



**Symptoms of prolonged grief, posttraumatic stress, depression, and anxiety in a
homicidally bereaved population: A confirmatory factor analysis**

Clinical Psychology Master's Thesis

by

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Date: July 2020

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Abstract

In response to the apprehension of prolonged grief disorder (PGD) as a new diagnostic entity, researchers have investigated the distinctiveness of symptoms of PGD, posttraumatic stress disorder (PTSD), depression, and anxiety. This research has provided conflicting results. The current study aimed to contribute to existing literature by conducting a confirmatory factor analysis (CFA) to examine whether symptoms of PGD, PTSD, depression, and anxiety are distinct in an adult treatment-seeking homicidally bereaved population. Participants were homicidally bereaved adults in the United Kingdom who were referred for cognitive behavioural therapy and completed pre-assessments ($N = 917$). Measures used to assess symptoms were the Inventory of Complicated Grief, Impact of Event Scale, Patient Health Questionnaire and Generalised Anxiety Disorder Scale. A CFA was conducted where six models were tested. The factor-structure comprising four, distinct factors of PGD, PTSD, depression, and anxiety fit the data the best. The unitary model fit the data the worst. The results support the distinctiveness of PGD as a new diagnostic entity. Furthermore, correlations between measures and factors suggest an overlap in symptoms, reflective of the pervasive distress and consequences of homicidal bereavement. Nevertheless, the current study added to existing evidence that PGD, PTSD, depression, and anxiety are distinct disorders.

Keywords: prolonged grief disorder, confirmatory factor analysis, homicidal bereavement, distinctiveness, loss

Acknowledgement

To say I was hesitant at the beginning of this thesis would be an understatement. I would not have been able to manage this without the help of Suzan Soydas and Paul Boelen who happily let me join this project even though I was new to the field of grief and nervous about Mplus. With their unrelenting trust and guidance I have reached the end of this thesis and now have a deep appreciation and respect for this field, and Mplus. A special thank you goes to Suzan for the numerous Skype calls, even when she was across the world in Australia. I enjoyed this process very much and have gained valuable skills and knowledge which I will carry with me throughout my career.

Symptoms of prolonged grief, posttraumatic stress, depression, and anxiety in a homicidally bereaved population: A confirmatory factor analysis

Following non-violent bereavement, most individuals experience symptoms of grief which are resolved after some time and have a relatively minimal impact on one's functioning (Bonanno et al., 2011). However, a recent meta-analysis found that an estimated 9.8% of bereaved adults experience symptoms of severe, prolonged and maladaptive grief causing significant functional impairment (Lundorff et al., 2017). The nature of disordered grief involves pervasive and persistent emotional distress, and can reflect complications in achieving "grief tasks" such as accepting the reality of the loss and finding meaning in life without the deceased (Boelen & Smid, 2017). This symptomatology of disordered grief after bereavement is proposed to be included in the DSM-5-TR or DSM-6 as prolonged grief disorder (PGD; APA, 2020). For the current study PGD will be used as a comprehensive label when referring to symptoms of PGD and similar diagnostic entities, namely persistent complex bereavement disorder and complicated grief (CG) (Shear, 2015; WHO, 2018).

As a relatively new entity, the diagnostic validity and clinical utility of PGD has been strongly debated. In fact, some critics have argued that PGD is similar to existing diagnostic entities such as posttraumatic stress disorder (PTSD), major depressive disorder (MDD) and generalised anxiety disorder (GAD; e.g. Schaal et al., 2009). PGD is characterised by longing/yearning for or preoccupation with the deceased as well as additional cognitive, emotional and behavioural symptoms (APA, 2020). Individuals with PTSD develop key features following a traumatic experience including intrusions, avoidance, and alterations in cognitions, mood and reactivity (APA, 2013). The primary criteria of MDD are described as depressed mood and the loss of interest or pleasure (APA, 2013). Lastly, GAD is marked by persistent worrying about various topics and is accompanied by physiological symptoms such as tension (APA, 2013).

