



Do prolonged grief disorder symptoms predict post-traumatic stress disorder symptoms following bereavement? A cross-lagged analysis

A.A.A. Manik J. Djelantik^{a,b,c,*}, Geert E. Smid^{b,c}, Rolf J. Kleber^{a,b}, Paul A. Boelen^{a,b}

^aDepartment of Clinical Psychology, Utrecht University, Utrecht, The Netherlands

^bArq Psychotrauma Expert Group, Diemen, The Netherlands

^cFoundation Centrum '45, Diemen, The Netherlands

Abstract

Background: Bereavement can precipitate different forms of psychopathology, including prolonged grief disorder (PGD) and posttraumatic stress disorder (PTSD) symptoms. How these symptoms influence each other is unclear. The aim of this study was to examine the temporal relationship of symptoms of PGD and PTSD following bereavement.

Methods: We included 204 individuals, confronted with the loss of a loved one within the past year, who completed self-report measures of PGD and PTSD and again completed these measures one year later. We conducted a cross-lagged analysis to explore cross-lagged and autoregressive relationships.

Results: A significant cross-lagged relationship was found between PGD symptoms at time point 1 (T1) and PTSD symptoms at time point 2 (T2) ($\beta - = 0.270$, $p < 0.001$). Furthermore, PGD symptoms at T1 predicted PGD symptoms at T2 and PTSD symptoms at predicted PTSD symptoms at T2 ($\beta - = 0.617$ and $\beta - = 0.458$, $ps < 0.001$, respectively). In addition, PGD and PTSD symptoms were significantly correlated on both time points.

Conclusions: We found that PGD symptoms predict PTSD symptoms after a loss. Potentially, this could help to design new strategies and interventions for bereaved individuals. Additionally, PGD symptom levels predicted PGD symptom levels one year later, independently of the PTSD levels. This finding adds to the accumulating evidence that PGD is a distinct disorder.

© 2017 Elsevier Inc. All rights reserved.

1. Introduction

Following the death of a loved one, symptoms of both grief and posttraumatic stress can develop in bereaved individuals. In most people these symptoms decrease over time. However, in others they remain and spiral into symptoms of Prolonged Grief Disorder (PGD) and/or Post Traumatic Stress Disorder (PTSD) [1,2]. Characteristic symptoms of PGD include frequent preoccupying thoughts and memories of the deceased person, a feeling of disbelief or inability to accept the loss, and difficulty imagining a meaningful future without the deceased person, to such an extent that the person is impaired in daily functioning during at least 6 months after the loss. A key distinctive feature of

PGD is “yearning for the deceased”, whereas “fear” is the hallmark symptom of PTSD [3,4]. PGD will likely be included in the forthcoming edition (11th) of the International Statistical Classification of Diseases and Related Health Problems [5,6]. Recently, Persistent Complex Bereavement Disorder (PCBD) has been included in the Diagnostic and Statistical Manual of Mental Disorders, 5th edition [7] as a condition requiring further research. Research has indicated that PGD and PCBD strongly overlap in terms of symptoms, prevalence, and health correlates [8].

In several studies the co-occurrence of symptoms of PGD and PTSD has been examined. In these studies subgroups of bereaved individuals emerged, some including people with pre-dominantly PGD symptoms and other including people with a combination of PGD and PTSD symptoms [2,9,10]. Little is known about whether and how symptoms of both disorders influence each other over time. In other words, are bereaved individuals with PTSD symptoms at risk of

* Corresponding author at: Department of Clinical Psychology, Utrecht University, PO Box 80140, 3508 TC Utrecht, The Netherlands.

E-mail address: a.a.a.m.j.djelantik@uu.nl (A.A.A.M.J. Djelantik).

developing PGD symptoms later in time, or are bereaved individuals with PGD symptoms at risk of developing PTSD symptoms later in time? Or are the two disorders so strongly related to each other that their symptoms tend to co-occur simultaneously in bereaved individuals over time?

