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SPECIAL ISSUE

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The influence of symptoms of prolonged grief disorder, depression, and anxiety on quality of life among bereaved adults

A prospective study

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Abstract *Objective* Research has shown that symptoms of Prolonged Grief Disorder (PGD, formerly called Complicated Grief) are distinct from those of depression and anxiety, and have incremental validity in that they predict impairments in functioning, independent of depression and anxiety. This study sought to replicate these findings using a prospective design, a heterogeneous sample of mourners, and the most recent criteria to define PGD. *Method* Data from 346 mourners who were bereaved between 6 months and 2 years and who were recruited from professional and lay mental health care workers and the Internet, were used in a confirmatory factor analysis to determine the distinctiveness of symptoms of PGD, depression, and anxiety. Regression analyses estimated the effects of symptoms of PGD, depression, and anxiety on quality of life and mental health 6 months (T2) and 15 months (T3) after baseline, in a subgroup of 96 mourners assessed at follow-up. *Results* PGD, depression, and anxiety represented three distinct factors. When we controlled the influence of relevant background variables but not the shared variance between the factors, all three factors predicted quality of life and mental health outcomes at T2 and T3. When we controlled the shared variance between factors, the PGD factor at T1 predicted unique variance in four outcomes at T2 (mental health, suicidal ideation, PGD severity, and depression severity) and two outcomes at T3 (mental health and PGD severity), the depression factor in one outcome at T2 (depression severity) but none at T3, and the anxiety factor in six outcomes at T2 (mental health, energy, general health perception, sleeping problems, depression severity, and anxiety severity) and one at T3 (anxiety severity). *Conclusions* We found PGD (defined according to the newest criteria) to be distinct from depression and anxiety and to be predictive of reduced quality of life and mental health. The concept of PGD is needed to detect mourners at risk for health impairments, who would go undetected with an exclusive focus on depression or anxiety.

Key words anxiety · death and dying · depression · grief · quality-of-life

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Introduction

Research has shown that after the loss of a significant other a sizeable minority of people develops debilitating symptoms of grief that are distinct from existing disorders in the Diagnostic and Statistical Manual of mental disorders (DSM) [1] and predictive of enduring functional and health impairments [18, 23, 26]. Against the background of this research, standardized criteria for the disorder Complicated Grief have been proposed by Prigerson et al. in the late 1990s [28]. Since that time, serious efforts are being made to establish Complicated Grief as a new disorder in the fifth edition of the DSM [19–22, 30].

Recently, criteria for Complicated Grief have been revised [22, 30]. This revision was motivated by empirical findings generated after the introduction of Complicated Grief in the late 1990s. Moreover, inde-

Table 1 Factor loadings for symptoms of Prolonged Grief Disorder (PGD), depression, and anxiety from confirmatory factor analysis among 96 bereaved individuals

	Loadings on Factor 1 (PGD)	Loading on Factor 2 (depression)	Loading on Factor 3 (anxiety)
Symptoms of PGD[a]			
Separation distress:			
Unbidden memories or intrusive thoughts related to lost relationship	NA		
Intense spells or pangs of severe distress related to lost relationship	NA		
Distressingly strong yearnings for that which was lost	0.54		
Cognitive, emotional, behavioural symptoms:			
Sense of self as confused or empty since the loss because a part of self died as a result of the loss	0.65		
Trouble accepting the loss as real	0.47		
Avoidance of reminders of the loss	0.20		
Inability to trust others since the loss	0.55		
Extreme bitterness or anger related to the loss	0.49		
Extreme difficulty moving on with life (e.g., making new friends, pursuing interests)	NA		
Pervasive numbness (absence of emotion) since the loss	0.83		
Feeling that life is unfulfilling, empty, and meaningless since the loss	0.66		
Feeling stunned, dazed or shocked by the loss	0.83		
Symptoms of depression[b]			
Poor appetite		0.49	
Feeling blue		0.87	
Worrying too much about things		0.74	
Feeling no interest in things		0.77	
Blaming yourself for things		0.53	
Symptoms of anxiety[b]			
Nervousness or shakiness inside			0.64
Feeling fearful			0.69
Heart pounding or racing			0.60
Spells of terror or panic			0.69
Feeling restless			0.56

