

**Validation of the TGI-SR+ in grieving Ukrainian Refugees &
Investigation of Age and Gender Effects**

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Abstract

As the current Russian invasion of Ukraine has triggered an immense refugee crisis, a substantial number of Ukrainian refugees are prone to the development of Prolonged Grief Disorder (PGD) in response to bereavement. This study aims to validate the TGI-SR+ (Trauma Grief Inventory - Self Report Plus) questionnaire within grieving Ukrainian refugees as well as investigate the relationship between the variables "Age" / "Gender" and the PGD symptomatology. Consequently, this research desired to examine if the TGI-SR+ is a reliable tool to assess PGD within Ukrainian refugees, as validation research for the rather novel TGI-SR+ is scarce. To acquire a sufficient sample of Ukrainian refugees ($N = 79$), a questionnaire has been disseminated online in Facebook groups for Ukrainians living abroad. The data indicates that the TGI-SR+ is a valid questionnaire to assess PGD symptomatology within grieving Ukrainian refugees (for both the DSM-5-TR PGD and ICD-11 PGD). The items have a good inter-correlation; the Confirmatory Factor Analysis (CFA) indicates a good fit of the DSM-5-TR PGD and ICD-11 PGD models, and a convergent validity analysis indicates that the TGI-SR+ and the PTSD Checklist for DSM-5 (PCL-5) measure a similar construct. The variable "Gender" did not significantly influence the PGD symptomatology within the sample; however, this result is not reliable because of the sample characteristics (male ($N = 2$); female ($N = 77$)). The variable "Age" did not significantly influence PGD symptomatology as well; a significant difference between two age groups in PGD symptomatology could be found within additional analyses, on the other hand. This research could broaden the validation research of the TGI-SR+ and provide some additional insights into the grief of Ukrainian refugees.

Keywords: Traumatic Grief Inventory - Self Report Plus, Prolonged Grief Disorder, Refugees, Ukraine

Introduction

War has been responsible for major destruction and the loss of countless human lives in the past and can be seen as one of the most severe states a civilization can be in (Badie et al., 2011). War is defined as an armed conflict between certain groups, the most prominent being between states (ICRC, 2008). For Ukraine, the dissolution of the USSR in 1991 meant the onset of an existence as an independent state, and while Russia's influence on Ukraine was still powerful after this event, the "Orange Revolution" in 2004 marked a beginning deterioration of Russian influence on Ukraine (Shevsky, 2022). The "Euromaidan Protest" of 2014 led to a Ukrainian reorientation to the EU & USA and the complete rejection of Russian influence. Since Russia views Ukraine as an integral part of its sphere of influence, it reacted with the annexation of the Crimean Peninsula in 2014 and, ultimately, the invasion of Ukraine in 2022 (Hunter, 2022; Mykhnenko, 2020; Shevsky, 2022).

A war can not only have severe physical consequences, with the worst outcome being death, but it also has enormous psychological consequences on the individuals who have to live through it, no matter if they are fighting as soldiers on the frontlines or if they are civilians fleeing the country (Murthy & Lakshminarayana, 2006). Individuals in a war zone will have to endure, in the worst cases, a constant bombardment on their infrastructure, food and water deprivation, the spread of diseases, the loss of their home and loved ones, serious physical injuries by any weapons used during the war and the experience of atrocities committed by the occupying military forces (e.g., looting, torture, rape, murder) (Karatzias et al., 2023).

These experiences are highly traumatizing and likely to affect the mental health of the individuals affected by them in the long term; individuals enduring such experiences will have a significantly higher prevalence of post-traumatic stress symptoms and anxiety afterwards (Priebe et al., 2013). Due to the temporal proximity of the ongoing invasion in Ukraine, there is little data yet about the psychological impact of the current war on the Ukrainian individuals experiencing it. However, considering other data from the 2014 affected Donetsk region and different warzones, a sharp rise in post-traumatic stress disorder (PTSD), anxiety disorders, and depression among Ukrainian individuals is expected, especially for those who have lived within or close to the war-torn regions (Karatzias et al., 2023). In particular Ukrainian children and adolescents are at risk of developing mental illness since they are in a vulnerable stage of psychological development and transition, which is partly severely disturbed by disruption of their social life, schooling, family life, and financial security (Gonçalves Júnior et al., 2022; Osokina et al., 2022)

Refugee Crisis in Ukraine

The conflict in Ukraine led to a significant displacement of Ukrainian people, partly displaced internally within Ukraine and partly seeking refuge in other countries (Jain et al., 2022). Cities and areas in Eastern Ukraine prone to clashes between the war parties have been virtually depopulated (Albrecht & Panchenko, 2022). As of the 15th of February 2023, 8 million Ukrainian refugees have been recorded in European countries, and around 5.3 million Ukrainians are estimated to be internally displaced, meaning that nearly a third of the Ukrainian population has been forced to leave their homes. Because of the military conscription, male adults are restricted from leaving the country, and around 80% of the Ukrainian refugees are adult females or children/adolescents (Coleman, 2022; IDMC, 2023; UNHCR, 2023).

Handling such a major refugee crisis is a massive humanitarian effort, not only for Ukraine but also for countries like Poland, Russia, or Germany (the most prominent destinations for Ukrainian refugees) and many other European nations affected by it (UNHCR, 2023). These nations must provide the Ukrainian refugees with financial and medical aid and housing to ensure appropriate humanitarian admission. (Jain et al., 2022) As aforementioned, these refugees have a significantly heightened likelihood of developing psychological issues because of their experiences in Ukraine but also from the experience of post-migration stressors (Karatzias et al., 2023; Li et al., 2016). Often mental health issues of refugees are overseen by host countries for various reasons (Javanbakht, 2022). Since many people die in this conflict, both civilians and soldiers, one major struggle for Ukrainian refugees might be grief in response to the death of a loved one (Karatzias et al., 2023).

Definition of refugees

The term “refugee” generally describes an individual forced to flee their home because of conflict or other legitimate reasons concerning the individual's safety and crossing international borders to seek asylum in another country (UNHRC, 2023). An Individual who fled their home but did not cross international borders is considered an “Internally Displaced Person” (IDP) and, therefore, distinct from refugees (UNHRC, 2023).

Theoretical Framework of “Bereavement” & Prolonged Grief Disorder

Bereavement is defined in the dictionary as being robbed of something immaterial (Maddrell, 2013); furthermore, it can be seen as the umbrella term for an individual losing another close person (usually due to death). Within bereavement, there are two distinct reactions, namely “grieving” and “mourning” (Corr, 2004).