PGD is characterized by separation distress and PTSD is characterized by traumatic distress, including intrusive memories and avoidance behaviors associated with the circumstances of the loss. Some have argued that PTSD symptoms could develop into PGD symptoms [11,12]. It seems a commonly accepted notion that the presence of PTSD symptomatology after loss may impair the processing of the loss itself, thereby maintaining grief symptoms. Indeed, it makes intuitive sense that, in case thoughts/memories of the loss elicit distressing images and fear, this may impair the processing of the implications and reality of the loss, which in turn will cause grief symptoms (i.e. separation distress) to persist.

Only one empirical study has yet tested this assumption [13]. Surprisingly, in that study a relationship opposite to the commonly accepted notion was found. Specifically, O'Connor and her colleagues [13] examined correlations between changes in severity of PGD and PTSD symptoms over 4 years following old age spousal bereavement. Their study showed linear decreasing PGD and PTSD symptoms over time. Furthermore, using lower level mediation analysis, changes in PGD were found to mediate 83% of the relationship between time and PTSD, whereas changes in PTSD only mediated 17% of the relationship between time and PGD. This suggests that changes in symptom levels of PGD mediated changes in PTSD severity to a greater extent than vice versa.

Knowledge about the temporal relationship between PGD and PTSD symptoms could inform attempts to refine treatment strategies for bereaved individuals with elevated psychopathology. For instance, if PGD symptoms would be found to predict PTSD symptoms, targeting PGD symptoms early after bereavement could help to curb the exacerbation of PTSD symptoms later on.

The present study sought to extend prior work on the temporal order of symptoms of PGD and PTSD using a cross-lagged panel path model. Using data from participants who completed questionnaires tapping PGD and PTSD within the first year after their loss and again one year later, we examined to what extent PGD and PTSD levels at time point 1 (T1) predicted PGD and PTSD levels at time point 2 (T2).

We hypothesized that we could replicate the findings of O'Connor et al. [13] and that we would find (1) a significant relationship between the symptom levels of PGD and PTSD on both time points and (2) a cross-lagged relationship between PGD and PTSD symptom levels over time, where the effects of PGD symptom levels at T1 on PTSD symptom levels at T2 would be stronger than the effects of PTSD symptoms levels at T1 on PGD symptoms levels at T2.

2. Methods

2.1. Participants and procedure

Data were collected in the context of two consecutive research programs on cognitive behavioral and memory processes in grief conducted at Utrecht University (in 2009–2011 and 2012–2016, respectively). The same recruitment methods and questionnaires were used in both research programs. Participants were recruited via announcements on websites providing information about grief. Research programs were approved by a local ethical review board and type-written informed consent was obtained from all participants. A total number of 408 people, who were bereaved maximally one year ago entered the studies. They were all invited to complete questionnaires again, one year after inclusion in the study. The current study was based on data from the 204 participants who did so (see¹). On average, the participants were 52.68 (SD = 14.44) years old. The sample included 165 (81%) women and 39 (19%) men. As for education, 99 (49%) individuals had been to college or university, the remaining 105 participants had followed education lower than college or university. The majority of the participants (118; 58%) had lost a spouse/partner; 14 (7%) had lost a child and 72 (35%) lost a loved one other than a spouse or a child (e.g., parent, sibling, or friend). On average, losses had occurred 4.49 (SD = 2.83) months earlier and were due to a natural cause in 182 (89%) of the cases and due to an unnatural cause (i.e., suicide, accident, homicide) in 22 (11%) cases.

2.2. Measures

2.2.1. Prolonged Grief Disorder Scale (PGD Scale)

The PGD scale is based on the Inventory of Complicated Grief [5]. It contains 11 items representing the criteria for PGD as per Prigerson et al. [5], a selection of which will be included in the forthcoming ICD-11 classification of PGD [8]. Accordingly, the scale includes one separation distress symptom, nine cognitive and emotional symptoms, and one functional impairment symptom. Participants rate how often symptoms occurred in the preceding month on a 5-point scale (1 = never, 5 = always). Prior research supported the internal consistency and concurrent validity of the measure [14]. In the current sample, Cronbach's α was 0.91 at T1 and 0.93 at T2.

