



# Comparison of six proposed diagnostic criteria sets for disturbed grief

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## ABSTRACT

Increased recognition that grief may turn into a disorder led to the inclusion of Persistent Complex Bereavement Disorder (PCBD) in DSM-5 and Prolonged Grief Disorder (PGD) in ICD-11. Four additional criteria sets for disturbed grief have been proposed in recent years: Prigerson et al. proposed criteria for PGD ("PGD-2009"), Maercker et al. presented an ICD-11 beta draft version of PGD ("PGD-BD"), Shear et al. put forth criteria for complicated grief ("CG"), and, recently, criteria for PGD in DSM-5-TR have been proposed. This study sought to evaluate these six sets in one sample, which has not been done before. Using self-reported data from 855 bereaved individuals, we examined the (i) dimensionality, (ii) number of possible symptom combinations to meet criteria for caseness, (iii) prevalence rates and diagnostic agreement, (iv) concurrent validity, and (v) socio-demographic and loss-related correlates for each set. Criteria for PCBD were best represented by a three-factor structure and CG by a two-factor structure. Symptoms of ICD-11 PGD, PGD-2009, PGD-BD, and PGD-DSM-5-TR formed a single dimension. Prevalence rates varied between ~10% and ~20%. Diagnostic agreement between sets was substantial. Sets differed in terms of possible symptom combinations and had comparable concurrent validity and socio-demographic and loss-related correlates.

## 1. Introduction

The death of a loved one is a life event that most people adapt to quite well, but still causes severe distress and disability in a significant minority of people (Lundorff et al., 2017; Nielsen et al., 2019). Symptoms that may be elevated following loss include depressive and anxious symptoms, suicidality, and persistent grief reactions that are distinct from common mental health disorders. An ever-growing body of knowledge supports the incremental validity of disturbed grief as a distinct and clinically useful diagnostic category (cf., Djelantik et al., 2017; Malgaroli et al., 2018). This has led to disturbed grief being added to recent versions of psychiatric classification systems. The fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) has included Persistent Complex Bereavement Disorder (PCBD) as a condition for further study (classifiable as "other specified trauma and stressor-related disorder"), defined by the presence of at least one of four separation distress symptoms plus six of 12 symptoms of reactive distress and social and identity disruption (APA, 2013). The 11th edition of the International Classification of Diseases (ICD-11; WHO, 2018) has put forth criteria for Prolonged Grief Disorder (PGD),

defined by the presence of either yearning or preoccupation with the death plus one or more of ten possible accompanying symptoms (Killikelly and Maercker, 2018).

The inclusion of PCBD in DSM-5 and PGD in ICD-11 may foster the recognition and treatment of disordered grief. At the same time, the inclusion of these syndromes in DSM-5 and ICD-11 has added to confusion about the precise criteria for disturbed grief, because these syndromes only partially resemble three other proposals for criteria for disturbed grief. The first of these is PGD as proposed by Prigerson et al., 2009 (henceforth referred to as PGD-2009); this syndrome is defined by the presence of separation distress, plus nine cognitive, emotional, and behavioural symptoms. PGD-2009 is perhaps the best validated criteria set (Boelen and Prigerson, 2012). The second of these is a beta draft version of ICD criteria, proposed by Maercker et al. in 2013 (referred to as PGD-BD); this syndrome is defined as present when the person experiences pervasive yearning or longing combined with several of five accompanying symptoms. The third set proposed earlier is Complicated Grief (CG), put forth by Shear et al. (2011). CG is defined by the presence of at least one of four symptoms of separation distress and at least two of eight additional symptoms. Consequently, five different criteria

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sets have so far appeared in the literature. Additionally, a sixth set of criteria has recently been advanced, in an attempt to harmonize the DSM-5 and ICD-11 proposals; these criteria, of a disorder that is also named PGD, are candidates for inclusion in a future text revision of DSM-5 (or DSM-6). These criteria, referred to as PGD-DSM-5-TR (with TR referring to "text revision") here, define the disorder as yearning/longing or preoccupation combined with a yet to be defined number of symptoms of a list of eight additional symptoms (Prigerson, personal communication, June 16, 2019). The presence of six criteria sets has some unfortunate consequences, taking into account that research findings (about e.g., prevalence rates, correlates, and treatments) obtained with one set may not necessarily apply to disturbed grief as defined by one of the other sets (Lenferink et al., *in press*).

Altogether, it is still unclear how disturbed grief is best defined. For instance, Maciejewski et al. (2016) compared prevalence rates and predictive validity of PCBD, PGD-2009, PGD-BD, and CG and found the first three sets to have high diagnostic agreement and predictive validity, whereas CG yielded considerably higher prevalence rates and poor predictive validity. Substantial diagnostic agreement between PCBD, PGD-2009, PGD-BD, was also reported by O'Connor et al. (2019). Several other studies examined the accuracy of different criteria sets in terms of identifying people with severe distress and disability and found CG to perform better compared to PCBD and PGD-2009 (Cozza et al., 2016) and compared to PCBD, PGD-2009, and ICD-11 PGD (Cozza et al., 2019). Still other studies compared PCBD and ICD-11 PGD, and found PCBD criteria to yield a two- to threefold lower prevalence rate and better validity, than ICD-11 PGD (Boelen et al., 2018, 2019a, 2019b). Lastly, researchers have counted the number of possible symptom combinations qualifying for caseness of PCBD and PGD-2009 (Boelen and Prigerson, 2012) and PGD-BD (Lenferink and Eisma, 2018), indicating substantial differences in symptom heterogeneity between syndromes.

