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Psychometric properties of the Texas Revised Inventory of Grief (TRIG) in Peruvian university students

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ABSTRACT

Objective: The Texas Revised Inventory of Grief (TRIG) is widely used to assess grief, although there is limited evidence regarding its factor structure and invariance. This study examined the psychometric properties of the TRIG, in its Spanish-adapted version (García-García et al., 2005), in Peruvian university students during the COVID-19 pandemic. **Method:** A sample of 1,433 students (M_{age} = 21.45, 62% female) participated in the study. **Results:** Using confirmatory factor analysis, it was found that the model with the best fit was that of two correlated factors, consistent with the original proposal [**χ^2 (*df*)** = 561.75(188), *CFI* = 0.995, TLI = 0.995, RMSEA = .041, SRMR = .045]. Invariance by gender and by experiences related to COVID-19 was confirmed, and internal consistency was adequate. **Conclusions:** These findings confirm the reliability, validity, and invariance of the TRIG, supporting its use as a valuable tool for assessing grief in student populations and in crisis contexts.

Keywords: Grief; loss; TRIG; factorial validity; COVID-19.

Propiedades psicométricas del Inventario de Duelo Revisado en estudiantes universitarios peruanos

RESUMEN

Objetivo: The Texas Revised Inventory of Grief (TRIG) es ampliamente utilizado para evaluar el duelo, aunque existe evidencia limitada sobre su estructura factorial e invarianza. Este estudio examinó las propiedades psicométricas del TRIG, en su versión adaptada al español (García-García et al., 2005), en estudiantes universitarios peruanos durante la pandemia de COVID-19. **Método:** Participó en el estudio una muestra de 1.433 estudiantes (62% mujeres, edades entre 18 y 59 años, *M* = 21.45). **Resultados:** Mediante Análisis Factorial Confirmatorio, se encontró que el modelo con el mejor ajuste fue el de dos factores correlacionados, consistente con la propuesta original [χ^2 (*df*) = 561.75(188), CFI = 0.995, TLI = 0.995, RMSEA = .041, SRMR = .045]. Se confirmó la invarianza por sexo y por experiencias relacionadas con la COVID-19, y la consistencia interna fue adecuada. **Conclusiones:** Estos hallazgos confirman la fiabilidad, validez e invarianza del TRIG, respaldando su uso como herramienta valiosa para la evaluación del duelo en poblaciones estudiantiles y en contextos de crisis.

Palabras clave: Duelo; pérdida; TRIG; validez factorial; COVID-19.

Introduction

Grieving, a basic human experience, involves a process of responding to the loss of a loved one (Shear et al., 2011), and is especially significant when confronting the death of someone close (Ukeh, 2018). Bereaved

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individuals are understood to go through several processes before being able to accept and integrate the loss of a loved one into their reality, give it meaning, and reengage with their relationships and everyday activities (Montano et al., 2016; Zisook & Shear, 2009). Eisma et al. (2020) highlight the importance of improving the treatment of grieving process, since grief that persists over time poses serious challenges to mental health. Eisma et al (2021) add that individuals who experience heightened emotional distress in bereavement could be at risk of developing pathological forms of grief. In that light, the grieving process is essential not only for the acceptance of loss, but also for emotional wellbeing and reinsertion into everyday life.

Grief is a multidimensional reaction to the loss of something or someone towards whom the person has developed love or emotional attachment (Shear et al., 2011). While no "normal" form of grieving exists, some individuals find it more difficult than others to deal with such situations and may require therapeutic support or intervention (Eisma et al., 2015; Lundorff et al., 2017; Shear et al., 2015). Results from a systematic review indicate that the younger a person is in the grieving process, the lower their resilience (Fernández-Fernández & Gómez-Díaz, 2022), which makes the study of the university student population particularly relevant. The availability of adequate tools for understanding specific grief experiences will make it possible to identify individuals going through a more complicated process, who may in consequence be at greater risk. These tools will also support research into the risk factors associated with complicated grief.

