a blinded independent researcher using a random number generator with a 1:1 allocation ratio. Participants in the intervention condition started treatment within 1 week after allocation. People allocated to the waitlist condition started treatment after a 20-week waiting period. All participants were asked to complete questionnaires online, before treatment (T1), immediately after treatment or a 12-week waiting-period (T2), and at 8 weeks post-treatment or after a 20-week waiting-period (T3). People in the waitlist condition completed two additional questionnaires, immediately after treatment (T4) and at 8-week follow-up (T5) (see Figure 1). Data from T1 through T3 were analyzed in this study.

Procedures

The participants had to meet the following inclusion criteria: (1) being a family member, spouse, or a friend of a person who died due to a traffic accident at least 1 year previously; (2) being at least 18 years old; and (3) meeting the DSM-5 criteria for probable persistent complex bereavement disorder,¹ PTSD, and/or depression, based on self-report questionnaires (for details, see our study-protocol: Lenferink, de Keijser, Eisma, et al., 2020). Exclusion criteria included not having sufficient proficiency in the Dutch language or not having access to the internet. We offered the online surveys in Dutch, assuming that people who are not able to read Dutch or have no access to the internet, would not participate.

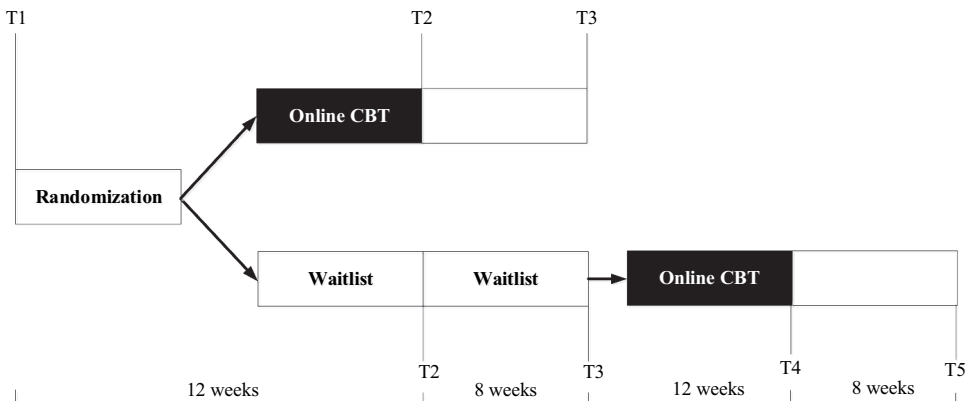


Figure 1. Design of RCT. CBT, cognitive behavioral therapy; T1, first timepoint; T2, second timepoint; T3, third timepoint; T4, fourth timepoint; T5, fifth timepoint.

Participants were recruited via several pathways. Inclusion for this trial started in May 2020 and lasted until April 2021. People who participated in a survey study (Lenferink, de Keijser, et al., 2021; Lenferink, Eisma, et al., 2022, Lenferink, Nickerson, et al., 2022) examining the psychological effects of losing a loved one after a traffic accident received an invitation email when they answered positively to the question: “In this study, we would like to offer psychological help to persons who experience emotional problems. May we approach you with more information about this offer, if your answers to this questionnaire show that you experience emotional problems?”. Moreover, members of a peer-support organization for people bereaved by a traffic accident received an invitation letter to participate. Additionally, we used online advertisements (Google Ads) to refer participants to a webpage that we launched for our project where people could sign up (www.rouwbehandeling.nl). Participation was free of costs for participants. Treatment costs, including the costs for the therapists, were covered by project funding. This study has been approved by the Medical Ethics Review Board of the University Medical Center Groningen (METc UMCG: M20.252121) and was pre-registered at the Dutch Trial Register (NL7497), and a study-protocol has been published (Lenferink, de Keijser, Eisma, et al., 2020).

Intervention

The individual online CBT consisted of eight sessions (i.e. online lessons), offered in a 12-week timeframe. The sessions were divided in three grief tasks, namely (1) facing the loss and the pain that comes with it; (2) keeping faith in yourself, others, life, and the future; and (3) doing helpful things. In the first session, psychoeducation was offered about possible emotional reactions after the death of a loved one in a traffic accident. It also included a rationale for the CBT interventions. Sessions 2–4 focused on exposure to stimuli associated with the loss. Participants were instructed to write a detailed account of the accident and to write down what they missed most now that their loved one was gone. In sessions 5 and 6, cognitive therapy was offered, including cognitive restructuring exercises. Sessions 7 and 8 were focused on encouraging the participants to (re-)engage in

social, recreational, and occupational activities that were important to them before the loss. Participants were instructed to start with session 1 and then move on to the next session after completing a session. While all sessions were accessible when entering the online platform, based on log information we confirmed that all participants followed the order of sessions as we intended. For a more detailed description of the treatment, see our study-protocol (Lenferink, de Keijser, Eisma et al., 2020).

Sessions were presented in a secured online platform called Therapieland. Therapists contacted participants twice a week via email messages; once to encourage participants to log in and complete assignments and once to provide feedback on assignments. Therapists were instructed to spend 30 minutes per week on reading assignments and providing feedback. All therapists received an online training about the treatment protocol and were offered supervision meetings by LL, MB, and PB upon request. Therapists were members of the traumatic grief network, i.e. an informal network of governmentally licensed therapists who are experienced in supporting traumatically bereaved people. Some of these therapists also participated in prior trials examining the effects of CBT treatments for bereavement-related psychopathology (Lenferink et al., 2019; Lenferink, de Keijser, Smid, et al., 2020; van Denderen et al., 2018).