Taken together, research has indicated that the criteria sets that have so far been tested do not identify the same diagnostic entity. Several researchers have called for attempts to harmonize the criteria for disturbed grief (Lenferink et al., *in press*). Indeed, there is an urgency to have one sound, agreed upon, reliable, and valid set of criteria for disturbed grief. That would be of great value to bereavement research and attempts to build a strong knowledge base about the prevalence and causes of, and care for disturbed grief, as well as for bereavement care where a diagnosis (and subsequent referral for treatment) should preferably not differ as a function of the criteria set that was used. Although prior studies have provided valuable knowledge about the validity of different candidate criteria sets for disturbed grief, these all focused on maximally four sets. No research has yet evaluated the performance of these six sets in a single study. The current study sought to address this issue, using data collected in prior studies. Specifically, using self-reported questionnaire data from 855 bereaved individuals, we examined (i) the dimensionality, (ii) the total number of possible symptom combinations to meet criteria for caseness, (iii) prevalence rates and diagnostic agreement, (iv) concurrent validity, and (v) socio-demographic and loss-related correlates of each of the six proposed criteria sets.

## 2. Methods

### 2.1. Participants and procedure

For this study we used data from 855 Dutch bereaved people, recruited in the context of a research program on cognitive behavioural variables in grief (see, e.g., Boelen and Van den Bout, 2005). Data were collected via different sources. A first group was recruited via professional and non-professional bereavement caretakers who distributed 1128 questionnaires, 492 (43.6%) of which were returned. Other participants were recruited via announcements on internet websites. After completing an application form, they were sent paper questionnaires or

referred to a secured internet website to complete questionnaires online. Six hundred people completed online questionnaires; 490 people had questionnaires sent to their homes, 260 (53.1%) of whom actually completed questionnaires. Participants younger than 18 years ( $N = 31$ ) and those bereaved less than 12 months earlier ( $N = 466$ ) were excluded from the current study, leaving 855 participants. A local review board approved the study.

The sample had a mean age of 43.82 ( $SD = 14.78$ ) years, included 710 (83.0%) women, and had a mean of 15.06 ( $SD = 3.22$ ) years of education; 384 (44.9%) lost a partner, 136 (15.9%) a child, and 333 (38.9%) another relative. Losses occurred 46.47 ( $SD = 43.65$ ) months ago on average and had natural/non-violent causes in 684 (80.0%) participants and unnatural/violent causes (i.e. suicide, homicide, or accident) in 171 (20.0%) cases.

### 2.2. Measures

Symptoms of the six criteria sets were assessed using the 29-item Dutch version of the Inventory of Complicated Grief-Revised (ICG-R; Boelen et al., 2003) and 15-item depression subscale<sup>1</sup> from the Symptom-Checklist-90 (SCL depression; Arrindell and Ettema, 2003). The ICG-R is an expanded version of the 19-item Inventory of Complicated Grief, developed by Prigerson and Jacobs (2001)- that assesses the occurrence of different markers of disturbed grief during the previous month on 5-point scales (1 = never, 5 = always). The 29-item Dutch version has good psychometric properties (Boelen et al., 2003). In the current sample, the alpha of the ICG-R was 0.94. The SCL depression scale measures the severity of depression symptoms during the previous week on 5-point scales (1 = not at all, 5 = extremely). The English (Derogatis, 1983) and Dutch versions (Arrindell and Ettema, 2003) have good psychometric properties. In the current sample, the alpha of the SCL depression scale was 0.94.

To evaluate the concurrent validity of the different criteria sets, we considered the total score on the 29 items ICG-R as an index of overall disturbed grief, the total score of the SCL-depression scale as index of depression, and the SCL depression item "Thoughts of ending your life" as index of suicidal ideation. In addition, we considered two further subscales from the SCL-90, the anxiety subscale, including ten mostly physical and cognitive symptoms of anxiety ( $\alpha = 0.91$ ) and the agoraphobia subscale, that includes seven symptoms of agoraphobic fear and avoidance ( $\alpha = 0.89$ ).