Grieving is the internal reaction to bereavement; it is a natural and universal response to the death of a loved one (Shear, 2012). The immediate grief reaction to bereavement consists mainly of multiple intense negative emotions (e.g., anger, denial, sorrow) combined with the experience of stress and confrontation with mortality (Gharmaz & Milligan, 2006; Shear, 2012).

Mourning, on the other hand, is defined as the outward behavioural expression of bereavement; it is the reaction that outsiders can observe; one facet of mourning is the traditional rituals established and shaped in one's culture (e.g., funeral ceremony, wearing black as a widow). Mourning can be seen as a coping effort of bereaved individuals to cope with the loss (Boerner et al., 2015; Gharmaz & Milligan, 2006)

Whereas grieving is more universal, mourning is highly dependent on the cultural context of individuals (Shear, 2012). Although every experience of bereavement and grief is individual and dependent on many factors, for most individuals, it is a temporal process that can be overcome with the help of internal and external resources (Zisook & Shear, 2013). About six months after the experienced loss, most individuals should be able to live an everyday life again (Zisook & Shear, 2013).

Nevertheless, this standard prognosis of the bereavement process is not always the case; around 10% of grieving individuals surpass the temporal limitations of the normal bereavement process and fulfil the diagnostic criteria for Prolonged Grief Disorder (PGD) (Lundorff et al., 2017). Individuals suffering from PGD experience continuous and life-impeding grief for losing a loved one, although the incident occurred at least a year ago for adults and at least half a year ago for adolescents and children. Individuals with a PGD will experience a sense of meaninglessness, feeling of loneliness, extremely negative emotions (e.g., anger, sadness), and a lack of acceptance of the loss (Prigerson, 2021). Mainly these individuals can not continue with their daily lives, e.g., going to school, going to work, or maintaining their social life. In extreme cases, PGD symptomatology is associated with suicidal ideation (Sekowski & Prigerson, 2022). Therefore, it can be considered a severe psychopathology (Lundorff et al., 2017). Although PGD is highly comorbid with the symptomatic characteristics of PTSD and depression, most individuals do not fulfil the criteria of these psychopathologies since the yearning for a lost loved one is the distinctive causality for the symptomatology (He et al., 2014). Certain groups are more prone to the experience of PGD, as they are more exposed to the experience of unexpected, violent loss and the lack of external support for their bereavement. These groups, like refugees, might have double the rate of PGD in comparison to bereaved people in general (Bryant et al.,

2021). This severe kind of unexpected loss of a loved one is likely to happen in a destructive, full-scale war, like the ongoing war in Ukraine.

TGI-SR+: Valid questionnaire for Ukrainian refugees?

Disordered grief is relatively new in clinical psychology/psychiatry; the first defined grief-related disorder Persistent Complex Bereavement Disorder (PCBD), was replaced by its successor PGD in the DSM-5-TR and implemented in the ICD-11 both in 2022 (Prigerson et al., 2021). To measure the novel condition of PGD, the questionnaire Traumatic Grief Inventory - Self Report Plus (TGI-SR+) has been developed (Lenferink et al., 2022). It has been validated with Dutch adults who either lost a close person due to various reasons in the first sample or lost a close person specifically due to a traffic accident in the second sample (Lenferink et al., 2022). The cut-off scores determining the prevalence of PGD with the TGI-SR+ are defined with the scores of the aforementioned Dutch sample populations (Lenferink et al., 2022).

Research suggests that the type of death is significant for the intensity of grief; since Ukrainian refugees who have been bereaved in the context of the war lost someone close mostly exclusively to an "unnatural" and unexpected cause of death, their grief experience may generally be more severe than in the Dutch population (Lenferink et al., 2022; Boelen et al., 2003). Additionally, the cultural differences between the country of standardization (Netherlands) and Ukraine bear the risk of decreasing validity; the Netherlands is considered a Western, individualistic country, whereas Ukraine, a European country with its historically Asian influence, exhibits a mixed culture of individualism and collectivism (Boone et al., 2007; Borysenko, 2017; Sperber, 2004). In particular, this could for example mean that the affiliation to the loved ones, the social support systems and the coping mechanism may differ due to cultural disparities, leading to variations of the grief experience (Rosenblatt, 2008). Since these two factors could decrease the validity of the Ukrainian version of the TGI-SR+, the validity has to be checked.

RQ1: Is the TGI-SR+ questionnaire a valid questionnaire assessment tool to assess Prolonged Grief Disorder in bereaved Ukrainian refugees?

Bereavement & Gender

The data on gender differences in PGD scores is not precise and rather of explorative nature yet. While data indicate that women could have higher grief symptomatology than men (Johnsen, 2012), the majority of data indicates less to no difference between male and female individuals on PGD scoring (Lenferink et al., 2022; Maccallum, 2023).

Other data (Lundorff et al., 2020) suggests that the most significant difference between male and female grief reactions lies within the trajectory of PGD symptomatology, with women having a lower intercept in the beginning and rising symptomatology with passing time, whereas men have a higher intercept of symptomatology at the beginning which decreases afterwards (Lundorff et al., 2020).

If the scope is widened beyond PGD in particular and looks more into the gender difference of the phenomenon of bereavement in general, there is an indication that men tend to have a higher exertion of health issues in response to bereavement, whereas women tend to feel more “upset” in response to a loss (Stroebe et al., 2001). While the type of death (natural/unnatural) does play a significant role in the intensity of grief within individuals, the reaction to different types of death of a loved one does not differ based on gender, according to available data (Boelen et al., 2003).

Since a great part of the Ukrainian refugee population is female (Albrecht & Panchenko, 2022), it would be of higher relevance to examine if there is a gender difference in the development of PGD to ensure that the mainly female general population of Ukrainian refugees will exert a higher/lower or equal level of PGD, than a gender-equal population. As the data is very conflicting and not clear, this research will hypothesize that the prior findings of minor differences between the genders are due to other variables which have not been considered in the analyses. Therefore, the hypothesis is that there is no gender-based difference between the level of PGD in males and females.

RQ2: Does the gender of individuals within the sample population influence the outcome of the TGI-SR+ scores, can the minor differences in gender response to bereavement of prior research be explained by other factors and variables than gender?

H2: Gender has no significant influence on the TGI-SR+ scores obtained by the sample population and the PGD severity is therefore generalisable for every gender.

