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The Traumatic Grief Inventory Self-Report Version (TGI-SR): Introduction and Preliminary Psychometric Evaluation

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ABSTRACT

Persistent Complex Bereavement Disorder (PCBD) is a disorder of grief newly included in the “Emerging Measures and Models” section of the 5th edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association, 2013). Prolonged Grief Disorder (PGD) is a disorder with similar symptoms, likely to be included in the forthcoming 11th edition of the International Classification of Diseases (ICD-11; World Health Organization, 1992). We developed the Traumatic Grief Inventory Self-Report version (TGI-SR), an 18-item measure, for the assessment of symptoms of PCBD and PGD in clinical and research settings. This study was an initial attempt to evaluate psychometric properties of the TGI-SR. To this end, the measure was administered to 327 patients of a mental health institute specialized in the treatment of psychopathology associated with loss and trauma. We found evidence that items of the TGI-SR (all 18 items, as well as the selection of 17 items representing PCBD criteria, and 11 items representing PGD criteria) loaded on one dimension. The TGI-SR demonstrated strong internal consistency. Elevated scores on the TGI-SR were significantly correlated with elevated scores on indices of psychopathology and lower quality of life, attesting to the concurrent validity. Receiver operation characteristic (ROC) analyses of the TGI-SR total score against provisional diagnoses of PCBD and PGD yielded a high area under the curve index suggesting that the TGI-SR total score can be used as an indicator for probable diagnoses of both PCBD and PGD. Results of this study provide initial evidence that PCBD and PGD symptoms may be readily and reliably measured using the TGI-SR.

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Since the mid-1990s there is growing evidence that, in a significant minority of individuals confronted with the death of a loved one, acute symptoms of grief do not diminish but instead spiral into persistent and chronically debilitating grief reactions (Prigerson et al. 1995, 2009; Shear, 2015). This evidence has culminated in proposals to include disorders of grief in psychiatric

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classification systems such as the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5, American Psychiatric Association [APA], 2013) and the Internal Classification of Diseases (ICD; e.g., World Health Organization [WHO], 1992). Specifically, in 2009, Prigerson et al. (2009) proposed criteria for Prolonged Grief Disorder (PGD) for inclusion in the 5th edition of the DSM and 11th edition of the ICD. PGD criteria included persistent separation distress, combined with cognitive, emotional, and behavioral symptoms (including difficulties to accept the loss, to move beyond the loss, and engage in fulfilling activities) coupled with functional impairment beyond six months postloss. In a shortened version, these criteria will likely indeed be included in the forthcoming ICD-11 (Maercker et al., 2013). In 2011, Shear et al. (2011) proposed criteria for Complicated Grief (CG). These criteria overlap with criteria for PGD but include additional symptoms such as loneliness, troubling rumination, and emotional or physiological reactivity. Based on proposals for PGD and CG, DSM-5 introduced criteria for persistent complex bereavement disorder (PCBD) representing a mixture of PGD and CG (APA, 2013, see also Boelen & Prigerson, 2012; Wakefield, 2012). PCBD is included in the “Emerging Measures and Models” section of DSM-5 and can be formally classified as “Other Specified Trauma- and Stressor-Related Disorder.”

Given the importance of ICD and DSM in clinical psychology and psychiatry, in the years to come, criteria for PGD and PCBD will likely be most frequently used as operationalizations of nonnormative, debilitating grief. There is a need for a self-report instrument for the assessment of these criteria. Different measurement instruments have been developed to assess symptoms of grief; yet, none include criteria of both PGD and PCBD. For instance, the most widely used instrument to assess symptoms of grief associated with impairment is the 19-item Inventory of Complicated Grief (ICG; Prigerson et al., 1995), followed up by extended versions, including the 34-item revised ICG (ICG-R; Prigerson & Jacobs, 2001). Although the ICG and ICG-R are both well-validated instruments, some of the PCBD criteria (e.g., “difficulty in positively reminiscing about the deceased,” “maladaptive appraisals about oneself in relation to the deceased or the death [e.g., self-blame],” “a desire not to live in order to be with the deceased”) are not included in these instruments. Recently, Lee (2015) introduced the Persistent Complex Bereavement Inventory, a promising new measure that was designed to assess PCBD, but not PGD.

In the Netherlands, we developed the Traumatic Grief Inventory Self-Report version (TGI-SR) in order to be able to assess symptoms of PGD and PCBD in clinical and research settings. Table 2 shows the 18 items included in the TGI-SR. The TGI-SR includes all 16 symptoms of PCBD, one additional symptom of PGD that is not part of the PCBD criteria (i.e., item 12: “feeling stunned/shocked”), and one item tapping “functional impairment” (i.e., item 13), included in both criteria for PCBD and PGD. The TGI-SR can be used for a variety of purposes, including (a) screening

individuals for PCBD and PGD, (b) monitoring changes in symptoms of PCBD and PGD in the context of treatment of research, and (c) making a provisional PCBD diagnosis or a provisional PGD diagnosis.

In the naming of the instrument, we sought to avoid the terms *prolonged*, *complicated*, or *persistent*, to avoid the suggestion that the instrument was exclusively designed to measure PGD put forth by Prigerson et al. (2009), CG put forth by Shear et al. (2011), and PCBD, now included in DSM-5 (APA, 2013). We decided to use the term *traumatic grief*, also used by Prigerson et al. (1999) in earlier conceptualizations of problematic grief, because this adequately captures that the scale was designed to tap into symptoms that may emerge when the loss itself is a “separation trauma.”