The availability of adequate tools for understanding specific grief experiences will make it possible to identify individuals going through a more complicated process, who may in consequence be at greater risk. These tools will also support research into the risk and protective factors associated with complicated grief, like intrapersonal, interpersonal or spiritual variables (Fernández-Fernández & Gómez-Díaz, 2022)

The psychological assessment of grief often measures several aspects of the grieving individual's inner response, such as, among others, feelings and expressions of sadness, the need to seek connection with the deceased, and persistent thoughts of that person (Tomita & Kitamura, 2002). This is the case with the Marwit-Meuser Caregiver Grief Inventory, which assesses caregivers of people afflicted with progressive diseases (Sanders et al., 2007), or the Prolonged Grief Disorder-13 scale (PG-13), which a number of studies have used to assess Prolonged Grief Disorder diagnostic criteria (Morina et al., 2011; Prigerson & Maciejewski, 2006; Steil et al., 2019).

The Texas Revised Inventory of Grief (TRIG) is one of the most widely used instruments in grief research and intervention (Abbott & Zakriski, 2014; Ginzburg et al., 2002; Gilbar & Ben-Zur, 2002; Hsieh et al., 2007; Montano et al., 2016; Ringdal et al., 2001; Sandler et al., 2010). Its first version, the Texas Grief Inventory (TIG), was developed by Faschingbauer and collaborators in 1977. The TIG was a 14-item scale measuring feelings and behaviors experienced by individuals immediately after the death of a family member, and it determined the level of unresolved grief. The measurement was adjusted twice by the original research team, first in the Expanded Texas Inventory of Grief (ETIG), a 58-item instrument that evaluated both current grief symptoms (present feelings) and reactions immediately after the death event (past feelings). In 1987, a further adjustment resulted in the TRIG, the test's final version is (Faschingbauer et al., 1987; Zisook et al., 1982).

The TRIG is designed to evaluate past and present cognitions, emotions, and behaviors associated with loss. It features 21 items and is divided into two subscales: Past Behaviors or Acute Grief (Part I) and Present Behaviors or Present Feelings (Part II) (Faschingbauer et al., 1987). Part I is comprised of 8 items that measure behaviors immediately after the death of the loved one (for example, "I found it hard to sleep after this person died"). Part II is comprised of 13 items that assess current symptoms of grief (for example, "I can't avoid thinking about the person who died").

Despite its widespread use in grief measurement, studies of the TRIG's psychometric properties are scarce (Futterman et al., 2010; Gruppi et al., 2022; García-García et al., 2005; Holm et al., 2018; Li et al., 2018; Nam & Eack, 2012; Samper, 2011; Yıldız & Cimete, 2011). Available studies tend to have been conducted with small samples, and some limit themselves to the present feelings subscale (Part II). Among the latter are Futterman et al. (2010), Gruppi et al. (2022), and Nam & Eack (2012), which coincide in finding a three-factor organization in this subscale: Nonacceptance, Emotional Response, and Thoughts. A study by Li et al. (2018), in turn, found only one dimension for the same subscale.

Research into the overall inventory, in turn, tends to favor a two-factor structure. García-García et al. (2005), Samper (2011), Yildiz & Cimete (2011), and Holm et al. (2018) all support a two-factor model for the TRIG. García-García et al. (2005) studied 118 bereaved spouses, and their exploratory factor analysis (EFA) revealed test scores to be organized in two factors, corresponding to parts I and II. Also using an EFA, Samper (2011) found the same two-factor structure in an evaluation of 141 young-adult members of Spain's Armed Forces. Holm et al. (2018) studied 129 bereaved caregivers and, after performing separate EFA procedures for each part, found a single-factor model for each subscale. Yildiz & Cimete (2011) studied 154 Turkish parents who lost children in neonatal Intensive Care Unit and performed separate confirmatory factor analyses (CFA) for the fathers' and mothers' responses, and for the overall sample. They found that the factorial structures for each of the two groups were similar to the structure of the original scale, although this could not be confirmed for the overall sample. In contrast, Wilson (2007), researched the overall test with 134 recently bereaved Latino adults, and his EFA identified three factors explaining around 70% of variance: Present Feelings (11 items), Past Behaviors (6 items), and a new factor, Disbelief (4 items). The latter subscale encompassed nonacceptance of loss as well as the rage and feelings of unfairness that individuals develop in connection with the death of a loved one.