In response to the apprehension of PGD, researchers have investigated the distinctiveness of symptoms among these related disorders. This research has provided conflicting results. To begin, some studies have shown results supporting the clear distinctiveness of the four syndromes. Using confirmatory factor analysis (CFA), Boelen and van den Bout (2005) found that CG, depression, and anxiety represented distinct symptom clusters in a large sample of Dutch mourners. Using a similar design, Boelen et al. (2010) found distinct symptom clusters for PGD, depression and PTSD and replicated these results in a second sample. Bonanno et al. (2007) examined CG, depression and PTSD and found that CG predicted unique variance in functioning, identifying it as an independent marker of bereavement-related psychopathology.

Other studies have found the symptoms to separate into less distinct, and more coinciding, syndromes. Schaal et al. (2012) found that symptoms of depression along with the cognitive, emotional and behavioural symptoms of PGD loaded onto the same factor of low mood. Price and van Stolk-Cooke (2015) also found strong interrelations between the clusters of PTSD, MDD and GAD. In O'Connor et al.'s (2010) CFA, a unitary model comprising CG and PTSD symptoms was found to have reasonable fit indices. Moreover, when the symptoms were separated into distinct factors of CG and PTSD, strong correlations between them existed. This led the authors to suggest an overlap between the dimensions, and that symptoms of CG or PGD may be accounted for by components of PTSD (O'Connor et al., 2010).

Lastly, some studies have shown that these symptoms are categorised as overlapping complaints which cannot be distinguished. A network analysis of PTSD, depression, and anxiety revealed strong, positive connections between the symptoms which indicated a lack of clear boundaries between the disorders, supporting the notion that these disorders are not distinct (Gilbar, 2020). Furthermore, individuals who experienced unnatural loss were found

to exhibit combined symptoms of PGD and depression (Boelen et al., 2016). Schaal (2015) also found no discriminant validity between PGD and depression, suggesting that the concept of PGD includes symptoms that are theoretically related to depression.

A review of the literature reveals two gaps that this study aimed to address. Firstly, few, if any, prior studies included symptom clusters of PGD, PTSD, depression, and anxiety in a single factor analysis. Literature has consistently shown that correlations exist among these syndromes (e.g. Price & van Stolk-Cooke, 2015). Studying multiple symptom clusters in a single analysis thus represents an opportunity to examine the distinctiveness of the four diagnostic entities at once. Furthermore, the more symptoms from different disorders are included, the better the chance of finding clusters which fit the data well. This is especially important given the unique study population and relates to the second gap in literature: few, if any, prior studies have examined the distinctiveness of these clusters in a sample exclusively comprised of homicidally bereaved individuals.

Homicidally bereaved individuals represent a unique population who have a high probability of developing severe and widespread complaints. They are more likely to be diagnosed with PGD, PTSD, depression, CG and substance abuse compared to individuals bereaved by other causes of death (Djelantik et al., 2020; van Denderen et al., 2015). Also, homicidally bereaved individuals not only face the difficulties that accompany grief but simultaneously have to deal with the complexities of the criminal justice system such as legal procedures and financial consequences (Casey, 2011). Lastly, mental health difficulties related to homicidal bereavement display high chronicity and impairment (Alves-Costa et al., 2019).

Studying multiple symptom clusters in this population is necessary. Firstly, overlapping symptoms clusters may be more likely in individuals bereaved by violent causes. Lenferink et al. (2017) investigated symptom clusters of PGD, MDD and PTSD in a

population of man-made disaster bereaved individuals and found that 38% of their sample displayed the presence of all three symptom clusters. Furthermore, Rheingold and Williams (2015) found an overlapping symptom presentation of PTSD, MDD and CG in their sample of survivors of homicide. Nevertheless, the manifestation of symptoms from multiple syndromes in homicidally bereaved individuals remains a relatively unexplored issue.