Sample size

As reported in our study protocol (Lenferink, de Keijser, Eisma et al., 2020), a sample size of 55 was estimated to be sufficient to find a difference between two groups (online CBT vs. waitlist controls) of at least a medium effect size ($f = 0.25$; based on prior research (Currier et al., 2010; Eisma et al., 2015; van Denderen et al., 2018)) with a power of 80%, an α of 0.017. The alpha-level was corrected for multiple testing, i.e. $0.05/3$, as there are three outcome measures (prolonged grief, post-traumatic stress, and depression symptoms). This sample size calculation included an estimated drop-out rate of 19% (Currier et al., 2010).

Measures

Outcome measures

Prolonged grief symptoms were measured with the Traumatic Grief Inventory-Self Report plus (TGI-SR+) (Lenferink, Eisma, et al., 2022). The TGI-SR+ is an expanded version of the TGI-SR (Boelen & Smid, 2017; Boelen et al., 2019), consisting of 22 items. Eleven items are used to measure 10 DSM-5-TR prolonged grief symptoms (the highest answer option on one of the two items (one related to anger and the other to sadness) were used to capture the symptom “intense emotional pain (e.g. anger, bitterness, sorrow) related to the death”). All items referred to the past month and are answered on a 5-point Likert scale ranging from 1 (“never”) to 5 (“always”). An example of an item is: “I felt emotionally numb”. Prior research showed that internal consistency of the DSM-5-TR prolonged grief items was high ($\omega = .92$) and good temporal stability and strong convergent validity were demonstrated (Lenferink, Eisma, et al., 2022). Cronbach’s alpha in this sample was .75 at T1.

Post-traumatic stress symptoms were measured with the PTSD checklist for DSM-5 (PCL-5) (Blevins et al., 2015; Boeschoten et al., 2014). Participants rated

for each of the 20 symptoms how often they were bothered by each symptom in the past month (e.g. “In the past month, how much were you bothered by loss of interest in activities that you used to enjoy?”). Participants rated their answer on 5-point Likert scales (0 = not at all, 4 = extremely). The “stressful event” as referred to in the original instruction and items was replaced by “the death of your loved one(s) due to a traffic accident”. The PCL-5 has adequate psychometric properties, with a high internal consistency ($\alpha = .94$) and good convergent and discriminant validity (Morrison et al., 2021). In this study, Cronbach’s alpha was .89 at T1.

Depression symptom levels during the past week were assessed with the depression subscale of the Hospital Anxiety Depression Scale (HADS-D) (Zigmond & Snaith, 1983). The seven items (e.g. “I still enjoy the things I used to enjoy”) were rated on 4-point scores ranging from 0 (e.g. “Definitely as much”) through 3 (e.g. “Hardly at all”). The HADS-D has sound psychometric properties (Spinhoven et al., 1997). Cronbach’s alpha in this study was .83 at T1.

Other measures

Self-constructed questions were used to assess background and loss-related characteristics (i.e. gender, age, and educational level, kinship to the deceased, number of traffic accident losses, and time since loss). Participants were allowed to receive other forms of support during participation in the trial. We monitored use of other forms of support by using the following question: “During the past 12 weeks/8 weeks (for T2 and T3, respectively) did you receive additional psychological professional support from a psychologist, therapist or psychiatrist other than the (online) therapist from the TrafVic-study?” When someone dropped out from the study we asked via email or telephone what the reason for dropout was.

Statistical analyses

To test the main hypotheses, differences in reductions of prolonged grief, post-traumatic stress, and depression symptom levels from pre- to post-treatment/waiting period between the two conditions were examined by multi-level modelling using SPSS (IBM Corp, 2017). Models including random intercepts were built first in order to calculate the intraclass correlation. Subsequently, we added time as linear predictor (coded as 1 = T1, 2 = T2, and 3 = T3), followed by a model including time dummy-coded (using the baseline scores (i.e. T1 scores) as reference category). The model with the best statistical fit (in terms of lowest Akaike information criterion value) was retained. Lastly, condition and time*condition effects were included in the model. Deviance tests were used to examine whether including interaction effects improved model fit (compared with a model including main effects only). As recommended by others (Snijders & Bosker, 2012), models with the smallest numbers of parameters for the random parts were preferred and random slopes were therefore not included in the models in case these were not significant. Following prior research, Cohen’s *d* effect sizes were calculated by dividing the unstandardized beta coefficient of the interaction-term by the pooled standard deviation of the T1 score (cf. Boelen, Lenferink, & Spuij, 2021; Bryant et al., 2014).

Three separate models were built, with prolonged grief, post-traumatic stress, and depression symptoms, respectively, included as dependent variables. Condition (coded as 0 = waitlist and 1 = online CBT), time, and time*condition (interaction term) were included as predictor variables, taking into account that repeated observations (level 1) are nested within individuals (level 2). If people in the two conditions differed in terms of sociodemographic and loss-related variables and use of co-interventions (yes/no) during participation in our study, these variables were included as covariates. People who completed less than seven (of eight) sessions were considered non-completers. Possible differences between completers and non-completers at T2 and T3 in terms of background- and loss-related characteristics and psychopathology levels at T1 were examined using chi-square tests (for dichotomous variables) and *t*-tests (for continuous variables). Same analyses were run to test for differences in background- and loss-related characteristics and psychopathology levels at T1 between people who were allocated to online CBT versus waitlist. Maximum likelihood functioning was used for handling missing data. Intention-to-treat analyses were utilized.