Note. NA = Not Assessed
[a] Assessed with the Inventory of Complicated Grief-revised
[b] Assessed with Symptom Checklist-90

pendently from Prigerson et al. [28], the influential researcher Horowitz and co-workers arrived at comparable criteria for a syndrome named "Complicated Grief Disorder" [17] and—in working towards DSM-V—it was considered important to resolve the relatively minor discrepancies and to integrate the two criteria sets. Revision of the Complicated Grief criteria has coincided with a renaming of the construct into Prolonged Grief Disorder. This name better captures the nature of the disorder—i.e., a persistently elevated set of specific symptoms of grief identified in those with problematic adjustment to a loss. Moreover, the term Complicated Grief could be confused with "Complicated Bereavement"—a term used in DSM-IV to refer to symptoms of Major Depression secondary to bereavement—whereas no such confusion occurs with the term "Prolonged Grief Disorder" (hereafter abbreviated as PGD). According to the most recent criteria, PGD is defined as present when, after loss, a person suffers from one of three symptoms of "Separation Distress" and five of nine "Cognitive, Emotional, and Behavioural Symptoms" that have been causing significant impairments in functioning for at least 6 months [22, 30]. Table 1 shows the syndrome's symptoms.

The introduction of criteria for PGD represents a culmination of studies that have supported the validity of the construct. Particularly important are studies that have proven that the construct has incremental validity. Among other things, prospective studies have shown that high levels of PGD pose an elevated risk for a variety of mental and physical health problems, even when controlling for the impact of co-morbid anxiety and depression [13, 23, 26]. In addition, independent of concomitant psychopathology, high PGD has been found to be associated with increased suicidal ideation in cross-sectional [27] and prospective studies [18, 26]. Finally, cross-sectional research has shown that, when controlling depression and anxiety, PGD is associated with reduced quality of life [31]. Thus, studies have shown that PGD represents a unique aspect of grief-related psychopathology that is needed to detect mourners at risk for health impairments, who would go unidentified (and untreated) with an exclusive focus on depression and anxiety.

Although they are of great importance, there are some limitations to studies conducted thus far on the incremental validity of PGD. For instance, most of these studies used samples of widowed elders and it is uncertain to what extent PGD is predictive of impairments in other bereaved groups. In addition, before the DSM-V field trial [22, 30] was conducted, prospective studies had mostly focussed on mental and physical health problems rather than quality of life outcomes,

Table 2 Background and loss characteristics of the samples at T1

	Sample 1 (N = 346)	Sample 2 (N = 96)
Background characteristics		
Sex (N (%))		
Men	70 (20.2)	18 (18.8)
Women	276 (79.8)	78 (81.2)
Age (years) (M (SD))	48.00 (14.82)	45.90 (14.46)
Education (years) (M (SD))	14.78 (3.13)	14.65 (3.06)
Loss characteristics		
Deceased is (N (%))		
Partner	211 (61.0)	58 (60.4)
Child	48 (13.9)	12 (12.5)
Parent	55 (15.9)	20 (20.8)
Other	32 (9.2)	6 (6.3)
Cause of death is (N (%))		
Illness <1 month	36 (10.4)	11 (11.5)
Illness >1 month	157 (45.4)	39 (40.6)
Traumatic (accident, suicide, homicide)	62 (17.9)	14 (14.6)
Unexpected medical cause (e.g., heart attack)	78 (22.5)	28 (29.2)
Other cause	13 (3.8)	4 (4.2)
Time from loss in months (M (SD))	14.46 (5.10)	9.27 (1.98)

Note. Sample 1 was included in the Confirmatory Factor Analyses. Sample 2 was included in the prospective analyses

and used different symptoms to define PGD. The DSM-V field trial is the single study yet available that demonstrated that PGD—defined according to its newest criteria—has predictive validity in predicting both health impairments and reduced quality of life, and there exists a need to replicate these initial results.

