Complicated Grief in a Spanish Sample of Victims of Terrorism: Evidence of Validity of the Inventory of Complicated Grief (ICG)

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Abstract

The Inventory of Complicated Grief (ICG) is the most widely used instrument to measure complicated grief (CG), but its psychometric properties have hardly been examined in relatives of those who died by violent means. The objective of this study was to obtain evidence of validity of the ICG in a relatives of those who died due to terrorist attacks in Spain. The factorial structure, internal consistency, and relationship with depression, anxiety, and post-traumatic stress were analyzed in a Spanish sample of 211 relatives of people who died in terrorist attacks. The ICG presented a one-factor structure that supports the validity of its total score. This score showed excellent internal consistency indices (alpha = .927; omega = .932) and adequate correlation indices with depression, anxiety, and post-traumatic stress (r =.71, .63 and .76, respectively). The ICG provides reliable and valid measures of CG in adults who have lost a family member due to violent death.

Complicated Grief in a Spanish Sample of Victims of Terrorism: Evidence of Validity of the Inventory of Complicated Grief (ICG)

Grief is a natural reaction to the death of a loved one, which is fundamentally emotional and negative, although it also involves other psychological and physiological behaviors. Given the inevitability of death and the inherent human need to form close affective bonds with others, grief is a universal reaction that virtually all people will experience at various points in their lives (Sanz et al., 2020). Grief specialists have always recognized the existence of reactions to the death of a loved one that are associated with discomfort, dysfunction, limitation, or disability in a degree of intensity, frequency, and/or duration that is not comprehensible as a function of the context in which these manifestations occur and do not represent a culturally accepted response to the death of a loved one (Sanz et al., 2020). These reactions, therefore, could properly be considered psychological symptoms, a psychological syndrome, or even a psychological disorder. This type of reaction is usually called complicated grief (Horowitz et al., 1997; Prigerson et al., 1995; Shear et al., 2011), although there is still no solid agreement in the scientific community on the name or conceptual status of this construct, for which other very diverse names have been proposed, such as, for example, pathological grief, abnormal grief, chronic grief, or traumatic grief (see, for a broader list of alternative names, Stroebe et al., 2000). To these names should be added the most recent one of persistent complex bereavement disorder and prolonged grief disorder proposed, respectively, by the two most consensual and validated diagnostic classifications of mental disorders, that of the *Diagnostic and Statistical Manual of Mental Disorders* 5th edition (DSM-5; American Psychiatric Association, 2013) and the *International Classification of Diseases* (ICD-11; World Health Organization, 2018).

There are numerous instruments to measure complicated grief. Neimeyer et al. (2008), Tomita and Kitamura (2002) and, most recently, Treml et al. (2020) performed revisions of these instruments and identified a total of 21, some of them abbreviated, expanded, or revised versions of the original instruments. However, of all the instruments described in those reviews, the Inventory of Complicated Grief (ICG; Prigerson et al., 1995) is by far the most used or cited by the scientific community. On April 4, 2022, a search was carried out in the PsycInfo bibliographic database with the names of these 21 instruments in the field of "tests and measures". This search revealed that the ICG had been used or cited in 329 publications, that is, 148 more publications than the second most used or cited instrument, the Inventory of Complicated Grief-Revised (ICG-R), formerly called the Inventory of Traumatic Grief (ITG; Prigerson & Jacobs, 2001), and 174 more publications than the third one, the Texas Revised Inventory of Grief (TRIG; Faschingbauer et al., 1977).

The ICG has shown good indices of reliability and validity in adult mourners both in its original version (Fisher et al., 2017; Prigerson et al., 1995; Simon et al., 2011) and in its adaptations in Germany (Lumbeck et al., 2012), China (Li & Progerson, 2016), Colombia (Gamba-Collazos & Navia, 2017), Spain (Limonero et al., 2009; Masferrer et al., 2017), Italy (Carmassi et al., 2014), Israel (Lifshitz et al., 2022), and Poland (Ludwikowska-Świeboda & Lachowska, 2019). However, all studies on the psychometric properties of the ICG in adult mourners, except for the study of Fisher et al. (2017), have been conducted with samples of participants composed wholly or mostly of people who had lost a loved one to nonviolent death (e.g., illness, natural death, occupational accident). In contrast, in the study of Fisher et al. (2017), the internal structure of the original version of the ICG was analyzed in a sample of 232 relatives of US military personnel most of whom had died in combat (44.4%), by

terrorist attack or homicide (12.1%), or by suicide (10.8%). Consequently, except for the study by Fisher et al. (2017), there are no known studies that have examined the psychometric properties of the ICG in adults who have lost a loved one to a violent death. In addition, the study of Fisher et al. (2017) analyzed the internal structure of the ICG but did not examine other basic psychometric properties of the instrument, such as internal consistency or its relationship with other theoretically related constructs.