Therefore, it is still debateable whether symptoms in this unique population form distinct syndromes or if symptoms co-exist without forming distinct entities. The latter would suggest that the notion of comorbid diagnostic entities within this population is not applicable, and thus treating this population needs to be approached from a different perspective. Seeing as homicidally bereaved individuals are still relatively under-investigated, strategies for approaching their treatment remain under-developed. In fact, Casey (2011) noted a lack of resources and infrastructure to deliver consistent levels of support and counselling in a population of homicidally bereaved families. It is thus important to investigate the manifestation of symptoms within this population to aid in delivering effective treatment.

The current study aimed to examine whether symptoms of PGD, PTSD, depression, and anxiety are distinct in an adult treatment-seeking homicidally bereaved population. It was expected that symptoms would form distinct factors, based on previous evidence. However, prior findings also suggest that homicidally bereaved individuals are at an increased risk for pervasive and overlapping symptoms. Therefore, the manifestation of correlated symptoms remained a possibility in the presence of distinct syndromes. This study thus conducted a CFA to further the knowledge about the distinctiveness of symptoms of different disorders among homicidally bereaved individuals. Six models were tested, comprising a unitary model of general distress, three two-factor models, one three-factor model and one four-factor model where each syndrome was represented by one factor. Although research has shown

some debate around the factor structure of PTSD (e.g. Boelen et al., 2010), such analyses would be outside the scope of this study and so symptoms of each syndrome were modelled as unitary factors.

Method

Participants and procedure

This study forms part of a broader research project where individuals in the United Kingdom bereaved by homicide were approached by the Victim Support Fund who then referred them to ASSIST Homicide Bereavement Therapeutic Service, between November 2010 and April 2017 (Soydas et al., submitted for publication). All participants signed consent forms allowing their data to be used for research purposes. This research received ethical approval from the Faculty Ethics Assessment Committee (FETC) at Utrecht University and is thus exempt from further evaluation from the Medical Ethical Commission.

A total of 935 adult individuals completed a trauma-focused cognitive behavioural therapy (CBT) intervention offered by the service and pre- and post-assessments using The Impact of Events Scale, The Inventory of Complicated Grief, The Patient Health Questionnaire and the Generalised Anxiety Disorder Scale. This study used the data collected from the pre-assessments ($N = 917$; 18 did not complete any pre-assessments). The mean age of participants was 43.5 ($SD = 14.47$; $N = 821$; 114 did not report age), ranging from 18 to 86. Most participants ($N = 702$; 75.2%; 1 missing) were female.

Design

The broader research project used a retrospective, naturalistic pretest-posttest study design among homicidally bereaved individuals who received and completed trauma-focused CBT in response to exhibiting symptoms of PGD, PTSD, depression, and anxiety. The symptoms were measured with pre- and post-assessment tests. The current study reflects a retrospective design where a CFA was conducted using the pre-assessment data. The model structures were

based on the reviewed literature. The variables investigated were 40 items across four questionnaires. No predictor variables were investigated in this study.

Measures

The Impact of Event Scale

The Impact of Event Scale (IES; Horowitz et al., 1979) is a self-report measure used to assess subjective distress associated with a specific event. The individual must indicate whether they have experienced each problem during the past seven days. The IES contains 15 items distributed across two subscales measuring intrusion (e.g. “I had waves of strong feelings about it”) and avoidance (e.g. “I made an effort to avoid talking about it”). Responses are scored as 0, 1, 3 or 5, such that higher scores represent greater frequency. The scores are summed to make up the total score, ranging from 0-75. Coffey et al. (2006) found high internal consistency for the measure (Cronbach’s alpha = .86). In the current sample, internal consistency, as measured by Cronbach’s alpha, was .78. Studies have shown satisfactory psychometric properties of the IES and support its continued use, including as a PTSD screening tool, despite some criticism regarding the lack of assessing hyperarousal (Beck et al., 2008; Coffey et al., 2006). In the current study, the 15th item (“My feelings about it were kind of numb”) was removed from the PTSD factor in order to represent the PGD factor in the CFA.