Bereavement & Age

As most of the incoming Ukrainian refugees are also adolescents and children, it could be of major importance to investigate age differences in the prevalence and level of PGD. Age is generally an essential factor for psychological research since age is accountable for significant changes in the mental set-up of individuals (Wohlwill, 1970). The available research on the age effect of bereavement mainly focuses on spousal bereavement; this particular research indicates that the grief is more severe in younger individuals since the death of the partner is less anticipated and factors like additional stress and financial

repercussions are more impactful, especially if the bereaved spouse has offspring (Zonnebelt-Smeenge & DeVries, 2003). The research on the age effect on psychopathology suggests generally lower psychopathology and higher well-being within older individuals in comparison to younger individuals (Erskine et al., 2007). Potential reasons for this may be the better coping mechanism of older individuals, furthermore, a higher capability to avoid and cope with distress through past life experience (e.g. experience with loss) (Erskine et al., 2007). Therefore, it will be hypothesized that there will be a negative correlation between age and the TGI-SR+ score, since bereavement seems more impactful for younger individuals and the personality set-up of younger individuals is more prone to psychopathology.

RQ3: Does the age of individuals within the sample population influence the outcome of the TGI-SR+ scores, does a multitude of factors like neuroticism, anticipation and consequences which vary according to the age influence the response and severity of bereavement?

H3: Age is significantly negatively correlated with the TGI-SR+ score of the sample population; individuals with a higher age tend to score lower on the TGI-SR+ than younger individuals.

The necessity of the research

Since both PGD and the TGI-SR+ are novel concepts, the research considering them is yet minimal; it is, therefore, necessary to get a deeper scientific insight into these concepts (Lenferink et al., 2022; Maercker et al., 2022). These concepts are relatively new and can still be important for European healthcare systems. As aforementioned, Europe is experiencing a major refugee wave from Ukraine due to the ongoing war. The psychological assessment of incoming refugees is an underestimated task for the entering countries but nevertheless an important task. Ukrainian refugees might be at elevated risk of developing PGD due to the war actions; thus, a reliable assessment and potential diagnosis of PGD is necessary to provide suitable treatment. This is ultimately important to ensure their well-being and mental health.

An insight into the applicability, particularly the validity of the TGI-SR+ in this specific population, is therefore imperative. It is important to consider the demographic characteristics of the Ukrainian refugee population (e.g., gender, age) and get further insight into whether these characteristics deteriorate the potential morbidity of PGD in this population. Because of the temporal proximity, the research on Ukrainian refugees' mental health is also minimal. In conclusion, considering the overall novelty of these concepts and

the contextual situation, research in these fields is highly necessary to get further insights into the exhibition and assessment of PGD within this population.

Methods

Study design

To test the correlation between the independent variables age & gender on the dependent variable PGD symptomatology/severity, as well as the validity of the TGI-SR+ within the target population, a cross-sectional quantitative study design was used.

The study was part of the “First Aid for Grief in Ukrainian Refugees” project, a cooperation between the University of Twente and Utrecht University, which aimed to examine grief among Ukrainians. Each researcher involved takes different perspectives on the gathered data and context. The process of participant sourcing is a group effort of these particular researchers; the questionnaire and ethical approval have been preliminary formulated in the context of the project.

The research project has been submitted to and assessed by the BMS Ethics Committee of the University of Twente, which approved the project subsequently (request nr.: 221111).

Participants and Procedure

The inclusion criteria for the general research project participants were limited to grieving adult Ukrainians. Individuals are defined as "adults" if they are 18 years or older. The term "Ukrainian" depicted in this context that the participants are citizens of Ukraine. "Grieving" depicts the situation of being bereaved, furthermore, having lost a loved one (e.g., friend, relative, spouse). Another inclusion criterion that is specific to this research is that the participants are considered "refugees". To fulfil the criteria "refugee" the participants needed to have crossed international borders to flee Ukraine in response to the ongoing Russian invasion. This specific criterion will be considered in the data cleaning, as not all participants in the general dataset are refugees. Despite the aforementioned characteristic-based inclusion criteria, the participants also needed to be willing to participate in the study. If all these factors were fulfilled, the individuals were eligible to participate in the questionnaire.

In total, 752 people participated in the study; after cleaning the data sample of participants who did not finish the questionnaire or did not approve the use of their data ($N = 362$), did not flee Ukraine ($N = 310$) or were outliers ($N = 1$), 79 participants remained in the final sample. The gender distribution has been 2 male participants (2.5%) and 77 female participants (97.5%), and the age span has been 19 years to 53 years old ($M = 34$, $SD = 7.19$).

The potential participant population can be generally considered a “hard-to-survey” group (Tourangeau et al., 2014), especially since bereavement is a highly sensitive topic and individuals affected by it typically refrain from openly addressing their situation (Goodrum & Keys, 2007). To still gather a sufficient number of participants for the study, a mix of convenience sampling and snowball sampling has been used (Naderifar et al., 2017; Sedgwick, 2013). In practice, a text has been formulated prior to the start of the research with the help of a Ukrainian / English proficient psychologist. The text explains the study with its aims, the information participants will get from it, and the inclusion criteria. The text is fully Ukrainian to be understandable for all participants (Appendix A).

The text also has a direct link to the Qualtrics questionnaire and additionally a link to the website of the general study. The site of the study is part of the “rouwbehandeling.nl” website, which has been created by the “Fonds Slachtofferhulp”, a Dutch humanitarian organization, dedicated to the support of bereaved individuals. The site of the study explained the measurement of grief generally, the background of the study, and data privacy to the potential participant; on the site, two links to the Qualtrics questionnaire can be found.

As a convenience sampling method (Dusek et al., 2015), the text has been posted in several Facebook groups of Ukrainians living abroad. Most posts have been made in Facebook groups for Ukrainians in European countries, but also in groups for Ukrainians living in Canada and the USA. This method was chosen for the present study because of the number of participants that can be reached (up to 100.000 group members per group). Although the text has been posted in 15 groups, it has been permanently active in only six groups (Appendix B), as the post was not approved initially or was removed by the administrators of the other groups. The reason for the deletion was most likely because the administrators of these groups deemed the post as not relevant for the group or as an advertisement, although the cause for deletions is rather speculative.

The snowball sampling aspect of the participant gathering comes with the fact that the posted text also invites every person reading the post and participating in it to share it with their friends on Facebook. The potentially additional participants are collected through referrals by prior participants or people who just shared the post. It is ultimately not known how many individuals did this (Atkinson et al., 2001; Dusek et al., 2015). Since the general interaction with the post has been rather low (e.g. likes, comments), the amount of shares is deemed to be low as well.