The aim of the current study was to introduce the TGI-SR and to conduct a preliminary psychometric evaluation, using data from 327 patients from a mental health care institute in the Netherlands, providing specialized care for psychopathology associated with loss and trauma. The patients completed the TGI-SR, together with measures tapping different psychological symptoms and aspects of quality of life. Using these data, we first examined the factor structure of the TGI-SR. Second, we examined its internal consistency. Third, we examined the concurrent and construct validity. With respect to the concurrent validity we expected (elevated) TGI-SR scores to be significantly associated with (elevated) indices of psychopathology and (lower) quality of life. With respect to the construct validity, we expected scores on the TGI-SR to be higher among participants confronted with unnatural or violent losses (due to, e.g., homicide, or accidents) compared to those confronted with natural losses (due to illness)—in keeping with prior evidence that unnatural or violent losses cause more intense emotional distress (Kristensen, Weisæth, & Heir, 2012). We also anticipated that TGI-SR scores were higher for participants who reported that they had been confronted with more than one loss, compared to participants who reported having experienced one loss. Fourth, to evaluate discriminant validity, we examined the distinctiveness of symptoms tapped by the TGI-SR from symptoms of depression. Fifth, we examined percentages of participants meeting criteria for provisional diagnoses of PCBD and PGD based on scores on the TGI-SR items, and used Receiver Operating Characteristics (ROC) to determine two cutoff scores on the TGI-SR, one for a provisional diagnosis of PCBD and the second for a provisional diagnosis of PGD. Finally, we explored the extent to which scores on the TGI-SR varied as a function of several sociodemographic variables.

Methods

Participants and procedure

Data were available from 327 patients referred for treatment at Foundation Centrum⁴⁵, a specialized Dutch center for diagnosis and treatment of

Table 1. Sociodemographic and loss-related characteristics of the sample.

| Demographic characteristics | | |
|--|-------|---------|
| Gender (<i>N</i> [%]) | | |
| Men | 192 | (58.7) |
| Women | 135 | (41.1) |
| Age (years) (<i>M</i> [<i>SD</i>]) | 50.25 | (11.31) |
| Highest education (<i>N</i> [%]) | | |
| Primary/secondary education | 178 | (54.4) |
| Higher education (college/university) | 100 | (30.6) |
| Education was unknown | 49 | (15.0) |
| Patient group (<i>N</i> [%]) | | |
| Profession related trauma | 94 | (28.7) |
| Refugees/Asylum seekers | 95 | (29.1) |
| Other | 137 | (41.9) |
| Country of birth (<i>N</i> [%]) | | |
| The Netherlands | 178 | (54.4) |
| Former Yugoslavia | 25 | (7.7) |
| Indonesia | 23 | (7.1) |
| Iraq | 17 | (5.2) |
| Iran | 16 | (4.9) |
| Afghanistan | 15 | (4.6) |
| Other county | 43 | (13.1) |
| County unknown | 10 | (3.1) |
| Loss characteristics | | |
| Mean number of losses (<i>M</i> [<i>SD</i>]) | 4.48 | (2.72) |
| Number of losses (<i>N</i> [%]) | | |
| One | 47 | (14.4) |
| Two | 45 | (13.8) |
| Three | 43 | (13.1) |
| Four | 50 | (15.3) |
| Five | 35 | (10.7) |
| Six | 26 | (8.0) |
| Seven | 33 | (10.1) |
| Eight | 23 | (7.0) |
| Nine | 13 | (4.0) |
| Ten or more | 12 | (3.7) |
| At least one loss due to violent/unnatural cause (<i>N</i> [%]) | | |
| No | 161 | (49.2) |
| Yes | 166 | (50.8) |

psychopathology following loss and trauma. Specific populations include asylum seekers and refugees, military veterans, and police officers. Since 2014, the TGI-SR is routinely administered to patients at the start of treatment, and at subsequent moments, for patients reporting that they experienced the death of one or more loved ones. For the present study, we used data from 327 patients, who all mastered Dutch sufficiently to complete Dutch versions of the TGI-SR and other questionnaires administered (addressed in the next section); patients completed questionnaires immediately at ($n = 118$) or 1–3 months after ($n = 209$) admission to Foundation Centrum '45. Characteristics of the total sample are shown in Table 1. Most participants had suffered more than one loss. More than half of all participants had lost at least one loved one due to an unnatural cause. About a

third were asylum seekers and refugees; another third were military veterans, police officers, ambulance personnel, and others confronted with loss and trauma during professional activities; still another third of all patients represented other groups (e.g., first- and second-generation World War II victims).

Measures

For the purpose of the present study, we selected data from the TGI-SR, and from the Brief Symptom Inventory (BSI), and the World Health Organization Quality of Life BREF (WHOQOL-BREF) from the routinely administered set of questionnaires.

