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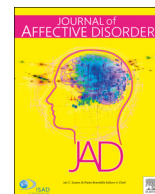
Research paper

Comparison of DSM-5 criteria for persistent complex bereavement disorder and ICD-11 criteria for prolonged grief disorder in help-seeking bereaved children

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ABSTRACT

Background: Persistent complex bereavement disorder (PCBD) is a disorder of grief that newly entered DSM-5. Prolonged grief disorder (PGD) is a disorder of grief included in ICD-11. No prior studies examined and compared the dimensionality, prevalence, and concurrent validity of both conditions among bereaved children.
Methods: With data from 291 help-seeking bereaved 8–18 year old children, we used confirmatory factor analysis to evaluate the fit of different factor models for PCBD and PGD. In addition, we determined diagnostic rates for probable PCBD and PGD and calculated associations of PCBD and PGD caseness with concurrently assessed symptoms of overall disturbed grief, depression, posttraumatic stress, and parent-rated problem behavior.
Results: For PCBD and PGD, one-factor models—with all symptoms forming a unidimensional factor of disturbed grief—fit the data best. The prevalence of probable DSM-5 PCBD (3.4%) was significantly lower than ICD-11 PGD (12.4%). Both PCBD and PGD were significantly associated with concurrently assessed overall disturbed grief, depression, and posttraumatic stress; associations with parent-rated problems were moderate.
Limitations: Findings were based on self-reported ratings of symptoms, obtained from three different scales not specifically designed to assess PCBD and PGD. The use of a help-seeking sample limits the generalization of findings to bereaved children generally.
Conclusions: Findings support the validity of DSM-5 PCBD and ICD-11 PGD. Prevalence rates of both constructs differ. This needs further scrutiny.

1. Introduction

The death of a loved one is among the most common stressful life events that children may experience and a risk factor for adverse health outcomes (Berg et al., 2016). Consequences of bereavement may be particularly profound when the loss was traumatic and concerns a parent or other attachment figure (Melhem et al., 2011). Most children do not experience persistent psychopathology (Bonanno and Mancini, 2008), yet a significant minority develops symptoms of depression (Hamdam et al., 2012), posttraumatic stress (Stoppelbein and Greening, 2000), or persistent, disturbing grief (Melhem et al., 2013). The validity of disturbed grief as a distinct condition is increasingly recognized. This has resulted in the inclusion of Persistent complex bereavement disorder (PCBD) in Section III of the fifth Diagnostic and Statistical Manual for Psychiatric Disorders (DSM-5; APA, 2013) and

Prolonged grief disorder (PGD) in the 11th edition of the International Classification of Diseases (ICD-11; WHO, 2018). PCBD can be diagnosed when a child suffered the death of a significant other and experiences symptoms of separation distress (e.g., yearning), combined with symptoms of "reactive distress to the death" (e.g., anger) and "social/ identity disruption" (e.g., difficulty trusting others) to a functionally impairing degree, at least 6 months (12 months in adults) following the loss. PGD can be diagnosed when a child suffers from one of two symptoms of separation distress and at least one of ten accompanying symptoms (e.g., emotional numbness) to a distressing and disabling degree at least 6 months after the death.

DSM-5 PCBD and ICD-11 PGD are similar in some respects. Both constructs include separation distress as hallmark feature, use a 6 months timing criterion, and conceptualize disturbed grief as a stagnation of acute (normal) grief symptoms. Yet, there are also differences

between PCBD and PGD, for instance, in terms of the nature of symptoms (e.g., "a wish to die to be with the deceased" and "difficulties positive reminiscing about the lost person" are included in PCBD but not PGD criteria) and the number of symptoms required for a diagnosis (more symptoms required for PCBD than for PGD).

To date, nine studies have yielded information about the two criteria-sets. Maciejewski et al. (2016) compared prevalence rates and validity of four criteria-sets proposed in the literature, including (i) PCBD as per DSM-5, (ii) a precursor of the current ICD-11 PGD criteria, (iii) a slightly different formulation of PGD proposed by Prigerson et al. (2009), and (iv) criteria for complicated grief (CG) proposed by Shear et al. (2011). They found that the first three sets yielded similar prevalence rates (11.9% − 14.2%) and had good predictive validity, whereas CG criteria yielded higher prevalence rates (30.2%) and had poor predictive validity. This study was recently replicated by O'Connor et al. (in press). Cozza et al. (2016) and Mauro et al. (2017) compared PCBD, PGD as per Prigerson, and CG in terms of their ability to distinguish people with disturbed and non-disturbed grief; they concluded that CG criteria performed better than PCBD criteria and PGD criteria (as per Prigerson) in terms of identifying clinical cases. Tay et al. (2016) studied the dimensionality of symptoms of disturbed grief in a sample of West Papuan refugees and found that the two-factor models of the PCBD criteria and criteria for PGD (slightly different from PGD criteria included in Prigerson et al. (2009), Maercker et al. (2013), and the ICD-11) displayed a poor fit to the data. Mauro et al. (2018) compared PGD as per Prigerson and PGD as per ICD-11; they found the latter criteria to perform better in terms of identifying people with disturbed grief. Lastly, Boelen et al. (2018) examined the dimensionality, prevalence rates, and validity of PCBD and ICD-11 PGD in a community sample. They found that criteria for PCBD yielded substantially lower prevalence rates compared to PGD (6.4% vs. 18.0%), that both sets evidenced adequate concurrent validity, but that PCBD criteria had better predictive validity. Comparable findings were observed by Boelen et al. (2019). One further study offered preliminary support for the two-factor structure of PCBD among 14–21 year old war-exposed youngsters (Claycomb et al., 2016).