In the present study, conducted in the Netherlands, we aimed to enhance knowledge of the incremental validity of PGD and—in particular—its role in predicting quality of life. To complement earlier studies, we used a prospective design, a sample that was heterogeneous with respect to cause of death and relationship to the deceased, and the most recent criteria to define PGD [22, 30]. First, we determined whether symptom clusters of PGD, depression, and anxiety represented distinct factors, using confirmatory factor analysis (CFA). Secondly, we examined associations of PGD, depression, and anxiety as assessed between 6 months and 1-year post-loss, with quality of life and mental health outcomes assessed 6 months later (12–18 months post-loss, at T2) and 15 months later (21–27 months post-loss, at T3).

Method

Participants and procedure

Data were available from two samples of bereaved individuals who were originally recruited for a research program on cognitive variables in grief [8]. Participants completed questionnaires at inclusion into the program. Those bereaved less than one year at inclusion, were invited to complete questionnaires again six and 15 months later. A first sample was recruited from professional and lay mental health care workers who came in contact with mourners through their work-related or voluntary activities. They distributed 1,128 questionnaire packets to mourners, 492 (43.6%) of which were returned. A second group was recruited through an advertisement on an Internet-site that briefly explained aims of the research program and invited bereaved individuals to participate by completing questionnaires. People could choose to complete questionnaires online or could ask for paper questionnaires to be sent to their homes. Data for the current study were gathered from those who chose the latter option; 490 questionnaires were sent and 260 (53%) were returned. (Data from online completers were included in other studies.) Included in the CFA, were all those participants who were at least 18 years of age and who lost a loved one at least 6 months and maximally 2 years ago, at inclusion into the research program.[1] There were N = 239 from the first, and N = 107 from the second sample. Table 2 shows characteristics of the total group included in the CFA (N = 346).

Included in the prospective analyses were those who were bereaved between 6 months and 1 year at inclusion into the study and who still participated at T2, which was the first moment that quality of life was assessed. In the first sample, 87 people were bereaved less than 1 year at T1, 55 of whom still participated at T2. In the second sample, 56 mourners were bereaved less than 1 year at T1, 41 of whom still participated at T2. We examined if participants recruited from professional and lay mental health care workers (N = 55) differed from those recruited through the Internet (N = 41). There were differences in kinship, with the former group including more bereaved partners and the Internet group including more bereaved adult children. In addition, those in the former group were older (M = 52.31 vs. M = 37.30 years, $t(94)$ = 5.85) and had higher anxiety scores (M = 19.82 vs. M = 16.90, $t(94)$ = 2.14, ps < 0.05). Yet, groups did not differ in gender, cause of loss, time from loss, years of education, and—importantly—levels of PGD and depression. Therefore, it was acceptable to combine groups to form the current (prospective) study sample (N = 96). Characteristics of the sample are displayed in Table 2.

Measures

Predictor variables

Symptoms of prolonged grief disorder. Items to assess PGD were taken from the Inventory of Complicated Grief-revised (ICG-r). The

[1]We wished to include at least nine indicators of PGD, five of depression, and five of anxiety in the CFA. As CFA requires at least N = 5 per estimated parameters [5] we needed data from at least 315 mourners to conduct CFA. Given that the sample included in the prospective analyses (consisting of those bereaved between 6 months and 1 year at T1) included only 96 people, for the CFA we included all those bereaved between 6 months and 2 years, in order to have sufficient data for these analyses. As PGD can only be diagnosed after the first half-year of bereavement we excluded mourners bereaved less than 6 months.

ICG-r was developed by Prigerson and Jacobs [20] as an extended version of the Inventory of Complicated Grief [24]. It taps most criteria for PGD and other problematic grief reactions. Respondents rate the presence of symptoms in the last month on 5-point scales ranging from 1 (never) to 5 (always). The 29-item Dutch ICG-r has good psychometric properties [10].

Depression and anxiety. Items for the depression factor and anxiety factor were taken from the 16-item depression scale and the 10-items anxiety scale of the SCL-90 [16]. The content of these scales corresponds to depressive and anxious states as described in DSM-IV. The depression scale includes most of the criteria for a major depressive episode, whereas the anxiety scale taps several state anxiety symptoms included in the description of panic disorder, generalized anxiety disorder, and post-traumatic stress disorder [1]. In both scales, respondents rate how often they experienced symptoms in the last week on 5-point scales ranging from 1 (never) to 5 (always). The Dutch SCL-90 has good psychometric properties [4].