Traumatic Grief Inventory Self-Report version (TGI-SR)

The TGI-SR was designed as a self-report measure of symptoms of PCBD proposed for DSM-5 (APA, 2013), and PGD, proposed for ICD-11 (Maercker et al., 2013; Prigerson et al., 2009). Table 2 shows which symptoms correspond to criteria for PCBD and PGD. As can be seen there, 16 items represent the 4 Criterion B items and 12 Criterion C items of PCBD; one item (item 13) assesses the functional disability criterion, represented in Criterion D from PCBD. The table also shows the 11 items corresponding to criteria for PGD; specifically, item 3 corresponding to Criterion B, items 4 through 12 corresponding to the 9 so-termed “cognitive, behavioural, and emotional symptoms” from Criterion B, and item 13 tapping the functional impairment item from Criterion E of PGD.

Most of the items of the TGI-SR, except items 15–17, were taken from the frequently used 19-item Inventory of Complicated Grief (ICG; Prigerson et al., 1995; Prigerson et al., 2009) and its slightly extended version, Inventory of Complicated Grief-Revised (ICG-R; Prigerson & Jacobs, 2001) with permission from the principal author of these scales (Prigerson). The ICG and ICG-R have both been validated in Dutch (e.g., Boelen, Van den Bout, De Keijser, & Hoijsink, 2003; Wijngaards-de Meij et al., 2005). Items 15, 16, and 17 were newly developed to tap three PCBD symptoms not included in the ICG and ICG-R. Initial versions of these items were formulated based on DSM-5 descriptions of these symptoms; their content was subsequently judged by expert clinicians, leading to small changes in phrasing. The instructions ask respondents to keep in mind the one particular loss that currently was most frequently on their mind or was considered to be the most distressing loss (in case they had experienced more than one loss) and then to rate the extent to which they experienced the 18 symptoms listed during the preceding month on 5-point scales: 1 = “never,” 2 = “rarely,” 3 = “sometimes,” 4 = “frequently,” and 5 = “always.”

There are at least five ways the TGI-SR can be scored. First, a *total TGI-SR score*, providing an index of the severity of potentially problematic grief, can

Table 2. Items of the Traumatic Grief Inventory–Self-Report version (TGI-SR) and summary of factor analyses.

| | | All TGI-SR | The 17 | | The 11 | |
|----|--|-----------------|-----------------|----------------|-----------------|---------------|
| | | items | PCBD-items | | PGD-items | |
| | | Factor loadings | Factor loadings | PCBD criterion | Factor loadings | PGD criterion |
| 1 | I had intrusive thoughts and images associated with his/her death | .76 | .76 | B3 | – | – |
| 2 | I experienced intense emotional pain, sorrow, or pangs of grief | .78 | .78 | B2 | – | – |
| 3 | I felt a strong longing or yearning for the deceased | .72 | .72 | B1 | .70 | B |
| 4 | I felt confusion about my role in life, or a diminished sense of identity | .64 | .65 | C11 | .62 | C1 |
| 5 | I had trouble to accept the loss | .81 | .80 | C1 | .83 | C2 |
| 6 | I avoided places, objects or thoughts reminding me of his/her death | .57 | .57 | C6 | .59 | C3 |
| 7 | I found it difficult to trust others | .67 | .68 | C8 | .66 | C4 |
| 8 | I felt bitter or angry about the loss | .81 | .80 | C4 | .82 | C5 |
| 9 | I experienced difficulty to move on with my life (e.g., pursue friendships, activities) | .81 | .81 | C12 | .82 | C6 |
| 10 | I felt numb over the loss | .78 | .78 | C2 | .79 | C7 |
| 11 | I felt that life is meaningless or empty without the deceased | .80 | .80 | C10 | .80 | C8 |
| 12 | I felt shocked or stunned by his/her death | .76 | – | – | .78 | C9 |
| 13 | I noticed that my functioning (in my work, private life, and/or social life) was seriously impaired as a result of his/her death | .82 | .82 | D | .81 | E |
| 14 | I had intrusive thoughts and images associated with the circumstances of his/her death | .77 | .77 | B4 | – | – |
| 15 | I had difficulties with positive reminiscing about the deceased | .58 | .58 | C3 | – | – |
| 16 | I had negative thoughts about myself in relation to the deceased or the death (e.g., self-blame) | .52 | .53 | C5 | – | – |
| 17 | I experienced a desire to die in order to be with the deceased | .65 | .66 | C7 | – | – |
| 18 | I felt alone or detached from other people | .69 | .70 | C9 | – | – |

Note. Factor loadings are all geomin rotated loadings, significant at the 5% level.

PCBD = persistent complex bereavement disorder. PGD = prolonged grief disorder. TGI-SR = traumatic grief inventory-self report version.

be obtained by summing the 18 items. Secondly, a *total PCBD symptom severity score* (range 17–85) can be obtained by summing the scores for items 1–11 and 13–18. Thirdly, a *total PGD symptom severity score* (range 11–55) can be obtained by summing the scores for items 3–13. Fourthly, a *provisional PCBD diagnosis* can be made by treating each item rated as 4 = “frequently” or 5 = “always” as a symptom endorsed and then follow the DSM-5 based diagnostic rule, which requires endorsement of (a) > 1 Criterion B item (items 1, 2, 3, 14), (b) > 6 Criterion C items (items 4–11 and 15–18), and (c) the Criterion D item (item 13). Fifthly, a *provisional PGD diagnosis* can be made by treating each item rated as 4 = “frequently” or 5 = “always” as a symptom

endorsed, and then follow Prigerson et al.'s (2009) diagnostic rule, which requires endorsement of (a) the Criterion B item (item 3), (b) > 5 Criterion C items (items 4–12), and (c) the Criterion E item (item 13).