To our knowledge, no studies have compared criteria for PCBD as per DSM-5 and PGD as per ICD-11 in bereaved children and youngsters in terms of their prevalence rates, factor structure, and validity. This is important for a number of reasons. For instance, there is still a need to enhance knowledge about prevalence rates of disturbed grief in children (e.g., Melhem et al., 2013). In addition, there is a need for information about the psychometric properties of PCBD and PGD criteria, to inform the use of these criteria in clinical and research settings. Furthermore, comparing the performance of these criteria is vital to establish whether (future) research findings about risk factors, diagnosis, and treatment of childhood disturbed grief as conceptualized in DSM-5 can be generalized to children with disturbed grief as per ICD-11 (and vice versa).

The present study offers the first evaluation of prevalence rates and psychometric properties of PCBD and PGD in children seeking psychological help following their loss. To this end, we re-analyzed data from a research program on the nature and correlates of disturbed grief in youngsters (see Boelen and Spuij, 2013; Boelen et al., 2017) and followed a similar analytic strategy as employed in a recent study among bereaved adults (Boelen et al., 2018). The first aim was to evaluate the dimensionality of DSM-5 PCBD and ICD-11 PGD. Items from the Inventory of Prolonged Grief for Children and Adolescents (Spuij et al., 2012), Children's Depression Inventory (CDI; Kovacs, 2003), and Child Posttraumatic Stress Disorder (PTSD) Symptom Scale (CPSS; Foa et al., 2001) were selected to assess symptoms of PCBD and PGD according to how closely they mapped onto both criteria-sets. We evaluated the fit of three PCBD-models, resembling the dimensionality as included in DSM-5: (i) a one-factor model with all PCBD-items loading on a single factor, (ii) a two-factor model with PCBD-items forming distinct, but correlated clusters of separation distress (factor 1) and reactive distress and social/identity disruption (factor 2), (iii) a three-factor model with PCBD-items forming distinct, but correlated clusters of separation distress (factor 1), reactive distress (factor 2), and social/identity disruption (factor 3). We also evaluated the fit of two PGD-models: (i) a one-factor model and (ii) a two-factor model with PGD-items clustering into correlated factors of separation distress and additional symptoms—mirroring the ICD-11 proposal (Killikelly and Maercker, 2018). As a second aim, we sought to determine and compare prevalence rates of disturbed grief as per DSM-5 and ICD-11, the level of agreement between criteria-sets, and the number of 'unique' cases of PCBD and PGD (i.e., children meeting criteria for one but not both criteria-sets). The third and final aim was to evaluate the concurrent validity of PCBD and PGD diagnoses. To this end, we compared levels of disturbed grief, depression, PTSD, and functional impairment (rated by the child), and internalizing, externalizing, and overall problem behavior (rated by one of the parents) between children meeting vs. not meeting criteria for caseness of PCBD and PGD. We anticipated that children meeting these criteria would evidence more severe distress and dysfunction. Given the composition of the sample, we were only able to evaluate the factor structure, prevalence, and correlates among help-seeking children as non-help-seeking children were not included in this study.

2. Method

2.1. Participants and procedure

Data were available from 332 children and adolescents, aged 8–18 years, participating in a research program on the nature and correlates of children's grief. As explained in more detail elsewhere (Boelen et al., 2017; Boelen and Spuij, 2013), 126 children were recruited from bereavement support organizations and completed questionnaires in the presence of a research assistant during a home visit, and 206 children were recruited via different outpatient clinics and completed questionnaires in the presence of their therapists. Assent was obtained from children (aged 8–12 years), informed consent from parents and adolescents (aged 13–18 years).

2.2. Measures

2.2.1. Demographic and loss-related variables

We collected data on the participants' gender, age, the relationship to the deceased (categorized as mother, father, sibling, or other loved one), cause of death (illness, violent cause [accident, suicide, homicide], unexpected medical cause [e.g., heart attack], or some other cause), whether the death was experienced as unexpected (yes/no), and the time passed since the death.

2.2.2. Inventory of prolonged grief for children (IPG-C) and inventory of prolonged grief for adolescents (IPG-A)

Symptoms of disturbed grief were assessed using the IPG-C and IPG-A developed by Spuij et al. (2012). Both are 30-item questionnaires based on the adult revised Inventory of Complicated Grief (ICG-R; Prigerson and Jacobs, 2001). Respondents rate the frequency of symptoms on 3-point scales (1 = *almost never*, 2 = *sometimes*, 3 = *always*). The content of the IPG-C and IPG-A items are similar although the wording of some of the items differs slightly to match with age groups. For instance, the item tapping searching behavior in the children's version was "I want to go to places that are related to him/her" and in the adolescent's version was "I seek out and feel attracted to places and things that are associated with him/her." Psychometric properties of the questionnaires are adequate. The α in the present sample for the IPG-C was 0.91 and the IPG-A was 0.94.

2.2.3. Child PTSD symptom scale (CPSS)

The CPSS (Foa et al., 2001) assessed DSM-IV-based (APA, 2000)

bereavement-related PTSD. Children were instructed to rate each of its 17 items—keeping in mind the loss as anchor-event—with symptoms rated on 4-point scales (0 = *not at all/only once a week* to 3 = *almost always/five or more times a week*). Apart from the 17 items tapping PTSD symptoms, the CPSS includes seven dichotomously rated (0 = *absent*, 1 = *present*) items tapping functional impairment associated with PTSD symptoms. The CPSS has adequate psychometric properties (Foa et al., 2001). The α in the present sample was 0.90 for the first 17 items and 0.67 for the functional impairment items.

2.2.4. Children's depression inventory (CDI)

The CDI is a 27-item questionnaire assessing depressive symptoms (Kovacs, 2003; Dutch version Timbremont et al., 2008). Each item contains three statements representing depressive symptoms at increasing levels of severity. Respondents select one statement that best describes how they felt in the preceding week, scored from 0 = *symptom absent* to 2 = *symptom present always/most of the time*. The α in the present sample was 0.86.