### 2.3. Measurement of the six criteria sets

Of all 16 DSM-5 PCBD symptoms, nine were represented by nine ICG-R items, three by two ICG-R items each, and three by three SCL depression items. One DSM-5 PCBD symptom "Difficulties positive reminiscing" was not represented by the items (and therefore not included). Of all 12 ICD-11 PGD symptoms, nine were represented by nine ICG-R items, and three by three SCL depression items. Of all 10 PGD-2009 symptoms, nine were tapped by nine ICG-R items and one by two ICG-R items. All seven PGD-BD symptoms were tapped by seven ICG-R items. Of all 12 CG symptoms, three were represented by one ICG-R item, five by two ICG-R items each, two by three ICG-R items each, and two by one ICG-R item and one SCL depression item. Of all nine PGD-DSM-5-TR criteria, six were represented by one ICG-R item, two by two ICG-R items each, and one criterion by two ICG-R and one SCL depression item. **Supplementary Tables S1-S6** show all symptoms and items. A symptom was considered "absent" when rated with a 1, 2, or 3 response and "present" when rated with 4 or 5 (on its 5-point scale). When a symptom was represented by two or three items, the highest of all items scores counted toward symptom presence/absence.

<sup>1</sup> Originally, the scale includes 16 items but one item referring to sexual interests was not included in the data collection.

## 2.4. Statistical analyses

Confirmatory factor analysis (CFA) in Mplus (version 8.0, Muthén and Muthén, 1998–2017) was used to evaluate the dimensionality of the six sets. For PCBD, we successively evaluated a one-factor model, a two-factor model with correlated clusters of separation distress (factor 1) and reactive distress and social/identity disruption (factor 2), and a three-factor model with correlated factors of separation distress (factor 1), reactive distress (factor 2), and social/identity disruption (factor 3), respectively. For PGD-2009 and PGD-DSM-5-TR, we tested a one-factor model only (it was impossible to treat the single yearning item as a distinct factor). For symptoms representing ICD-11 PGD, PGD-BD, and CG, we tested two models, namely a one-factor model and a two-factor model with correlated clusters of items representing separation distress and items representing accompanying symptoms.

Dichotomized scores on disturbed grief items were included in the CFAs. Therefore, weighted least square mean and variance adjusted (WLSMV) estimation was used. Kline's (2005) recommendations for evaluating model fit were used: (i) Comparative Fit Index (CFI) and Tucker Lewis Index (TLI) values  $>0.90$  reflecting acceptable model fit and values  $>0.95$  reflecting excellent fit; and (ii) root-mean-square error of approximation with 90% confidence intervals (RMSEA 90% CI) values of  $<0.10$  reflecting acceptable fit and values  $<0.05$  reflecting excellent model fit. The DIFFTEST command in Mplus was used to compare the fit of nested models. A maximum of three responses ( $<1.0\%$ ) were missing for each item. Missing data were accounted for using full maximum likelihood estimation.

The total number of possible symptom combinations to meet diagnostic criteria for each set was calculated using the following binomial equation  $\Pi_n = \sum_{k=1}^n \binom{n}{k}$ , where  $\binom{n}{k} = n! / (k!(n-k)!)$ , whereby  $n$  is defined as the maximum number of symptoms per cluster and  $k$  is the minimum number of symptoms needed to meet cluster criteria (see also Boelen and Prigerson, 2012; Lenferink and Eisma, 2018; Galatzer-Levy and Bryant, 2013).

Then, we counted the number of diagnostic cases in accord with each of the six sets. Criteria for probable DSM-5 PCBD-caseness required the endorsement of  $\geq 1$  separation distress symptom (symptoms 1–4, **Supplementary Table S1**),  $\geq 6$  symptoms of reactive distress and social/identity disruption (symptoms 5–16, **Supplementary Table S1**), and the ICG-R functional impairment item (“I believe that my grief has resulted in significant impairments in my social, occupational, or other areas of functioning”). Criteria for probable ICD-11 PGD-caseness required the endorsement of  $\geq 1$  separation distress symptom (symptoms 1–2, **Supplementary Table S2**),  $\geq 1$  accompanying symptom (symptoms 3–12, **Supplementary Table S2**), and the functional impairment item (Mauro et al., 2019; WHO, 2018).<sup>2</sup> Criteria for caseness of PGD-2009 required the endorsement of the separation distress symptom (symptom 1, **Supplementary Table S3**),  $\geq 5$  accompanying symptom (symptoms 2–10, **Supplementary Table S3**), and the functional impairment item. Criteria for caseness of PGD-BD required the endorsement of  $\geq 1$  separation distress symptom (symptoms 1–2, **Supplementary Table S4**),  $\geq 1$  accompanying symptom (symptoms 3–7, **Supplementary Table S4**), and the functional impairment item. Criteria for caseness of CG required the endorsement of  $\geq 1$  separation distress symptom (symptoms 1–4, **Supplementary Table S5**),  $\geq 2$  accompanying symptom (symptoms 5–12, **Supplementary Table S5**), and the functional impairment item. Criteria for caseness of PGD-DSM-5-TR required the endorsement of the separation distress symptom (symptom 1, **Supplementary Table S6**), a not yet specified number of

eight possible accompanying symptom (symptoms 2–9, **Supplementary Table S6**), and the functional impairment item. Because the number of accompanying symptoms was not yet defined, we calculated caseness for different numbers (i.e., from 1+ through 7+) of accompanying symptoms. Pairwise agreement between tests was evaluated using Kappa statistics.