The questionnaire started with assessing the demographic data of the participants. Afterwards, the participant filled out a grief-related survey and received feedback in the form

of the “grief monitor”. A higher rating of an item on the Likert scale means a stronger exhibition of PGD symptomatology. The accumulated sum of Likert-point indications of each participant forms the score of the “grief monitor” which will be provided as feedback to the participants after answering the TGI-SR+ items.

Then participants are invited to fill out several other questionnaires which examine other related constructs, such as the Posttraumatic Stress Disorder Checklist (PCL-5), Patient Health Questionnaire-9 (PHQ9), the Harvard Trauma Questionnaire (HTQ), Post Migration Living Difficulties Checklist (PMLD) and the Moral Inquiry Appraisals Scale (MIAS-9).

At the end of the grief questionnaire, the participants are asked if they want the data to be processed and used in the study. The whole questionnaire was translated into the Ukrainian language.

Measures and Materials

Preliminary to any construct measurement is the inquiry of demographic characteristics (age and gender), if the participant had to flee their home due to the Russian invasion, and questions regarding details of the individual bereavement circumstances, such as the date of the loss, the cause, and the relationship to the lost person.

The Traumatic Grief Inventory-Self Report Plus (TGI-SR+ -)

The TGI-SR+ consists of 22 items and each item is answered on a five-point Likert scale (1 = "never", 2 = "seldomly", 3 = "sometime", 4 = "frequently", 5 = "all the time"). Out of all items, 11 items (items; 1, 2, 3, 6, 9, 10, 11, 18, 19, 21) are relevant to indicate PGD symptomatology under the DSM-5-TR within bereaved individuals, whereas 13 items (1, 2, 3, 5, 8, 9, 10, 13, 16, 19, 20, 21, 22) indicate PGD symptomatology by the ICD-11 (Lenferink et al., 2022).

The DSM-5-TR and ICD-11 criteria for PGD do not only differ in the number of items; they also differ in the type of symptoms and the time criterion (Lenferink et al., 2022). As Lenferink et al., 2022 define it for DSM-5-TR PGD "To meet DSM-5-TR PGD criteria, at least one of the two Criterion B (i.e., separation distress) items (item 1 and 3), at least three of the eight Criterion C (cognitive, emotional, and behavioural) symptoms, and the Criterion D (i.e., functional impairment) item (item 13) should be endorsed. All Criterion C symptoms are tapped by one of the TGI-SR+ items (items 6, 9, 10, 11, 18, 19, and 21), except for one symptom (C4 criterion: "Intense emotional pain (e.g., anger, bitterness, sorrow) related to the death"), which is captured by two TGI-SR+ items (items 2 and 8)". The structure of the PGD ICD-11, on the other hand, is described by Lenferink et al., 2022 as "Probable cases for ICD-11 PGD are identified by the endorsement of at least one Criterion B (i.e., separation distress)

symptom (items 1 and 3), at least one Criterion C (cognitive, emotional, and behavioral) symptom (items 2, 5, 8, 9, 10, 16, 19, 20, 21, and 22), and the Criterion D (i.e., functional impairment) item (item 13).".

The cut-off value for a probable indication of PGD within the tested individual was a total score (all relevant TGI-SR+ items combined) of ≥ 33 for DSM-5-TR PGD and ≥ 41 for ICD-11 PGD (Lenferink et al., 2022).

The Posttraumatic Stress Disorder Checklist (PCL-5)

The PCL-5 is the originally 20-item DSM-5-TR-affiliated measurement tool for probable PTSD indications within individuals. As for the TGI-SR+, the PCL-5 uses a five-point Likert scale asking for PTSD symptomatology within the past month, each item will be answered with these five options (0 = "Not at all", 1 = "A little bit", 2 = "Moderately", 3 = "Quite a bit" and 4 = "Extremely") (Ashbaugh et al., 2016; Blevins et al., 2015). A higher score also indicates a higher exhibition of PTSD within the assessed individual; total scores of 31 - 33 or higher indicate a potential PTSD condition (Blevins et al., 2015).

To measure PTSD by the ICD-11 criteria, the PCL-5 has been reduced to six items (item 2, item 3, item 6, item 7, item 17, item 18). This adjustment also allows a convergent validity between PGD ICD-11 and PCL-5 (Shevlin et al., 2017). The TGI-SR+ and the PCL-5 both detected a similar construct (PTSD) within the sample population of the validation study of TGI-SR+ (Lenferink et al., 2022); this indicates a significant convergence between the two scales.

Data Analysis

The data has been drawn from the Qualtrics environment (*Qualtrics XM*, 2022) and furtherly analyzed with the program "R" (*R Core Team*, 2022). To get a better overview of the sample characteristics, descriptive statistics have been used to get an overview of the demographic distribution of the participants, as well as the circumstances of the loss.

To partly check the validity of the TGI-SR+ within the sample, the results have been controlled for various aspects. All validation checks have considered both the DSM-5-TR PGD and ICD-11 PGD relevant items and scores. First, the kurtosis and the skewness of each relevant TGI-SR+ item total PGD scores have been assessed to ensure that a normal distribution of the item scores is mostly given. The general ICD-11 and DSM-5-TR PGD scores have been tested with a Shapiro-Wilk normality test to ensure a normal distribution of the relevant data. The internal consistency has been assessed by measuring both Guttman's Lambda and Cronbach's Alpha. The S/N (Signal-to-Noise) ratio and the inter-correlation between the items have been measured to ensure that all items measure the same construct. A

CFA (Confirmatory Factor Analysis) has been run to estimate the fit of both TGI-SR+ models to a baseline model and to investigate the construct validity. To determine the fit of the model, the CFI (Comparative-Fit-Index), the TLI (Tucker-Lewis-Index), the RMSEA (Root Mean Square Error of Approximation) and the SRMR (Root Mean Square Residual) have been analyzed. To further assess the convergent validity of the TGI-SR+, the Pearson's coefficient of the TGI-SR+ and the PCL-5 have been checked to examine if both scales measure a similar construct within the sample population as for the population which has been used for the validation of the TGI-SR+ (Lenferink et al., 2022).

To analyze the interaction between the independent variables “age” and the dependent variable TGI-SR+ scores, the data has been checked for the assumptions of homoscedasticity, linearity, normality of residuals, and independence of errors. After ensuring no violations of the assumptions, a linear regression model that used “age” as a continuous variable to predict TGI-SR+ scores was run. The results have been visualized with a graph to show TGI-SR+ results with increasing age; a regression line visualizes the mean PGD symptomology development by age.