Results

Sample characteristics

See Figure 2 for a participant flowchart. In total, 66 people signed up for the study and completed T1, 26 of them were not eligible for study participation. Forty people were randomized; 19 were allocated to the online CBT condition and 21 to the waitlist control condition. Twenty-five people (63%) were recruited via participation in prior survey studies from our research group, 5 (13%) via invitation letter from Victim Support, 5 (13%) via membership of peer-support organization, 2 (5%) via social media, and 1 (3%) via referral of a family member or friend. See Table 1 for sample characteristics and group

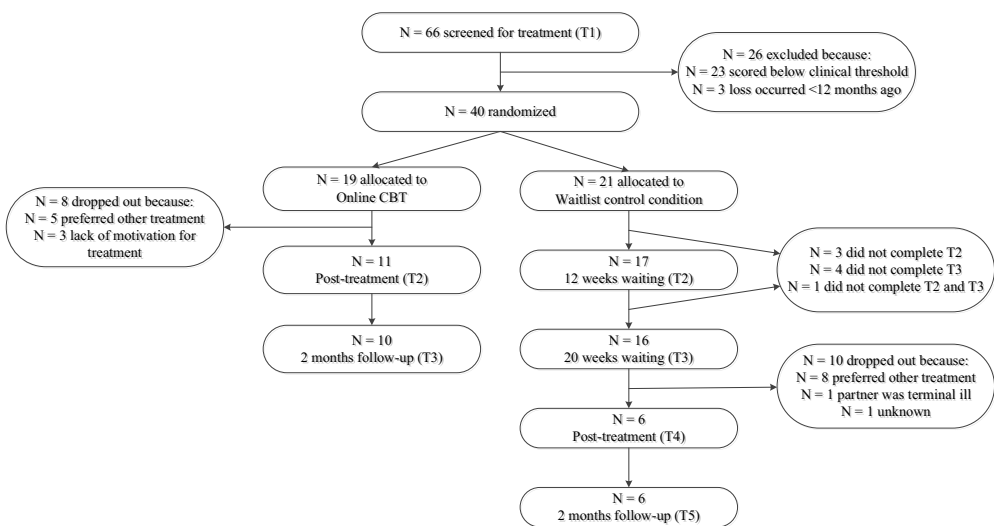


Figure 2. Flowchart.

Table 1. Sample characteristics at T1 ($N = 40$).

Characteristic	Total group	Treatment condition				Test	<i>p</i> -value
		Online CBT		Waitlist			
Sex, <i>n</i> (%)						$\chi^2(1, N = 40) = 0.30$.583
Male	10 (25)	4 (21)	6 (29)				
Female	30 (75)	15 (79)	15 (71)				
Age, <i>Mean</i> (<i>SD</i>)	52.75 (9.51)	52.32 (9.24)	53.14 (9.95)			$t(df = 38) = 0.27$.787
Education, <i>n</i> (%)						$\chi^2(1, N = 40) = 2.41$.121
Other than college/university	24 (60)	9 (47)	15 (71)				
College/university	16 (40)	10 (53)	6 (29)				
Time since loss in years, <i>Mean</i> (<i>SD</i>)	4.38 (6.18)	4.68 (4.85)	4.10 (7.29)			$t(df = 38) = -0.30$.768
Deceased is ^a , <i>n</i> (%)							
Child	25 (63)	11 (58)	14 (67)			$\chi^2(1, N = 40) = 3.03$.082
Partner	7 (18)	2 (11)	5 (24)				
Parent	4 (10)	3 (16)	1 (5)				
Sibling	3 (8)	2 (11)	1 (5)				
Other	1 (3)	1 (5)	0 (0)				
Multiple losses due to traffic accident, <i>n</i> (%)						$\chi^2(1, N = 40) = 0.26$.609
No	37 (93)	18 (95)	19 (91)				
Yes	3 (8)	1 (5)	2 (10)				
Symptom levels at T1, <i>Mean</i> (<i>SD</i>)							
Prolonged grief	38.15 (4.78)	37.37 (5.28)	38.86 (4.28)			$t(df = 38) = 0.98$.332
Post-traumatic stress	36.85 (13.23)	37.26 (13.30)	36.48 (13.49)			$t(df = 38) = -0.19$.854
Depression	10.83 (3.97)	10.47 (4.25)	11.14 (3.77)			$t(df = 38) = -0.53$.601

^aWe dichotomized this variable into loss of child/spouse vs. other close person, when testing for differences in frequencies between conditions.

comparisons. No significant differences were found between the two conditions in terms of background and loss-related characteristics and psychopathology levels at T1.

For people in the online CBT condition who completed T2 ($n = 11$), it took on average 58 days (range 35–89 days) to complete 100% of the treatment. For those who dropped out of the online CBT condition ($n = 8$), three people did not start the treatment, one person completed only session 1, one person only sessions 1 through 3, and two people sessions 1 through 5. When comparing completers to non-completers in terms of background and loss-related characteristics and psychopathology levels at T1, we also found no significant differences (see Supplementary Table S1).