We used nine, five, and five items for the PGD, depression, and anxiety factors, respectively. For the PGD factor, we selected "yearning" from the symptom cluster "Separation Distress" and all but the "difficulties moving on" item from the "Cognitive, Emotional, and Behavioural Symptoms" of the revised criteria for PGD [22, 30]. For the depression and anxiety factors, we selected five items that corresponded closely to symptoms of a major depressive episode and five items corresponding to anxious states, respectively, as described in DSM-IV. Table 1 shows all items. PGD, depression, and anxiety factor scores were calculated as the summed score of all selected items as completed at T1.

Dependent variables

Quality of life. Quality of Life was assessed with the Rand 36-item Health Survey (RAND 36) [33]. This questionnaire assesses subjective health status and functioning in eight domains: physical functioning (10 items), social functioning (2 items), role limitations due to emotional problems (3 items), role limitations due to physical problems (4 items), mental health (5 items), pain (2 items), energy (4 items), and general health perception (5 items). In addition, one item is included to assess the direction of change in health over the preceding year. Domain total scores are calculated such that higher scores reflect better functioning. The items of the RAND 36 are identical to those of the well-validated Medical Outcomes Survey Short Form-36 [34]. The instrument has yielded adequate psychometric properties [15, Dutch version: 35]. In the current study the subscale physical functioning was not administered. The subscale pain was only administered at T3.

Suicidal ideation. Suicidal was measured with one item from the SCL-90 that rates the occurrence of "Thoughts of ending your life" in the preceding week.

Sleeping problems. Sleeping problems were assessed by summing three items from the SCL-90 that rate the occurrence of sleeping problems in the preceding week.

Overall PGD, depression, and anxiety severity. Overall PGD, depression, and anxiety symptom severity scores were calculated as summed scores on the 29 items of the ICG-r, the 16 items from the SCL-90 depression scale, and the 10 items from the SCL-90 anxiety scale, respectively.

Statistical analyses

Means on the symptom measures at the different time points were calculated to examine symptom severity in the samples and the development of symptoms over time. To examine the factor structure of PGD, depression, and anxiety symptoms, we conducted CFA, using Amos 5 [2, 3]. Our main interest was to compare the fit of a unitary model with the fit of a three-factor model in which symptoms of PGD, depression, and anxiety represented three distinct factors. Goodness-of-fit was evaluated using the comparative fit index (CFI), and Tucker-Lewis index (TLI), with values of >0.90 indicating good fit, and the root mean square error of approximation (RMSEA) for which values of <0.08 indicate acceptable fit. The chi-square difference test was used to compare the fit of competing models.

The association of PGD, depression, and anxiety symptoms with quality of life and mental health outcomes was investigated in two steps. First, we examined the extent to which PGD, depression, and anxiety factor scores at T1 predicted quality of life/mental health outcomes at T2 and T3, controlling for the influence of relevant background variables. In these analyses, PGD, depression, and anxiety factor scores were consecutively treated as predictor variables. Relevant background variables were those that exerted an influence on outcome variables at T2 and T3, or predictor variables at T1. This was examined using parametric statistics for continuous and non-parametric statistics for ordinal variables. To rule out possible effects of the source from which participants were recruited (i.e., 55 from mental health care workers and 41 from the Internet) recruitment source was also entered as a control variable in the regression analyses.[2] As a second step, we examined which of the three syndromes (PGD, depression, anxiety) were most important in predicting outcomes at T2 and T3. To this end, we conducted multiple regressions in which each of the outcome variables was consecutively regressed on PGD, depression, and anxiety factor scores entered simultaneously, while controlling for relevant background variables.

We used linear regression with continuous outcome variables and ordinal regression with ordinal outcomes variables (i.e., role limitations due to emotional problems, role limitations due to physical problems, change in health, and suicidal ideation). Considering the distribution of responses, for the first two of these variables the link function was the logit function, for change in health it was the probit function, and for suicidal ideation it was the negative log–log function.