To examine concurrent validity, we used t-tests to compare mean scores of concurrently assessed overall disturbed grief, depression, anxiety, agoraphobia, and suicidality between participants meeting vs. not meeting criteria for PCBD, ICD-11 PGD, PGD-2009, PGD-BD, CG, and PGD-DSM-5-TR.

Finally, Chi square tests and t-tests were used to compare cases and non-cases of in terms of sociodemographic and loss-related characteristics (i.e., age, gender, years of education, kinship to the deceased, time since loss, and dichotomized cause of death).

## 3. Results

### 3.1. Confirmatory factor analyses

Fit indices are shown in **Table 1**. For PCBD, the three-factor model showed the best fit to the data. For ICD-11 PGD, the one-factor model fitted best (compared to the two-factor model). For PGD-2009, fit indices for the one-factor model were adequate. For PGD-BD, the one-factor model fitted better than the two-factor model and had good fit estimates. For CG, the two-factor model fitted better than the one-factor model. For PGD-DSM-5-TR, fit indices for the one-factor model were adequate. See **Supplementary Tables S1–S6**.

### 3.2. Number of possible combinations for each set

We counted the number of possible combinations in which a person could qualify for caseness, according to each of the six sets. The algorithm for PCBD caseness yielded 37,650 possible combinations. The number of possible combinations for ICD-11 PGD was 3069 for 1+ accompanying symptoms; and 3039 for 2+, 2904 for 3+, 2544 for 4+, 1914 for 5+, 1158 for 6+, and 528 for 7+ accompanying symptoms. The PGD-2009 algorithm yielded 256 possible symptom combinations. The PGD-BD algorithm yielded 93 possible combinations for 1+ accompanying symptoms.<sup>3</sup> The CG criteria yielded 3705 combinations. The number of possible combinations for PGD-DSM-5-TR was 255 for 1+ accompanying symptoms; and 247 for 2+, 219 for 3+, 163 for 4+, 93 for 5+, 37 for 6+, and 9 for 7+ accompanying symptoms.

### 3.3. Diagnostic rates and agreement

**Table 2** shows percentages of people meeting criteria for probable disturbed grief according to the six diagnostic tests. Prevalence rates were the lowest for DSM-5 PCBD (11.1%) and PGD-2009 (11.2%) and higher for ICD-11 PGD (19.8%), PGD-BD (19.2%), and CG (21.5%). For PGD-DSM-5-TR, we calculated caseness and agreements for different numbers (i.e., from 1+ to 7+) of accompanying symptoms, with prevalence rates varying from 6.8% (7+ additional symptoms) to 20.2% (1+ additional symptoms). **Table 2** also shows pairwise agreements between the six tests. The strongest agreement ( $K = 0.98$ ) was between ICD-11 PGD and PGD-BD—and between ICD-11 PGD and PGD-DSM-5-TR with 1+ accompanying symptoms. The weakest agreement ( $K = 0.42$ ) was between PGD-DSM-5-TR with 7+ accompanying symptoms and CG.

Although ICD-11 PGD caseness formally requires only one additional symptom (Mauro et al., 2019; WHO, 2018), there has been

<sup>2</sup> The timing criterion was  $\geq 12$  months for both the DSM-5 PCBD and ICD-11 PGD criteria sets, because an evaluation of differences and overlap between the symptom criteria was deemed more important than a comparison based on differences in the timing criterion.

<sup>3</sup> Numbers for PCBD, PGD-2009, and ICD-11 PGD with 1+ accompanying symptoms have been reported elsewhere earlier (Boelen and Prigerson, 2012; Lenferink and Eisma, 2018).

**Table 1**  
Fit indices ( $N = 855$ ) factor structure for 6 disturbed grief criteria sets.

	CFI	TLI	RMSEA (90% CI)	Chi square	DF	Correlation between factors	Difftest
<b>PCBD</b>							
1-factor model	0.968	0.963	0.057 (0.051–0.064)	341.874	90		
2-factor model	0.969	0.963	0.057 (0.050–0.063)	333.044	89	F1 with F2 0.930	9.389 (1), $p = .0022$
3-factor model	0.979	0.975	0.047 (0.040–0.054)	249.189	87	F1 with F2 0.864 F1 with F3 0.905 F2 with F3 0.808	55.133 (2), $p < .001$
<b>PGD ICD-11</b>							
1-factor model	0.974	0.969	0.049 (0.040–0.057)	163.454	54		
2-factor model	0.974	0.968	0.049 (0.041–0.058)	163.085	53	F1 with F2 0.971	0.456 (1), $p = .4996$
<b>PGD-2009</b>							
1-factor model	0.972	0.964	0.071 (0.061–0.081)	187.000	35		
<b>PGD-BD</b>							
1-factor model	0.969	0.954	0.070 (0.054–0.086)	71.992	14		
2-factor model	0.969	0.949	0.073 (0.057–0.090)	71.896	13	F1 with F2 0.977	0.242 (1), $p = .6227$
<b>CG</b>							
1-factor model	0.976	0.971	0.075 (0.067 – 0.083)	311.538	54		
2-factor model	0.977	0.972	0.074 (0.066 – 0.082)	301.408	53	F1 with F2 0.934	12.790 (1), $p < .001$
<b>PGD-DSM-5-TR</b>							
1-factor model	0.989	0.986	0.051 (0.039 - 0.063)	86.285	27		

Note. CFI = Comparative Fit Index. DF = degrees of freedom. PCBD = Persistent complex bereavement disorder. PGD = Prolonged grief disorder. RMSEA = root-mean-square error of approximation. TLI = Tucker Lewis Index.