2.2.5. Child behavior Checklist/6–18 (CBCL)

The CBCL was used to measure problem behavior as observed by the children's caregivers (Achenbach and Rescorla, 2001). Its 118 items are rated on 3-point scales (0 = *not true*, 1 = *somewhat/sometimes true*, 2 = *very true/often true*) and represent different problem areas. As recommended (Verhulst et al., 1996) both parents completed the CBCL, if possible. In case one of the parents died or other cases were one parent was available, one parent completed the measure. We selected data from one randomly selected parent when both parents completed the scale; this was justified given that scores from two parents—if available—were highly correlated (see Boelen et al., 2017). The CBCL provides indices of internalizing problems, externalizing problems, and total problem behavior. Its original (Achenbach and Rescorla, 2001) and Dutch versions (Verhulst et al., 1996) have established psychometric properties. In our sample, α's of the internalizing, the externalizing, and the total scale were 0.95, 0.89, and 0.91, respectively.

2.3. Statistical analyses

Items from the IPG, CDI, and CPSS were used to tap symptoms of PCBD and PGD. Fifteen of all 16 PCBD-symptoms (all symptoms except "Difficulty positive reminiscing about the deceased") were represented by 11 IPG items, three CDI items, and one CPSS item (see Table 1). All 12 PGD-items were represented by 8 IPG items, three CDI items, and one CPSS item (Table 2). To examine the factor structure of the PCBD and PGD items, confirmatory factor analyses were conducted in Mplus Version 5.2 (Muthén and Muthén, 1998–2007). The fit of the one-factor, two-factor, and three-factor models of the PCBD items and the one-factor and two-factor models of PGD items were evaluated. Data on all variables were categorical and scored on 3-point scales except for one item tapped from the CPSS (i.e. "Difficult moving on") that was scored on a 4-point scale. None of the individual item distributions showed extreme outliers (absolute skew ≥ 3.0 and absolute kurtosis ≥ 10.0; Kline, 2005). The mean- and variance-adjusted weighted least squares (WLSMV) method was used, which is a recommended estimator for analyzing categorical variables (Kline, 2011). 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 (RMSEA) values of <0.10 reflecting acceptable fit and values <0.05 reflecting excellent model fit. There was less than 1% missing data on each indicator variable. Missing data were accounted for using the default option in Mplus (i.e., pairwise deletion).

To address the second aim, we counted the number of children meeting criteria for probable DSM-5 PCBD and ICD-11 PGD. In so doing, symptom-scores were dichotomized as 0 = *absent* and

1 = *present*, with IPG-items rated as present when scored with a 3 response (on the 1–3 Likert scale), CDI-items rated as present when scored 2 (on the 0–2 Likert scale), and the CPSS-item rated as present when scored with a 2–3 response (on the 0–3 scale). Criteria for probable PCBD-caseness required the presence of at least 1 separation distress symptom (symptoms 1–4, Table 1) and at least 6 additional symptoms (symptoms 5–16, Table 1), along with the presence of the IPG functional impairment item (IPG-C: "I am doing worse (in school and with friends) since s/he died", IPG-A: "Since s/he died, my functioning in different areas is impaired (for instance my functioning in school, with friend, in my job"). Criteria for probable PGD-caseness required the presence of at least 1 separation distress symptom (symptoms 1–2, Table 2) and at least 1 additional symptom (symptoms 3–12, Table 2), along with the presence of the same ICG-R functional impairment item. Pairwise agreement between tests was evaluated using kappa statistics.

To address our third aim, we calculated mean scores of concurrently assessed overall disturbed grief (IPG total score), depression (CDI total score), PTSD cluster and total scores (CPSS), functional impairment (CPSS) as rated by the children as well as internalizing, externalizing, and total problem behavior (CBCL) rated by the parent. Using *t*-tests, we compared these scores between children meeting vs. not meeting criteria for PCBD and, additionally, for children meeting vs. not meeting criteria for PGD.

3. Results

3.1. Participant characteristics

Participants recruited from bereavement support organizations (*n* = 126) and those recruited from outpatient clinics (*n* = 206) did not differ on variables assessed for the present study and were combined in the analyses. Because PCBD and PGD can only be diagnosed after six months after the loss, we removed data from 41 children who were in the first half-year of bereavement, yielding a final sample of 291 children. They had a mean age of 11.7 (SD = 2.7; range 8–17) years; 164 (56.4%) were girls. Most children had experienced the death of a father (*n* = 170, 58.4%) or mother (*n* = 68, 23.4%), 26 (8.9%) lost a sibling, and 23 (7.9%) another relative. Losses were caused by an illness in 154 (52.9%) cases, by an unnatural cause (i.e., accident, homicide, suicide) in 65 (22.3%) cases, by an unexpected medical cause in 58 (19.9%) cases, and by some other causes in 12 (4.1%) cases. Deaths occurred, on average 34.6 (SD = 25.1, range 6–119) months prior to the data collection.

3.2. Confirmatory factor analysis

With respect to PCBD, fit-indices pointed at good fit for the one-factor model, two-factor model (both models: CFI = 0.95, TLI = 0.98, RMSEA = 0.06), and three-factor model (CFI = 0.96, TLI = 0.98, RMSEA = 0.05). However, in the two-factor model, the correlation between factors was 0.997 and in the three-factor model, one of the correlations between factors was >1. This indicates that factors in the two-factor and three-factor solutions were indistinguishable (Muthén, 2011). Likewise, for PGD, the one-factor and two-factor models both yielded adequate fit (CFI = 0.95, TLI = 0.97, RMSEA = 0.06). Here also, the correlation between factors was >1. Hence, within the present dataset, for PCBD and PGD one-factor models seemed to fit the data best. Standardized factor loadings are shown in Table 1 (PCBD) and Table 2 (PGD). For PCBD, loadings ranged from 0.41 to 0.79, with all but two loadings >0.50; for PGD, loadings ranged from 0.37 to 0.71, with all but two loadings >0.50.

3.3. Prevalence rates, agreement, and correlates of caseness

The diagnostic rate for probable PCBD was 3.4% (*n* = 10) and for

Table 1

DSM-5 criteria for persistent complex bereavement disorder and factor-loadings, mean scores, and percentage of participants with symptoms.