It bears noting that some of the studies mentioned provide evidence of validity for the TRIG and its parts, based on their relationships with other variables. Correlations have been found between the TRIG scales and the Hospital Depression and Anxiety Scale (HADS) and its subscales, HADS-Anxiety and HADS-Depression (Holm et al., 2018). Similarly, both parts of the TRIG correlate positively and significantly with most of the Grief Experience Inventory (GEI) scales (García-García et al., 2005) and with the Center for Epidemiologic Studies–Depressed Mood (CES-D) scale (Wilson, 2008). Lastly, all these studies found adequate consistency indices for the overall scale and the subscales, in ranges between .75 and .95

Although this test is widely used and evidence of its reliability is robust as is the evidence for its validity based on its relationship with other variables, the TRIG's factorial structure remains to be confirmed and the effect of biases by gender needs further evaluation. Furthermore, the prevalence of studies based on EFA, or featuring small samples, makes the use of CFA with a considerably sized sample imperative to resolve previous inconsistencies. There is some evidence indicating that women experience more intense and difficult grieving processes (Bistricean & Shea, 2021; Thimm et al., 2020), but it is also possible that men and women follow different grief trajectories, with different intensities and durations (Lundorff et al., 2020; Yıldız & Cimete, 2011).

This again underscores the importance of an effective instrument for measuring grief in the context of the pandemic and the post-pandemic, a period of great loss globally and in particular in Peru, one of the world's most grievously impacted countries (Ministerio de Salud [MINSA], 2023; Orús, 2023). Many Peruvian college students were forced to deal with the loss of loved ones due to COVID-19 and other ailments that could not be treated properly because of the healthcare crisis (Mesa de Concertación para la Lucha Contra la Pobreza, 2020).

Adding to the loss of life are losses in other realms: the pandemic derailed students' academic and professional projects, and imposed unexpected impediments on their interpersonal relationships. This is why Sirrine et al. (2021) believe that, in the specific college context, the notion of loss must be expanded to encompass the loss of normal routines, relationships, modes of study, and contact with significant persons.

The aim of this study is to complement and expand the existing literature by explicitly addressing current methodological and contextual limitations. We analyzed the psychometric properties of the Texas Revised Inventory of Grief (TRIG), in its Spanish version (García-García et al., 2005), in a large sample of university students following the COVID-19 pandemic. To do so, we will use CFA to compare competing structural models and provide robust evidence to resolve existing factorial inconsistencies found in the literature. In addition, we will rigorously examine its factorial invariance across genders and types of pandemic-related losses, a crucial step that is largely omitted in the literature and evaluate its reliability indicators.

Method

Participants

A sample of 1,433 students participated in the study, with 62% identifying as female and 38% as male. Participants' ages ranged from 18 to 59 years (M = 21.45, SD = 4.13). The majority of participants were born in Lima (73.1%), with 26.1% originating from other regions. Nearly all (94.9%) lived with their family, 2.9% lived with friends or others, and 2.5% lived alone. The inclusion criteria were undergraduate students aged 18 and older, enrolled for the second semester of 2021, utilizing a convenience sampling method. Participants came from 14 different schools at the Pontifical Catholic University of Peru, with the majority enrolled in General Letters (19.1%), Sciences and Engineering (17.5%), General Science (16.1%), and Law (10.2%).