Brief symptom inventory (BSI)

The BSI (Derogatis & Melisaratos, 1983; Dutch version De Beurs, 2004) is a 53-item self-report measure of psychopathology modeled after the Symptom Checklist-90-R (SCL-90-R; Derogatis, 1983). Respondents are instructed to endorse the degree to which they experienced 53 symptoms in the past 7 days on 5-point scales ranging from 0 = “not at all” to 4 = “extremely.” Apart from providing an overall psychopathology index—obtained by summing scores on all items—the BSI measures nine symptom dimensions: (a) somatization, (b) obsessive-compulsivity, (c) interpersonal sensitivity, (d) depression, (e) anxiety, (f) hostility, (g) phobic anxiety, (h) paranoid ideation, and (i) psychoticism.

World health organization quality of life brief (WHOQOL-BREF)

The WHOQOL-BREF (Skevington, Lotfy, & O’Connell, 2004) is a 26-item measure tapping four broad domains of quality of life: physical health (e.g., sleep, mobility), psychological health (e.g., positive and negative feelings), social relationships (e.g., social support), and environment (e.g., financial resources, safety). These are scored such that higher scores reflect better quality of life. Items are rated on different 5-point scales (some ranging from “never” to “always,” others ranging from “dissatisfied” to “satisfied”).

Results

Factor structure of the TGI-SR

To examine the dimensionality of the TGI-SR, three exploratory factor analyses (EFA) were conducted, a first including all 18 items, a second including the 17 items of the PCBD criteria, and a third including the 11 items of the PGD criteria (see Table 2). Analyses were performed using Mplus (Version 7.3; Muthén & Muthén, 1998–2015), using the default geomin rotation, allowing for factors to be correlated.

The first EFA (with all 18 items) generated two factors with eigenvalues greater than 1.0 (i.e., 10.021 and 1.150, respectively). The first factor accounted for 55.67% and the second factor for 6.39% of the explained variance. In the two-factor solution, items 4, 7, and 18 loaded strongly and significantly on the second factor. Yet, it was deemed difficult to interpret these items as representing one distinct factor. Moreover, some other items loaded highly and significantly on both factors. In the one-factor solution, factor loadings were all high (>.50) and statistically significant. Hence, the one-factor solution was retained. The EFA using the 17 PCBD items yielded similar results.

Two factors with eigenvalues greater than 1.0 (9.45 and 1.12, respectively) emerged, the first accounting for 55.59% and the second for 6.59% of the variance. Again, some of the items had high loadings on a second factor (e.g., items 4, 6, 7, 15, 16, and 18) whereas other items (e.g., items 8, 13, and 14) cross-loaded on both factors. In the one-factor solution, factor loadings were all high (>.50) and statistically significant. Taking into account the difficult interpretability of the two-factor model, the one-factor solution was retained. The EFA using the 11 PGD items yielded one eigenvalue greater than 1 (i.e., 6.67), accounting for 60.61% of the variance; factor loadings were all high (>.58) and significant. Thus, the one-factor solution seemed most appropriate with the present sample. Table 2 shows factor loadings for all one-factor models.

Reliability of the TGI-SR

Consistent with the findings of the EFA, the Cronbach's alpha of the TGI-SR (with all 18 items) was .95. The internal consistency of the 17 PCBD items was also .95. The internal consistency of the 11 items representing PGD criteria was .93. In none of these three combinations of items (18 items, 17 items, or 11 items) did the alpha increase with the deletion of one of the items.

Concurrent validity

Table 3 shows correlations of the TGI-SR scores (including the summed 18 items, the summed 17 PCBD items, and the summed 11 PGD items) with

Table 3. Correlations between TGI-SR scores and psychopathology and quality of life.

| | Summed 18 TGI-SR items | Summed 17 PCBD items | Summed 11 PGD items |
|--|---------------------------|-------------------------|------------------------|
| Brief symptom inventory | | | |
| Somatization | .54* | .54* | .53* |
| Obsessive-compulsivity | .49* | .49* | .48* |
| Interpersonal sensitivity | .51* | .51* | .49* |
| Depression | .48* | .48* | .46* |
| Anxiety | .54* | .54* | .52* |
| Hostility | .37* | .37* | .37* |
| Phobic anxiety | .50* | .50* | .49* |
| Paranoid ideation | .48* | .49* | .47* |
| Psychoticism | .54* | .54* | .52* |
| Total score | .58* | .58* | .56* |
| World Health Organization Quality of Life BREF | | | |
| Psychological health | -.43* | -.44* | -.41* |
| Physical health | -.46* | -.46* | -.46* |
| Social relationships | -.34* | -.34* | -.34* |
| Environment | -.43* | -.43* | -.44* |

Note. Correlations with the BSI were based on $n = 311$. Correlations of the World Health Organization Quality of Life BREF were based on $n = 284$.

PCBD = persistent complex bereavement disorder. PGD = prolonged grief disorder. TGI-SR = Traumatic Grief Inventory–Self-Report Version.

* $p < .001$.

the subscales of the BSI and the WHOQOL-BREF. All correlations were statistically significant and in the expected direction, such that higher scores on the TGI-SR were associated with higher scores on indices of psychopathology (BSI) and lower scores on quality of life (WHOQOL-BREF). These findings attest to the concurrent validity of the TGI-SR.