	Symptoms	Item match	Factor-loadings (one-factor model)	M (SD)	% with symptom present
1	Persistent yearning/longing for the deceased	I would like to be with him/her (IPG-C), I long for him/her (IPG-A)	0.592	2.58 (0.61)	64.6
2	Intense sorrow and emotional pain	I am sad once in a while/I am sad many times/I am sad all the time (CDI)	0.582	0.31 (0.52)	2.7
3	Preoccupation with the deceased person	I find it hard to do the things I normally do, because I think of him/her so much (IPG-C), I think of him/her so often, that it's hard for me to do the things I usually do (IPG-A)	0.756	1.49 (0.64)	8.2
4	Preoccupation with circumstances of the death	Thinking of him/her confuses me (IPG-C), Memories of him/her upset me (IPG-A)	0.612	1.66 (0.69)	12.7
5	Difficulty accepting the death	It feels difficult that s/he died, I think it's not fair (IPG-C), I find it hard to accept that s/he is dead (IPG-A)	0.622	2.24 (0.74)	42.6
6	Disbelief or numbness	It feels as if nothing really touches me (IPG-C, IPG-A)	0.690	1.41 (0.60)	5.8
7	Difficulty positive reminiscing about deceased	–	–	–	–
8	Bitterness or anger	I am angry about his/her death (IPG-C, IPG-A)	0.523	1.89 (0.76)	24.1
9	Maladaptive appraisals about the self associated with the loss (e.g., self-blame)	I do not feel guilty for the bad things that happen/Many bad things that happen are my fault/ev Everything bad things that happen is my fault (CDI)	0.453	0.17 (0.42)	1.7
10	Excessive avoidance of stimuli	I don't want to think about the fact that s/he is dead (IPG-C), I do everything to avoid thinking about the fact that s/he is dead (IPG-A)	0.405	1.73 (0.75)	18.2
11	A desire to die to be with the deceased	I do not think about killing myself/I think about killing myself but would not do it/I want to kill myself (CDI)	0.514	0.30 (0.52)	3.1
12	Difficulty trusting other people	I find it difficult to trust other people since s/he has died (IPG-C, IPG-A)	0.736	1.39 (0.67)	10.7
13	Feeling alone or detached from other persons	I feel very alone since s/he died (IPG-C), I feel lonely since s/he died (IPG-A)	0.716	1.77 (0.74)	18.9
14	Feeling that life is empty or meaningless or one is unable to function without the deceased	I feel no interest in things since s/he died (IPG-C), Life feels empty or meaningless since s/he died (IPG-A)	0.787	1.52 (0.67)	10.0
15	Confusion about one's role and diminished identity (e.g., feeling that part of self died)	It feels as if a part of me is dead (IPG-C), It feels as if part of me has died with his/her death (IPG-A)	0.656	1.71 (0.72)	15.8
16	Difficulties to pursue interests or plan for the future (e.g., friendships, activities)	Having much less interest or not doing the things you used to do (CPSS)	0.768	0.69 (0.95)	18.9

Note. CDI = Children's Depression Inventory. CPSS = Child Posttraumatic Stress-Disorder Symptom Scale. IPG-C = Inventory of Prolonged Grief for Children. IPG-A = Inventory of Prolonged Grief for Adolescents.

Table 2
ICD-11 criteria for prolonged grief disorder and factor-loadings, mean scores, and percentage of participants with symptoms.

	Symptoms	Item match	Factor-loadings (one-factor model)	M (SD)	% with symptom present
1	Longing for the deceased	I would like to be with him/her (IPG-C), I long for him/her (IPG-A)	0.596	2.58 (0.61)	64.6
2	Persistent preoccupation with the deceased	I find it hard to do the things I normally do, because I think of him/her so much (IPG-C), I think of him/her so often, that it's hard for me to do the things I usually do (IPG-A)	0.788	1.49 (0.65)	8.2
3	Accompanied by: intense emotional pain, e.g.: sadness	I am sad once in a while/I am sad many times/I am sad all the time (CDI)	0.587	0.31 (0.52)	2.7
4	Guilt	It feels unfair that I am still alive while s/he is dead; I feel guilty about that (IPG-C), I feel guilty about the fact that I am still alive while s/he is dead (IPG-A)	0.749	1.44 (0.69)	11.7
5	Anger	I am angry about his/her death (IPG-C, IPG-A)	0.537	1.89 (0.76)	24.1
6	Denial	I don't want to think about the fact that s/he is dead (IPG-C), I do everything to avoid thinking about the fact that s/he is dead (IPG-A)	0.368	1.73 (0.75)	18.2
7	Blame	I do not feel guilty for the bad things that happen/Many bad things that happen are my fault/Everything bad things that happen is my fault (CDI)	0.499	0.17 (0.42)	1.7
8	Difficulty accepting the death	It feels difficult that s/he died, I think it's not fair (IPG-C), I find it hard to accept that s/he is dead (IPG-A)	0.671	2.24 (0.75)	42.6
9	Feeling one has lost a part of one's self	It feels as if a part of me is dead (IPG-C), It feels as if part of me has died with his/her death (IPG-A)	0.612	1.71 (0.72)	15.8
10	An inability to experience positive mood	I have fun with many things/I have fun with some things/Nothing is fun for me (CDI)	0.532	0.47 (0.53)	1.7
11	Emotional numbness	It feels as if nothing really touches me (IPG-C, IPG-A)	0.689	1.41 (0.60)	5.8
12	Difficulty in engaging with social or other activities	Having much less interest or not doing the things you used to do (CPSS)	0.709	0.69 (0.95)	18.9

Note. CDI = Children's Depression Inventory. CPSS = Child Posttraumatic Stress-Disorder Symptom Scale. IPG-C = Inventory of Prolonged Grief for Children. IPG-A = Inventory of Prolonged Grief for Adolescents.

probable PGD it was 12.4% ($n = 36$). Tables 1 and 2 show mean scores for each item and percentages of participants with symptoms "present". The difference in diagnostic rates according to the two criteria-sets was statistically significant (Fisher's exact test, $p < .001$). There were no 'unique' PCBD cases (i.e., children meeting criteria for PCBD-caseness but not PGD-caseness). There were 26 (9.3%) 'unique' ICD-11 PGD-cases (meeting PGD criteria but not PCBD criteria). Ten (3.4%) children met criteria for both PCBD and PGD, representing 'fair' diagnostic agreement (Kappa = 0.40, SE = 0.09, $p < .001$; Landis and Koch, 1977).