Procedure

The study was approved by the university's Research Ethics Committee with their resolution (Nº 052-2021/CEI-PUCP). Prior to participation, students provided informed consent to take part in an anonymous, voluntary, and free survey. Calls for participants were sent via email. The survey was conducted using Survey Monkey and was available to participants from November 8 through December 15 of 2021. The survey was self-administered and asynchronous, meaning researchers were not present during the completion process. Only participants who reported the death of one or more loved ones due to COVID-19 or pandemic-related complications were retained for the final sample analysis. At the end of the survey, contact information for the university's wellbeing services was provided. Participants were encouraged to contact those services for financial, psychological, medical, or spiritual support. The data selection process revealed that, of 2,527 total survey respondents, 1,433 (56.7%) reported the death or one or more loved ones due to COVID-19 or to pandemic-related complications. Thus, the final sample included 1,433 students.

Instruments

Demographic Data. Participants provided demographic data such as sex, place of birth, current place of residence, school of enrollment and major, and number of semesters of college enrollment (current semester included.)

Pandemic-Related Data. Participants were asked whether they or a family member had contracted COVID-19 at any point.

Loss-Related Data. Participants responded to questions about losses associated with the COVID-19 pandemic or with pandemic-related complications (deaths not directly caused by COVID-19 infection). Questions about job or income loss by and financial provider in their family were also included, as well as questions about job loss by the respondent and about the interruption of personal and/or academic projects, either permanently or temporarily. Participants were also asked to report the number of deceased family members, the time since the last death event, and their relationship with the deceased.

The Texas Revised Inventory of Grief (TRIG; Faschingbauer, 1981) was used to measure distress associated with grief for the death of a loved one. The Spanish version of the instrument (García-García et al., 2005) was employed. This version is comprised of 21 items measured on a 5-point Likert scale (1 = "completely false," 2 = "mostly false," 3 = "true and false," 4 = "mostly true," 5 = "completely true"). Higher scores indicate more severe symptoms of grief. Reliability results were ω = 0.970 for the total scale, ω = 0.940 for acute grief (Part I), and ω = 0.960 for current grief (Part II), indicating optimal reliability levels (Kelley & Pornprasertmanit, 2016).

Statistical Analyses

Data analysis proceeded in two stages. First, confirmatory factor analyses (CFA) were conducted to evaluate the optimal factor structure of the TRIG. CFA was selected as the most appropriate technique for testing the goodness-of-fit of the theoretical models previously proposed in the literature. Then, multigroup confirmatory factor analyses (MGCFA) were performed to establish the instrument's factorial invariance, which is essential to ensure that the scale measures the construct comparably across the different subgroups of the sample. Both procedures were performed using the lavaan package in RStudio (Rossel, 2021). The first stage assessed three factorial models for the TRIG: one-factor, uncorrelated two-factor, and correlated two-factor.

To evaluate goodness of fit for the factorial models, Kline's (2016) and Hu & Bentler's (1999) recommendations were followed, using both absolute and relative fit indices. Two absolute fit indices were estimated: root mean square error of approximation (RMSEA), with a predicted value lower than 0,06, and standardized root mean square residual (SRMR), with a predicted value lower than 0,08 (Hooper et al., 2008). Other commonly used statistics were nor considered, such as $\boldsymbol{\chi 2}$ or the quotient between $\chi 2$ and the degrees of freedom. For relative fit indices, the comparative fit index (CFI) and the Tucker-Lewis Index (TLI) were used, with predicted values above 0,95 (Hooper et al., 2008; Hu & Bentler, 1999; Kline, 2016).

To select the model with best fit, the akaike information criterion (AIC) and the bayesian information criterion (BIC) were considered, alongside the absolute and relative fit indices. These criteria identify, at a descriptive level, the optimal model, the one with the lowest AIC and BIC values being preferrable, as low values indicate greater parsimony (Kline, 2016).