Treatment outcomes

The models including dummy-coded time fitted better than models with time included as linear predictor (prolonged grief $\Delta AIC = 5.73$, post-traumatic stress $\Delta AIC = 9.99$, and depression $\Delta AIC = 4.47$). The models with dummy-coded time were therefore retained. Random slopes were non-significant and were not included in our models.

For prolonged grief symptoms, when we entered the interaction effects (i.e. time*condition) the model fit significantly improved compared with the model including only main effects for time and condition ($\Delta\chi^2(2) = 18.25$, $p < .001$). Both interaction terms were significant and showed large effects (T1 versus T2 $d = -1.26$; T1 versus T3 $d = -1.18$), indicating that people in the treatment condition showed a stronger decline in prolonged grief symptom levels than people who waited for treatment. See Table 2 for outcomes. See Supplementary Table S2 for observed means and SDs for T1, T2, and T3.

Table 2. Estimates for prolonged grief, post-traumatic stress, and depression symptoms for intention-to-treat sample ($N = 40$).

	Prolonged grief			Post-traumatic stress			Depression		
	<i>B</i>	<i>SE</i>	<i>p</i> -Value	<i>B</i>	<i>SE</i>	<i>p</i> -Value	<i>B</i>	<i>SE</i>	<i>p</i> -Value
Intercept	38.86	1.16	<.001	36.48	2.90	<.001	11.14	0.87	<.001
T1 vs. T2	-2.69	0.93	.005	-4.17	2.06	.048	-0.61	0.61	.321
T2 vs. T3	-3.46	0.95	<.001	-2.75	2.11	.199	-0.74	0.62	.238
Condition	-1.49	1.68	.380	0.79	4.20	.852	-0.67	1.27	.601
T1 vs T2 * Condition	-6.01	1.47	<.001	-12.88	3.29	<.001	-5.01	0.96	<.001
T2 vs T3 * Condition	-5.64	1.52	<.001	-9.73	3.39	.006	-4.12	1.00	<.001

Condition was coded as 0 = waitlist and 1 = online CBT.

For post-traumatic stress symptoms, adding interaction effects (i.e. time*condition) significantly improved model fit compared with the model including only main effects for time and condition ($\Delta\chi^2(2) = 15.12, p < .001$). Both interaction terms were significant. A large effect size was found for T1 versus T2 ($d = -0.97$), and a moderate effect size was found for T1 versus T3 ($d = -0.74$). This indicates that people in the treatment condition showed a stronger decline in PTSD levels compared with waitlist controls.

For depression symptoms, again the interaction effects (i.e. time*condition) significantly improved model fit compared with the model including main effects for time and condition only ($\Delta\chi^2(2) = 24.90, p < .001$). The interaction terms were significant and showed large effects (T1 versus T2 $d = -1.26$; T1 versus T3 $d = -1.04$), meaning that people in the treatment condition reported a stronger decline in depression levels than people who waited for treatment.

In the waitlist control condition, 6 of 17 people (35%) received treatment from a psychologist, therapist or psychiatrist between T1 and T2 and 8 people (50%) did so between T2 and T3. In the treatment condition, one person (9%) received treatment in addition to online CBT and also continued treatment between T2 and T3. Usage of (co-) intervention between T1 and T3 was included in additional models as covariate. This did not change the effects meaningfully; the significant interaction terms were still significant.

Discussion

The aim of the present study was to investigate the efficacy of internet-based CBT for traffic accident bereaved adults with clinically relevant symptom levels of prolonged grief, post-traumatic stress, and/or depression. Our RCT demonstrated that internet-based CBT led to significant, predominantly large effects on prolonged grief, post-traumatic stress and depression symptoms at post-treatment and 8-week follow-up relative to being on a waitlist. Our findings suggest that internet-based CBT is a promising intervention to treat common mental health problems experienced by this vulnerable bereaved population. However, a relatively high dropout rate is notable, and retention of clients remains an important challenge to further investigation and eventual implementation.

Our findings align with prior RCTs demonstrating that therapist-guided writing exercises based on cognitive behavioral principles and treatments applying adapting face-to-face CBT components in online formats ameliorate post-loss psychopathology (e.g.

Eisma et al., 2015; Kersting et al., 2013; Litz et al., 2014; Wagner et al., 2006). Additionally, results add to a small evidence base of RCTs demonstrating that CBT delivered in face-to-face or online formats can help reduce post-loss mental health problems in people bereaved due to unnatural causes (Lenferink et al., 2019; Lenferink, de Keijser, Smid, et al., 2020; Trembl et al., 2021; van Denderen et al., 2018). To our knowledge, this is the first trial to demonstrate that people bereaved due to traffic accidents can benefit from internet-based CBT. Moreover, results suggest that internet-based CBT could be an alternative to face-to-face grief therapy, as well as a viable treatment option for distressed bereaved people with mobility issues, who live remotely, or are subject to pandemic lockdowns (Andersson & Titov, 2014; Boelen, Eisma, et al., 2021; Eisma et al., 2020; Reitsma et al., 2021; Wind et al., 2020). Another interesting feature of the present study is that it has tested the delivery of a CBT containing all key components (i.e. exposure, cognitive restructuring, and behavioral activation) to bereaved adults via an online platform, while prior web-based grief-specific CBT-based trials mainly relied on some, but not all of these elements (cf. Eisma et al., 2015; Kersting et al., 2013; Wagner et al., 2006, but see; Reitsma et al., 2023). Our study thereby adds to growing evidence that CBT delivered via multiple modalities, including email, online platforms, and apps, or a combination, can be effective ways to reduce prolonged grief and related mental health problems (Eisma et al., 2015; Eklund et al., 2022; Litz et al., 2014; Reitsma et al., 2023; Wagner et al., 2006).