On another hand, the factor analyses carried out by Fisher et al. (2017) revealed a five-factor structure of the ICG, which does not coincide with those found among the mourners of deceased due to non-violent deaths, which range from one factor (Carmassi et al., 2014; Ludwikowska-Świeboda & Lachowska, 2019; Lumbeck et al., 2012; Prigerson et al., 1995; Simon et al., 2011, full bereaved sample), three factors (Gamba-Collazos & Navia, 2017; Li & Prigerson, 2016; Lifshitz et al., 2022; Limonero et al., 2009), four factors (Masferrer et al., 2017) to six factors (Simon et al., 2011, complicated grief cases). This discrepancy in comparison to Fisher et al.'s (2017) results could indicate that the characteristics of complicated grief in mourners may be different depending on the cause of the loved one's death, although other differences among mourner samples may also affect the factor structure of the ICG, including the differences in the prevalence of complicated grief. For example, Simon et al. (2011) found a one-factor structure in a bereaved sample, but a six-factor structure in a subsample only composed of complicated grief cases. In this regard, it is important to point out that Nakajima et al. (2012) have reviewed data from several studies suggesting a higher prevalence of complicated grief in mourners of those who died from violent causes than in mourners of those who died from nonviolent causes, as well as greater comorbidity of post-traumatic stress disorder (PTSD). Moreover, in the systematic review of Sanz et al. (2020) on the prevalence of complicated grief in relatives of those

killed in terrorist attacks, it was found that this prevalence quadrupled the prevalence of complicated grief in relatives of those who died from nonviolent causes (42.6% vs. 9.8%) or, taking into account only the studies that used the ICG to measure complicated grief, doubled it (42.6% vs. 21.7%).

Consequently, given the possible differential characteristics of complicated grief in mourners of those who died due to violent deaths and the limited research on the psychometric properties of ICG in this type of population, the objective of this study was to examine the factorial structure and internal consistency of the ICG as well as its relationship with other constructs theoretically associated with complicated grief—depression, post-traumatic stress, and anxiety—in a sample of adults who had lost a family member to a terrorist attack in Spain.

Method

Participants

This study involved 211 adult relatives of a person killed in a terrorist attack in Spain. All participants were recruited through Spain's Association of Victims of Terrorism (AVT), of which they were members, and were part of a wider investigation into the long-term psychological consequences of terrorist attacks. The selection of this sample of participants was carried out in two phases. In the first phase, 759 adults who belonged to the AVT and who were relatives of a person killed in a terrorist attack were contacted by telephone. Of them, 410 completed a telephone psychological interview, while 11 participants requested the interview in person. In a second phase, the 421 family members interviewed in the first phase were invited to undergo a more comprehensive face-to-face psychological assessment that included various psychopathological questionnaires, including the ICG, and a structured diagnostic interview for emotional disorders. Of the total number of people invited, 246 performed

this second face-to-face psychological evaluation, but not all participants completed the ICG, so the final sample for the present study was reduced to 211 participants.

The age range of the participants was between 19 and 87 years, with a mean of 52.48 years (*SD* = 14.43), and more than half were women (67.5%). Regarding their current marital status, 45% were married, 30.3% were widowed, 16.1% were single, 3.8% lived with a stable partner, 2.8% were divorced, and 1.9% were separated. Concerning education, 39.8% of the participants had secondary education, 34.2% had university studies, 23.2% had primary studies, and the remaining 2.8% had no regulated studies. Concerning kinship, 41.7% of the participants were children of the person killed in the terrorist attack, 31.3% were spouses or stable partners, 13.3% were siblings, 3.8% were mothers or fathers, and the remaining 9.9% were other types of relatives (e.g., son-in-law, daughter-in-law, grandchild). The terrorist attack that ended the life of their relative had occurred an average of 26.35 years (*SD* = 9.04) before the psychological evaluation interview was conducted.