Once the model with best fit was identified, a multigroup confirmatory factor analyses (MGCFA) was performed. Two grouping variables were considered: sex, and personal experience with problems associated with COVID-19. For the MGCFA, analyses of measurement invariance were performed with the goal of establishing that the identified variable was comparable between the different groups (Chen, 2008; Hirschfeld & von Brachel, 2014; Kline, 2016). Invariance analysis proposes several nested levels. The four levels of invariance were evaluated, (configural, metric, scalar and strict) taking into account the two grouping variables mentioned above. To evaluate the different levels of invariance obtained, differences in the $\chi 2$ statistic and degrees

Table 1. Goodnes of fit indices for the overall sample factorial models

	Model	χ2 (*df*)	CFI	TLI	RMSEA (90% CI)	SRMR	BIC	AIC
1	Single factor	1255.29*** (189)	.986	.985	.069 (.066-.073)	.067	69447	69234
2	Uncorrelated two-factor	29911.12*** (189)	.612	.569	.366 (.363-.370)	.325	68925	68712
3	Correlated two-factor	561.75*** (188)	.995	.995	.041 (.037-.043)	.045	67927	67709

Note. χ2 (*df*) = chi-square (degrees of freedom); CFI = comparative fit index; TLI = Tucker-Lewis index; RMSEA (90% CI) = root mean square error of approximation (90% confidence interval); SRMR = standardized root mean square residual; BIC = Bayesian information criterion; AIC = Akaike information criterion. *** $p < .001$.

Table 2. Goodness of fit indices for factorial models calculated for both groups (Models 4 and 5), of configural invariance (Model 6) and metric invariance (Model 7)

	Model	χ2 (*df*)	CFI	TLI	RMSEA (90% CI)	SRMR	AIC
4	Group 1 (men)	209.89*** (188)	.999	.999	.016 (.000 -.027)	.044	26668.93
5	Group 2 (women)	425.17*** (188)	.994	.993	.042 (.037 -.047)	.052	40858.07
6	MGCFA -1a	634.36*** (376)	.996	.996	.034 (.030-.039)	.047	67611.01
7	MGCFA -2b	750.73*** (395)	.995	.995	.039 (.035 -.043)	.051	1036.54

Note. MGCFA = multi-group confirmatory factorial analysis; χ2 (df) = chi-square (degrees of freedom); CFI = comparative fit index; TLI = Tucker-Lewis index; RMSEA (90% CI) = root mean square error of approximation (90% confidence interval); SRMR = standardized root mean square residual; AIC = Akaike information criterion. *** $p < .001$.

of freedom were evaluated, considering each level of invariance, a procedure used for comparing nested models. If those differences turn out to be significant, fitting the corresponding parameters to the assessed level of invariance is not adequate (Kline, 2016; Meredith, 1993). Lastly, the chosen model's reliability level was evaluated with consideration of the Omega coefficient (Elosua & Zumbo, 2008).

Results

To evaluate the TRIG's factorial structure, three different models were considered and tested by confirmatory factorial analyses (CFA) intended to identify the model with best fit for the data collected.

Three models were assessed: (1) a unidimensional model where all the items are reflected in a single factor; (2) an uncorrelated two-factor model; and (3) a correlated two-factor model. The results indicated that, at a descriptive level, the correlated two-factor model presented better fit indices than the other two, as was also the case in the model-comparison criteria (AIC and BIC) (See Table 1). The correlation between the two factors was $r = .813$.

Once the model with best fit for the whole sample was identified (Model 3), invariance analyses were performed with sex as the grouping variable. Thus, two additional models were evaluated: men (Group 1: Model 4) and women (Group 2, Model 5). Model 3 was successfully replicated with both groups, with good results in terms of fit indices. Next, MGCFAs were performed for the configural and metric levels (Model 6 and model 7, respectively). Table 2 shows fit indices for the four models described. In every case, results for fit are adequate.

Along with invariance by sex, invariance by participants' personal experience with COVID-related problems was analyzed. In that way, two additional models were evaluated: participants with personal experience (Group 1: Model 8) and participants without (Group 2: Model 9). Model 3 was successfully replicated with both groups, with good results in terms of fit indices. Next, MGCFAs were performed for the configural and metric levels (Model 8 and model 9, respectively). Table 3 shows fit indices for the four models described. In every case, results for fit are adequate.