Construct validity

As a preliminary test of construct validity, the ability of the TGI-SR to discriminate between participants who reported having lost at least one relative to a violent or unnatural cause ($n = 166$) and participants who had not suffered violent loss was examined ($n = 161$). As would be expected based on prior research (e.g., Kristensen et al., 2012), the former group scored significantly higher than the latter group on the summed 18 items of the TGI-SR ($M = 53.41$, $SD = 16.56$ vs. $M = 42.04$, $SD = 15.51$, $t[325] = 11.47$), the summed 17 PCBD items ($M = 50.15$, $SD = 15.54$ vs. $M = 39.43$, $SD = 14.61$, $t[325] = 10.72$), and the summed 11 PGD items ($M = 33.49$, $SD = 10.63$ vs. $M = 26.09$, $SD = 10.56$, $t[325] = 7.41$, all $ps < .001$).

We also tested the ability of the TGI-SR to discriminate between participants who reported having lost more than one close relative ($n = 280$) versus participants reporting that they had suffered one loss ($n = 47$). As anticipated, the former group scored significantly higher than the latter group on the summed 18 items of the TGI-SR ($M = 49.36$, $SD = 16.64$ vs. $M = 38.96$, $SD = 17.73$, $t[325] = 10.40$), the summed 17 PCBD items ($M = 46.26$, $SD = 15.63$ vs. $M = 36.59$, $SD = 15.78$, $t[325] = 9.66$), and the summed 11 PGD items ($M = 30.80$, $SD = 10.96$ vs. $M = 24.8$, $SD = 10.83$, $t[325] = 60.60$, all $ps < .001$).

Numbers of participants meeting criteria for a “Provisional PCBD diagnosis” and a “Provisional PGD diagnosis”

Using the scoring rules defined above (see Methods section), we found that $n = 58$ (17.7%) of all participants met criteria for a “provisional PCBD diagnosis” and $n = 56$ (17.1%) of all participants met criteria for a “provisional PGD diagnosis.” The pairwise agreement of these provisional diagnoses yielded a Kappa of .92, reflecting “almost perfect agreement” (Landis & Koch, 1977).

Concurrent validity of “Provisional PCBD diagnosis” and “Provisional PGD diagnosis”

Next, we examined the concurrent validity of the provisional diagnoses, in terms of their ability to distinguish between people with different scores on

the BSI and WHO-QOL BREF, tapping different aspects of psychopathology and quality of life, respectively. In Table 4, scores on these measures for participants meeting and not meeting criteria for a “provisional PCBD diagnosis” and for participants meeting and not meeting criteria for a “provisional PGD diagnosis” are shown. As can be seen, a positive provisional PCBD diagnosis and a positive provisional PGD diagnosis were both associated with higher scores on all BSI scales and lower scores on all WHOQOL-BREF scales.

Discriminant validity

We used confirmatory factor analyses, implemented in Amos 23 (Arbuckle, 2014), to examine the distinctiveness of symptoms tapped by the TGI-SR from six symptoms of depression included in the BSI depression subscale. Specifically, we compared the fit of a one-factor model with all items from the TGI-SR and depression loading on a single factor, with a two-factor model with items loading on distinct grief and depression factors. Outcomes showed that the one-factor model had a poor fit to the data (e.g., TLI = .71, CFI = .74, RMSEA = .13). The two-factor model with two distinct correlated factors fit significantly better than the unitary model (χ^2 difference = 782.6, $\Delta df = 1$, $p < .001$) and had marginally acceptable fit estimates (CFI = .89, TLI = .88, RMSEA = .082). Modification indices indicated that correlations existed

Table 4. Differences in psychopathology and quality of life between people meeting/not meeting provisional PCBD and PGD diagnoses.

| | Meeting criteria for provisional PCBD diagnosis? | | | | | Meeting criteria for provisional PGD diagnosis? | | | | |
|--|--|-----------|----------|-----------|----------|---|-----------|----------|-----------|----------|
| | No | | Yes | | <i>t</i> | No | | Yes | | <i>t</i> |
| | <i>M</i> | <i>SD</i> | <i>M</i> | <i>SD</i> | | <i>M</i> | <i>SD</i> | <i>M</i> | <i>SD</i> | |
| Brief symptom inventory | | | | | | | | | | |
| Somatization | 1.09 | 0.86 | 2.24 | 0.96 | 8.68* | 1.11 | 0.87 | 2.20 | 0.99 | 8.01* |
| Obsessive-compulsivity | 1.87 | 0.99 | 3.00 | 0.78 | 9.21* | 1.90 | 1.01 | 2.90 | 0.84 | 6.72* |
| Interpersonal sensitivity | 1.50 | 0.95 | 2.57 | 0.94 | 7.56* | 1.54 | 0.96 | 2.43 | 1.03 | 6.07* |
| Depression | 1.63 | 0.98 | 2.68 | 0.88 | 7.29* | 1.67 | 0.99 | 2.55 | 0.95 | 5.86* |
| Anxiety | 1.68 | 0.95 | 2.79 | 0.96 | 7.77* | 1.71 | 0.97 | 2.71 | 0.98 | 6.78* |
| Hostility | 1.24 | 0.92 | 1.89 | 0.94 | 4.66* | 1.26 | 0.94 | 1.79 | 0.94 | 3.69* |
| Phobic anxiety | 1.36 | 1.08 | 2.57 | 1.00 | 7.57* | 1.40 | 1.10 | 2.40 | 1.07 | 6.00* |
| Paranoid ideation | 1.49 | 1.00 | 2.49 | 0.94 | 6.76* | 1.51 | 1.00 | 2.46 | 0.99 | 6.23* |
| Psychoticism | 1.27 | 0.84 | 2.43 | 0.89 | 9.03* | 1.31 | 0.85 | 2.31 | 1.00 | 7.46* |
| Total score | 1.46 | 0.80 | 2.51 | 0.72 | 8.93* | 1.49 | 0.82 | 2.44 | 0.78 | 7.73* |
| World Health Organization Quality of Life BREF | | | | | | | | | | |
| Psychological health | 42.76 | 15.48 | 27.56 | 13.66 | 6.09* | 42.36 | 15.46 | 28.76 | 15.50 | 5.21* |
| Physical health | 50.58 | 18.72 | 31.76 | 13.93 | 6.35* | 50.26 | 18.72 | 32.25 | 14.99 | 6.84* |
| Social relationships | 49.38 | 19.59 | 37.79 | 17.85 | 3.61* | 49.01 | 19.59 | 38.67 | 18.62 | 3.01* |
| Environment | 60.02 | 14.80 | 48.72 | 14.40 | 4.68* | 59.82 | 14.83 | 49.14 | 14.82 | 4.27* |