No differences were found between PCBD and PGD cases and non-cases in terms of the socio-demographic/loss variables that we assessed, with one exception: children meeting criteria for PCBD were more often confronted with an unexpected loss compared to their counterparts not meeting PCBD criteria (Fisher's exact test, $p = .035$).

3.4. Concurrent validity of PCBD-caseness and PGD-caseness

Table 3 shows mean scores for all outcomes, for the total sample and for children meeting and not meeting criteria for PCBD-caseness and PGD-caseness, together with t-tests testing for differences. For all self-rated outcomes, children meeting criteria for PCBD ($n = 10$) had significantly higher scores than children not meeting criteria ($n = 281$) and children meeting criteria for PGD caseness ($n = 36$) had higher scores than children not meeting criteria ($n = 255$); all p's $< .001$. For all parent-rated outcomes, PCBD cases and non-cases did not differ and PGD cases and non-cases differed in terms of internalizing and total problem behavior (p's $< .01$).[1]

3.5. Additional analyses with less conservative symptom-threshold

As noted, symptom scores were dichotomized to calculate DSM-5 PCBD and ICD-11 PGD prevalence rates, with symptoms considered "present" when scored with the highest response on the three-point frequency-scale and symptoms considered "absent" when scored with the lowest or intermediate responses on the three-point frequency-scale. For exploratory reasons, we also calculated the prevalence rates, agreement, and concurrent validity of DSM-5 PCBD and ICD-11 PGD when using the less conservative threshold, with symptoms considered present when rated with the intermediate or highest response on the three-point frequency-scale. Using this cut-off, the probable diagnostic rate for PCBD was 28.5% ($n = 83$) and for PGD it was 43.0% ($n = 125$). Eighty-three (28.5%) participants met criteria for both PCBD and PGD, representing substantial diagnostic agreement (Kappa = 0.69, SE = 0.04, $p < .001$; Landis and Koch, 1977). With respect to the concurrent validity, for all self-rated outcomes, children meeting criteria for PCBD had significantly higher scores than children not meeting criteria and children meeting criteria for PGD caseness had higher scores than children not meeting criteria (p's $< .001$). For all parent-rated outcomes, PCBD cases and non-cases differed in terms of internalizing ($p < .05$) and PGD cases and non-cases differed in terms of internalizing and total problem behavior (p's $< .001$). Outcomes of these analyses are shown in Supplementary File A.

4. Discussion

With respect to our first aim, confirmatory factor analyses indicated that PCBD items loaded on a single dimension. Outcomes of the two-factor and three-factor models indicated that symptoms of separation

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[1] Differences between participants with vs. without PCBD and between participants with vs. without PGD on all the self-rated outcomes for grief, depression, and PTSD remained statistically significant at the $p < .001$-level when items that were used as indicators of PCBD and/or PGD were removed from these measures of grief, depression, and PTSD.

Table 3

Differences in psychopathology and functional impairment between children meeting/not meeting criteria for provisional PCBD and PGD diagnoses with conservative threshold for symptom presence.

| | Total sample | | Meeting criteria for provisional PCBD-diagnosis? | | | Meeting criteria for provisional PGD-diagnosis? | | |
			No	Yes		No	Yes	
Self-rated	M (SD)	N	M (SD)	M (SD)	t	M (SD)	M (SD)	
Overall disturbed grief (IPG total)	50.60 (12.02)	291	49.75 (11.24)	74.30 (8.81)	6.83**	48.47 (10.71)	65.63 (9.91)	9.07**
Depression (CDI total)	10.60 (7.14)	290	10.12 (6.68)	24.00 (7.07)	6.44**	9.57 (6.56)	17.86 (6.93)	7.03**
Reexperiencing (CPSS)	4.17 (3.41)	291	3.99 (3.27)	9.30 (3.50)	5.04**	3.75 (3.15)	7.17 (3.72)	5.95**
Avoidance (CPSS)	4.88 (4.24)	291	4.58 (3.89)	13.50 (4.81)	7.06**	4.14 (3.62)	10.17 (4.61)	9.01**
Hyperarousal (CPSS)	4.59 (3.53)	291	4.41 (3.38)	9.80 (3.68)	4.94**	4.15 (3.30)	7.69 (3.58)	5.97**
Overall PTS (CPSS total)	13.64 (9.99)	291	12.97 (9.29)	32.60 (10.88)	6.53**	12.04 (8.87)	25.03 (10.17)	8.07**
Impairment in functioning (CPSS)	1.80 (1.72)	290	1.72 (1.68)	3.90 (1.37)	4.04**	1.57 (1.64)	3.38 (1.44)	6.31**
Parent-rated								
Internalizing problems (CBCL)	12.50 (9.14)	279	12.45 (9.13)	13.81 (9.90)	0.46	11.90 (8.81)	16.57 (10.34)	2.90*
Externalizing problems (CBCL)	9.71 (8.53)	279	9.61 (8.41)	12.40 (11.60)	1.01	9.31 (8.11)	12.44 (10.71)	2.07
Total problems (CBCL)	38.95 (25.51)	279	38.71 (25.52)	45.54 (25.57)	0.83	37.37 (24.68)	49.62 (28.68)	2.71*

Note. Samples sizes differ due to occasional missing values. CDI = Children's Depression Inventory. CBCL = Child Behavior Checklist. CPSS = Child Posttraumatic Stress-Disorder Symptom Scale. IPG = Inventory of Prolonged Grief. PTS = posttraumatic stress.
*p < .01. **p < .001.

distress and reactive distress and social/identity disruption did not represent distinguishable factors. Thus, the DMS-5 model was not confirmed with the present data. PGD items were also found to represent one factor, rather than distinct factors of separation distress and accompanying symptoms as described in ICD-11. Our findings contrast with our prior study among adults in which multidimensional models for PCBD, with correlated, but distinct clusters of separation distress, reactive distress, and social/identity disruption and for PGD with correlated, but distinct dimensions of separation distress and accompanying symptoms fit the data better than one-factor models—albeit that one-factor models of PCBD and PGD also yielded acceptable fit (Boelen et al., 2018). It would be relevant for future studies to further explore the factor structure of PCBD and PGD symptoms among children and adults as well as the invariance of the dimensionality across age groups.