Factor loadings for models 3, 4, 5, 7, 8, 9, and 11 are presented in Table 4. Given that the factor loadings for each separate group are the same as obtained for configural invariance (Model 6 and Model 10) and that no parameter is set, only loadings by group are shown (Model 4, Model 5, Model 8, and Model 9). As can be observed, factor loadings for the general model (Model 3) and for the models by group are significant and adequate (Kline, 2016), with magnitudes oscillating between .492 and .893.

For the evaluation of metric invariance, factor loadings were set in each dimension of the latent variable and the existence of significant differences at the level of χ2 (df) was assessed. This process resulted

Table 3. Goodness of fit indices for factorial models calculated for both groups (Models 8 and 9), of configural invariance (Model 10) and metric invariance (Model 11)

	Model	χ2 (*df*)	CFI	TLI	RMSEA (90% CI)	SRMR	AIC
8	Group 1 (with problems)	240.97*** (188)	.998	.998	.025 (.014| -.034)	.049	26191.90
9	Group 2 (w/o problems)	357.62*** (188)	.996	.996	.036 (.030 -.040)	.047	41298.48
10	MGCFA -1c	598.58*** (376)	.997	.997	.032 (.027-.037)	.045	67574.39
11	MGCFA -2d	714.66*** (395)	.996	.995	.037 (.033 -.042)	.046	67558.37

Note. MGCFA = multi-group confirmatory factorial analysis; χ2 (df) = chi-square (degrees of freedom); CFI = comparative fit index; TLI = Tucker-Lewis index; RMSEA (90% CI) = root mean square error of approximation (90% confidence interval); SRMR = standardized root mean square residual; AIC = Akaike information criterion. *** $p < .001$.

in two models (Model 7 and Model 11), each referred to each evaluated grouping variable (sex and COVID-related problems.) Factor loadings for each model display significant and adequate loadings (Kline, 2016). Nevertheless, comparisons at the level of **χ2 (df)** revealed the existence of significant differences at both levels of invariance, both in terms of sex (diff = 116.370 (19), $p = .000$) and in terms of COVID-related problems (diff = 116.081 (19), $p = .000$), which means that the model with fewer degrees of freedom turns out to be the most parsimonious: in this case, and for both grouping variables evaluated, the configural invariance model.

Table 4. Factor loadings in TRIG models 3 and beyond

Items in factor	Model 3	Model 4	Model 5	Model 7	Model 7	Model 8	Model 9	Model 11	Model 11
	Total Sample	Men	Women	Metric Invariance (sex)	Metric Invariance (sex)	With problems	Without problems	Metric Invariance (problems C19)	Metric Invariance (problems C19)
	Global	Global	Global	Group 1	Group 2	Group	Group	Group 1	Group 2
TRIG I									
itrd_a01	.766	.760	.752	.740	.776	.771	.762	.750	.774
itrd_a02	.807	.783	.808	.811	.779	.788	.812	.817	.796
itrd_a03	.798	.781	.800	.781	.805	.802	.789	.784	.800
itrd_a04	.756	.773	.740	.746	.765	.758	.743	.750	.749
itrd_a05	.719	.729	.698	.705	.720	.684	.735	.703	.724
itrd_a06	.850	.863	.848	.846	.866	.855	.838	.847	.844
itrd_a07	.571	.612	.551	.549	.615	.547	.574	.524	.589
itrd_a08	.793	.816	.768	.786	.794	.762	.807	.793	.788
TRIG II									
itrd_b01	.860	.874	.834	.867	.838	.864	.854	.873	.849
itrd_b02	.767	.769	.746	.797	.710	.794	.749	.804	.744
itrd_b03	.675	.691	.648	.648	.692	.690	.661	.653	.684
itrd_b04	.745	.726	.748	.755	.718	.741	.743	.785	.720
itrd_b05	.837	.843	.822	.830	.835	.840	.831	.863	.818
itrd_b06	.859	.858	.852	.848	.862	.867	.848	.872	.847
itrd_b07	.872	.860	.865	.840	.893	.858	.874	.859	.874
itrd_b08	.723	.694	.732	.738	.687	.736	.707	.768	.690
itrd_b09	.849	.838	.851	.830	.867	.845	.846	.807	.870
itrd_b10	.531	.556	.503	.542	.508	.585	.492	.535	.520
itrd_b11	.720	.668	.744	.711	.708	.684	.732	.732	.703
itrd_b12	.685	.725	.652	.663	.711	.705	.665	.649	.702
itrd_b13	.873	.863	.879	.851	.897	.861	.876	.885	.862