Results

Descriptive statistics

In the CFA sample (N = 346) mean total scores on the ICG-r and SCL-90 depression and anxiety scales were M = 80.32 (SD = 19.79), M = 37.77 (SD = 12.63), and M = 18.47 (SD = 6.93), respectively. In the prospective sample (N = 96) mean scores were M = 81.13 (SD = 17.40), M = 38.64 (SD = 11.59), and M = 18.57 (SD = 6.74). Mean ICG-r scores of the first and second sample were both significantly lower than the mean score of 97.33 of 54 patients who sought therapy for PGD and who participated in a treatment study [11] ($t(345) = -15.99$ and $t(95) = -9.13$, $ps < 0.001$, respectively). In both samples, depression and anxiety scores (SCL-90) were below average in comparison with a Dutch outpatient reference group [4]. In the prospective sample, repeated measures ANOVAs showed that there were main effects for time, for all three symptom measures (ICG-r, $F(2, 166) = 46.83$; SCL-90 depression, $F(2, 164) = 13.02$; SCL-90 anxiety, $F(2, 166) = 6.90$, $ps < 0.001$). This indicates that average symptom levels diminished over time. Post-hoc tests showed that ICG-r scores declined from T1

[2]Participants recruited from mental health care workers received different sorts of help of different duration. Yet, neither the sort nor the duration of help influenced symptom scores at T1 in this group. Hence, it was considered appropriate only to control for recruitment source and not sort and duration of help.

to T2 and T2 to T3. Depression and anxiety declined from T1 to T2 but not from T2 to T3.

Confirmatory factor analysis

The one-factor model with all 19 items loading on a single factor did not fit the data (CFI = 0.69, TLI = 0.75, RMSEA = 0.10). The three-factor model with symptoms loading on three distinct, but correlated factors fit significantly better than the unitary model ($\chi^2_{\text{difference}} = 326.08$, $\Delta df = 3$, $p < 0.001$) and had good fit estimates (CFI = 0.91, TLI = 0.90, RMSEA = 0.07). Table 1 shows factor loadings of this model. The correlation of the PGD factor with the depression factor was 0.75 and with the anxiety factor was 0.56. The correlation between the depression and anxiety factors was 0.78.

Prospective analyses

Several qualities of life/mental health outcomes at T2 and T3 were affected by background variables. At T2, role limitations due to emotional problems were associated with cause of death, sleeping problems with age and years of education, the ICG-r total score with kinship, and the SCL-90 depression and anxiety total scores with age. The other outcomes were not affected by background variables. At T3, role limitations due to physical problems were influenced by time from loss, mental health by age of respondent and time from loss, sleeping problems and SCL-90 anxiety scores by age, and suicidal ideation by cause. ICG-r and SCL-90 depression scores were influenced by age and gender. The other outcomes were not affected by background variables. None of the background variables affected the predictor variables (PGD, depression, and anxiety factor scores at T1), with the exception of gender that influenced the depression factor score (men had slightly higher scores, $p = 0.02$). Therefore, in all analyses where the depression factor was included as a predictor, gender was added as a control variable.

Regression analysis was used to examine the extent to which PGD, depression, and anxiety factor scores predicted outcomes at T2 and T3, controlling for relevant background variables, recruitment source, and—where the depression factor was a predictor—gender, whilst not controlling for the shared variance between the factor scores. Table 3 summarizes the results. The PGD factor significantly predicted all outcomes at T2 ($p < 0.01$), except role limitations due to physical problems and change in health. The PGD factor predicted eight of the 13 outcomes at T3 ($ps < 0.05$). The depression factor was significantly correlated with all quality of life/mental health outcomes at T2 and with ten of all 13 outcomes at T3 ($ps < 0.05$). The anxiety factor significantly predicted all outcomes at T2 except change in health, and nine of all 13 outcomes at T3 ($ps < 0.05$).