Furthermore, for the analysis of the independent variable "gender" and the dependent variable TGI-SR+ scores, the data has been again checked for the assumptions of homoscedasticity, linearity, normality of residuals, and independence of errors. Subsequently, the PGD scores were grouped by "female" and "male" participants, and an ANOVA was run to compare the PGD symptomatology between both groups. To visualize the effect of gender on the TGI-SR+ scores, a boxplot has been created to compare PGD symptomatology between the two groups.

Results

Descriptive Statistics

The overall sample is highly dominated by female individuals with 77 female (97.5%) and 2 male (2.5%) participants. Considering the age distribution, the sample has an age mean of 34 years ($SD = 7.19$), furthermore, 22 participants are in the age group of 18 - 29 years old (27.85%), 54 participants are 30 - 49 years old (68.3%) and 3 participants are 50+ years old (3.79%).

The mean PGD score of the participants have both been above the cut-off values for ICD-11 (41) ($M = 44.9$, $SD = 9.4$) and DSM-5-TR (33) ($M = 33.6$, $SD = 8.1$). Taking the individual PGD scores into consideration, 67% of the participants scored over the ICD-11 cut-off value for PGD whereas 56.9% of the participants scored over the DSM-5-TR cut-off

value. See Table 1 for additional information concerning the circumstances of the loss and the destination of the individuals, for the full demographic overview see Appendix C.

Table 1

Circumstances of the loss & asylum destination

Variable	n (%)
Cause of death	
Physical illness	41 (51.9)
Accident	6 (7.6)
Suicide	3 (3.8)
Murder or manslaughter (not related to Russian invasion)	4 (2.5)
Murder or manslaughter (related to Russian invasion)	19 (24)
Disappearance	4 (5)
Other	4 (5)
Years passed since the loss (approx.)	
0	21 (26.6)
1	23 (29.1)
2	10 (12.6)
3	3 (3.8)
4+	22 (27.8)
Country fled to	
European (without Russia)	62 (78.4)
Americas	9 (11.3)
Other	2 (2.5)
No response	6 (7.6)

Validation of the TGI-SR+

Distribution of normality

The confirmatory factor analysis for the relevant PGD items indicated a valid total kurtosis between -10 and +10 and a valid total skewness between -3 and +3 for both DSM-5-

TR and ICD-11 PGD (see Table 2). In particular, only item 5 and item 19 slightly exceeded a skewness of -1; the other items are within a range of -1 and +1, indicating a rather symmetric distribution. (Groeneveld & Meeden, 1984) Furthermore, the kurtosis of item 1 is relatively low (1.63) and of item 5 relatively high (4.16), though most items are close to the kurtosis value of a normal distribution (3) (Ho & Yo, 2015).

Table 2

PGD item performance and distribution of normality

PGD Item (Criteria)	Score, M (SD)	Skewness	Kurtosis
Item 1 (ICD / DSM)	2.77 (1.29)	-0.22	1.63
Item 2 (ICD / DSM)	3.87 (0.85)	-0.75	3.78
Item 3 (ICD / DSM)	4.11 (0.78)	-0.68	3.18
Item 5 (ICD)	4.20 (1.03)	-1.33	4.16
Item 6 (DSM)	2.89 (1.29)	-0.06	1.98
Item 8 (ICD)	3.66 (1.11)	-0.83	3.32
Item 9 (DSM)	3.18 (1.36)	-0.35	1.86
Item 10 (ICD / DSM)	3.63 (1.17)	-0.91	3.08
Item 11 (DSM)	3.01 (1.36)	-0.08	1.81
Item 13 (ICD)	3.23 (1.25)	-0.36	2.13
Item 16 (ICD)	3.15 (1.27)	-0.32	2.07
Item 18 (DSM)	3.01 (1.22)	-0.36	2.07
Item 19 (ICD / DSM)	3.89 (1.20)	-1.04	3.28
Item 20 (ICD)	2.60 (1.31)	0.24	1.89
Item 21 (ICD / DSM)	3.25 (1.33)	-0.27	1.95
Item 22 (ICD)	3.31 (0.98)	-0.42	2.58
ICD-11 Items total	3.45 (1.25)	-0.59	2.38
DSM-5-TR Items total	3.41 (1.28)	-0.57	2.29

ICD-11

The total PGD scores for the ICD-11 measurement were potentially normally distributed as the null hypothesis of the Shapiro-Wilk normality test could not be rejected, since the p-value did not indicate significance. ($W = 0.97, p = .053$). Parametric testing was therefore feasible for this data (Royston, 1983).

The internal consistency, furthermore, the standardized Cronbach's Alpha of the TGI-SR+ can be considered good ($\alpha = 0.88$), >0.9 would be even considered excellent (Gliem & Gliem, 2003). Guttman's Lambda 6 has a value of 0.91 which indicates a high internal consistency (Callender & Osburn, 1978). The inter-item correlation score is 0.36 which is considered an average inter-correlation and indicates averagely the measurement of the same construct (PGD) of the items (Cohen & Swerdlik, 2005). The notion that the TGI-SR+ items measure overall the same construct is also supported by the S/N (Signal-to-Noise Ratio), which had a high value of 7.2, indicating low measurement error for measuring the construct.

The CFA (Confirmatory Factor Analysis) approved the significance of the fit of the TGI-SR+ (ICD-11) model to the baseline model, as the p-value (chi-square) is $<.001$ (see Table 3). The CFI (Comparative Fit Index) indicated a good fit of the model >0.8 , whereas the TLI (Tucker-Lewis Index) indicated a rather improvable but still sufficient fit of the model >0.75 . The RMSEA (Root Mean Square Error of Approximation) value of 0.134 speaks for a rather suboptimal fit of the model, since an optimal RMSEA value is ≤ 0.10 . The SRMR (Root Mean Square Residual) is >0.08 , which is the threshold for a good fit of a model, but since the value is very close to this threshold (0.082) it could be deemed acceptable. The overall indication of the CFA is a slightly flawed, but generally sufficient fit.

Table 3
Confirmatory Factor Analysis

	χ^2 (df)	p-value	CFI	TLI	RMSEA (90% CI)	SRMR
PGD ICD-11 1-factor model	140.108	0.000	0.802	0.763	0.127 (0.098 - 0.157)	0.082
PGD DSM-5- TR 1-factor model	299.861	0.001	0.885	0.852	0.117 (0.072 - 0.143)	0.070

The Pearson correlation coefficient suggested a moderate to strong positive relationship between the PGD scores (ICD) and the PCL-5 scores within the sample; the

correlation has been statistically significant ($r(77) = 0.59, p = < .001$). The average correlation of the PCL-5 and PGD items was 0.28; the correlation between the items has been visualized in a correlational matrix (see Appendix E). The Pearson correlation of the PCL-5 and the TGI-SR+ indicated that both scales measure similar constructs and have a reciprocal consistency to a significant degree.