Note. Coefficients are significant at $p < .001$; TRIG I = TRIG acute; TRIG II = TRIG present

Table 5. TRIG's means *(M),* standard deviations *(SD),* Cronbach's alfa (α), omega coefficient (ω), and range of item- test correlation (r), overall and by groups evaluated in the CFA

	M	*SD*	α	ω	*r*
Overall					
TRIG I	2.475	1.454	0.940	0.940	.63-.86
TRIG II	2.764	1.536	0.960	0.960	.60-.86
Sex: Men					
TRIG I	2.379	1.350	0.920	0.944	.61-.87
TRIG II	2.642	1.391	0.962	0.970	.55-.86
Sex: Women					
TRIG I	2.533	1.513	0.908	0.933	.57-.86
TRIG II	2.839	1.615	0.957	0.968	.52-.85
COVID Experience: with problems					
TRIG I	2.721	1.457	0.911	0.938	.57-.87
TRIG II	3.015	1.521	0.962	0.971	.57-.88
COVID Experience: without problems					
TRIG I	2.318	1.432	0.914	0.938	.58-.85
TRIG II	2.606	1.527	0.958	0.968	.51-.86

Note. TRIG = Texas Revised Inventory of Grief (I = subscale Acute, II = subscale Present).

Finally, Table 5 shows the means, standard deviation, Cronbach's alfa, omega coefficient, and item-test correlations for each one of the TRIG's two subscales, acute (TRIG I) and present (TRIG II). It must be noted that the levels of internal consistency, considering both the Cronbach's alfa statistic ad the omega coefficient, revealed adequate levels in both dimensions. The item-test correlations show adequate levels of discrimination between items (> .50).

Discussion

A precise evaluation of the grieving process is essential to understand and adequately support individuals experiencing it (Eisma et al., 2020; Lundorff et al., 2017; Shear et al., 2015). However, few instruments exist for an effective measurement of grief. The Texas Revised Inventory of Grief (TRIG) is widely used for that purpose, but its psychometric properties are yet to be explored in depth; greater evidence of its reliability has been found, but its factorial structure is still in need of confirmation (Futterman et al., 2010; García-García et al., 2005; Gruppi et al., 2022; Holm et al., 2018; Li et al., 2018; Nam & Eack, 2012; Samper, 2011; Yıldız & Cimete, 2011). This emphasizes the need to delve deeper into the TRIG's functioning and its application in different contexts and populations.

Globally, the effects of the COVID-19 pandemic have been devastating, involving great loss of life. Peru was one of the most severely impacted countries (MINSA, 2023; Orús, 2023), with an unprecedented rise in the occurrence of loss and grief. This context of mass isolation is crucial, as a psychometric finding suggests it created a unique experience of grief where factors related to relational growth and emotional expression were limited (Cassaretto & Gargurevich, 2024). This further underscores the urgent need for precise evaluation instruments that are sensitive to the different ways people experience grief in such exceptional circumstances (Sirrine et al., 2021). This need is especially relevant for college students, who along with the loss of loved ones are confronted with losses in other realms, such as their academic and professional projects, and even their interpersonal relationships (Sirrine et al., 2021).

In this context, studying grief and assessing the TRIG's properties has become acutely necessary. Our study analyzed the instrument's psychometric properties and found satisfactory evidence. Particularly significant are our finding in support of a correlated two-factor structure, similar to what earlier studies of the instrument have reported (García-García et al., 2005; Samper, 2011; Yıldız & Cimete, 2011). These results also coincide with the TRIG's original formulation, which suggests the existence of two subscales that, while able to be treated as independent, are intrinsically connected and comprehensive in their reflection of the experience of grief.