**Table 2**  
Number (and%) of probable cases for each diagnostic criterion set and pairwise agreement (Kappa) between sets.

	N (%)	PCBD	ICD-11 PGD (1 +)	PGD-2009	PGD-BD	CG
PCBD	95 (11.1)	–				
ICD-11 PGD (1 +)	169 (19.8)	.66	–			
PGD-2009	96 (11.2)	.83	.67	–		
PGD-BD	164 (19.2)	.66	.98	.70	–	
CG	184 (21.5)	.63	.92	.63	.91	–
PGD-DSM-5-TR (1 +)	173 (20.2)	.64	.98	.67	.96	.92
PGD-DSM-5-TR (2 +)	167 (19.5)	.66	.96	.69	.95	.91
PGD-DSM-5-TR (3 +)	152 (17.8)	.71	.93	.74	.93	.87
PGD-DSM-5-TR (4 +)	132 (15.4)	.79	.85	.81	.86	.80
PGD-DSM-5-TR (5 +)	105 (12.3)	.88	.73	.86	.74	.68
PGD-DSM-5-TR (6 +)	84 (9.8)	.84	.61	.79	.63	.57
PGD-DSM-5-TR (7 +)	58 (6.8)	.71	.46	.66	.47	.42

Note. BD = Beta-draft. CG = Complicated Grief. PCBD = Persistent complex bereavement disorder. PGD = Prolonged grief disorder.

debate about heightening this threshold (Boelen et al., 2019a; Bonanno and Malgaroli, 2020). Accordingly, we also examined numbers of probable caseness of ICD-11 PGD and pairwise agreement (Kappa) with other sets with different numbers of accompanying symptoms for an ICD-11 PGD diagnosis (i.e., from 1+ through 7+). These findings are included in **Supplementary Table S7**. Optimal agreement with PCBD was reached with 5+ symptoms, optimal agreement with PGD-2009 with 4+ symptoms, and optimal agreement with both PGD-BD and CG with 1+ symptoms.

### 3.4. Concurrent validity

Table 3 shows mean scores (SDs) on the ICG-R total-scores, SCL depression scores, SCL anxiety scores, SCL agoraphobia scores, and SCL suicidality item for people meeting criteria for probable caseness according to each of the 6 sets (with PGD-DSM-5-TR caseness calculated for 1+ through 7+ accompanying symptoms) and people not meeting these criteria. T-test values are also shown. Results showed that, for all sets, people meeting criteria scored significantly higher than people not meeting criteria (all t-values were  $> 7.80$ , all  $p$ -values were  $< 0.001$ ). We again also performed these analyses with different numbers of accompanying symptoms for an ICD-11 PGD diagnosis, ranging from 1+ through 7+ additional symptoms; for all comparisons people meeting criteria for caseness scored significantly higher than people not meeting criteria (outcomes are available on request).

### 3.5. Sociodemographic correlates of caseness

We examined whether cases and non-cases differed in terms of the socio-demographic and loss-related variables that we assessed. Compared to non-cases, participants with probable PCBD were older ( $M = 47.0$ ,  $SD = 16.0$  vs.  $M = 43.4$ ,  $SD = 14.6$  years,  $t(853) = 2.23$ ,  $p = .026$ ), had less years of education ( $M = 13.7$ ,  $SD = 2.7$  vs.  $M = 15.2$ ,  $SD = 3.2$  years,  $t(128.6) = 5.13$  (equal variances not assumed),  $p < .001$ ), and were more frequently confronted with unnatural loss ( $\chi^2(1, N = 855) = 4.47$ ,  $p = .040$ ). They did not differ in terms of gender, time since loss, and kinship.

With respect to PGD as per ICD-11, compared to non-cases, cases had less years of education ( $M = 14.2$ ,  $SD = 3.0$  vs.  $M = 15.3$ ,  $SD = 3.2$  years,  $t(275.3) = 4.23$  (equal variances not assumed),  $p < .001$ ) and had experienced their loss more recently ( $M = 40.4$ ,  $SD = 42.0$  vs.  $M = 48.0$ ,  $SD = 43.9$  years,  $t(853) = 2.01$ ,  $p = .040$ ). In addition, they differed in terms of kinship ( $\chi^2(2, N = 855) = 8.89$ ,  $p = .012$ ), with ICD-11 PGD cases being more often confronted with the death of a child, and cause ( $\chi^2(1, N = 855) = 8.03$ ,  $p = .005$ ), with cases being more frequently confronted with unnatural/violent deaths. No significant differences were found in terms of age and gender.