Two points of concern are difficulties in recruitment and the relatively high dropout in the treatment condition. There are multiple plausible explanations for difficulties in recruitment. First, we recruited participants during the COVID-19 pandemic. Possibly, people were too preoccupied with adapting to the new situation that emerged during the pandemic to seek therapy for their mental health problems. Second, the number of traffic deaths in the Netherlands, at 600–700 people per year, is comparatively low. The total population of people bereaved due to traffic accidents in the Netherlands is small, this limited opportunities to recruit eligible participants in our language area. Deaths due to traffic accidents are much more common in other parts of the world, including Africa, the Middle-East and South-East Asia. It could be worthwhile to adapt and evaluate the current treatment for application in these countries. Third, prior survey research on treatment preferences of people bereaved due to traffic accidents, showed that only two out of five people with elevated prolonged grief symptom levels would be inclined to use online therapy if it was offered (Lenferink, Keijser, et al., 2021). Given the promising effects of internet-based CBT, it appears important to improve the acceptability of this treatment, for instance through videos providing information on the effectiveness and advantages of online treatments (Ebert et al., 2015).

Regarding the high dropout rates, 12 out of 40 people (30%) dropped out at the 12 weeks post-baseline assessment of whom 8 out of 19 people (42%) dropped out in the online CBT condition during the treatment phase. These rates are similar to dropout rates found in prior studies evaluating web-based bereavement care, which showed that dropout rates ranged from 10% to 59% with higher dropout rates in treatment conditions than control groups (Wagner et al., 2020). An important finding from our study is that most people dropped out because they preferred another type of treatment. Unfortunately, no further information was gathered about what type of treatment was preferred. It could be that some

more complex CBT treatment elements are difficult to deliver online. For example, email-delivered behavioral activation has been shown to lead to relatively high dropout rates among bereaved adults, whereas exposure exercises yielded lower dropout rates (Eisma et al., 2015). It could also be that participants feel that face-to-face contact with a therapist is more appropriate when being treated for mental health problems that originate from a highly emotional event. However, this explanation is less plausible, since prior RCTs testing writing exercises with emailed therapist support for people who experienced suicide bereavement did not result in similarly high dropout rates (Trembl et al., 2021). Finding ways of improving retention in online grief treatments is an important goal for future research.

Limitations and recommendations for future research

Some limitations warrant mention. First, the difficulties in recruitment resulted in recruiting fewer than the planned number of participants affecting our statistical power. Replication of this study with a larger sample is therefore warranted. Second, female participants, people with higher education, and people who lost a child were overrepresented in our sample. This limited the generalizability of our findings to all bereaved people. Third, for pragmatic reasons, we used self-reported prolonged grief, post-traumatic stress, and depression levels, which may have resulted in overestimation of symptom levels (cf. Engelhard et al., 2007) and precluded the establishment of formal diagnoses. While no validated clinical diagnostic interviews are yet available for PGD per DSM-5-TR (O'Connor et al., 2020), we recommend the use of clinical diagnostic interviews to confirm the diagnostic status of participants in future treatment studies of online grief therapies.

Conclusion

Notwithstanding these limitations, the present RCT is the first to examine the efficacy of comprehensive internet-based CBT for prolonged grief, post-traumatic stress, and depression symptoms in adults bereaved through traffic accidents. While independent replication of present findings in larger and more diverse samples is indicated, our findings support the potential of online CBT to ameliorate commonly experienced mental health problems after traumatic loss. Taken together with prior research, our work supports continued investigation into the application, effects, and implementation of internet-based treatments for distressed bereaved adults in needing professional support.

Note

1. At the time of inclusion of participants for this trial, the DSM-5-TR PGD criteria were not yet released. That is why the persistent complex bereavement disorder criteria as defined in DSM-5 were used as one of the inclusion criteria.




Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

Fonds Slachtofferhulp [Fund Victim Support] subsidized this work (grant number: not applicable).

ORCID

L.I.M. Lenferink  <https://orcid.org/0000-0003-1329-6413>
 M.C. Eisma  <https://orcid.org/0000-0002-6109-2274>
 J. de Keijser  <https://orcid.org/0000-0003-1229-3042>
 P.A. Boelen  <https://orcid.org/0000-0003-4125-4739>