The results of this study confirm the structure proposed by Faschingbauer et al. (1987), which distinguishes between two key areas for exploring grief. Area 1 (past behaviors) evaluates behaviors experienced in the past after the death of the loved one, involving disturbed sleep, lack of interest in interacting with family and friends, neglect of activities outside the home, and others. Area 2 (present feelings) focuses on the current symptoms of grief, such as recurring thoughts of the deceased person. Both areas are essential for understanding the grieving process, but they can also be explored independently, according to the needs of the specific study or evaluation (Futterman et al., 2010; Gruppi et al., 2022; Nam & Eack, 2012). Our analysis of the scales also found high levels of reliability, which, along with their flexibility of use, ensures a consistent pattern of responses and guarantees the precision and validity of results, regardless of whether the overall two-part scale is used, or each subscale individually.

While the scores in these samples offer greater evidence for a correlated two-factor structure, appealing to two differential aspects of grief at a conceptual level, it must be noted that indices for a unidimensional structure are also adequate, an intriguing finding that invites future study of a possible hierarchy that respects the instrument's complementary character, but also its global use.

A crucial aspect of this study is the evidence it provides on factorial invariance, considering grouping variables like sex and personal experience with COVID-19 pandemic-related problems. In both structural equation modeling (SEM) and confirmatory factor analyses (CFA), measurement invariance testing provides evidence of the equivalence of latent variables between different groups (Hirschfeld et al., 2014; Kline, 2016). Invariance analysis is organized by hierarchical levels: configural invariance, which ensures the same factor structure across groups; metric invariance, which adds equality of factor loadings, allowing to compare relationships between latent variables; scalar invariance, which includes equality of intercepts to allow the comparison of latent means; and strict invariance, which also guarantees equality of residual variances, enabling a more rigorous testing of hypotheses for the latent means and relationships across groups (Hirschfeld et al., 2014; Kline, 2016).

The results of the present study indicate that the proposed model for the TRIG, a correlated two-factor model, reached the level of configural invariance for the two grouping variables proposed. We can conclude, then, that the proposed correlated two-factor structure is the same for male and female participants, as well as for those who personally experienced COVID-19-related problems and those who did not. The implication is that items are grouped in the same factors in each of the four groups. Nevertheless, it does not mean that other parameters such as factor loadings, intercepts, or residuals are equivalent, since that would require different levels of invariance (Kline, 2016).

Providing evidence of configural invariance makes it possible to verify the presence of the same factorial organization in each group, confirming the model's adequate fit for each group. If the model's fit is good in each group, it can be assumed to be configurally invariant (Chen, 2008; Hirschfeld et al., 2014; Kline, 2016; Meredith, 1993).

In conclusion, this study provides solid evidence of the TRIG's validity and reliability in a sample of Peruvian college students during the COVID-19 pandemic, which adds to other efforts of adapting instruments to the Peruvian reality (Rodas-Vera et al., 2024). These findings are especially valuable given the dearth of earlier studies validating such a widely used instrument, a scarcity even greater when it comes to aspects of invariance across different groups. This study also underscores the TRIG scale's potential for application in future research and clinical interventions, reaffirming it as a robust, adaptable tool for understanding and approaching experiences of grief in similar contexts.

Lastly, some limitations of the present study must be considered when interpreting its results. First, prior evidence of the TRIG scale's validity is scant, which limits a comparative and contextual reading of our findings. Also, this study's sample includes a greater proportion of female than male participants, which may have an impact on the adequateness of the results. While participant ages range from 18 through 59 years old, most cluster within the 18-to-25 range, which limits the representation of other age groups. Finally, sampling was limited to students in a private university in the Peruvian capital, which may limit the result's applicability to more diverse populations.

Conflicts of interest

The authors have no conflicts of interest to disclose.

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