2.2.2. PTSD symptom scale self-report version (PSS-SR)

The PSS-SR is a 17-item measure of PTSD symptoms as defined in DSM-IV [15,16]. Respondents rate the frequency of symptoms on a 4-point scale (0 = not at all, 4 = five or more times per week/almost always). The index event was

¹ The samples of the two subsequent data collections did not differ in terms of sociodemographic variables, except for age and gender. We therefore examined whether age and gender affected the results of our analyses when including these variables as covariates to all four sum scores in our analysis. This was not case.

defined as “the death of your loved one” (e.g., “How often did you have unpleasant dreams or nightmares about the death of your loved one?”). In this research, the Dutch version was used [17]. In the current sample, Cronbach’s α was 0.87 at T1 and 0.89 at T2.

2.3. Statistical analysis

Firstly, we examined differences in demographic characteristics (age, gender, and level of education) and variables related to the loss (cause of the loss, kinship, and time since loss) between the participants dropping out between T1 and T2 (henceforth referred to as dropouts) and those who continued to participate (referred to as completers). We examined the differences with *t*-tests or chi-square tests using SPSS (version 24; IBM Corp., Armonk, NY, USA). Additionally, we explored the mean scores on the measures of PGD and PTSD and the number of people meeting criteria for probable caseness of PGD and PTSD at both time points. A score of 4 or 5 on the “yearning-symptom”, a score of 4 or 5 on the “impairment in functioning” item, and a score of 4 or 5 on at least 5 of the 9 “cognitive, emotional, and behavioral symptoms” was used as the criterion for probable PGD caseness. Based on the scoring rule put forth by Brewin et al. [18] probable PTSD caseness (as per DSM-IV) was defined as a score of at least 2 (i.e. two to four times a week/half of the time) on at least one re-experiencing symptom, three avoidance symptoms, and two hyperarousal symptoms.

Subsequently, we constructed a cross-lagged panel path model in Mplus 7.3.1 [18]. In this model, we examined the relationships between the sum score of PGD and PTSD at T1 and the sum score of PGD and PTSD at T2. Because of our sample size, the number of parameters we could estimate was limited [19]. The 44 missing values (3% of the total number of values) in our dataset were handled using full information maximum likelihood (FIML) estimation.

In our cross-lagged panel path analysis autoregressive, correlated, and cross-lagged relationships were included in one single model [20]. The autoregressive relationships accounted for the stability over time for both the PGD sum score and the PTSD sum scores. Additionally, we included the correlations between the sum score of PGD and PTSD at T1 and T2, taking into account that the two constructs are moderately to strongly associated [2,9,21]. Hence, the cross-lagged effects can be interpreted as the predictive effects of (1) the sum scores of PGD at T1 on PTSD at T2 and (2) the sum scores of PTSD at T1 on PGD at T2. The model is depicted in Fig. 1.

The data collection of the first measurement took place in the first year after the loss. However, some participants filled in questionnaires only a few weeks to months after their loss, others filled in questionnaires almost 1 year after their loss. To evaluate whether time passed since loss influenced the results of our primary model, we ran a second model in which we included time since loss as a covariate to all four sum scores.