Instruments

Inventory of Complicated Grief (ICG; Prigerson et al., 1995; Spanish adaptation of Limonero et al., 2009). The ICG consists of 19 statements about thoughts and behaviors related to grief whose frequency must be rated by the person on five-point Likert scales ranging from 0 (*Never*) to 4 (*Always*). The sum of all the items provides an overall score in complicated grief that ranges from 0 to 76, with higher scores indicating a higher level of symptoms of complicated grief. According to the authors of the original version, a total score higher than 25 is an indicator of complicated grief (Prigerson et al., 1995). The ICG has good reliability and validity indices, both in its original version (e.g., Cronbach's alpha = .94, test-retest reliability =

.80; Prigerson et al., 1995) and in its Spanish adaptation (e.g., Cronbach's alpha = .88, test-retest reliability = .81; Limonero et al., 2009).

Structured Clinical Interview for Axis I Disorders of the DSM-IV, Clinical Version (SCID-I-VC; First et al., 1997). For the diagnosis of mood and anxiety disorders and PTSD, the corresponding modules of the Spanish translation of the SCID-I-VC were applied (First et al., 1999). The SCID-I-CV has obtained adequate evidence of reliability and validity for major depressive disorder, anxiety disorder, and PTSD diagnoses (Lobbestael et al., 2011).

Beck-II Depression Inventory (BDI-II; Beck et al., 1996; Spanish adaptation in Beck et al., 2011). This is a self-reporting instrument of 21 items or groups of statements created to assess the presence and severity of depressive symptoms. In each item, the person has to choose the statement that best reflects their condition during the last two weeks, which is valued from 0 to 3 points, such that a score in depressive symptomatology between 0 and 63 is obtained. The Spanish adaptation has obtained good or acceptable evidence of validity in different samples of participants, including people with psychological disorders (Beck et al., 2011), in whom, for example, a Cronbach's alpha coefficient of .91 and areas under the ROC curve of .82 – .88 have been obtained to distinguish severity levels of depressive symptomatology (Sanz & García-Vera, 2013). In this study, a Cronbach's alpha coefficient of .94 was obtained for the sample of mourners.

Beck Anxiety Inventory (BAI; Beck & Steer, 1993; Spanish adaptation in Beck & Steer, 2011). The BAI consists of 21 items created to assess the presence and severity of anxiety symptoms. In each of the 21 items, the person evaluated must rate on a 4-point Likert scale, the degree to which such symptoms have bothered them in the last week, from 0 (*Not at all*) to 3 (*Severe*), such that the BAI provides a total score in

anxiety. There is abundant empirical literature indicating that the BAI has adequate indices of reliability and validity in a wide range of populations (Beck & Steer, 2011). The Spanish adaptation has also shown adequate reliability and validity indices in Spanish samples from the general population and patients with psychological disorders (e.g., Cronbach's alpha = .88 – .92; Sanz et al., 2012). In the present sample of mourners, the BAI obtained a Cronbach's alpha coefficient of .95.

Post-Traumatic Stress Disorder Checklist, specific version (PCL-S; Weathers et al., 1993). The Spanish adaptation of the PCL-S designed for victims of terrorist attacks by Vázquez et al. (2006) was used. The PCL-S consists of 17 items that describe symptoms of PTSD according to the DSM-IV. Each item is scored from 1 to 5 points, such that a score in post-traumatic stress symptomatology between 17 and 85 is obtained. Both the original version of the PCL-S and its Spanish adaptation have good indices of reliability, convergent validity, and diagnostic validity (Cobos Redondo et al., 2021; Weathers et al., 1993). In the sample of mourners in the present study, the PCL-S obtained an internal consistency index (Cronbach's alpha) of .93.

Procedure

Participants' verbal informed consent was obtained prior to the telephone interview and, during the face-to-face interview, they signed an informed consent to collaborate in a broader investigation on the long-term psychological consequences of terrorism. Subsequently, a psychologist assessed the psychopathological consequences derived from the attack through the following instruments applied in the following order: SCID-I VC, BDI-II, BAI, PCL-S and ICG. All psychologists who acted as evaluators had been specifically trained in conducting assessments through a university diploma focused on psychological care for victims of terrorist attacks, observing

assessments, conducting supervised assessments, and conducting weekly clinical sessions.