DSM-5-TR

As for the ICD-11 relevant scores, the DSM-5-TR relevant scores may be normally distributed as well, as the null hypothesis of the Shapiro-Wilk normality test cannot be rejected since the p-value does not indicate significance. ($W = 0.97, p = .19$). Parametric testing was therefore also reasonable for this particular data (Royston, 1983).

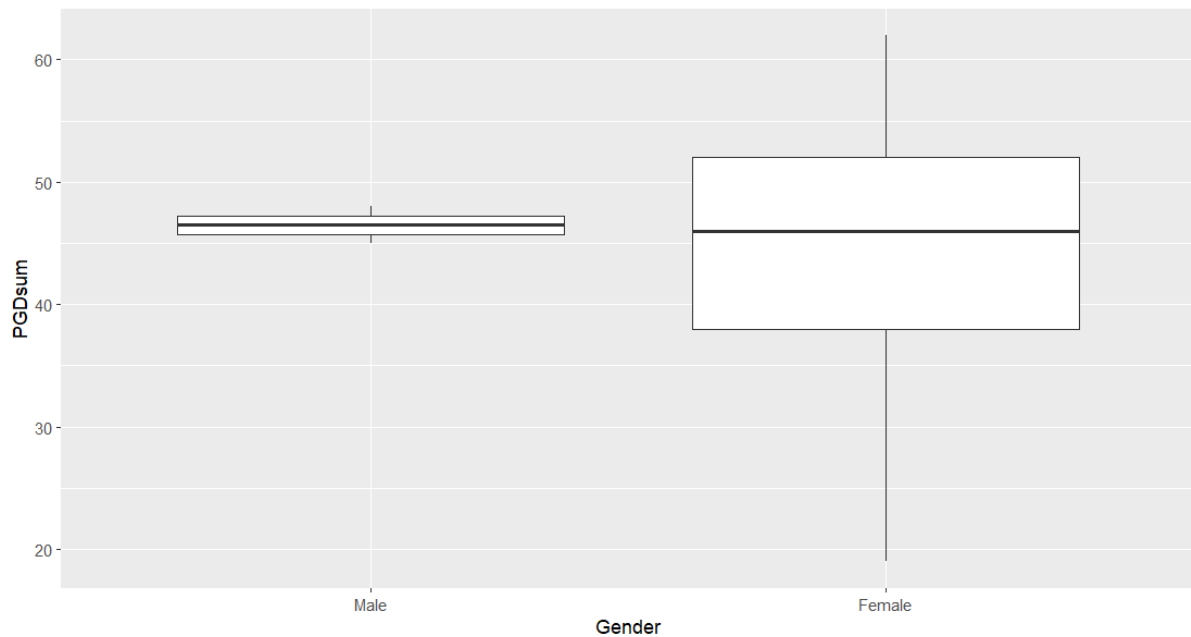
The DSM-5-TR relevant items of the TGI-SR+ have high internal consistency, as Cronbach's Alpha is relatively high ($\alpha = 0.87$), and the Guttman's Lambda 6 value approves this indication (0.89) (Callender & Osburn, 1978; Gliem & Gliem, 2003). The high internal consistency indicates that these items measure the same construct to a high degree. The relatively high S/N value (6.8) and the moderate average inter-correlational value (0.41) reinforce this judgment further.

A CFA of the TGI-SR+ (DSM-5-TR) model indicated a significant and good fit for the model as CFI and TLI were both >0.85 ($p = .001$) (see Table 3). The RMSEA is slightly $> .10$ and can be considered rather poor, the SRMR on the other hand is $<.080$ which approves the fit. The CFA therefore generally indicates a good fit.

The Pearson correlation coefficient also suggests a strong positive relationship between the DSM-5-TR-related PGD items and the PCL-5, this relationship is significant ($r(77) = 0.618, p < .001$). The average correlation between the items of both scales is 0.31. As the 95% confidence interval of the correlation coefficient is 0.460 - 0.738, no correlation between the items of both scales can be considered highly unlikely. A correlational matrix illustrates the correlation values between each item (Appendix F).

Gender & PGD score

The ANOVA between male and female participants on their PGD total scores has a p-value of 0.8, therefore the null hypothesis, that gender does not influence the total PGD scores, cannot be rejected. A boxplot of the PGD total scores by gender visualizes the non-significant difference between the male and female participants, as well as the striking quantitative disparity between male and female participants.

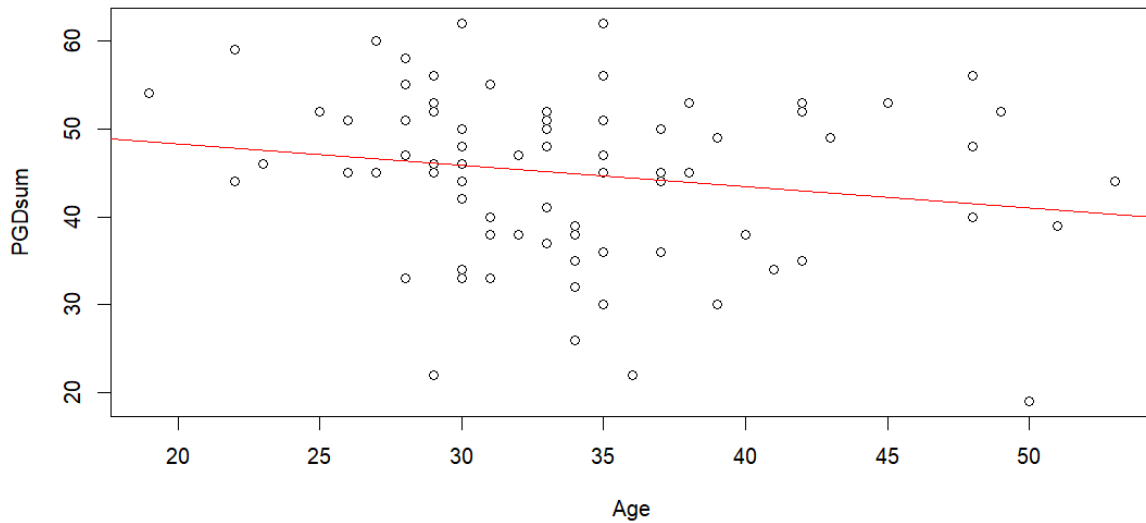
Figure 1*Boxplot of PGD total scores by gender*

The assumption of normality is not violated, as a Shapiro-Wilk normality test for the data residuals is not significant with a p-value of 0.066. Additionally, a QQ plot approves this indication, as it visually aligns with a normal distribution. The assumption of homogeneity is not violated either, since Levene's test for homogeneity is not significant ($p = .16$), therefore a homogeneity of variance can be assumed.