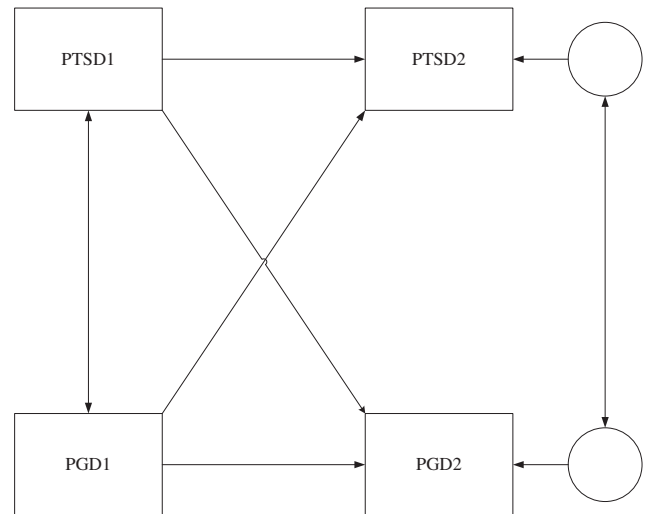


Fig. 1. The cross-lagged panel path model without the covariate time passed since loss. *Note.* PGD1 = Prolonged Grief Disorder sum score at time point 1, PGD2 = Prolonged Grief Disorder sum score at time point 2, PTSD1 = Post Traumatic Stress Disorder sum score at time point 1, PTSD2 = Post Traumatic Stress Disorder sum score at time point 2.

Both models were saturated models with zero degrees of freedom and a comparative fit index (CFI = 1) indicating perfect fit.

3. Results

3.1. Drop-out analyses and characteristics of PGD and PTSD

Results of the drop-out analyses are presented in Table 1. From the 408 participants at T1, 204 participated at T2 as well. These completers were more likely to have lost a partner than the dropouts. There were no statistically significant differences between the completers and the dropouts in terms of demographic characteristics (age, gender, and level of education) and the other loss-related variables at T1.

Both the mean scores of PGD and PTSD and the percentages of people meeting criteria for probable PGD and probable PTSD caseness declined from T1 to T2, see Table 2.

3.2. Predictive effects of PGD and PTSD symptoms over time

Table 3 summarizes results of the cross-lagged analysis. PGD symptoms at T1 significantly predicted PTSD symptoms at T2 ($\beta = 0.270$, $p < 0.001$). This indicates that for every one point increase of the PGD sum score at T1, the PTSD sum score at T2 will be 0.270 points higher on the standardized scale, when controlling for the other parameters in the model. PTSD symptoms at T1 did not predict PGD symptoms at T2 ($\beta = 0.120$, $p = 0.122$).

Table 1

Differences between the participants dropping out between T1 and T2 (dropouts) and those who continued to participate (completers).

	Dropouts (<i>n</i> = 204)	Completers (<i>n</i> = 204)	Significance tests for differences between the groups
Gender, <i>n</i> (%)			$\chi^2(1, N = 408) = 1.449$
Males	48 (24)	39 (19)	
Females	155 (76)	165 (81)	
Age, <i>M</i> (SD)	50.06 (14.09)	52.68 (14.44)	$t(406) = -1.849$
Education, <i>n</i> (%)			$\chi^2(1, N = 408) = 0.000$
College/university-level education	99 (49)	99 (49)	
Other education	105 (51)	105 (51)	
Violent cause, <i>n</i> (%)			$\chi^2(1, N = 408) = 0.026$
Yes	21 (10)	22 (11)	
No	183 (90)	182 (89)	
Kinship, <i>n</i> (%)			$\chi^2(2, N = 408) = 8.459^*$
Partner	89 (44)	118 (58)	
Child	16 (8)	14 (7)	
Other	99 (49)	72 (35)	
Time since the loss in months, <i>M</i> (SD)	4.49 (3.01)	4.49 (2.83)	$t(406) = -0.017$
Mean PGD total score, <i>M</i> (SD)	29.06 (8.91)	29.81 (9.37)	$t(389) = -0.446$
Mean PTSD total score, <i>M</i> (SD)	32.71 (10.56)	33.36 (8.97)	$t(353) = -0.623$

PGD = Prolonged Grief Disorder, PTSD = Post Traumatic Stress Disorder. SD = Standard Deviation.

* $p < 0.050$.** $p < 0.010$.*** $p < 0.001$.

As for the auto-regressive relationships, PGD symptom scores at T2 were significantly associated with PGD symptom scores at T1 ($\beta = 0.617, p < 0.001$). Similarly, PTSD scores at T2 were significantly associated with PTSD symptom scores at T1 ($\beta = 0.458, p < 0.001$).