Patient Health Questionnaire

The Patient Health Questionnaire (PHQ-9) is a nine-item questionnaire developed to screen for the DSM-IV MDD criteria in primary care (APA, 2013; Kroenke et al., 2001). The individual must indicate how often they have experienced each problem during the last two weeks. Each of the items (e.g. “poor appetite or overeating”) is scored from 0 (“not at all”) to 3 (“nearly every day”). The scores are summed to make up the total score, ranging from 0-27, with higher scores indicating greater severity of depression. Kroenke et al. (2001) found the

internal consistency to be excellent (Cronbach's alpha = 0.89) which was later reinforced by Kocalevent et al. (2013) with a sample of over 5000 participants (Cronbach's alpha = 0.87). In the current sample, internal consistency for the PHQ-9, as measured by Cronbach's alpha, was .85. Satisfactory construct validity as well as a high test-retest reliability of .84 was also found, supporting its use in both health care settings and in the general population (Kocalevent et al., 2013; Kroenke et al., 2001). In the current study, the first item ("little interest or pleasure in doing things") was removed from the depression factor in order to represent the PGD factor in the CFA.

Generalized Anxiety Disorder Scale

Symptoms of anxiety were measured with the Generalised Anxiety Disorder Scale, a seven-item questionnaire assessing the presence of DSM-IV GAD symptoms (GAD-7; APA, 2013; Spitzer et al., 2006). The individual must indicate how often they have experienced each problem during the last two weeks. Each of the items (e.g. "trouble relaxing") is scored from 0 ("not at all") to 3 ("nearly every day"). The scores are summed to make up the total score, ranging from 0-21, with higher scores indicating greater severity of anxiety. In their sample of over 9000 individuals, Hinz et al. (2017) found the GAD-7 to have high internal consistency (Cronbach's alpha = .85) and adequate construct validity when compared with quality of life components, sustaining the GAD-7 as an efficient, valid and reliable measure for assessing generalised anxiety. In the current sample, internal consistency, as measured by Cronbach's alpha, was .84.

Inventory of Complicated Grief

The Inventory of Complicated Grief (ICG; Prigerson et al., 1995) is a 19-item self-report scale used to assess maladaptive grief. Individuals must indicate the frequency of experiencing each state. Each of the items (e.g. "I feel disbelief over what happened") is scored from 0 ("never") to 4 ("always"). The scores are summed to make up the total score,

ranging from 0-76, with higher scores indicating greater impairment of functioning. Prigerson et al. (1995) found a high internal consistency (Cronbach's alpha = .94) for the ICG as well as strong concurrent validity with other measures of grief. In the current sample, internal consistency was found to be high with a Cronbach's alpha of .86.

In this study, only nine items were used from the ICG to form the PGD factor. Items were selected according to Boelen and Lenferink's (2020) CFA which found satisfactory factor loadings for these ICG items according to the DSM-5-TR PGD symptoms (APA, 2020). Two aforementioned items from the PHQ-9 and IES which matched the criteria were included to form an 11-item PGD factor. The item representation of the nine DSM-5-TR symptoms can be seen in Appendix A. One DSM-5-TR symptom "Identity disruption (e.g., feeling as though part of oneself has died)" was not represented by the items.

Statistical analyses

Descriptive analyses were conducted using SPSS Statistics (version 25.0). CFAs in Mplus (version 8.3; Muthén & Muthén, 1998-2017) were used to evaluate the distinctiveness of PGD, PTSD, depression, and anxiety symptoms. CFAs are used to verify the number of underlying dimensions (factors) and the pattern of item-factor relationships, which have been previously specified based on past evidence and theory (Brown, 2006). Goodness-of-fit was evaluated using the comparative fit index (CFI), Tucker-Lewis index (TLI) and root mean square error of approximation (RMSEA). According to conventional guidelines, adequate fit is considered if CFI and TLI values are more than 0.90 and RMSEA is smaller than 0.08 (Hu & Bentler, 1999).