With respect to PGD-2009, compared to non-cases, cases had less years of education ( $M = 14.0$ ,  $SD = 2.9$  vs.  $M = 15.2$ ,  $SD = 3.2$  years,  $t(1278.4) = 3.77$  (equal variances not assumed),  $p < .001$ ), and differed in terms of kinship ( $\chi^2(2, N = 855) = 6.57$ ,  $p = .037$ , more frequent loss of children among cases), and cause ( $\chi^2(1, N = 855) = 7.04$ ,



**Table 3**

Concurrent validity: Differences in psychopathology between participants meeting/not meeting criteria for disturbed grief according to different criteria sets.

	ICG-r		SCL depression		SCL anxiety		SCL agoraphobia		SCL suicidal ideation	
	M	SD	M	SD	M	SD	M	SD	M	SD
PCBD no	73.98	18.18	34.52	11.89	17.45	6.82	9.84	4.24	1.26	0.62
PCBD yes	109.67	10.85	59.06	10.39	29.67	9.06	17.23	7.27	2.86	1.55
t	27.46		19.13		12.64		9.66		9.91	
ICD-11 PGD no	72.27	18.06	33.47	11.52	16.94	6.65	9.65	4.17	1.24	0.62
ICD-11 PGD yes	100.93	14.31	52.52	12.90	26.42	8.87	14.76	6.85	2.24	1.41
t	22.00		17.50		12.96		9.19		8.96	
PGD-2009 no	73.94	18.15	34.62	12.09	17.43	6.83	9.90	4.39	1.28	0.67
PGD-2009 yes	109.67	10.84	57.75	10.97	29.53	8.98	16.58	7.12	2.68	1.52
t	27.64		19.22		12.74		8.97		8.89	
PGD-BD no	72.35	18.05	33.54	11.52	16.97	6.64	9.67	4.17	1.24	0.62
PGD-BD yes	101.48	14.01	52.83	12.91	26.57	8.94	14.83	6.90	2.27	1.41
t	22.50		17.51		12.86		9.09		9.07	
CG no	71.99	18.09	33.17	11.39	16.78	6.48	9.58	4.04	1.22	0.57
CG yes	99.62	14.69	52.05	12.74	26.20	8.97	14.61	6.91	2.24	1.39
t	21.39		18.16		13.26		9.31		9.69	
PGD-DSM-5-TR (1+) no	72.26	18.10	33.44	11.56	16.93	6.67	9.64	4.17	1.24	0.61
PGD-DSM-5-TR (1+) yes	100.29	14.83	52.19	12.88	26.24	8.83	14.66	6.80	2.23	1.41
t	21.13		17.39		12.89		9.18		8.99	
PGD-DSM-5-TR (2+) no	72.29	18.04	33.51	11.56	16.95	6.66	9.64	4.16	1.24	0.62
PGD-DSM-5-TR (2+) yes	101.21	14.15	52.59	12.85	26.48	8.85	14.87	6.84	2.25	1.41
t	22.31		17.49		12.98		9.36		8.95	
PGD-DSM-5-TR (3+) no	72.48	17.93	33.52	11.52	17.01	6.70	9.69	4.21	1.24	0.61
PGD-DSM-5-TR (3+) yes	103.20	13.02	54.44	11.55	27.15	8.65	15.17	6.87	2.37	1.42
t	24.43		20.22		13.51		9.37		9.60	
PGD-DSM-5-TR (4+) no	72.87	17.86	33.78	11.57	17.11	6.69	9.72	4.21	1.24	0.61
PGD-DSM-5-TR (4+) yes	105.75	11.83	56.18	10.90	28.14	8.67	15.78	6.94	2.52	1.45
t	26.76		20.56		13.78		9.66		9.93	
PGD-DSM-5-TR (5+) no	73.70	18.11	34.39	11.91	17.36	6.78	9.82	4.29	1.27	0.65
PGD-DSM-5-TR (5+) yes	108.31	11.37	57.63	10.81	29.24	8.96	16.64	7.06	2.66	1.49
t	26.68		18.84		12.95		9.61		9.45	
PGD-DSM-5-TR (6+) no	74.42	18.42	34.88	12.21	17.61	6.97	9.93	4.35	1.28	0.67
PGD-DSM-5-TR (6+) yes	110.30	11.44	59.04	10.54	29.99	9.07	17.33	7.44	2.90	1.48
t	25.26		17.33		11.99		8.88		9.89	
PGD-DSM-5-TR (7+) no	75.29	18.77	35.54	12.67	17.90	7.17	10.13	4.58	1.32	0.73
PGD-DSM-5-TR (7+) yes	114.54	10.35	60.86	10.17	31.32	9.40	18.04	7.55	3.16	1.49
t	25.75		14.74		10.55		7.80		9.28	

Note. BD = Beta-draft. CG = Complicated Grief. ICG-R = Inventory of Complicated Grief-Revised. PCBD = Persistent complex bereavement disorder. PGD = Prolonged grief disorder. SCL = Symptom Checklist. All t-values are significant at  $p < .001$ .