References

- American Psychiatric Association. (2022). *Diagnostic and statistical manual of mental disorders, text revision DSM-5-TR*. Amer Psychiatric Pub Inc.
- Andersson, G., & Titov, N. (2014). Advantages and limitations of internet-based interventions for common mental disorders. *World Psychiatry, 13*(1), 4–11. <https://doi.org/10.1002/wps.20083>
- 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>
- Boelen, P. A., de Keijser, J., van den Hout, M. A., & van den Bout, J. (2007). Treatment of complicated grief: A comparison between cognitive-behavioral therapy and supportive counseling. *Journal of Consulting & Clinical Psychology, 75*(2), 277–284. WorldCat.org. <https://doi.org/10.1037/0022-006X.75.2.277>
- Boelen, P. A., Djelantik, A. A. A. M. J., de Keijser, J., Lenferink, L. I. M., & Smid, G. E. (2019). Further validation of the Traumatic Grief Inventory-Self Report (TGI-SR): A measure of persistent complex bereavement disorder and prolonged grief disorder. *Death Studies, 43*(6), 351–364. <https://doi.org/10.1080/07481187.2018.1480546>
- Boelen, P. A., Eisma, M. C., Smid, G. E., de Keijser, J., & Lenferink, L. I. M. (2021). Remotely delivered cognitive behavior therapy for disturbed grief during the COVID-19 crisis: Challenges and opportunities. *Journal of Loss and Trauma, 26*(3), 1–9. <https://doi.org/10.1080/15325024.2020.1793547>
- Boelen, P. A., Lenferink, L., & Spuij, M. (2021). Cognitive behavioral therapy for prolonged grief in children and adolescents: A randomized clinical trial. *American Journal of Psychiatry, 178*(4), 294–304. <https://doi.org/10.1176/appi.ajp.2020.20050548>
- Boelen, P. A., & Smid, G. E. (2017). The Traumatic Grief Inventory Self-Report Version (TGI-SR): Introduction and preliminary psychometric evaluation. *Journal of Loss and Trauma, 22*(3), 196–212. <https://doi.org/10.1080/15325024.2017.1284488>
- Boelen, P. A., van de Schoot, R., van den Hout, M. A., de Keijser, J., & van den Bout, J. (2010). Prolonged grief disorder, depression, and posttraumatic stress disorder are distinguishable syndromes. *Journal of Affective Disorders, 125*(1–3), 374–378. <https://doi.org/10.1016/j.jad.2010.01.076>
- Boeschoten, M. A., Bakker, A., Jongedijk, R. A., & Olf, M. (2014). *PTSS checklist voor de DSM-5 (PCL-5)*. Arq Nationaal Psychotrauma Centrum.
- Bryant, R. A., Kenny, L., Joscelyne, A., Rawson, N., Maccullum, F., Cahill, C., Hopwood, S., Aderka, I., & Nickerson, A. (2014). Treating prolonged grief disorder: A randomized clinical

- trial. *JAMA Psychiatry*, 71(12), 1332–1339. WorldCat.org. <https://doi.org/10.1001/jamapsychiatry.2014.1600>.
- Currier, J. M., Holland, J. M., & Neimeyer, R. A. (2010). Do CBT-Based interventions alleviate distress following bereavement? A review of the current evidence. *International Journal of Cognitive Therapy*, 3(1), 77–93. <https://doi.org/10.1521/ijct.2010.3.1.77>
- Djelantik, A. A. A. M. J., Smid, G. E., Mroz, A., Kleber, R. J., & Boelen, P. A. (2020). The prevalence of prolonged grief disorder in bereaved individuals following unnatural losses: Systematic review and meta regression analysis. *Journal of Affective Disorders*, 265, 146–156. <https://doi.org/10.1016/j.jad.2020.01.034>
- Doering, B. K., & Eisma, M. C. (2016). Treatment for complicated grief: State of the science and ways forward. *Current Opinion in Psychiatry*, 29(5), 286–291. <https://doi.org/10.1097/YCO.0000000000000263>
- Ebert, D. D., Berking, M., Cuijpers, P., Lehr, D., Pörtner, M., & Baumeister, H. (2015). Increasing the acceptance of internet-based mental health interventions in primary care patients with depressive symptoms. A randomized controlled trial. *Journal of Affective Disorders*, 176, 9–17. <https://doi.org/10.1016/j.jad.2015.01.056>
- Eisma, M. C., Boelen, P. A., & Lenferink, L. I. M. (2020). Prolonged grief disorder following the Coronavirus (COVID-19) pandemic. *Psychiatry Research*, 288, 113031. <https://doi.org/10.1016/j.psychres.2020.113031>
- Eisma, M. C., Boelen, P. A., van den Bout, J., Stroebe, W., Schut, H. A. W., Lancee, J., & Stroebe, M. S. (2015). Internet-based exposure and behavioral activation for complicated grief and rumination: A randomized controlled trial. *Behavior Therapy*, 46(6), 729–748. <https://doi.org/10.1016/j.beth.2015.05.007>
- Eisma, M. C., Lenferink, L. I. M., Chow, A. Y. M., Chan, C. L. W., & Li, J. (2019). Complicated grief and post-traumatic stress symptom profiles in bereaved earthquake survivors: A latent class analysis. *European Journal of Psychotraumatology*, 10(1), 1558707. <https://doi.org/10.1080/20008198.2018.1558707>
- Eklund, R., Eisma, M. C., Boelen, P. A., Arnberg, F. K., & Sveen, J. (2022). My grief app for prolonged grief in bereaved parents: A pilot study. *Frontiers in Psychiatry*, 13, 13. <https://doi.org/10.3389/fpsy.2022.872314>
- Engelhard, I. M., Arntz, A., & Van den Hout, M. A. (2007). Low specificity of symptoms on the post-traumatic stress disorder (PTSD) symptom scale: A comparison of individuals with PTSD, individuals with other anxiety disorders and individuals without psychopathology. *British Journal of Clinical Psychology*, 46(4), 449–456. <https://doi.org/10.1348/014466507X206883>
- Heeke, C., Franzen, M., Hofmann, H., Knaevelsrud, C., & Lenferink, L. I. M. (2022). A latent class analysis on symptoms of prolonged grief, post-traumatic stress, and depression following the loss of a loved one. *Frontiers in Psychiatry*, 13, 13. <https://doi.org/10.3389/fpsy.2022.878773>
- IBM Corp. (2017). *IBM SPSS statistics for windows, version 28.0*.
- Johannsen, M., Damholdt, M. F., Zachariae, R., Lundorff, M., Farver-Vestergaard, I., & O'Connor, M. (2019). Psychological interventions for grief in adults: A systematic review and meta-analysis of randomized controlled trials. *Journal of Affective Disorders*, 253, 69–86. WorldCat.org. <https://doi.org/10.1016/j.jad.2019.04.065>
- Kaiser, J., Nagl, M., Hoffmann, R., Linde, K., & Kersting, A. (2022). Therapist-assisted web-based intervention for prolonged grief disorder after cancer bereavement: Randomized controlled trial. *JMIR Mental Health*, 9(2), e27642. <https://doi.org/10.2196/27642>
- Kersting, A., Dölemeyer, R., Steinig, J., Walter, F., Kroker, K., Baust, K., & Wagner, B. (2013). Brief Internet-based intervention reduces posttraumatic stress and prolonged grief in parents after the loss of a child during pregnancy: A randomized controlled trial. *Psychotherapy and Psychosomatics*, 82(6), 372–381. <https://doi.org/10.1159/000348713>
- Komischke-Konnerup, K. B., Zachariae, R., Johannsen, M., Nielsen, L. D., & O'Connor, M. (2021). Co-occurrence of prolonged grief symptoms and symptoms of depression, anxiety, and post-traumatic stress in bereaved adults: A systematic review and meta-analysis. *Journal of Affective Disorders Reports*, 4, 100140. WorldCat.org. <https://doi.org/10.1016/j.jadr.2021.100140>