Next, we examined which of the three symptom clusters were most important in predicting outcomes. Table 4 summarizes results of the regression analyses in which quality of life/mental health outcomes at T2 and T3 were regressed on PGD, depression, and anxiety factor scores at T1 entered simultaneously, while controlling for recruitment source, gender, and other relevant background variables. High levels of PGD were uniquely associated with lower mental health scores, more severe suicidal ideation, and higher overall PGD severity and depression severity at T2. In addition, the PGD factor was marginally associated with poorer social functioning ($p = 0.08$) and lower energy ($p = 0.06$). High levels of PGD were uniquely associated with lower mental health and higher overall PGD severity at T3. High levels of depression were uniquely associated with higher overall depression severity at T2, marginally associated with role limitations due to emotional problems ($p = 0.07$) and lower mental health ($p = 0.07$) at T2, and marginally associated with role limitations due to emotional problems ($p = 0.09$) and overall depression severity ($p = 0.06$) at T3. High levels of anxiety were uniquely associated with lower mental health, less energy, a less positive general health perception, greater sleeping difficulties, and greater overall depression and anxiety severity at T2. The anxiety factor was significantly associated with overall anxiety severity and near-significantly with lower mental health ($p = 0.06$) at T3.

Discussion

We examined whether the revised symptom criteria for PGD (formally called Complicated Grief, CG) recently introduced by Prigerson et al. [22, 30] are distinct from symptoms of depression and anxiety. We used data from 346 mourners bereaved between 6 months and 2 years that were also used in an earlier study on the distinctiveness of PGD/CG as defined according to Prigerson et al.'s 1999-consensus criteria [6]. Outcomes of the CFA showed that the revised symptom criteria of PGD/CG are distinct from, rather than on a single dimension with, symptoms of depression and anxiety. The findings are consistent with earlier studies (with other samples) that have shown that PGD/CG is distinct from depression and anxiety [7, 13, 23–25]. Importantly, the current findings indicate that this distinctiveness also applies when PGD/CG is defined according to the new, refined criteria.

Next, we examined associations of PGD, depression, and anxiety factor scores (calculated as the summed PGD, depression, and anxiety item scores) as assessed between 6 and 12 months post-loss (T1) with quality of life/mental health impairments assessed 6 months (T2) and 15 months later (T3), using a subgroup of the CFA sample encompassing 96 respondents whose losses occurred 6–12 months

Table 3 Associations of Prolonged Grief Disorder (PGD), depression, and anxiety assessed 6–12 months post-loss (T1) with quality of life/health outcomes assessed 6 months later (T2) and 15 months later (T3)

	PGD at T1 Association controlling background variables	Depression at T1 Association controlling background variables	Anxiety at T1 Association controlling background variables
T2			
Social functioning [a]	−0.38***	−0.41***	−0.35**
Role limitations due to physical problems[a]	−0.05	−0.10*	−0.13*
Role limitations due to emotional problems[b]	−0.12**	−0.27***	−0.27***
Mental health[a]	−0.51***	−0.59***	−0.56***
Energy[a]	−0.42***	−0.47***	−0.48***
General health perception[a]	−0.34**	−0.37***	−0.43***
Change in health[a]	−0.03	−0.06*	−0.06
Sleeping problems[c]	0.26**	0.40***	0.43***
Suicidal ideation[a]	0.15**	0.14**	0.15**
ICG-r total score[d]	0.66***	0.45***	0.37***
SCL depression total score[e]	0.54***	0.65***	0.59***
SCL anxiety total score[e]	0.36***	0.60***	0.76***
T3			
Social functioning[a]	−0.18	−0.23*	−0.22*
Role limitations due to physical problems[f]	−0.04	−0.13*	−0.16*
Role limitations due to emotional problems[a]	−0.05*	−0.16**	−0.22**
Mental health[g]	−0.43***	−0.47***	−0.47***
Energy[a]	−0.31**	−0.38**	−0.37**
General health perception[a]	−0.28**	−0.30**	−0.21
Change in health[a]	0.01	−0.03	−0.01
Pain[a]	−0.07	−0.11	−0.17
Sleeping problems[e]	0.26**	0.31**	0.26*
Suicidal ideation[b]	−0.01	0.06	0.06
ICG-r total score[h]	0.60***	−0.51***	0.40***
SCL depression total score[h]	0.40***	0.51***	0.46***
SCL anxiety total score[e]	0.37***	0.47***	0.57***