$p = .010$ , more frequent unnatural/violent deaths among cases). The cases and non-cases did not differ with respect to age, gender, and time since loss.

With respect to PGD-BD, compared to non-cases, cases had less years of education ( $M = 14.1$ ,  $SD = 3.0$  vs.  $M = 15.3$ ,  $SD = 3.2$  years,  $t(263.5) = 4.39$  (equal variances not assumed),  $p < .001$ ), experienced their loss more recently ( $M = 40.1$ ,  $SD = 42.1$  vs.  $M = 48.0$ ,  $SD = 43.9$  years,  $t(853) = 2.09$ ,  $p = .037$ ), differed in kinship ( $\chi^2(2, N = 855) = 11.14$ ,  $p = .004$ , more frequent loss of children among cases), and cause ( $\chi^2(1, N = 855) = 7.02$ ,  $p = .008$ , more frequent unnatural/violent losses among cases). No age and gender differences were found.

With respect to CG, compared to non-cases, cases had less years of education ( $M = 14.1$ ,  $SD = 3.1$  vs.  $M = 15.2$ ,  $SD = 3.2$  years,  $t(305.0) = 3.19$  (equal variances not assumed),  $p = .002$ ) and more frequently had lost someone due to unnatural/violent losses ( $\chi^2(1, N = 855) = 6.44$ ,  $p = .013$ ). They did not differ in terms of age, time since loss, gender, and kinship.

For PGD-DSM-5-TR, caseness differed as a function of education, time since loss, kinship, and cause when counted with 1+ through 3+ accompanying symptoms, also differed by age when counted with 4+ through 6+ accompanying symptoms, and differed by age, education, and time since loss when counted with 7+ accompanying symptoms (data are available on request).

#### 4. Discussion

An ever-growing body of knowledge supporting the incremental validity of disturbed grief as a clinically useful diagnostic category has

culminated in the inclusion of PCBD in DSM-5 and PGD in ICD-11. Although this inclusion was at least partly motivated by the ambition to enhance clarity about criteria for disturbed grief, this clarity is still far from optimal because several other ways to define disturbed grief have been proposed in recent years. Specifically, apart from PCBD in DSM-5 (APA, 2013) and PGD as per ICD-11 (WHO, 2018), Prigerson et al. proposed criteria for PGD in 2009 (referred to as PGD-2009 in this study), Maercker et al. (2013) presented an ICD-11 beta draft version of PGD in 2013 (PGD-BD), Shear et al. (2011) put forth criteria for CG, and criteria for PGD for DSM-5-TR have been proposed (Prigerson, personal communication).

Studies comparing these criteria sets have indicated that their performance in terms of prevalence rates and validity differ (see Lenferink et al., in press). The current study expanded prior work by testing the performance of all six sets in a single sample, which has not been done before. A first aim was to examine the dimensionality of criteria sets. With respect to PCBD, we found that the three-factor model, with distinct clusters of separation distress, reactive distress, and social/identity disruption fitted better than one-factor and two-factor solutions. This accords with two prior studies (Boelen et al., 2018, 2019a) supporting the three-factor structure. The criteria for ICD-11 PGD, PGD-2009, PGD-BD, and DSM-5-TR PGD all formed a single dimension. Criteria for CG were best represented by a two-factor structure of separation distress symptoms and accompanying symptoms, respectively. Although findings provide further evidence that putative symptoms of disturbed grief are best conceptualized as forming one dimension, distinguishable dimensions of grief symptoms appear to emerge when the number of symptoms forming the disorder is

expanded. More research is needed to examine the validity and utility of different dimensions of disturbed grief such as the dimensions included in the PCBD and CG criteria. If additional dimensions have no added clinical or theoretical value, it seems better to use shorter criteria sets for the sake of clinical utility (Killikelly and Maercker, 2018). Notably, women were overrepresented in our sample (83% vs. 17% men) and so where people confronted with a natural loss (80% vs. 20% confronted with unnatural/violent loss). To our knowledge, there is no prior evidence that the factor structure of disturbed grief symptomatology differs as a function of these variables and we were unable to examine this in our study, because of the low sample sizes of subgroups. It would be relevant for future research to explore the possible impact of gender and cause of loss on the structure of these grief symptoms.

Our second aim was to count the total number of possible symptom combinations to meet criteria for caseness for each grief disorder, in order to evaluate symptom profile heterogeneity. In accord with prior work (Boelen and Prigerson, 2012; Lenferink and Eisma, 2018), criteria sets differed considerably in terms of the number of possible combinations. PCBD yielded by far the highest number of possible symptom combinations (i.e., 37,650), followed by 3705 ways to meet CG criteria and 3069 ways to meet ICD-11 PGD criteria. The number of possible combinations for the other sets were even lower, 256 combination to meet PGD-2009 criteria, 93 combinations to meet PGD-BD criteria, and 255 combinations to PGD DSM-5-TR criteria with 1+ accompanying symptoms, decreasing to nine combinations for 7+ combinations. Thus, the number of possible combinations differs considerably between sets; PCBD is particularly heterogeneous with at least a ten-fold greater number of combinations relative to the other sets, which, arguably, impedes the clinical utility of that set.