Our second aim was to compare the number of children meeting criteria for a probable diagnosis of PCBD and a probable diagnosis of PGD. The diagnostic rate for PCBD was lower (3.4%) than for PGD (12.4%); all 10 children meeting criteria for PCBD also met criteria for PGD, reflecting fair agreement (Landis and Koch, 1977). In our study among adults, diagnostic rates were 6.4% for PCBD and 18.0% for PGD (Boelen et al., 2018). Taken together, these findings suggest that the overlap between PCBD as per DSM-5 and PGD as per ICD-11 is smaller for bereaved children than for bereaved adults. However, this conclusion is tentative given that no further studies evaluated and compared diagnostic rates of PCBD and PGD in children and adults. The current findings are consistent with our earlier findings in suggesting that PGD criteria lead to considerably higher prevalence rates of disturbed grief than PCBD criteria. ICD-11 seeks to offer relatively simple descriptions of disorders and algorithms for classification and values sensitivity (identifying people with the condition) over specificity (identifying people without impairments; cf. Keeley et al., 2016; Killikelly and Maercker, 2018). The use of simple descriptions enhances clinical utility of criteria and has great advantages for classification in lower-resourced contexts. However, the down side may be that too many are also falsely classified as suffering from disturbed grief.

To investigate the concurrent validity of PCBD and PGD (aim 3), we examined the degree to which cases and non-cases, according to the DSM-5 and ICD-11, differed in levels of concurrent self-rated mental health, including overall disturbed grief, the DSM-IV based clusters of PTSD, overall PTSD, and impairments in functioning. PCBD and PGD both distinguished children with different levels of distress and dysfunction. That is, children with PCBD as per DSM-5 had poorer scores than their counterparts not meeting criteria for PCBD. Similarly, PGD cases had worse scores than non-cases. When looking at parent-rated

functioning of children, a slightly different picture emerged. PGD cases differed from non-cases in terms of internalizing as well as total problem behavior (at a *p* < .001 level), whereas PCBD cases did not differ from non-cases in terms of parent-rated outcomes. This suggests that PGD criteria are somewhat more sensitive in differentiating between different levels of distress as observed by parents. Our findings support the concurrent validity of both PCBD and PGD and parallel evidence in adults that both conditions are associated with distress and dysfunction (Boelen et al., 2018; Maciejewski et al., 2016).

We conducted additional analyses with a less conservative threshold for symptom-presence (i.e. with symptoms considered "present" when rated with the intermediate or highest response on the three-point scale). As could be expected, these analyses yielded higher rates of PCBD-caseness (i.e. 28.5%) and PGD-caseness (43.0%) but, in accord with our main analyses, continued to indicate that agreement between DSM-5 PCBD and ICD-11 PGD was far from perfect, with ICD-11 PGD criteria leading to considerably higher prevalence rates.

The present outcomes should be considered in the context of some limitations. First, items assessing PCBD and PGD were taken from three different instruments that were not specifically designed to tap the symptoms; for instance, one PCBD item ("difficulty positive reminiscing") was not covered. Consequently, conclusions should stay tentative pending replication with measures specifically designed to assess the whole range of PCBD and PGD symptoms. Notably, such measures have been developed very recently (Andriessen et al., 2018; Kaplow et al., 2018). Secondly, the prevalence rates of PCBD and PGD likely do not generalize to the general population of bereaved children. That is because they are based on self-reported data that may give an overestimation of symptom rates compared to interview-based assessment (Engelhard et al., 2007). Moreover, thresholds for considering a symptom as present that we used do not perfectly mirror thresholds of the criteria; e.g., DSM-5 prescribes that PCBD symptoms should be present "on more days than not and to a clinically significant degree" whereas we used high scores on Likert-scales as symptom-threshold. In addition, prevalence rates are likely higher in the present sample compared to the general population of bereaved children because all the study participants received sought some form of help or support following their loss—although this is not entirely sure given that we used a fairly conservative threshold for symptom presence. Thirdly, our goal was to compare DSM-5 PCBD criteria and ICD-11 PGD criteria; to this end, we used scores on self-report scales as indicators of symptoms, and used DSM-5-based and ICD-11-based diagnostic algorithms to calculate prevalence rates of probable PCBD-caseness and PGD-caseness, respectively. In clinical practice, this procedure should not be used to diagnose grief-related disorders in children. Instead, expert clinical

interviewing is required to diagnose children with PCBD and/or PGD in that context. Fourthly, our findings may not generalize to PGD criteria as put forth by Prigerson et al. (2009); although it is possible that these criteria have better psychometric properties, it was considered pertinent to focus on criteria now included in the dominant classification systems. A fifth limitation is that the lack of longitudinal data precluded the evaluation of the predictive validity of criteria; in our study among adults, the predictive validity of PCBD criteria was better than PGD criteria (Boelen et al., 2018). Whether or not that also holds for children still remains to be studied. One final relevant point is that DSM-5 and ICD-11 descriptions of disturbed grief were central to this study. It is notable that—apart from a different timing criterion and wording of some symptoms—there are no differences between PCBD and PGD criteria for children and for adults. Although our key interest was to evaluate the DSM-5 and ICD-11 criteria as currently defined, more research is urgently needed to examine whether these criteria are sufficiently developmentally sensitive to capture essential features of disturbed grief in childhood (cf. Kaplow et al., 2018).