PGD symptoms and PTSD symptoms were significantly correlated at both time points. At T1 there was a correlation of $\beta = 0.758, p < 0.001$. At T2 there was a correlation of $\beta = 0.733, p < 0.001$. The inclusion of the covariate time passed since loss had a small effect on all β but did not alter the number and type of the significant effects.

4. Discussion

4.1. Relationship of the findings with prior work

In this study, we sought to further our knowledge about the temporal relationships between PGD and PTSD symptoms. We found a significant relationship between symptom levels of PGD and PTSD on both time points and a cross-lagged relationship between PGD symptoms at T1 and

PTSD symptoms at T2. With regard to the interpretation of the values of the predictive relationships between PGD and PTSD our findings indicate that the sum score of PGD at T1 predicts both the sum scores of PGD and PTSD at T2, but the prediction for the sum score of PGD at T2 is stronger than for the sum score of PTSD at T2. The PTSD sum score at T1 only predicts the PTSD sum score at T2 and does not predict the PGD sum score at T2. This indicates that a higher score on PGD symptoms in the first year following bereavement is associated with a higher score on PTSD symptoms one year later, even when controlling for the stability of symptom levels of PGD and PTSD over time and correlations between symptom levels.

The temporal relationship between PGD symptoms and PTSD symptoms has been previously examined by O'Connor et al. [13]; that study relied on a different type of sample, included more than two time measurements, and used a different statistical approach. The fact that we have found the same temporal relationship between PGD and PTSD symptoms, although we took into account more relationships simultaneously, used different time lags and

Table 2

PGD and PTSD characteristics at both time points.

Characteristics	T1	T2
PGD sum score, <i>M</i> (SD)	29.81 (9.37)	24.41 (9.50)
Persons scoring above cut-off point PGD scale, <i>n</i> (%)	26 (13)	11 (5)
PTSD sum score, <i>M</i> (SD)	33.36 (8.97)	29.15 (8.07)
Persons scoring above cut-off point PTSD scale, <i>n</i> (%)	44 (22)	19 (9)

PGD = Prolonged Grief Disorder. PTSD = Post Traumatic Stress Disorder. SE = Standard Error. T1 = time point 1. T2 = time point 2.

Table 3
Standardized results of the model with and without covariate time passed since loss.

Parameters	Model without covariate β (SE)	Model with covariate β (SE)
Autoregressive effects		
PGD1 to PGD2	0.617 (0.071)***	0.597 (0.072)***
PTSD1 to PTSD2	0.458 (0.079)***	0.481 (0.078)***
Cross-lagged effects		
PGD1 to PTSD2	0.270 (0.081)**	0.597 (0.081)**
PTSD1 to PGD2	0.120 (0.078)	0.136 (0.078)
Correlations		
PTSD1 with PGD1	0.758 (0.031)***	0.763 (0.031)***
PTSD2 with PGD2	0.733 (0.035)***	0.729 (0.035)***

β = standardized regression coefficient. PGD1 = Prolonged Grief Disorder at time point 1. PGD2 = Prolonged Grief Disorder at time point 2. PTSD1 = Post Traumatic Stress Disorder at time point 1. PTSD2 = Post Traumatic Stress Disorder at time point. SE = Standard Error.

* $p < 0.05$.

** $p < 0.01$.

*** $p < 0.001$.

assessed it in a different sample, contributes to the evidence that PGD symptoms early after bereavement may contribute to the exacerbation and maintenance of PTSD symptoms over time.

Our second finding, namely that PGD symptoms are strongly associated with PGD scores at T2, independently of the sum score of PTSD symptoms one year later, lends support to the accumulating evidence that PGD and PTSD are different symptom constructs. This has been previously shown in several bereaved populations and already resulted in the proposed inclusion of a grief disorder in the DSM 5 and ICD-11 [2,22–24].