Data Analysis

Factorial Structure

Factor analyses were performed on the responses to the ICG items using the FACTOR program, v. 10.8.04 (Ferrando & Lorenzo-Seva, 2017). Factor analyses were performed on the matrix of polychoric correlations between items, as most of the 19 items (13 items; 68.4%) had values of kurtosis or skewness outside of the range that indicates a normal distribution of their scores (-1/+1) and Mardia's analysis of kurtosis and multivariate skewness revealed significant results for kurtosis ($p < .05$), although not for skewness.

The Bartlett sphericity test and the Kaiser-Meyer-Olkin test (KMO) were performed to analyze the adequacy of the data for factor analysis, and five procedures were carried out to determine the most appropriate number of factors to extract: Cattell's scree plot, Hull's method, Velicer's minimum mean partial correlation test or MAP, classical parallel analysis, and Timmerman and Lorenzo-Seva's (2011) optimal parallel analysis. As many factors as were recommended by most of these procedures were extracted, using the estimation method of robust unweighted least squares (RULS) because it does not assume a multivariate normal distribution of the data.

The following goodness-of-fit indices were calculated for each one of the recommended factorial solutions (with the corresponding criteria for adequate fit; West et al., 2012): 1) χ^2/df (≤ 5); 2) goodness-of-fit index (GFI $\geq .95$); 3) Bentler's comparative fit index (CFI $\geq .95$); 4) non-normed fit index or Tucker-Lewis index (NNFI or TLI $\geq .95$); 5) root mean square error of approximation (RMSEA $\leq .08$), and 6) weighted residual mean quadratic root (WRMR $< .90$). When a single factor was

extracted, the following three fit indices for a one-dimensional solution were calculated: unidimensional congruence index (UniCo), percentage of explained common variance (ECV), and mean of the residual absolute loadings of the items (MIREAL) (Ferrando & Lorenzo-Seva, 2018).

The results of these indices were assessed in the context of the psychological interpretation of the factor loading matrix of the different factorial solutions, a matrix that, in the case of the solutions of two or more factors, was rotated through an oblique promin procedure. In the psychological interpretation, the content of the items that presented factor loadings of ≥ .35 in one factor in these matrices and that, at the same time, presented lower factor loadings in the remaining factors, was taken into account.

Most grief researchers hypothesize that reaction to the loss has multiple facets and consists of emotional, cognitive, somatic, and behavioral elements. The factor analyses examined if sets of those facets or elements correlate high together but low with other facets or elements, that is, if sets of those facets or elements are grouped into factors and, therefore, it makes sense to create as many ICG subscales as found factors. The factor analyses also examined if all grief facets or elements correlate well with all the other facets or elements, not just some, and it makes more sense to use a total ICG score instead of scores for several ICG subscales. Of course, the factor analysis results could also indicate that both options make sense.

Internal Consistency

Internal consistency analyses were carried out with the JASP program, v. 0.14 (JASP Team, 2020), using Cronbach's alpha coefficient and McDonald’s omega coefficient for the total scale or subscales of the ICG defined by the factorial solution considered most appropriate. In addition, the reliability indices of the ICG items were calculated, obtaining the corrected item-total or item-subtotal correlations for,

respectively, the total score or the subtotal scores defined by the most appropriate factorial solution. Corrected item-total or item-subtotal correlations of .30 or higher were considered acceptable evidence of item reliability (Kline, 2000).

Distribution of Scores

For the total score or the subtotal scores defined by the most appropriate factorial solution, statistics of central tendency (mean and median), dispersion (standard deviation), and distribution (skewness and kurtosis) were calculated with the SPSS .v. 25 program.

Relationship to Other Theoretically Related Constructs

The Pearson product moment correlations of the measures of depression (BDI-II), anxiety (BAI), and post-traumatic stress (PCL-S) were calculated using the SPSS program, v. 25, with the scores of the total scale or subscales defined by the factorial solution considered most appropriate.