Our third aim was to compare prevalence rates as per each criteria set. Roughly, prevalence rates were ~10% for PCBD, PGD-2009, and PGD-DSM-5-TR (5+ through 7+ accompanying symptoms) and ~15%–20% for the other sets. Considering PCBD and ICD-11 PGD, the agreement between these sets turned out higher in this sample ( $K = 0.66$ ) compared to prior studies ( $K = 0.48$ , Boelen et al., 2018;  $\kappa = 0.51$ , Boelen et al., 2019a). Still, this agreement was far from optimal, considering that PCBD and ICD-11 PGD should tap into the same concept. In keeping with prior work (Boelen et al., 2019a), we found the agreement to improve when increasing the number of additional symptoms required for a diagnosis of ICD-11 PGD. Considering PCBD, PGD-2009, PGD-BD, and CG, the agreement rates of CG with the other sets were considerably larger than agreements in two prior studies (Maciejewski et al., 2016; O'Connor et al., 2019). This could be due to the fact that our sample was more heterogeneous in terms of kinship and time since loss compared to samples from these other studies, or that we assessed a more complete list of symptoms of CG. At the very least, it shows that the agreement of CG with other sets may be better than previously suggested. Concerning PGD-DSM-5-TR, diagnostic agreements with other sets were  $>0.60$  for the 1+ through 5+ thresholds for number of accompanying symptoms, and declined for the 6+ and 7+ thresholds. The 3+, 4+, and 5+ thresholds yielded the best agreements with the other sets. Taken together, the main finding of our examination of the diagnostic agreement between sets was that—except for agreements with the PGD-DSM-5-TR 6+ and 7+ sets—all agreements were  $>0.60$ , reflecting “substantial” agreement (Landis and Koch, 1977).

Our fourth aim was to evaluate the concurrent validity of the sets. To this end, meeting criteria for caseness for each set was examined in relation to overall disturbed grief and depression, anxiety, agoraphobic avoidance, and suicidal ideation. Straightforwardly, for each set, meeting criteria for caseness was connected with significantly higher scores on these outcomes. Maciejewski et al. (2016) found that, in terms of predictive validity, PCBD, PGD-2009, and PGD-BD, performed better than CG. In comparisons between PCBD and ICD-11 PGD, the concurrent validity was found to be similar (Boelen et al., 2018, 2019a, 2019b), whereas PCBD outperformed ICD-11 PGD in terms of predictive

validity (Boelen et al., 2018). The current findings contrast with some of these prior findings in showing no differences between sets in terms of concurrent validity.

Our fifth and final aim was to examine differences between sets in terms of socio-demographic and loss-related correlates. This also revealed a fairly straightforward picture, with most sets being associated with education, kinship, and cause of loss, such that caseness was associated with lower education, the loss of closer loved ones, and losses being due to unnatural causes. These findings generally accord with prior research findings (e.g., Lenferink et al., 2020; Smith and Ehlers, 2020). However, here again we point at the overrepresentation of women and people confronted with unnatural loss. Gender differences in caseness possibly went undetected, because the group of men included only 17% of the sample. Furthermore, although cause of loss was associated with caseness, differences in prevalence rates of caseness between people exposed to natural vs. unnatural losses might have been more pronounced in a sample with a more balanced distinction between these groups.

Several other limitations warrant consideration. First, items from the ICG-R and SCL depression scale were used as indicators of disturbed grief. These items were similar, but not identical, to symptoms of each set. Moreover, not all symptoms (e.g., the PCBD symptom “Difficulties positive reminiscing”) were captured. Future research could overcome this limitation by using an instrument that captures symptoms from multiple grief disorders (Lenferink et al., *in press*). In addition, we were not able to examine the predictive validity of the six criteria sets. This needs to be examined in future studies. Finally, most participants were woman and highly educated, and deaths took place four years earlier on average and were mostly due to a natural cause. This limits the generalization of findings.

Notwithstanding these considerations, the present findings add to a growing knowledge base about the performance of different sets of criteria to define disturbed grief. The six diagnostic sets proposed in recent years differ considerably in terms of prevalence rates and number of possible symptom combinations. Yet, at the same time, the diagnostic agreement between all sets is substantive. Moreover, the sets perform quite similar in terms of concurrent validity. It is our hope that this study will contribute to ongoing attempts to clarify diagnostically and clinically useful criteria for disturbed grief, reflecting a common language to distinguish “normal” from “disturbed” grief.

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## Author's contribution

PB collected the data. PB and LL analysed the data and wrote the manuscript.

## CRediT authorship contribution statement

**Paul A. Boelen:** Data curation, Formal analysis, Writing - original draft. **Lonneke I.M. Lenferink:** Formal analysis, Writing - original draft.

## Declaration of Competing Interest

The authors declare to have no conflict of interest.

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## Supplementary materials

Supplementary material associated with this article can be found, in the online version, at [doi:10.1016/j.psychres.2020.112786](https://doi.org/10.1016/j.psychres.2020.112786).

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