Notwithstanding these considerations, this study adds knowledge about the similarities and differences between PCBD in DSM-5 and PGD in ICD-11 among help-seeking bereaved children. In a number of ways—i.e., the nature of key symptoms, their ability to distinguish between different levels of concurrent depression and PTSD—both conditions seem similar, and both conditions can aid in identifying bereaved children in need of professional care and support. On the other hand, the overlap in terms of diagnostic rates is far from optimal. More research is needed to evaluate and compare the DSM-5 and ICD-11 criteria. Eventually, bereaved children across the world would benefit from optimal harmonization of diagnostic systems such that research findings on underlying mechanisms and treatments based on DSM-5 PCBD criteria can inform treatment options for ICD-11 PGD (and vice versa), and such that, independent of the country where a child lives and the dominant diagnostic system of that county, children with severe grief-related distress are identified.

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Author's contribution

PB and LL undertook the statistical analyses. MS collected most of the data. PB and LL wrote the completed draft of the manuscript. All authors contributed to and have approved the final manuscript.

Conflict of interest

The authors declare no conflicts of interest.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.jad.2019.02.046.

References

Achenbach, T.M., Rescorla, L.A., 2001. Manual for the ASEBA School-age Forms and Profiles. University of Vermont, Burlington, VT.

American Psychiatric Association, 2000. Diagnostic and Statistical Manual of Mental Disorders: DSM-IV-TR, Fourth ed. Author, Washington, DC (text revision).

American Psychiatric Association, 2013. Diagnostic and Statistical Manual of Mental Disorders: DSM-5,, Fifth ed. Author, Washington, DC.

Andriessen, K., Hadzi-Pavlovic, D., Draper, B., Dudley, M., Mitchell, P.B., 2018. The adolescent grief inventory: development of a novel grief measurement. J. Affect. Disord. 240, 203–211. https://doi:10.1016/j.jad.2018.07.012.

Berg, L., Rostila, M., Hjern, A., 2016. Parental death during childhood and depression in young adults—a national cohort study. J. Child Psychol. Psychiatry 57, 1092–1098.

https://doi.org/10.1111/jcpp.12560.

Boelen, P.A., Lenferink, L.I.M., Nickerson, A., Smid, G.E., 2018. Evaluation of the factor structure, prevalence, and validity of disturbed grief in DSM-5 and ICD-11. J. Affect. Disord. 240, 79–87. https://doi.org/10.1016/j.jad.2018.07.041.

Boelen, P.A., Lenferink, L.I.M., Smid, G.E., 2019. Further evaluation of the factor structure, prevalence, and concurrent validity of DSM-5 criteria for persistent complex bereavement disorder and ICD-11 criteria for prolonged grief disorder. Psychiatry Res. 273, 206–210. https://doi.org/10.1016/j.psychres.2019.01.006.

Boelen, P.A., Spuij, M., 2013. Symptoms of post-traumatic stress disorder in bereaved children and adolescents: factor structure and correlates. J. Abnorm. Child Psychol. 41, 1097–1108. https://doi:10.1007/s10802-013-9748-6.

Boelen, P.A., Spuij, M., Reijntjes, A., 2017. Prolonged grief and posttraumatic stress in bereaved children: a latent class analysis. Psychiatry Res. 258, 518–524. http://dx. doi.org/10.1016/j.psychres.2017.09.002.

Bonanno, G.A., Mancini, A.D., 2008. The human capacity to thrive in the face of potential trauma. Pediatrics 121, 369–375. https://doi.org/10.1542/peds.2007-1648.

Claycomb, M.A., Charak, R., Kaplow, J., Layne, C.M., Pynoos, R., Elhai, J.D., 2016. Persistent complex bereavement disorder symptom domains relate differentially to PTSD and depression: a study of war-exposed Bosnian adolescents. J. Abnorm. Child Psychol. 44, 1361–1373. https://doi:10.1007/s10802-015-0107-7.

Cozza, S.J., Fisher, J.E., Mauro, C., Zhou, J., Ortiz, C.D., Skritskaya, N., ... Shear, M.K., 2016. Performance of DSM-5 persistent complex bereavement disorder criteria in a community sample of bereaved military family members. Am. J. Psychiatry 173, 919–929. https://doi.org/10.1176/appi.ajp.2016.15111442.

Engelhard, I.M., Van den Hout, M.A., Weerts, J., et al., 2007. Deployment-related stress and trauma in Dutch soldiers returning from Iraq. Br. J. Psychiatry 191, 140–145.

Foa, E.B., Johnson, K.M., Feeny, N.C., Treadwell, K.R.H., 2001. The Child PTSD Symptom Scale: a preliminary examination of its psychometric properties. J. Clin. Child Adolesc. Psychol. 30, 376–384. https://doi:10.1207/S15374424JCCP3003_9.

Hamdam, S., Melhem, N.M., Porta, G., Walker Payne, M., Brent, D.A., 2012. The phenomenology and course of depression in parentally bereaved and non-bereaved youth. J. Am. Acad. Child Adolesc. Psychiatry 51, 528–536. https://doi:10.1016/j.jaac.2012.02.021.

Kaplow, J.B., Layne, C.W., Oosterhoff, B., Goldenthal, H., Howell, K.H., Wamser-Nanney, R., ... Pynoos, R., 2018. Validation of the persistent complex bereavement disorder (PCBD) checklist: a developmentally informed assessment tool for bereaved youth. J. Trauma Stress 31, 244–254. https://doi.org/10.1002/jts.22277.

Keeley, J.W., Reed, G.M., Roberts, M.C., Evans, S.C., Medina-Mora, M.E., Robles, R., ... Saxena, S., 2016. Developing a science of clinical utility in diagnostic classification systems: field study strategies for ICD-11 mental and behavioral disorders. Am. Psychol. 71 (1), 3–16. https://doi:10.1037/a0039972.