Lastly, adding the covariate time passed since loss did not alter the significant pathways. This suggests that symptoms experienced by participants, who filled in the first questionnaires early in the first year of bereavement, followed the same temporal path as symptoms experienced by participants, who filled in the first questionnaire at the end of the first year. These findings are reminiscent of findings from other studies showing that time since loss has a limited impact on psychopathology after loss [2,21].

4.2. Theoretical and clinical implications

Our finding that PGD symptoms predict PTSD symptoms after bereavement is contrary to the clinical notion that fear, stress and intrusive memories of the loss might impair the grieving process [11,12]. Therefore, we may need to re-examine our notions about the development of and relationship between PGD and PTSD symptoms in bereaved individuals. There are several possible explanations for why elevated PGD symptoms could contribute to PTSD symptomatology.

For example, in the cognitive behavioral theoretical framework of PGD three processes have been described to add to PGD symptomatology. These three processes are 1) anxious and depressive avoidance strategies in experiencing grief reactions, 2) negative global beliefs and misinterpre-

tations of grief reactions and 3) a poor integration of the memory of the loss in the autobiographical knowledge of the bereaved individual [25]. The outcome of these processes is elevated bereavement-related distress and fear of experiencing grief reactions. In this perspective, one could argue that the avoidance of reminders of the loss of the loved one could gradually develop in avoidance of reminders of the (traumatic) event of the loss. For instance, one could start with avoiding pictures of the deceased and this could in turn develop into avoiding pictures related to the event of the loss.

Another perspective is the stress sensitization theory. According to this theory, individuals who have experienced a major life event are more vulnerable for developing PTSD symptoms in response to subsequent stressful events [26–29]. Accordingly, bereaved individuals with elevated PGD symptoms could be considered to be prone to developing PTSD-like symptoms when confronted with subsequent stressors in the period after the loss of a loved one.

A further perspective is that one could argue that the death of a loved one influences the social support for the bereaved individual. In many studies social support is mentioned as an important resource available after the experience of a trauma and has been consistently associated with positive mental and physical health [30]. A note that has to be taken into account is that actual and perceived social support can be interpreted differently by the affected individual. For instance, when a person providing social support is being perceived as unresponsive, it could also have negative effects on the traumatized individual [31]. A bereaved individual may perceive a lack of social support for several reasons. First, logically, a loved one, an important resource which could be the one able to provide social support to the bereaved individual, has died and is therefore not available. Second, one could argue that other possible providers of social support, like family members or close friends, are mourning themselves and therefore less available to support the individual who is coping with PGD symptoms. Third,

characteristic symptoms of PGD include “feeling distant to others” and “difficulty trusting people”. Intuitively, these feelings influence the way social support is perceived by the bereaved individual. A lack of perceived social support could enhance the development of PTSD symptoms. This could therefore be a mechanism towards experiencing more PTSD symptoms after experiencing PGD symptoms in bereaved individuals.

Pending future studies replicating the current findings, our results may have clinical implications. In case of PGD symptoms leading to PTSD symptoms, it could mean that reductions in PGD symptoms in an early stage after the loss of a loved one may protect bereaved individuals from developing intense PTSD symptoms later on. This may guide the development of preventive interventions for bereaved individuals in the first year after bereavement. For example, counselling after bereavement could focus first on the acceptance of the loss before targeting the circumstances around the death. Furthermore, our results indicate that symptoms of psychopathology after loss are, to some extent, stable over time. This comprises presumptive evidence that individuals at risk for mental health problems could be identified early after bereavement and that PGD and PTSD symptoms are important to be assessed separately following a loss of a loved one.

4.3. Limitations

There are several limitations to the current study, which have to be considered. Firstly, this study has been carried out in a community-dwelling sample and included relatively many female widowers. Therefore, generalization can only be done with caution. Also, we did not add variables that could have influenced the temporal relationship between PGD and PTSD such as depression, other traumatic events, other losses, and use of psychosocial or medication treatment. The degree to which these and other variables moderate the association of symptoms of PGD and PTSD over time remains to be studied. A further limitation is that self-report questionnaires rather than clinical interviews were used to assess symptoms of PGD and PTSD. Thus, we were unable to examine true prevalence rates of full blown PGD and PTSD in our sample. Finally, because this study relied on a community sample, the degree of distress was relatively low. It would be interesting to further examine the relationship between PGD and PTSD in clinical samples.