Note. Analyses with the BSI were based on $n = 311$. Analyses with the World Health Organization Quality of Life BREF were based on $n = 284$. PCBD = persistent complex bereavement disorder. PGD = prolonged grief disorder. TGI-SR = Traumatic Grief Inventory–Self-Report Version.

* $p < .001$.

between the error terms of TGI-SR items 1 and 14 (both referring to intrusive symptoms) and items 2 and 3 (referring to emotional distress); fit estimates improved to an acceptable level when we allowed the error terms of these items to be correlated (CFI = .90, TLI = .91, RMSEA = .078). Similar outcomes were obtained using the 17 PCBD items of the TGI-SR, with the one-factor having a poor fit (e.g., TLI = .71, CFI = .73, RMSEA = .134) and the two-factor model fitting better (χ^2 difference = 773.1, $\Delta df = 1$, $p < .001$). Fit estimates were marginally good (CFI = .88, TLI = .89, RMSEA = .084) and again passed the threshold for acceptable model fit when error terms of items 1 and 14 and 2 and 3 were allowed to be correlated (CFI = .90, TLI = .91, RMSEA = .078). Similar outcomes were also found using the 11 PGD items of the TGI-SR; the one-factor fit poorly (e.g., TLI = .66, CFI = .77, RMSEA = .17). The two-factor model fit significantly better (χ^2 difference = 798.1, $\Delta df = 1$, $p < .001$) and had acceptable model fit (CFI = 0.94, TLI = 0.92, RMSEA = .081).

Determination of provisional cutoff scores

We used Receiver Operating Characteristic analysis (ROC-analysis; e.g., Fletcher, Fletcher, & Wagner, 1996; Swets, 1988) to determine the cutoff scores on the TGI-SR that best distinguished between participants who did and did not meet criteria for a provisional PCBD diagnosis, and between participants who did and did not meet criteria for a provisional PGD diagnosis. We felt it could be useful to be able to get a rapid impression of possible “PCBD-caseness” and “PGD-caseness” based on the summed total score of the TGI-SR, without using the complex diagnostic algorithms, described earlier—particularly for professionals employing the TGI-SR in clinical practice. Of note, cutoff scores on a self-report instrument only serve the aim of informing the clinician and should never be used to replace the results of a thorough clinical (interview-based) evaluation.

ROC-analyses (results of which are summarized in Table 5) showed that a score of ≥ 61 optimally classified participants as meeting or not meeting the criteria for PCBD-caseness (Area Under the Curve, AUC = 0.99 [95% CI: 0.98–0.99]). Using this cutoff score, the TGI-SR correctly classified 58 of the 58 participants meeting criteria for a “provisional PCBD diagnosis,” pointing at a sensitivity of 100%. In addition, 244 out of 269 participants were correctly classified as not meeting criteria for PCBD, indicating a specificity of 91%. In total, 92% of the participants were classified correctly.

Similarly, a score of ≥ 61 optimally classified participants as meeting or not meeting the criteria for a provisional PGD diagnosis (AUC = 0.98 [95% CI: 0.97–0.99]). Using this cutoff score, the TGI-SR correctly classified 55 of the 56 participants with provisional PGD, pointing at a sensitivity of 98%. In addition, 244 out of 271 participants were correctly classified as not

Table 5. Summary of outcomes for ROC analyses.