Six models were tested. Based on the literature, each factor was allowed to correlate (e.g. Boelen et al., 2010; Price & van Stolk-Cooke, 2015). Due to non-normality, maximum likelihood estimation with robust standard errors (MLR) was used. The model with the best fit indices indicated the best-fitting structure for these symptoms. Difference testing using

MLR was computed using the output results from Mplus (see Brown, 2006, pp. 379-387). These χ^2 – difference tests, calculated using the Satorra-Bentler scaled difference test for MLR (Satorra & Bentler, 2001), and Akaike information criteria (AIC) were used to compare the fit of competing models.

In *Model 1*, a one-factor model was tested where PGD, PTSD, depression and anxiety represented one unitary factor of general distress.

In *Model 2*, a two-factor model was tested where PGD, PTSD and depression loaded onto one factor of dysphoria while anxiety remained a distinct factor.

In *Model 3*, a second two-factor model was tested where depression, PTSD and anxiety loaded onto one factor of dysphoric avoidance while PGD remained distinct.

In *Model 4*, a third two-factor model was tested where depression and PGD represented one factor of low mood, and anxiety and PTSD represented one factor of anxious fear.

In *Model 5*, a three-factor model was tested where PGD and PTSD represented one factor of traumatic distress while depression and anxiety each remained distinct.

Lastly, in *Model 6*, a four-factor model was tested where each syndrome was a distinct entity.

Results

Data were collected from the pre-assessments of 917 participants (98% of original sample).

Table 1*Fit indices for CFAs (N = 917)*

Model	χ^2	df	CFI	TLI	RMSEA	SRMR	AIC
1	3924.11	740	0.63	0.61	0.07	0.08	102547
2	3560.90	739	0.67	0.65	0.07	0.08	102127
3	3775.52	739	0.65	0.63	0.07	0.08	102371
4	3656.96	739	0.66	0.64	0.07	0.08	102241
5	3312.88	737	0.70	0.68	0.06	0.07	101847
6	3068.32	734	0.73	0.71	0.06	0.07	101568
7	1536.56	399	0.83	0.81	0.06	0.06	69342
8	1024.73	396	0.91	0.90	0.04	0.06	68753

Note. AIC = Akaike information criterion; CFI = comparative fit index; RMSEA = root mean square error of approximation; SRMR = standardised root mean square residual; TLI = Tucker-Lewis Index.

Table 1 shows the outcomes of the CFAs. Models 1 through 6 provided a poor fit to the data, not reaching adequate fit indices (Hu & Bentler, 1999). However, χ^2 -difference tests indicate that Models 2 through 6 all fit significantly better than the unitary model ($\chi^2 > 55.67$, $P_s < 0.001$). Model 6 provided the best fit of the original six models compared to the unitary model: it had the largest difference in chi square value between any of the models and the unitary model ($\chi^2 = 449.76$, $P < 0.001$), the lowest AIC and the best fit-indices.

The standardised factor loadings of seven IES and three ICG items in Model 6 were below 0.40, indicating that these items were relatively weak markers of PTSD and PGD (see Appendix B). Accordingly, a seventh model was tested with the same factor structure as the sixth model and without these 10 items. Although the fit of the seventh model could be considered adequate, modification indices indicated that strong correlations existed between the error terms of the depression factor and PHQ-9-item 1 (little interest/pleasure), between PHQ-9-item 3 (poor sleep) and IES-item 4 (poor sleep), and between GAD-7-items 3 (worrying too much about different things) and 2 (uncontrollable worrying). Seeing as these

item-pairs contained comparable content, it was assumed that these correlations reflected non-random measurement error stemming from content overlap. Accordingly, an eighth model was tested in which these error-terms were allowed to correlate, again following the same factor structure as the sixth model. Model 8 fit the data significantly better than did Model 7 ($\chi^2 = 422.07$, $P < 0.001$) and had good fit estimates.