Results

Clinical Characteristics of the Participant Sample

Based on the diagnoses made by psychologists using the information from the structured diagnostic interview, 48.1% of participants had some kind of psychological disorder (PTSD, depressive disorder or anxiety disorder) at the time of the interview, in particular, 20.8% of participants (n = 44) had PTSD, 21.7% (n = 46) had a major depressive or dysthymic disorder, and 35.8% (n = 76) of the victims had an anxiety disorder.

Factorial Structure

The results of Bartlett's sphericity test (2346.7, $p < .0001$) and the KMO test (.878), considered good according to conventional criteria, indicated that the matrix of polychoric correlations was suitable for factor analysis.

The results of the scree plot (Figure 1) and the other four procedures for determining the number of factors to be extracted (Table 1) did not indicate a unanimous factorial solution, but instead solutions of one (unifactorial) or two factors (bifactorial). Therefore, one factor and two factors were extracted to compare their indices of goodness of fit and their psychological interpretation.

Figure 1

Table 1

The goodness-of-fit indices obtained for the unifactorial and bifactorial solutions are shown in Table 2. Both solutions showed acceptable or good fit indices according to conventional criteria, although those of the bifactorial solution were slightly better (see Table 2). Concerning the one-factor solution, two of the three additional indices that specifically evaluated the fit of a single-factor solution (ECV and MIREAL) suggested that such a solution fit the data well, while the remaining index (UniCo) was below the conventional criterion indicating a good fit (> .95), although only slightly (.944).

Table 2

Concerning the psychological interpretation of the factorial solutions, the factor loadings obtained in the unifactorial solution and those obtained in the rotated matrix of the bifactorial solution are presented in Table 3. These factor loadings indicated that the second factor of the bifactorial solution was defined (factor loadings ≥ .35 in the factor and lower in the remaining factors) by only five items, one of them (Item 10) with a factor loading (≥ .35) also relevant in the first factor. These five items had a very varied symptomatic content and did not seem to reflect the content or theme common to all of

them: feelings of estrangement from others (Item 10), suffering the same pains or symptoms as the deceased person (Item 11), deviating from one's path to avoid memories of the deceased person (Item 12), listening to the deceased person (Item 14) and seeing the deceased person (Item 15). However, a common feature of these five items was that they had the lowest mean scores (see Table 4). In fact, four of the five items had the highest frequencies of score 0. This score corresponds to the response option indicating that the symptom reflected in the item had "never" been suffered. Thus, 92% of the participants chose the "never" response option for Item 11, 82.1% for Item 15, 74.1% for Item 14, and 70.8% for Item 12. Furthermore, the fifth item, Item 10, was only exceeded by Item 16 in terms of the higher frequency of the “never” response option or score 0 (67% and 69.8% of participants, respectively). Therefore, this second factor seemed to respond more to a technical factor (or a difficulty factor) than to a content or substantial factor, that is, a factor resulting from very similar distributions of scores among those five items, in this case, distributions with positive skew and high peak at score 0, and these distributions differ from items not related to the factor (Gorsuch, 1997).

On another hand, all items showed high factor loadings (≥ .45) in the unifactorial solution; moreover, 16 of the 19 items showed factor loadings greater than .60 in this solution (see Table 3), supporting the suitability of the unifactorial solution. In addition, the Pearson product moment correlation between the two factors of the bifactorial solution was positive and very high, .71, also supporting the suitability of the unifactorial solution.

In summary, the results of the factor analyses indicated that the factor structure of the ICG in the sample of participants in this study was unifactorial.

Table 3

Internal Consistency

The finding of a unifactorial structure in the ICG would justify the attainment and the validity of a total score in ICG. The results of the internal consistency reliability analyses of the total ICG scores revealed that, according to the standards, these scores obtained excellent internal consistency coefficients (≥ .85), in particular, a Cronbach's alpha coefficient of .927 and a McDonald's omega coefficient of .932. The corrected item-total correlations of the ICG items exceeded in all cases the value of .30, ranging between .364 and .779, except for Item 11 ("I have pain in the same area of my body or have some of the same symptoms as the person who died") which was .255.