5. Conclusions

Notwithstanding the limitations, this study suggests that PGD symptoms in the first year after a loss of loved one affect PTSD symptoms more strongly than vice versa. This might be beneficial in developing new strategies in the care of bereaved individuals. Potentially, targeting PGD symptoms in the first year after the loss, may prevent further psychopathology one year later. Furthermore, our findings

suggest that PGD symptom levels were able to predict PGD symptom levels a year later independently of the PTSD symptom levels. This finding lends support to the validation of PGD as a separate construct and the inclusion of PGD and PCBD in the ICD-11 and the DSM-5.

Author disclosure

The authors declare that they have no disclosures to report.

Role of funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Contributors

PB was responsible for the data-collection. MD was responsible for the design of the study, data-analysis, and interpretation of the data. PB, RK and GS supervised MD. MD wrote the drafts of the manuscript. All authors were involved in revising the draft versions critically and all authors approved the final version of the manuscript.

Acknowledgement

The authors thank all participating bereaved individuals for their co-operation. We also thank S.K.S. Kroes, MA, and E.L. Hamakers, PhD, for their help in the data-analysis.

Conflict of interest

The authors declare that they have no conflict of interest to report.

References

- [1] Lundorff M, Holmgren H, Zachariae R, Farver-Vestergaard I, O'Connor M. Prevalence of prolonged grief disorder in adult bereavement: a systematic review and meta-analysis. *J Affect Disord* 2017;212:138–49.
- [2] Djelantik AAAMJ, Smid GE, Kleber RJ, Boelen PA. Symptoms of prolonged grief, post-traumatic stress, and depression after loss in a Dutch community sample: a latent class analysis. *Psychiatry Res* 2017;247:276–81.
- [3] Maercker A, Znoj H. The younger sibling of PTSD: similarities and differences between complicated grief and posttraumatic stress disorder. *Psychotraumatol* 2010;1, <https://doi.org/10.3402/ejpt.v1i0.5558> [Epub 2010 Dec 6].
- [4] Shear MK. Clinical practice. Complicated grief. *Med* 2015;372:153–60.
- [5] Prigerson HG, Horowitz MJ, Jacobs SC, Parkes CM, Aslan M, Goodkin K, et al. Prolonged grief disorder: psychometric validation of