Table 2 shows standardised factor loadings from Model 8. Correlations between the factors of PGD and depression, PTSD, and anxiety were 0.76, 0.67 and 0.60 respectively. Correlations between the factors of depression and PTSD and anxiety were 0.62 and 0.76 respectively. Lastly, the correlation between the factors of PTSD and anxiety was 0.60.

Table 2*Model 8 Standardised Factor Loadings*

	Loadings on PGD factor	Loadings on depression factor	Loadings on PTSD factor	Loadings on anxiety factor
Inventory of Complicated Grief				
1. Preoccupation	0.67			
4. Longing	0.64			
7. Disbelief	0.46			
10. Feeling detached from others	0.48			
13. Life is empty	0.71			
19. Feeling lonely	0.69			
Patient Health Questionnaire				
1. Diminished interest/pleasure	0.54			
2. Feeling down/depressed/hopeless		0.75		
3. Poor sleep		0.53		
4. Low energy		0.59		
5. Poor appetite		0.58		
6. Feeling bad about self		0.55		
7. Poor concentration		0.66		
8. Psychomotor retardation or hyperactivity		0.58		
9. Thoughts of self-harm		0.45		
Impact of Event Scale				
1. Intrusive thoughts			0.60	
4. Poor sleep			0.46	
5. Waves of strong feelings			0.58	
8. Feeling of unrealness			0.38 ^a	
10. Intrusive images			0.63	
11. Indirect reminders			0.62	
12. Unmanaged feelings			0.38 ^a	
14. Reminders brought back feelings			0.61	
Generalised Anxiety Disorder Scale				
1. Feeling nervous/on edge				0.72
2. Uncontrollable worrying				0.66
3. Worrying about different things				0.62
4. Trouble relaxing				0.73
5. Restless				0.66
6. Easily annoyed/irritable				0.47
7. Feeling afraid				0.59

^a These factor loadings were >.40 in Model 6 and thus remained in the subsequent models.

Discussion

To the best knowledge of the authors, this is the first study that used CFA to examine the distinctiveness of symptoms belonging to four syndromes (PGD, PTSD, depression, and anxiety) in an exclusively homicidally bereaved adult population. Pre-assessment data were used from 917 adults who were bereaved by homicide and were undergoing a treatment intervention of trauma-focused CBT. Six models were tested to examine the factor-structure of the data. The findings showed that models in which symptoms formed four distinct factors of PGD, PTSD, depression, and anxiety fit the data significantly better than a unitary model where all items formed a single dimension of general distress.

These findings are in line with Boelen and van den Bout (2005), Bonanno et al. (2007) and Boelen et al. (2010) who found that similar symptoms formed distinct entities within bereaved populations. The distinctiveness of four syndromes in this sample implies that each syndrome is identified by a unique and distinguishable cluster of symptoms, and should be regarded as separate disorders. This study therefore further supports PGD as a distinct diagnostic entity which comprises symptoms that cannot be accounted for by other established syndromes such as PTSD, depression, and anxiety. However, despite the CFA verifying the distinction of four separate disorders, the individual symptoms and factors may still display connections to one another outside of this four-factor structure. In fact, some of this study's findings indicate strong connections between the symptoms, aligning with the expectation of overlapping symptoms in a homicidally bereaved population (Lenferink et al., 2017; Rheingold & Williams, 2015), even in the presence of separate disorders.

Firstly, the fit-indices of the various models indicate an overlapping pattern of symptom presentation. Model 3, with the second worst fit indices after the unitary model, suggests that the symptoms of PGD may at times be better represented when in combination with other symptoms of distress such as depression and/or PTSD in Models 2 and 4, which fit

the data better (see Table 1). In fact, Model 5, where symptoms of PGD and PTSD were combined to form a single factor of Traumatic Distress, had the second best fit-indices before Model 6. This would suggest that symptoms of PGD may not always cluster as a distinct disorder in homicidally bereaved populations. This is further indicated by the correlated item-pairs between the symptoms and factors of depression and PGD, and between PTSD and depression. In other words, the severe psychological consequences of homicidal bereavement may sometimes be better expressed as a combination of symptoms of PGD, depression, and PTSD. Together with the strong correlations found between the distinct factors, these results point to robust connections between the symptoms of these distinct entities.