Table 4

Distribution of Scores

The total ICG scores ranged from 7 to 66, with a mean of 23.46, a median of 21.5, and a standard deviation of 16.31. The distribution of the total ICG scores followed an approximately normal distribution, as both the kurtosis and skewness indexes (-0.73 and 0.48, respectively) were in the range between -1 and 1. Taking into account the criterion of a score of 25, 42.5% of the people evaluated (n = 90) were considered at high risk for requiring clinical care for complicated grief.

In sum, the factor analysis and internal consistency results revealed that all ICG items correlate well with all the items, not just some, and it makes sense to obtain a total ICG score instead of scores for several ICG subscales. In addition, this total ICG score approximately distributes as a normal curve in the participant sample and, therefore, it allows one to grasp individual differences among Spanish mourners in terms of the presence and intensity of complicated grief symptoms.

Relationship to Other Theoretically Related Constructs

Significant, and, according to Cohen's (1988) standards, large (≥ .50) Pearson product moment correlations of the total ICG scores with the BDI-II measure of depressive symptoms (r = .713), the BAI measure of anxiety symptoms (r = .626), and the PCL-S measure of post-traumatic stress symptoms (r = .757) were found.

Discussion

The main objective of this study was to obtain evidence of validity of the ICG in a sample of adult mourners who had lost a relative in a terrorist attack in Spain. The results allow us to state that, at least in this type of sample, the ICG scores present adequate indices of validity and reliability to measure the symptoms of complicated grief. In particular, the results present adequate empirical evidence of internal structure, internal consistency, and relationship with measures of other constructs theoretically related to the symptoms of complicated grief, namely depressive, anxiety, and post-traumatic stress symptoms.

Regarding the internal structure, the results indicate that the ICG has a one-factor structure that would justify and validate the overall score in complicated grief that is usually obtained with the ICG. This unifactorial solution coincides with that obtained not only in the study that originally developed the ICG (Prigerson et al., 1995) but also in the studies of the German (Lumbeck et al., 2012), Italian (Carmassi et al., 2014), and Polish (Ludwikowska-Świeboda & Lachowska, 2019) adaptations as well as in the study of Simon et al. (2011) with a large and heterogeneous sample of 782 American mourners, even though, in all these five studies, the samples of participants were composed totally or mostly of people who had lost a loved one by non-violent death, whereas, in the present study, the participants were people who had lost a loved one due to violent death. Therefore, initially, it could be concluded that the results of this study

suggest that the unifactorial solution of the ICG that is obtained in many studies with mourners of deceased by non-violent causes, is generalized to mourners of deceased by violent causes.

It is true, however, that, in the only previous study conducted with a sample of mourners of those who died of violent causes— the study of Fisher et al. (2017) with relatives of military personnel most of whom who died in combat, by homicide, terrorist attack or suicide—, it was found that the ICG had a five-factor structure, not a unifactorial one. However, this five-factor solution is questionable, as, in order to obtain it, the researchers eliminated three of the 19 ICG items because, due to these items, the covariance matrix of the latent variables was not positively defined. In addition, this solution was the result of a confirmatory factor analysis in which, to obtain an acceptable fit of the data, four residual correlations between pairs of items were included a posteriori. Moreover, this confirmatory factor analysis was performed on dichotomized responses to the ICG items (symptom present = *often* or *always* vs. symptom absent = *never, rarely,* or *sometimes*), rather than on responses in the full range of the Likert scales of the ICG items.

On another hand, it is also true that, in samples of mourners of deceased due to non-violent causes, factorial solutions other than the unifactorial one have been obtained, specifically, three factors (Gamba-Collazos & Navia, 2017; Li & Prigerson, 2016; Lifshitz et al., 2022; Limonero et al., 2009), four factors (Masferrer et al., 2017), and six factors (Simon et al., 2011, complicated grief cases). However, these factorial solutions are also questionable, as most of the studies that obtained them used outdated and problematic procedures to perform the corresponding exploratory factor analyses. For example, most studies used a principal component analysis for the extraction of the factors (Gamba-Collazos & Navia, 2017; Li & Prigerson, 2016; Lifshitz et al., 2022;

Limonero et al., 2009; Masferrer et al., 2017) and/or the Kaiser criterion of eigenvalues greater than 1 for the identification of the number of factors to be extracted (Gamba-Collazos & Navia, 2017; Lifshitz et al., 2022; Limonero et al., 2009; Masferrer et al., 2017; Simon et al., 2011). Both procedures are problematic in the factor analysis of the items of a test and usually lead to solutions with an erroneously high number of factors (Gorsuch, 1997). Of course, in addition to those methodological factors, there are other relevant factors that might explain the variability of factorial solutions across different validation studies (e.g., gender distribution, age, time since death, translation, culture, relation to the deceased).