| Score | N | PCBD | | | PGD | | | | |
|--------|-----|------|--------------|-------------|-------------|---|--------------|-------------|-------------|
| | | N | % Cumulative | Sensitivity | Specificity | N | % Cumulative | Sensitivity | Specificity |
| < = 56 | 220 | 0 | 0.0% | 1.00 | < = 0.82 | 0 | 0.0% | 1.00 | < = 0.80 |
| 57 | 2 | 0 | 0.0% | 1.00 | 0.83 | 0 | 0.0% | 1.00 | 0.80 |
| 58 | 7 | 0 | 0.0% | 1.00 | 0.85 | 0 | 0.0% | 0.98 | 0.83 |
| 59 | 4 | 0 | 0.0% | 1.00 | 0.87 | 1 | 2.0% | 0.98 | 0.84 |
| 60 | 7 | 0 | 0.0% | 1.00 | 0.89 | 0 | 2.0% | 0.98 | 0.87 |
| 61 | 4 | 0 | 0.0% | 1.00 | 0.91 | 0 | 2.0% | 0.98 | 0.88 |
| 62 | 5 | 1 | 1.7% | 0.98 | 0.92 | 2 | 5.4% | 0.95 | 0.90 |
| 63 | 6 | 1 | 3.4% | 0.97 | 0.94 | 1 | 7.1% | 0.93 | 0.91 |
| 64 | 6 | 2 | 6.9% | 0.93 | 0.96 | 2 | 10.7% | 0.89 | 0.93 |
| 65 | 9 | 6 | 17.2% | 0.83 | 0.97 | 5 | 19.6% | 0.80 | 0.94 |
| 66 | 6 | 4 | 24.1% | 0.76 | 0.97 | 2 | 23.2% | 0.77 | 0.96 |
| 67 | 5 | 4 | 31.0% | 0.69 | 0.98 | 4 | 30.4% | 0.70 | 0.97 |
| 68 | 3 | 3 | 36.2% | 0.64 | 0.98 | 3 | 35.7% | 0.64 | 0.97 |
| 69 | 6 | 3 | 41.4% | 0.59 | 0.99 | 3 | 41.1% | 0.59 | 0.97 |
| 70 | 6 | 5 | 50.0% | 0.50 | 0.99 | 4 | 48.2% | 0.52 | 0.99 |
| 71 | 2 | 0 | 50.0% | 0.50 | 1.00 | 0 | 48.2% | 0.52 | 0.99 |
| 72 | 1 | 1 | 51.7% | 0.48 | 1.00 | 1 | 50.0% | 0.50 | 1.00 |
| 73 | 5 | 5 | 60.3% | 0.40 | 1.00 | 5 | 58.9% | 0.41 | 1.00 |
| 74 | 3 | 3 | 65.5% | 0.34 | 1.00 | 3 | 64.2% | 0.36 | 1.00 |
| 76 | 3 | 3 | 70.7% | 0.29 | 1.00 | 3 | 69.6% | 0.30 | 1.00 |
| 77 | 2 | 2 | 74.1% | 0.26 | 1.00 | 2 | 73.2% | 0.27 | 1.00 |
| 78 | 2 | 2 | 77.6% | 0.22 | 1.00 | 2 | 76.8% | 0.23 | 1.00 |
| 79 | 1 | 1 | 79.3% | 0.21 | 1.00 | 1 | 78.6% | 0.21 | 1.00 |
| 80 | 2 | 2 | 82.8% | 0.17 | 1.00 | 2 | 82.1% | 0.18 | 1.00 |
| 81 | 1 | 1 | 84.5% | 0.16 | 1.00 | 1 | 83.9% | 0.16 | 1.00 |
| 82 | 3 | 3 | 89.7% | 0.10 | 1.00 | 3 | 89.3% | 0.11 | 1.00 |
| > = 84 | 6 | 6 | 100.0% | < = 0.09 | 1.00 | 6 | 100.0% | < = 0.10 | 1.00 |

Note. Area under curve (AUC) for PCBD: 0.99 (95% CI: 0.98–0.99), for PGD: 0.98 (95% CI: 0.97–0.99).

PCBD = persistent complex bereavement disorder. PGD = prolonged grief disorder. TGI-SR = Traumatic Grief Inventory–Self-Report Version.

meeting criteria for PGD, indicating a specificity of 90%. In total, 91% of the participants were classified correctly.

Differences in TGI-SR scores as a function of sociodemographic variables

Scores on all summed 18 items of the TGI-SR, the summed 17 PCBD items, and summed 11 PGD items did not differ as a function of gender (all t 's < 1.12 all ps > .48) and did not differ between participants who had been to college or university versus those with lower education (all t 's < 1.95, all ps > .052). Younger participants scored higher on the summed 18 items of the TGI-SR ($r = -.14$), the summed 17 PCBD items ($r = -.14$), and summed PGD items ($r = -.16$, all ps < .01). Scores differed significantly between the three patient groups; for the summed 18 items of the TGI-SR, $F(2, 325) = 36.10$; for the summed 17 PCBD items, $F(2, 325) = 36.64$; and for the summed 11 PGD-items, $F(2, 325) = 34.76$ (all ps < .001). Post-hoc tests showed that refugees or asylum seekers scored significantly higher than the other two groups (ps < .001), whereas scores of these other two groups did not differ significantly (ps > .46).

Discussion

The aim of this study was to introduce the TGI-SR as a new instrument for the assessment of symptoms of PCBD proposed for DSM-5 and PGD proposed for ICD-11. The instrument is different from existing instruments for the assessment of grief; for instance, it differs from the Texas Revised Inventory of Grief (TRIG; Faschingbauer, Zisook, & DeVaul, 1987) that was designed as a measure of normative rather than nonnormative grief, differs from the Inventory of Complicated Grief (Prigerson et al., 1995) that does not tap all symptoms of PCBD (e.g., wish to die to be with lost person, trouble positive reminiscing), and differs from Lee's (2015) "Persistent Complex Bereavement Inventory" that represents all PCBD symptoms, but not all PGD symptoms.