- criteria proposed for DSM-V and ICD-11. *PLoS Med* 2009;6: e1000121.
- [6] Maercker A, Brewin CR, Bryant RA, Cloitre M, van Ommeren M, Jones LM, et al. Diagnosis and classification of disorders specifically associated with stress: proposals for ICD-11. *World Psychiatry* 2013;12:198–206.
- [7] American Psychiatric Association. *Diagnostic and statistical manual of mental disorders*. 5th ed. Arlington, VA: American Psychiatric Publishing; 2013.
- [8] Maciejewski PK, Maercker A, Boelen PA, Prigerson HG. “Prolonged grief disorder” and “persistent complex bereavement disorder”, but not “complicated grief”, are one and the same diagnostic entity: an analysis of data from the Yale Bereavement Study. *World Psychiatry* 2016;15:266–75.
- [9] Nickerson A, Liddell BJ, Maccallum F, Steel Z, Silove D, Bryant RA. Posttraumatic stress disorder and prolonged grief in refugees exposed to trauma and loss. *BMC Psychiatry* 2014;14:106, <https://doi.org/10.1186/1471-244X-14-106>.
- [10] Lenferink LIM, de Keijser J, Smid GE, Djelantik AAAMJ, Boelen PA. Prolonged grief, depression, and posttraumatic stress in disaster-bereaved individuals: latent class analysis. *Psychotraumatol* 2017;8:1298311.
- [11] Nakajima S, Ito M, Shirai A, Konishi T. Complicated grief in those bereaved by violent death: the effects of post-traumatic stress disorder on complicated grief. *Dialogues Clin Neurosci* 2012;14:210–4.
- [12] Raphael B, Martinek N. Assessing traumatic bereavement and posttraumatic stress disorder. In: Wilson JP, & Keane TM, editors. *Assessing psychological trauma and PTSD*. New York: The Guilford Press; 1997. p. 373–96.
- [13] O’Connor M, Nickerson A, Aderka IM, Bryant RA. The temporal relationship between change in symptoms of prolonged grief and posttraumatic stress following old age spousal bereavement. *Depress Anxiety* 2015;32:335–40.
- [14] Boelen PA, Keijsers L, van den Hout MA. Peritraumatic dissociation after loss: latent structure and associations with psychopathology. *J Nerv Ment Dis* 2012;200:362–4.
- [15] American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*. 4th ed. Arlington, VA: American Psychiatric Publishing; 2000. rev text. ed.
- [16] Foa EB, Riggs DS, Dancu CV, Rothbaum BO. Reliability and validity of a brief instrument for assessing post-traumatic stress disorder. *J Trauma Stress* 1993;6:459–73.
- [17] Engelhard IM, Arntz A, van den Hout MA. 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. *Clin Psychol* 2007;46:449–56.
- [18] Muthén LK, Muthén BO. *Mplus User’s Guide*. 6th ed. Muthén & Muthén; 1998–2011 [Los Angeles, CA].
- [19] Jackson DL. Revisiting sample size and number of parameter estimates: some support for the N:q hypothesis. *Struct Equ Model Multidiscip J* 2003;10:128–41.
- [20] Geiser C. *Data analysis with Mplus*. Guilford Press; 2012.
- [21] Boelen PA, Reijntjes AHA, Djelantik AAAMJ, Smid GE. Prolonged grief and depression after unnatural loss: latent class analyses and cognitive correlates. *Psychiatry Res* 2016;240:358–63.
- [22] Boelen PA, van den Bout J. Complicated grief, depression, and anxiety as distinct postloss syndromes: a confirmatory factor analysis study. *Psychiatry* 2005;162:2175–7.
- [23] Lichtenthal W, Cruess D, Prigerson H. A case for establishing complicated grief as a distinct mental disorder in DSM-V. *Clin Psychol Rev* 2004;24:637–62.
- [24] Maercker A, Lalor J. Diagnostic and clinical considerations in prolonged grief disorder. *Dialogues Clin Neurosci* 2012;14: 167–76.
- [25] Boelen PA, Van Den Hout MA, Van Den Bout J. A cognitive-behavioral conceptualization of complicated grief. *Clin Psychol Sci Pract* 2006;13:109–28.
- [26] Antelman SM, Yehuda R. *Time-dependent change following acute stress: relevance to the chronic and delayed aspects of PTSD*. Washington, DC: American Psychiatric Press; 1994.
- [27] McFarlane AC. The long-term costs of traumatic stress: intertwined physical and psychological consequences. *World Psychiatry* 2010;9: 3–10.
- [28] Smid GE, van Zuiden M, Geuze E, Kavelaars A, Heijnen CJ, Vermetten E. Cytokine production as a putative biological mechanism underlying stress sensitization in high combat exposed soldiers. *Psychoneuroendocrinology* 2015;51:534–46.
- [29] Smid G, Kleber R, de la Rie S, Bos J, Gersons B, Boelen P. Brief Eclectic Psychotherapy for Traumatic Grief (BEP-TG): toward integrated treatment of symptoms related to traumatic loss. *Psychotraumatol* 2015;6:27324.
- [30] Maercker A, Horn AB. A socio-interpersonal perspective on PTSD: the case for environments and interpersonal processes. *Clin Psychol Psychother* 2013;20:465–81.
- [31] Schwarzer R, Knoll N. Functional roles of social support within the stress and coping process: a theoretical and empirical overview. *Psychol* 2007;42:243–52.