Age & PGD score

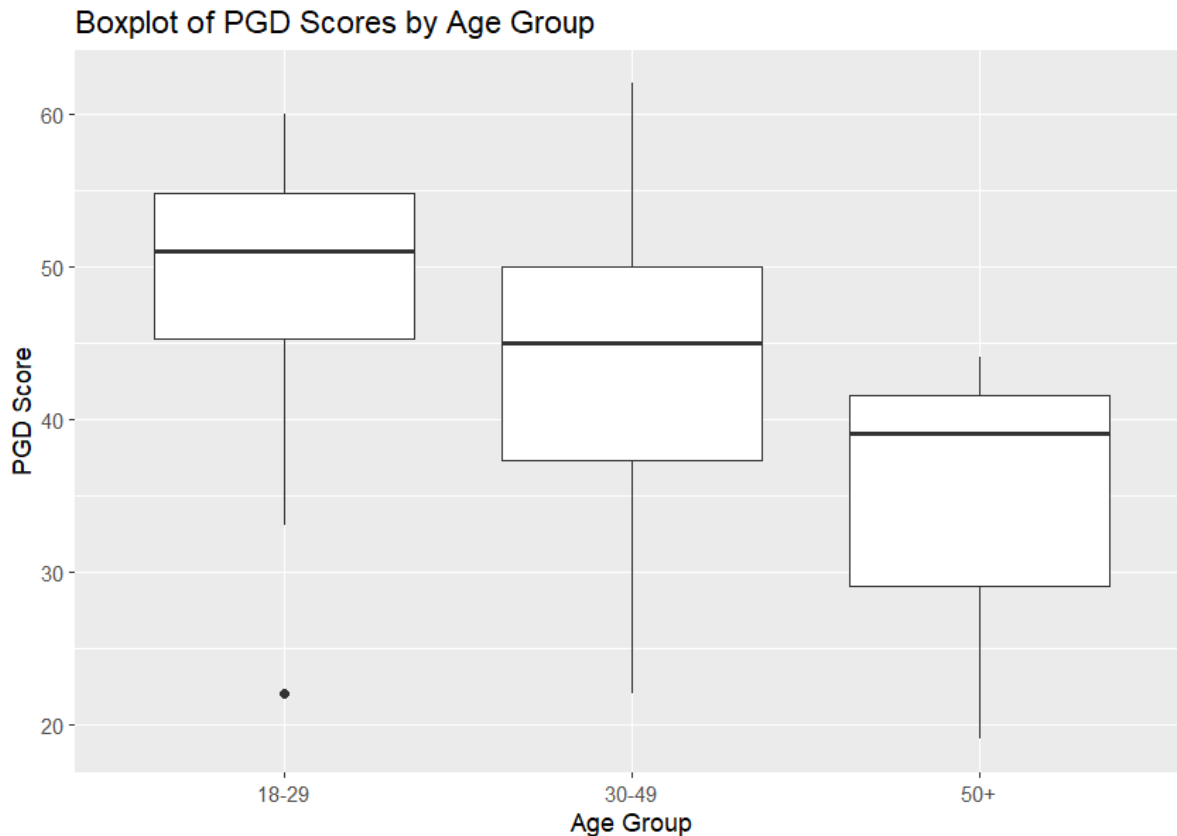
A QQ plot visually approves the assumption of normality as all the participants are within the acceptable distribution, additionally, a Shapiro-Wilk test further approves this assumption as the test is insignificant, with $p = .06$.

The intercept of the linear regression model for the effect of age on PGD score is 53.1, with an age effect of -0.24, but the null hypothesis for the age effect cannot be rejected ($p = .1$), therefore the effect of age is deemed as insignificant. Figure 2 visualizes the slightly negative slope from the age effect within the data.

Figure 2*Effect of Age on PGD total score***Additional Analyses*****Age groups PGD differences***

A one-way ANOVA comparing the age groups (18 - 29, 30 - 49, 50+) indicates a significant difference in the PGD symptomatology between the different age groups, $F(2, 76) = 4.888, p = .010$. A Tukey post-hoc test indicated that the youngest (18 -29) and the oldest group differ significantly ($p = .022$) with the oldest group $M = 34$ and the youngest group $M = 49$ in PGD severity, the differences between the middle group (30 - 49) and the other groups is insignificant.

The boxplot (Fig. 3) displays the PGD scores for the three different age groups (18 - 29, 30 - 49, 50+) with their mean score and their IQR (Interquartile Range). It visually reinforces the indication of the ANOVA that there is a significant difference in the PGD symptomatology between the youngest and the oldest age group.

Figure 3*Boxplot comparing three age groups****Cause of Death effect on PGD score***

An ANOVA revealed that there is a significant effect of the cause of death (of the lost loved one) on the PGD symptomatology within the sample population $F(1, 77) = 8.92, p = .004$. The differential PGD symptomatology depending on the cause of death has been visualized in a boxplot (see Appendix G). Individuals who lost their loved one due to murder or manslaughter in the context of the Russian invasion exhibit the highest PGD mean score ($M = 53.4$) in comparison to the other causes of death.

Discussion

The aim of this study has been the validation of aspects of the TGI-SR+ for the sample population of grieving Ukrainian refugees and additionally the exploration of possible effects of the variables “Gender” and “Age” on the PGD symptomatology.

Validation of the TGI-SR+

The TGI-SR+ seems to be a valid questionnaire for both the ICD-11 and DSM-5-TR measurements of PGD within the sample population of grieving Ukrainian refugees; this aligns with the prior validation studies of the instrument (Lenferink et al., 2022). The results suggest good reliability and internal consistency, the TGI-SR+ items measure the same

construct. The CFA generally approves both models the ICD-11 PGD model and the DSM-5-TR PGD model, but the DSM-5-TR PGD model seems to be a better fit for the factor. Hypothetically because the ICD-11 measurement includes item 5 whereas DSM-5-TR excludes this item, the relatively unfavorable kurtosis and skewness of item 5 could diminish the normality of distribution and therefore the accuracy of the ICD-11-related model (Ho & Yu, 2015). The convergent validity between the TGI-SR+ and the PCL-5 is positive, both scales do indeed measure a similar construct within the sample population; this construct is most likely PTSD, and this result aligns with the validation study as well (Lenferink et al., 2022). This evidence further reinforces the implication that both PTSD and PGD might be related and are part of a similar construct, although being distinctive disorders (Boelen et al., 2010). Future research could investigate further which PGD model (DSM-5-TR vs. ICD-11) does predict the construct of PGD with more reliability and accuracy, moreover which consequences should be taken for the potentially inferior model in future versions of the statistical manual.