Killikelly, C., Maercker, A., 2018. Prolonged grief disorder for ICD-11: the primacy of clinical utility and international applicability. Eur. J. Psychotraumatol. 6, 1476441. https://doi.org/10.1080/20008198.2018.1476441.

Kline, R.B., 2005. Principles and practice of structural equation modeling, 2nd ed. Guilford, New York.

Kline, R.B., 2011. Principles and practice of structural equation modeling, 3rd ed. Guilford, New York.

Kovacs, M., 2003. Children's Depression Inventory (CDI): Technical Manual Update. Multi-Health Systems, North Tonawanda, NY.

Landis, J.R., Koch, G.G., 1977. The measurement of observer agreement for categorical data. Biometrics 33, 159–174.

Maercker, A., Brewin, C.R., Bryant, R.A., Cloitre, M., van Ommeren, M., Jones, L.M., ... Reed, G.M., 2013. Diagnosis and classification of disorders specifically associated with stress: proposals for ICD-11. World Psychiatry 12 (3), 198–206. https://doi.org/10.1002/wps.20057.

Mauro, C., Reynolds III, C.F., Maercker, A., Skritskaya, N., Simon, N., Zisook, S., ... Shear, M.K., 2018. Prolonged grief disorder: clinical utility of ICD-11 diagnostic guidelines. Psychol. Med. 1–7. https://doi.org/10.1017/S0033291718001563.

Mauro, C., Shear, M.K., Reynolds, C.F., Simon, N.M., Zisook, S., Skritskaya, N., ... Glickman, K., 2017. Performance characteristics and clinical utility of diagnostic criteria proposals in bereaved treatment-seeking patients. Psychol. Med. 47, 608–615. https://doi.org/10.1017/S0033291716002749.

Maciejewski, P.K., Maercker, A., Boelen, P.A., Prigerson, H.G., 2016. "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 15, 266–275. https://doi.org/10.1002/wps.20348.

Melhem, N.M., Porta, G., Shamseddeen, W., Payne, M.W., Brent, D.A., 2011. Grief in children and adolescents bereaved by sudden parental death. Arch. Gen. Psychiatry 68, 911–919. http://dx.doi.org/10.1001/archgenpsychiatry.2011.101.

Melhem, N.M., Porta, G., Walker Payne, M., Brent, D.A., 2013. Identifying prolonged grief reactions in children: dimensional and diagnostic approaches. J. Am. Acad. Child Adolesc. Psychiatry 52, 599–607. https://doi.org/10.1016/j.jaac.2013.02.015.

Muthén, B.O., 2011. Mplus discussion. Confirmatory factor analysis. Posted on March 18, 2011. Retrieved from. http://www.statmodel.com/discussion/messages/9/380.html?1529966348.

Muthén, L.K., Muthén, B.O., 1998. Mplus User's Guide, Fifth ed. Muthén & Muthén, Los Angeles, CA.

O'Connor, M., Lasgaard, M., Larsen, L., Johannsen, M., Lundorff, M., Farver-Vestergaard, I., Boelen, P.A., 2019 O'Connor et al. Comparison of proposed diagnostic criteria for pathological grief using a sample of elderly bereaved spouses in Denmark: perspectives on future bereavement research. J. Affect. Disord.

Prigerson, H.G., Horowitz, M.J., Jacobs, S.C., Parkes, C.M., Aslan, M., Goodkin, K., ... Maciejewski, P.K., 2009. Prolonged grief disorder: psychometric validation of criteria proposed for DSM-V and ICD-11. PLoS Med. 6 (8), e1000121. https://doi.org/10.

1371/journal.pmed.1000121.

Prigerson, H.G., Jacobs, S.C., 2001. Traumatic grief as a distinct disorder: a rationale, consensus criteria, and a preliminary empirical test. In: Stroebe, M.S., Hansson, R.O., Stroebe, W., Schut, H.A.W. (Eds.), Handbook of Bereavement Research. APA, Washington, DC, pp. 613–647 Consequences, coping, and care.

Shear, M.K., Simon, N., Wall, M., Zisook, S., Neimeyer, R.A., Duan, N., …, Keshaviah, A., 2011. Complicated grief and related bereavement issues for DSM-5. Depress. Anxiety 28, 103–117. https://doi.org/10.1002/da.20780.

Spuij, M., Prinzie, P., Zijderlaan, J., Stikkelbroek, S., Dillen, L., De Roos, C., Boelen, P.A., 2012. Psychometric properties of the Dutch Inventories of Prolonged Grief for Children and Adolescents (IPG-C and IPG-A). Clin Psychol Psychother 19, 540–551.

Stoppelbein, L., Greening, L., 2000. Posttraumatic stress symptoms in parentally bereaved children and adolescents. J. Am. Acad. Child Adolesc. Psychiatry 39, 1112–1119.

https://doi.org/10.1097/00004583-200009000-00010.

Tay, A.K., Rees, S., Chen, J., Kareth, M., Silove, D., 2016. Factorial structure of complicated grief: associations with loss-related traumatic events and psychosocial impacts of mass conflict amongst West Papuan refugees. Soc. Psychiatry Psychiatr. Epidemiol. 51, 395–406. https://doi.org/10.1007/s00127-015-1099-x.

Timbremont, B., Braet, C., Roelofs, J., 2008. Handleiding Children's Depression Inventory (Herziene Versie) [Manual for Children's Depression Inventory (Revised Version)]. Pearson, Amsterdam.

Verhulst, F., Van Der Ende, J., Koot, H., 1996. Handleiding voor de CBCL/4-18 (Manual for the CBCL/4-18) Department of Child and Adolescent Psychiatry. Erasmus Academic Medical Centre, Rotterdam.

WHO 2018 ICD-11 Prolonged grief disorder criteria. Retrieved from: https://icd.who.int/browse11/l-m/en#/http://id.who.int/icd/entity/1183832314.