Note. In total, 96 respondents were included at T1 and T2, and 85 at T3. Linear regression was used with continuous and ordinal regression with ordinal outcome variables. With continuous outcome variables β's and significance levels of corresponding *t*-tests are shown. With ordinal outcome variables estimated coefficients and significance levels of the corresponding Wald statistic are shown. Where Depression at T1 was the predictor variable, gender was always included as control variable. Superscripts [a] to [h] represent other background variables controlled in the analyses
ICG-r = Inventory of Complicated Grief-revised, SCL = Symptom Checklist
[a] Controlling recruitment
[b] Controlling cause and recruitment
[c] Controlling age, education, and recruitment
[d] Controlling kinship and recruitment
[e] Controlling age and recruitment
[f] Controlling time from loss and recruitment
[g] Controlling age, time from loss, and recruitment
[h] Controlling age, gender, and recruitment
* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

prior to T1. In these analyses, we controlled for the influence of relevant background variables (i.e., those that influenced dependent variables at T2 and T3, or predictor variables at T1). It is noteworthy that, overall, the influence of background variables on outcomes was weak. For instance, cause of loss and kinship, variables that have often been linked with health impairments after bereavement, only influenced two and one of all outcomes, respectively. These findings are consistent with earlier studies [14, 29] and suggest that other variables than static demographic or situational variables underlie functional impairments after loss [9].

Regression analyses showed that—when controlling for relevant background variables, recruitment source, but not for the shared variance between factor scores—PGD, depression, and anxiety factor scores at T1 were all three related with most outcomes at T2 and T3. These findings indicate that, when seen as independent clinical entities, PGD, depression, and anxiety are all associated with a myriad of adverse physical and mental health outcomes [13]. The outcomes change of health in the preceding year, pain, and suicidal ideation at T3 were not affected by PGD, nor by depression or anxiety. This may reflect that variables other than high levels of PGD, depression, and anxiety are responsible for problems in these areas. Yet, alternative explanations are that the magnitude of the sample limited statistical power to detect significant effects on these outcomes, and/or that lack of variability in these outcomes by this time accounted for absence of significant results.[3]

[3]In keeping with this notion, at T3, over 80% answered that they "never" had thoughts of ending their lives, whereas only $N = 2$ (2.3%) noted that they "often" had these thoughts.

Table 4 Summary of regression analyses for the effect of prolonged grief disorder (PGD), depression, and anxiety assessed 6–12 months post-loss (T1) with quality of life/health outcomes assessed 6 months later (T2) and 15 months later (T3)

	Independent variables in each model			Model[a]	
	PGD at T1	Depression at T1	Anxiety at T1	R^2	F
T2					
Social functioning[a]	−0.21†	−0.20	−0.12	0.17	4.76**
Role limitations due to physical problems[a]	−0.01	−0.04	−0.10	0.08	–
Role limitations due to emotional problems[b]	−0.04	−0.16†	−0.14	0.37	–
Mental health[a]	−0.25*	−0.24†	−0.29*	0.40	13.37***
Energy[a]	−0.22†	−0.15	−0.28*	0.26	7.64***
General health perception[a]	−0.18	−0.04	−0.32*	0.18	5.01***
Change in health[a]	−0.01	−0.03	−0.02	0.06	–
Sleeping problems[c]	0.05	0.17	0.28*	0.25	5.63***
Suicidal ideation[a]	0.13*	−0.04	−0.03	0.18	–
ICG-r total score[d]	0.60***	0.03	0.11	0.51	13.02***
SCL depression total score[e]	0.24*	0.33**	0.25*	0.50	16.71***
SCL anxiety score[e]	0.01	0.13	0.66***	0.57	21.79***
T3					
Social functioning[a]	−0.09	−0.09	−0.12	0.32	8.74
Role limitations due to physical problems[f]	−0.02	−0.05	−0.10	0.15	–
Role limitations due to emotional problems[a]	−0.05	−0.14†	−0.13	0.26	–
Mental health[g]	−0.25*	−0.14	−0.25†	0.36	7.75***
Energy[a]	−0.14	−0.15	−0.19	0.12	3.39**
General health perception[a]	−0.17	−0.21	0.03	0.18	4.58**
Change in health[a]	0.03	−0.06	0.02	0.15	–
Pain[a]	0.04	−0.01	−0.17	0.37	10.88***
Sleeping problems[e]	0.08	0.21	0.07	0.24	5.50 ***
Suicidal ideation[b]	0.06	0.002	0.02	0.21	–
ICG-r total score[e]	0.46***	0.19	0.03	0.44	12.00***
SCL depression total score[e]	0.14	0.29†	0.19	0.37	9.20***
SCL anxiety score[e]	0.10	0.07	0.47***	0.40	10.28***