Regarding the internal consistency of the total scores of the ICG in mourners of deceased due to violence, the indices obtained in the present study indicate that this consistency is excellent (alpha = .927 and omega = .932). These indices are similar to those obtained in many studies with samples of mourners of deceased due to non-violent causes (range = .93 – .947; Carmassi et al., 2014; Gamba-Collazos & Navia, 2017; Li & Prigerson, 2016; Ludwikowska-Świeboda & Lachowska, 2019; Masferrer et al., 2017; Prigerson et al., 1995). Therefore, the results of this study suggest that the excellent internal consistency of the ICG that is usually obtained in mourners of deceased by non-violent causes is generalized to mourners of deceased by violent causes.

Finally, concerning the relationship of ICG measures with construct measures theoretically associated with complicated grief, the results of the present study indicate that, as might be expected, the total ICG scores in mourners of deaths due to violence are positively and significantly related to measures of depression, anxiety, and post-traumatic stress, with large effect size coefficients, ranging from .63 to .76. These coefficients point in the same direction as those found in studies with mourners of

people who died from non-violent causes and, in fact, are slightly higher. For example, with measures of depression also obtained from the BDI or any of its versions, a correlation was found with the ICG of .67 in Prigerson et al. (1995), of .43 in Limonero et al. (2009), of .38 in Lumbeck et al., (2012), of .61 in Gamba-Collazos and Navia (2017), and of .50 in Ludwikowska-Świeboda and Lachowska (2019), whereas in this study, a correlation of .71 was obtained. With measures of anxiety also obtained from the BAI, a correlation was found with the ICG of .24 in Limonero et al. (2009), of .57 in Gamba-Collazos and Navia (2017), and of .49 in Lifshitz et al. (2022), whereas in this study, a correlation of .63 was obtained. Finally, with measures of post-traumatic stress also obtained from the PCL or any of its versions, a correlation with the ICG was found of .55 in Charney et al. (2018), whereas in this study, a correlation of .76 was obtained. Consequently, it could be concluded that the results of this study suggest that the association that ICG usually shows with measures of depression, anxiety, and post-traumatic stress in mourners of deceased due to nonviolent causes is generalized to mourners of deceased due to violence.

In summary, the results of the present study offer empirical support for the validity of interpretations of the total ICG score as a measure of symptoms of complicated grief in mourners of people who died due to violence, especially in mourners of those who died in terrorist attacks.

However, this conclusion and the previous ones should be assessed in light of the limitations of this study. The most important is that the participants were not selected by a random procedure, but belonged to a convenience sample and, therefore, the results are susceptible to the biases of this type of sampling. Furthermore, the mourner sample of this study is very particular because it was made up entirely of people who had lost a family member in a terrorist attack and who were assessed many

years after the loss. Consequently, it would be appropriate to obtain evidence of the validity of the ICG in other samples of Spanish adults who have lost a loved one due to other types of acts of violence and who have been assessed days, months or few years after the loss. It would also be useful to examine other sources of evidence of validity not addressed in this study (e.g., test-retest reliability, relation to other measures of complicated grief).

Despite these limitations, the findings of this study suggest that the ICG can be applied with adequate psychometric support in Spanish people with symptoms of complicated grief after the death of a loved one due to violence, which facilitates the psychological evaluation of these people, especially those who may have complicated grief disorders, which are much more frequent in this population than among people who have lost a loved one due to a nonviolent cause (Nakajima et al., 2012; Sanz et al., 2020).

Therefore, the findings of this study have relevant implications on practice, especially for practitioners and clinicians who provide clinical care to mourners and, in particular, in cases not only of sudden death due to terrorist attacks and other types of acts of violence, but also in cases of sudden death due to natural disasters, traffic accidents, suicide, and so on. The findings support the use of the ICG for identifying a group of symptoms which consistently occur together in a significant percentage of those cases —a syndrome frequently called complicated grief— and distinguishing different levels of severity of those symptoms. In this regard, the ICG may be administered during the initial assessment to estimate the need for clinical care for complicated grief and it may be also administered over the course and follow-up of a treatment for complicated grief in order to monitor the progression and benefits of this treatment.