In fact, violent loss has been shown to precipitate a combination of symptoms of grief, traumatic stress, depression and anxiety (Boelen et al., 2016; Djelantik et al., 2017; Kristensen et al., 2015). Grant et al. (2008) found that the aftermath of a trauma resulted in the comorbid, distinguishable syndromes of PTSD, MDD and GAD. Djelantik et al. (2017) provide a simple explanation that a violent loss represents a combination of a traumatic event, resulting in PTSD symptoms, and a loss, resulting in PGD symptoms. Kristensen et al. (2015) note that anxiety is a natural reaction after a loss which for some develops into a disorder and can even contribute to the development of other disorders (Marques et al., 2013). Moreover, Boelen et al. (2016) suggest that individuals displaying mainly symptoms of depression (without PGD) are more likely to be bereaved by natural loss. Therefore, individuals bereaved by unnatural loss are more likely to display symptoms belonging to multiple syndromes.

Combining these results with the findings in the current study, it appears that homicidal loss is associated with more pervasive distress compared to natural loss. This follows Casey's (2011) review suggesting that homicidally bereaved populations stand apart

from other bereaved populations due to the widespread complaints experienced, following psychological, financial, and legal consequences. In fact, the majority of Mack and Goodfellow's (2005) sample of homicidally bereaved individuals presented with severe symptoms of PTSD, depression, anxiety and CG. It therefore appears that homicidally bereaved individuals display symptoms of comorbid PGD, PTSD, depression, and anxiety which represent highly related but distinguishable constructs.

Implications of this study include support for the diagnostic validity of PGD as an entity distinct from PTSD, depression, and anxiety. This finding supports the notion for including PGD in the DSM-5-TR or DSM-6 under the Depressive Disorders chapter in order to facilitate the accurate diagnosis and treatment of individuals (APA, 2020). The distinctiveness of the symptom clusters should facilitate the process of diagnosis by reducing the challenge of differential diagnosis. Nevertheless, it is likely that clinicians will encounter comorbidity of these four syndromes in homicidally bereaved populations, which undoubtedly presents a challenge regarding treatment selection. It requires time, resources and energy to implement treatment for all four of these distinct disorders. However, the robust connections found between disorders could indicate that one treatment strategy might be effective for related disorders as well (O'Connor et al., 2010).

This implies that, after the identification of symptoms belonging to the clusters of PGD, PTSD, depression or anxiety, the treatment of one cluster of symptoms could reduce complaints across the board. This is shown in Mack and Goodfellow's (2005) study where the implementation of grief and trauma focused exposure in individuals bereaved by homicide successfully reduced symptoms of PGD, PTSD, depression, and anxiety simultaneously. Therefore, having multiple comorbid diagnoses does not have to represent a treatment challenge. Studies involving transdiagnostic treatment in populations facing widespread complaints are vital for the understanding of overlapping symptoms.

The strengths of this study lie in the large sample size. This enhances the statistical power of the analyses conducted, especially considering the large number of items that were included (Brown, 2006). Limitations of this study include that the data were self-reported, the results of this study are limited in generalisability to a British adult population of homicide survivors, and correlating the error-terms of three item-pairs in Model 8 may indicate a weak factor structure. However, this is not unexpected given the overlap in content between the items. Also, fit-statistics of the seventh model without these correlations were already acceptable (Hu & Bentler, 1999) and superior to those of the unitary model.