Note. With ordinal outcome variables the R^2 represent Nagelkerke's pseudo R^2
[a] Controlling gender and recruitment
[b] Controlling gender, cause, and recruitment
[c] Controlling gender, age, education, and recruitment
[d] Controlling gender, kinship, and recruitment
[e] Controlling gender, age, and recruitment
[f] Controlling gender, time from loss and, recruitment
[g] Controlling gender, age, time from loss, and recruitment
† $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Most pertinent to the aims of this study was our examination of the question which of the three symptom clusters had a unique link with prospective quality of life/health outcomes, when adjusting for the influence of relevant background variables. Results showed that the PGD factor predicted unique variance in mental health, suicidal ideation, overall PGD severity, and overall depression severity at T2, and in mental health and overall PGD severity at T3. The depression factor explained unique variance in overall depression severity at T2. The anxiety factor explained unique variance in mental health, energy, general health perception, sleeping problems, overall depression severity, and overall anxiety severity at T2, and in overall anxiety severity at T3. The finding that anxiety was a unique predictor of several outcomes links up with earlier findings that anxiety is an important determinant of functioning after loss [13] and indicates that PGD and depression should not receive the sole emphasis after loss. Importantly, the PGD factor—but not the depression or the anxiety factor—uniquely predicted suicidal ideation at T2; those with higher PGD levels at 6–12 months post-loss, experienced suicidal thoughts more often at 12–18 months post-loss than those with lower PGD levels. This confirms earlier findings that PGD heightens the risk of suicidal thoughts even beyond the influence of depression and anxiety [18, 26, 27, 32].

Altogether, findings attest to the incremental validity of PGD. Nevertheless, a few limitations should be kept in mind when interpreting these results. First, the sample included in the prospective analyses was relatively small. This likely has compromised statistical power needed to detect significant associations, both between background variables and outcomes as well as between PGD, depression, and anxiety factor scores and outcomes. It is conceivable that more unique associations between the symptom clusters and outcomes would be found in larger samples. A second limitation is that we could not control for baseline (T1) levels of quality of life/health outcomes when examining effects of symptom clusters on prospective outcomes because these were not assessed. Hence, it is uncertain to what extent predicted outcomes represented impairments that already existed at T1 (or even before that time) or developed newly over the course of time. Strictly speaking, we cannot

rule out that baseline quality of life/health impairments were strong predictors of later outcomes and it is even possible that these baseline impairments in turn, were relatively unaffected by PGD, depression, and anxiety. Future studies should control for baseline impairments. Nevertheless, although such an approach elucidates the extent to which PGD predicts residual changes in quality of life, the current findings still show that PGD symptoms are associated with future quality of life impairments. A third limitation is that the current study did not include a complete assessment of the new PGD criteria. A fourth caveat is that we hardly assessed physical health problems as was done in other studies on the incremental validity of PGD [13, 23, 26]. Consequently, the extent to which PGD predicts physical problems still needs further exploration. A final limitation is that self-report measures were used to assess both dependent and independent variables. This may have inflated the relations between the two.

Notwithstanding these considerations, the current study is important as it represents a replication of earlier findings that symptoms of PGD are distinct from those of depression and anxiety [7, 13, 22–25, 30]. In addition, they complement earlier findings that PGD puts mourners at risk for impairments in functioning and reduced quality of life [18, 22, 23, 26, 30]. It is important for future studies to further examine the extent to which PGD represents a unique determinant of functional problems in recovery from loss. Further establishing the incremental validity of PGD is perhaps one of the most important goals of research in the upcoming years towards the development of DSM-V [12]. The current study and earlier studies show that the construct of PGD is needed to identify a subgroup of mourners at risk for quality of life and mental health impairment, that would go undetected with an exclusive focus on depressive and anxious syndromes and symptoms. Replication of these findings with larger groups would certainly attest to the necessity of establishing PGD as a formal disorder in DSM-V.

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