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Table 1. Recommended number of factors to be extracted in the matrices of polychoric correlations of the ICG items

Procedure for determining the number of factors	No. of factors
Cattell’s scree test (scree plot)	1 or 2
Optimal implementation of parallel analysis	1
Horn’s parallel analysis	2
Hull’s method	1
Velicer's minimum average partial (MAP) test	2

Table 2. Fit indices of ICG factorial solutions

Index	One factor	Two factors
% of explained variance	54%	63%
χ^2 / df	1.89*	1.20*
GFI	.978*	.991*
CFI	.986*	.997*
NNFI	.984*	.996*
RMSEA	.065*	.031*
WRMR	.073*	.050*
Unidimensionality indices		
UniCo	.944	—
ECV	.859*	—
MIREAL	.233*	—

Note. Factor analysis performed with the robust method of unweighted least squares (RULS). GFI: goodness-of-fit index. CFI: Bentler's comparative fit index. NNFI: non-normal fit index. RMSEA: root mean square error of approximation. WRMR: weighted residual mean square root. *Acceptable or good fit indices according to conventional criteria: χ^2 / df < 5; GFI, CFI and NNFI > .95; RMSEA ≤ .08; WRMR < .90; UniCo > .95; ECV > .85; MIREAL < .30.

Table 3. Matrix of factor loadings of the factorial solutions of the ICG

Item	One-factor solution	Two-factor solution	
		Factor 1	Factor 2
1. I think about this person so much that it's hard for me to do the things I normally do.	.832	.832	
2. Memories of the person who died upset me.	.779	.820	
3. I feel I cannot accept the death of the person who died.	.751	.959	
4. I feel myself longing for the person who died.	.708	.951	
5. I feel drawn to places and things associated with the person who died.	.651	.766	
6. I can't help feeling angry about his/her death.	.734	.821	
7. I feel disbelief over what happened.	.741	.573	
8. I feel stunned or dared over what happened.	.868	.571	.369
9. Ever since s/he died it is hard for me to trust people.	.789	.576	
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.	.748	.383	.451
11. I have pain in the same area of my body or have some of the same symptoms as the person who died.	.467	-.304	.949
12. I go out of my way to avoid reminders of the person who died.	.647		.692
13. I feel that life is empty without the person who died.	.841	.784	
14. I hear the voice of the person who died speak to me.	.602		.687
15. I see the person who died stand before me.	.541		.852
16. I feel that it is unfair that I should live when this person died.	.722	.568	
17. I feel bitter over this person's death.	.794	.843	
18. I feel envious of others who have not lost someone close.	.584	.567	
19. I feel lonely a great deal of the time ever since s/he died.	.754	.735	

Note. Factor loadings less than .30 are not presented. The matrix of factor loadings for the bifactorial solution is the matrix rotated by oblique promin rotation.

Table 4. Mean, standard deviation (*SD*), percentage of participants who answer *often* or *always* (%), and corrected item-total correlation ($r_{i\text{-}t}$) of the ICG items

Item	Mean	*SD*	%	$r_{i\text{-}t}$
1	1.12	1.18	12.2	.752
2	1.12	1.24	16.0	.696
3	1.47	1.49	25.5	.685
4	2.98	1.18	66.1	.591
5	1.90	1.49	35.9	.592
6	1.98	1.53	36.0	.651
7	1.49	1.57	29.3	.643
8	1.23	1.35	19.8	.779
9	1.10	1.38	19.8	.684
10	0.69	1.14	10.9	.607
11	0.18	0.67	3.3	.255
12	0.64	1.17	9.5	.501
13	1.49	1.41	27.0	.771
14	0.50	0.98	5.6	.437
15	0.34	0.85	4.3	.364
16	0.69	1.21	9.9	.581
17	2.05	1.55	40.1	.704
18	1.28	1.51	24.1	.496
19	1.26	1.40	22.2	.664

Figure 1. ICG scree plot graph based on the polychoric correlation matrix