- Lenferink, L. I. M., de Keijser, J., Eisma, M. C., Smid, G. E., & Boelen, P. A. (2020). Online cognitive-behavioural therapy for traumatically bereaved people: Study protocol for a randomised waitlist-controlled trial. *British Medical Journal Open*, 10(9), e035050. <https://doi.org/10.1136/bmjopen-2019-035050>
- Lenferink, L. I. M., de Keijser, J., Eisma, M. C., Smid, G. E., & Boelen, P. A. (2021). Treatment gap in bereavement care: (Online) bereavement support needs and use after traumatic loss. *Clinical Psychology & Psychotherapy*, 28(4), 907–916. <https://doi.org/10.1002/cpp.2544>
- Lenferink, L. I. M., de Keijser, J., Smid, G. E., & Bdoelen, P. A. (2020). Cognitive therapy and EMDR for reducing psychopathology in bereaved people after the MH17 plane crash: Findings from a randomized controlled trial. *Traumatology*, 26(4), 427–437. <https://doi.org/10.1037/trm0000253>
- Lenferink, L. I. M., de Keijser, J., Smid, G. E., Djelantik, A. A. A. M. J., & Boelen, P. A. (2017). Prolonged grief, depression, and posttraumatic stress in disaster-bereaved individuals: Latent class analysis. *European Journal of Psychotraumatology*, 8(1), 1298311. <https://doi.org/10.1080/20008198.2017.1298311>
- Lenferink, L. I. M., de Keijser, J., Wessel, I., & Boelen, P. A. (2019). Cognitive behavioural therapy and mindfulness for relatives of missing persons: A pilot study. *Pilot and Feasibility Studies*, 5(1), 93. <https://doi.org/10.1186/s40814-019-0472-z>
- Lenferink, L. I. M., Eisma, M. C., Smid, G. E., de Keijser, J., & Boelen, P. A. (2022). Valid measurement of DSM-5 persistent complex bereavement disorder and DSM-5-TR and ICD-11 prolonged grief disorder: The Traumatic Grief Inventory-Self Report Plus (TGI-SR+). *Comprehensive Psychiatry*, 112, 152281. <https://doi.org/10.1016/j.comppsy.2021.152281>
- Lenferink, L. I. M., Nickerson, A., Kashyap, S., de Keijser, J., & Boelen, P. A. (2022). Associations of dimensions of anger with distress following traumatic bereavement. *Psychological Trauma: Theory, Research, Practice, & Policy*. <https://doi.org/10.1037/tra0001275>
- Lenferink, L. I. M., van den Munckhof, M. J. A., de Keijser, J., & Boelen, P. A. (2021). DSM-5-TR prolonged grief disorder and DSM-5 posttraumatic stress disorder are related, yet distinct: Confirmatory factor analyses in traumatically bereaved people. *European Journal of Psychotraumatology*, 12(1), 1–14. <https://doi.org/10.1080/20008198.2021.2000131>
- Litz, B. T., Schorr, Y., Delaney, E., Au, T., Papa, A., Fox, A. B., Morris, S., Nickerson, A., Block, S., & Prigerson, H. G. (2014). A randomized controlled trial of an internet-based therapist-assisted indicated preventive intervention for prolonged grief disorder. *Behaviour Research and Therapy*, 61, 23–34. <https://doi.org/10.1016/j.brat.2014.07.005>
- Lundorff, M., Holmgren, H., Zachariae, R., Farver-Vestergaard, I., & O'Connor, M. (2017). Prevalence of prolonged grief disorder in adult bereavement: A systematic review and meta-analysis. *Journal of Affective Disorders*, 212, 138–149. <https://doi.org/10.1016/j.jad.2017.01.030>
- Morrison, K., Su, S., Keck, M., & Beidel, D. C. (2021). Psychometric properties of the PCL-5 in a sample of first responders. *Journal of Anxiety Disorders*, 77, 102339. <https://doi.org/10.1016/j.janxdis.2020.102339>
- O'Connor, M., Larsen, L., Joensen, B. V., Boelen, P. A., Maccallum, F., Komischke-Konnerup, K., & Bryant, R. A. (2020). Valid ICD-11 PGD scales and structured clinical interviews needed. *Frontiers in Psychology*, 11. <https://doi.org/10.3389/fpsyg.2020.01120>
- O'Connor, M., Lasgaard, M., Shevlin, M., & Guldin, M.-B. (2010). A confirmatory factor analysis of combined models of the harvard trauma questionnaire and the inventory of complicated grief-revised: Are we measuring complicated grief or posttraumatic stress? *Journal of Anxiety Disorders*, 24(7), 672–679. <https://doi.org/10.1016/j.janxdis.2010.04.009>
- Reitsma, L., Boelen, P. A., de Keijser, J., & Lenferink, L. I. M. (2021). Online treatment of persistent complex bereavement disorder, posttraumatic stress disorder, and depression symptoms in people who lost loved ones during the COVID-19 pandemic: Study protocol for a randomized controlled trial and a controlled trial. *European Journal of Psychotraumatology*, 12(1), 1987687. <https://doi.org/10.1080/20008198.2021.1987687>
- Reitsma, L., Boelen, P. A., de Keijser, J., & Lenferink, L. I. M. (2023). Self-guided online treatment of disturbed grief, posttraumatic stress, and depression in adults bereaved during the