We administered the TGI-SR to 327 patients from a mental health care institute that specialized in the treatment of psychopathology associated with loss and trauma to be able to conduct a preliminary psychometric evaluation of the measure. Outcomes of our EFA indicated that the 18 items of the TGI-SR, the 17 items representing PCBD symptoms, and the 11 items representing PGD symptoms loaded on a single dimension of potentially problematic grief reactions. This is consistent with prior research showing such grief reactions to form a unitary construct (e.g., Boelen & Hoijtink, 2009; Prigerson et al., 1995). A further finding was that, in keeping with the findings from the EFA, the internal consistency of the 18 items of the TGI-SR, but also the selection of 17 PCBD items and selection of 11 PGD items, was strong.

We examined the associations of the TGI-SR scores with one measure tapping different dimensions of psychopathology, including depression, anxiety, and a second measure assessing aspects of quality of life. Associations were significant and in the expected directions such that higher scores on the TGI-SR (including all summed items, summed PCBD items, and summed PGD items) coincided with higher scores on indices of psychopathology and lower scores on indices of quality of life. The findings attest to the concurrent validity of the TGI-SR. The TGI-SR was also found to differentiate between participants who had suffered at least one loss due a violent or unnatural cause (generally yielding considerably more distress compared to other losses; cf. Kristensen et al., 2012) and participants who reported that they had not suffered violent or unnatural loss. In addition, higher TGI-SR scores were reported by participants who had reported more than one loss compared to those who had suffered one loss. These findings provide preliminary evidence supporting the construct validity of the TGI-SR. Confirmatory factor analyses showed that models in which symptoms tapped by the TGI-SR and symptoms of depression loaded on two factors was superior to a unitary model; these findings accord with prior evidence that symptoms of potentially problematic grief are distinct from symptoms of depression (see e.g., Prigerson & Jacobs,

2001) and provide preliminary evidence supporting the discriminant validity of the TGI-SR.

Exploratory analyses focusing on sociodemographic correlates of scores on the TGI-SR indicated that younger participants had higher TGI-SR scores. Moreover, it was found that, of the three patient groups included in our study (i.e., professional related traumatized patients, refugees or asylum seekers, others), refugees or asylum seekers had the highest scores. These findings are not totally unexpected, taking into account prior findings of elevated rates of grief in refugee and non-Western conflict-affected populations (e.g. Morina, Rudari, Bleichhardt, & Prigerson, 2010; Schaal, Jacob, Dusingizemungu, & Elbert, 2010).

We examined the number of people meeting criteria for a provisional PCBD diagnosis and for a provisional PGD diagnosis, treating TGI-SR items rated as 4 = “frequently” or 5 = “always” as a symptom endorsed, and then following the DSM-5 based diagnostic rule for PCBD, and Prigerson et al.’s (2009) scoring rule for PGD. In total, 17.7% met criteria for a provisional PCBD diagnosis and 17.1% for a provisional PGD diagnosis, with the pairwise agreement between the two diagnoses being “substantial” (Kappa = 0.86). Prevalence rates were lower than could be expected in a treatment-seeking sample; this could be due to our reliance on a strict criterion for item endorsement (4 = “frequently” or 5 = “always”). In addition, it could be due to the fact that grief-related psychopathology is not always well recognized in primary care, and may therefore be underrepresented in the population referred to Centrum ‘45 (cf. Lichtenthal et al., 2011). Notably though, more valid determination of prevalence rates of PCBD and PGD requires the use of clinical interviews.

There are several other caveats that should be considered. First, items of an existing measure of problematic grief—the ICG (Prigerson et al., 1995)—were taken as a starting point for the development of the TGI-SR. The ICG has repeatedly been found to be a valid tool and much of the research underlying PCBD and PGD was performed using this scale. Although our reliance on this ICG in developing the TGI-SR likely strengthened its content validity, one could argue that developing an entirely new scale using gold standard procedures (e.g., starting with a large pool of newly formulated items, testing their performance in the entire target population, and selecting the most reliable and valid items) would yield an instrument with even better content and construct validity. Secondly, analyses were conducted using a heterogeneous clinical sample, which limits the generalization to other, both clinical and nonclinical bereaved groups. Validation of the TGI-SR in the general population and other groups is needed. Thirdly, we only evaluated limited aspects of validity; future research is needed to explore—among other things—the association of TGI-SR scores with other indices of psychopathology (to further examine concurrent validity), and with other measures of grief (to

further examine convergent and divergent validity). A fourth limitation is that we used self-reported scores on the TGI-SR to determine whether or not participants met criteria for PCBD and criteria for PGD. Importantly, future research should include validated clinical interviews to establish absence or presence of PCBD and PGD—in order for a more reliable determination of prevalence rates of PCBD and PGD, and in order to further examine cutoff scores for “caseness” of PCBD and PGD. The prevalence rates and cutoff score reported in the current study must remain tentative, pending such future research, preferable in heterogeneous samples of bereaved individuals. Finally, the current study evaluated the Dutch version of the TGI-SR; therefore, evaluation of versions in other languages is an additional topic for further research.

Notwithstanding these considerations, this study provides preliminary evidence that the TGI-SR is a reliable, valid, and useful measure to assess the severity of symptoms of PCBD (included in DSM-5) and PGD (to be included in ICD-11) in clinical and research settings.

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