It is important to note a weakness in the IES measure. A total of six out of 14 IES items were removed in Model 7 due to low loadings on the PTSD factor. This not only suggests that these items are weak markers of PTSD, but also that the IES could be a weak marker of PTSD in this study. Researchers have previously criticised this measure for lacking items matching symptoms of hyperarousal, now commonly agreed by the larger academic and clinical community to be a prominent criterion of PTSD (APA, 2013; Beck et al., 2008; WHO, 2018). The revised model, the IES-R, is thus recommended for assessing symptoms of PTSD (Weiss & Marmar, 1997). However, the results of this study indicate that some of the original IES items maintained in the IES-R might not measure the latent construct of PTSD adequately. These findings therefore imply careful consideration when using the IES-R to assess PTSD in homicidally bereaved populations.

This study did not provide information about the causes for the various factor structures examined. Therefore, future studies should examine possible predictors of symptom presentation within this population. Literature (e.g. Djelantik et al., 2017; van Denderen et al., 2015) has shown that certain predictors including the nature of the loss, the relationship to the deceased, and education level influence the factor-structure of the symptoms. Conversely, Boelen and van den Bout (2005) found that the distinct factors of

CG, depression and anxiety were invariant across subgroups. Further investigation is thus needed to examine predictors of the factor structure of symptoms in a homicidally bereaved population.

To conclude, this study contributes to the current knowledge of symptom presentation in bereaved populations by examining symptoms of PGD, PTSD, depression, and anxiety in an exclusively homicidally bereaved population. CFAs showed that these symptoms formed four distinct factors in line with each syndrome. This complements earlier findings which support PGD as a distinct diagnostic entity. Furthermore, correlations between measures and factors suggest an overlap in symptoms, reflective of the pervasive distress and consequences of homicidal bereavement. Nevertheless, the current study added to existing evidence that PGD, PTSD, depression, and anxiety are distinct disorders. Further investigation into possible predictors of such symptom manifestation is recommended.

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Appendix A

Symptoms of PGD-DSM-5-TR or DSM-6

Symptoms	Item match
1 Since the death, there has been a grief response characterized by intense yearning/longing for the deceased person or a preoccupation with thoughts or memories of the deceased person.	ICG 1. I think about this person so much that it's hard for me to do the things I normally do ICG 4. I feel myself longing for the person who died
2 Identity disruption (e.g., feeling as though part of oneself has died)	/
3 Marked sense of disbelief about the death	ICG 7. I feel disbelief over what happened
4 Avoidance of reminders that the person is dead	ICG 12. I go out of my way to avoid reminders of the person who died
5 Intense emotional pain (e.g., anger, bitterness, sorrow) related to the death	ICG 6. I can't help feeling angry about his/her death ICG 17. I feel bitter over this person's death
6 Difficulty moving on with life (e.g., problems engaging with friends, pursuing interests, planning for the future)	PHQ-9 1. Little interest or pleasure in doing things
7 Emotional numbness	IES 15. My feelings about it were kind of numb
8 Feeling that life is meaningless	ICG 13. I feel that life is empty without the person who died
9 Intense loneliness (i.e., feeling alone or detached from others)	ICG 19. I feel lonely a great deal of the time ever since s/he died ICG 10. Ever since s/he died I feel like I have lost the ability to care about other people or I feel distant from people I care about

Appendix B

Model 6 Low Standardised Factor Loadings

Item	Factor Loading	
	PTSD	PGD
IES 2.		
"I avoided letting myself get upset when I thought about it or was reminded of it"	0.287	
IES 3.		
"I tried to remove it from memory"	0.304	
IES 6.		
"I had dreams about it"	0.399	
IES 7.		
"I stayed away from reminders of it"	0.381	
IES 9.		
"I tried not to talk about it"	0.314	
IES 13.		
"I tried not to think about it"	0.391	
PGD 6.		
"I can't help feeling angry about his/her death"		0.349
PGD 12.		
"I go out of my way to avoid reminders of the person who died"		0.220
PGD 17.		
"I feel bitter over this person's death"		0.397
IES 15.		
"My feelings about it were kind of numb"		0.317