- COVID-19 pandemic: A randomized controlled trial. *Behaviour Research and Therapy*, 163, 104286. <https://doi.org/10.1016/j.brat.2023.104286>
- Rosner, R., Pfoh, G., Kotoučová, M., & Hagl, M. (2014). Efficacy of an outpatient treatment for prolonged grief disorder: A randomized controlled clinical trial. *Journal of Affective Disorders*, 167, 56–63. <https://doi.org/10.1016/j.jad.2014.05.035>
- Shear, K., Frank, E., Houck, P. R., & Reynolds, C. F. (2005). Treatment of complicated grief: A randomized controlled trial. *JAMA*, 293(21), 2601–2608. WorldCat.org. <https://doi.org/10.1001/jama.293.21.2601>
- Shear, M. K., Wang, Y., Skritskaya, N., Duan, N., Mauro, C., & Ghesquiere, A. (2014). Treatment of complicated grief in elderly persons: A randomized clinical trial. *JAMA Psychiatry*, 71(11), 1287–1295. <https://doi.org/10.1001/jamapsychiatry.2014.1242>
- Snijders, T. A. B., & Bosker, R. J. (2012). *Multilevel analysis: An introduction to basic and advanced multilevel modeling* (2nd ed.). Sage; WorldCat.org.
- Spinoven, P. H., Ormel, J., Sloekers, P. P. A., Kempen, G. I. J. M., SPECKENS, A. E. M., & HEMERT, A. M. V. (1997). A validation study of the Hospital Anxiety and Depression scale (HADS) in different groups of Dutch subjects. *Psychological Medicine*, 27(2), 363–370. <https://doi.org/10.1017/S0033291796004382>
- Treml, J., Nagl, M., Linde, K., Kündiger, C., Peterhänsel, C., & Kersting, A. (2021). Efficacy of an Internet-based cognitive-behavioural grief therapy for people bereaved by suicide: A randomized controlled trial. *European Journal of Psychotraumatology*, 12(1), 1926650. <https://doi.org/10.1080/20008198.2021.1926650>
- van Denderen, M., de Keijser, J., Stewart, R., & Boelen, P. A. (2018). Treating complicated grief and posttraumatic stress in homicidally bereaved individuals: A randomized controlled trial. *Clinical Psychology & Psychotherapy*, 25(4), 497–508. <https://doi.org/10.1002/cpp.2183>
- Wagner, B., Knaevelsrud, C., & Maercker, A. (2006). Internet-based cognitive-behavioral therapy for complicated grief: A randomized controlled trial. *Death Studies*, 30(5), 429–453. <https://doi.org/10.1080/07481180600614385>
- Wagner, B., Rosenberg, N., Hofmann, L., & Maass, U. (2020). Web-based bereavement care: A systematic review and meta-analysis. *Frontiers in Psychiatry*, 11, 11. <https://doi.org/10.3389/fpsy.2020.00525>
- Wind, T. R., Rijkeboer, M., Andersson, G., & Riper, H. (2020). The COVID-19 pandemic: The ‘black swan’ for mental health care and a turning point for e-health. *Internet Interventions*, 20, 100317. <https://doi.org/10.1016/j.invent.2020.100317>
- World Health Organization. (2018). *ICD-11 for Mortality and Morbidity Statistics: 6B42 Prolonged grief disorder*. <https://icd.who.int/browse11/l-m/en#/http://id.who.int/icd/entity/1183832314>
- Zigmond, A. S., & Snaith, R. P. (1983). The hospital anxiety and depression scale. *Acta Psychiatrica Scandinavica*, 67(6), 361–370. <https://doi.org/10.1111/j.1600-0447.1983.tb09716.x>