It can be therefore concluded that the TGI-SR+ is a valid tool to assess PGD within grieving Ukrainian refugees. The circumstantial and cultural differences between the Ukrainian sample population and the Dutch sample population of the original validation do not seem to significantly alter the validity of the TGI-SR+ within Ukrainian refugees. The hypothetical reasoning for this outcome could be twofold, one option would be that the cultural differences between Ukraine and the Netherlands are not substantial enough to elicit significant divergence in grief between both samples (Shafiro et al., 2003). The other option would be that cultural factors solely influence the act of mourning (Gharmaz & Milligan, 2006), but not the general experience of grief, which could be rather universal (Shear, 2012). The similar construct of PTSD does contain a high cross-cultural validity, although the exhibition rates of PTSD are immensely dependent on the context (Hinton & Lewis-Fernandez, 2011). The TGI-SR+ and PGD could be perhaps highly cross-culturally applicable as well (Eisma et al., 2020), which would explain the outcome of this research. Although cross-cultural validity can potentially have important implications on the applicability of the TGI-SR+ within non-Western / non-European populations, only limited cross-cultural validation took place yet (Ashouri & Yousefi, 2023; Koukou-Kpolou et al., 2022). Upcoming research should consider the cross-cultural validity of the TGI-SR+ in greater detail.

Gender Effect on PGD symptomatology

Gender has no significant influence on the PGD symptomatology within the sample population; both male and female participants do score similarly on the PGD. Prior research

on this particular effect has been highly ambiguous, but this result aligns with the majority of prior research on the gender effect on PGD symptomatology (Lenferink et al., 2022; Maccallum, 2023). The main reason for this outcome could be that males and females have a similar subjective experience of grief, furthermore, the emotional experience in the face of loss is most likely very similar (Stelzer et al., 2019). The similar experience of grief could be an explanation for similar PGD symptomatology. The second hypothesis is therefore accepted since no significant effect could be found. This finding could imply that the female-dominated population of Ukrainian refugees is not at risk of exhibiting higher or lower PGD symptomatology than a gender-equal population, because of their gender set-up. On the contrary, this finding has to be handled with caution, it could be prone to Type I error due to the sample characteristics (Akobeng, 2016), more to that in the limitations. A sample with a greater proportion of male participants would be necessary for upcoming research to verify this particular outcome.

Age effect on PGD symptomatology

The variable "Age" does not significantly influence the PGD symptomatology within the sample. Using a plot with a regression line does visually indicate a slight decrease in PGD symptomatology with increasing age. This decrease would align with the hypothesis that age has a negative effect on PGD symptomatology. However, this effect has no significance in this research. The third hypothesis about the influence of age on grief has to be rejected. There are several potential reasons for this particular outcome. Prior research reports heightened PGD values by increasing age, potentially due to lack of social support, (Lundorff et al, 2017) (this study reported low external validity of this effect), while other research on age as a predictor on general psychopathology reports decreasing psychopathology with increasing age (Erskine et al., 2007). Both effects could hypothetically offset each other. However, the sample characteristics highly limit the external validity of the age effect within this study, which will be explained furtherly in the limitations. Upcoming research should investigate the impact of the variable "Age" on PGD symptomatology more comprehensively, as current research lacks external validity or focuses solely on spousal grief. Implications for potential age effects could be important to identify at-risk groups for PGD.

Additional Analyses

As the linear age effect is insignificant within this study, it has been decided to investigate if the individuals' age can be a predictor on a greater scale, by exploring potential cohort effects within the study. This investigation has been conducted by comparing generational age groups within the sample on their PGD symptomatology. The age groups in

their PGD indeed indicate a significant difference in their PGD symptomatology. Despite the insignificant general age effect, the generational differences on PGD severity seem to be more striking. Research does indicate that there are general generational differences in psychopathology; the younger birth cohorts do exhibit higher psychopathologies than their predecessors (Twenge et al., 2010). While this effect could originate from a multitude of sociological factors (e.g. individualism, materialism) (Twenge et al., 2010), further research on the generational differences in the experience of grief in particular could be of interest. Considering the sample of Ukrainian refugees, there are specific factors that could be specific to the Ukrainian population in addition to the aforementioned universal differences between the generations. The older Ukrainian generations (in our sample Gen X) are more traditional and conforming to norms, and this could hypothetically lead this older generation to be less open about their mental health to conform to social norms (Nagorniak, 2020). Additionally, this generation had to endure several hardships, especially the collapse of their system (collapse Soviet Union, Perestroika) and the associated economic burdens (Nagorniak, 2020). The experience of these hardships may strengthen coping mechanisms to deal with distress, which are not present in younger generations (Gen Y, Gen Z) because of the lack of these experiences. However, the underlying factors for the significant differences in PGD symptomatology between the generations need to be studied in future research.

Considering the general PGD scores of the sample population, Ukrainian refugees seem to be significantly more susceptible to the exhibition of PGD in comparison to a normal population. This also aligns with the research of Bryant et al., 2021, which indicates a doubled amount of PGD cases within refugee populations. Potential factors could be missing psychological support systems and the nature of loss, in the sample population, it can be seen that 24% of the individuals lost their loved one due to murder or manslaughter in the context of the Russian invasion. These violent and unexpected losses could be an important factor contributing to the relatively high PGD scores within the population (Bryant et al., 2021; Holland & Niemeyer, 2011). This notion is reinforced by the significant impact of the cause of death of the loved one on the PGD severity of the participants. The additional boxplot (Appendix G) visualizes that individuals who lost their loved one violently due to the Russian invasion exhibit the highest PGD symptomatology of all potential causes of death. The relatively high PGD scores within the sample population can be considered as concerning considering the dimension of the Ukrainian refugee crisis. Future research should examine the extent and exhibition of PGD among Ukrainian refugees more thoroughly; hence the healthcare and support systems of the refugee host countries can act appropriately.

Strengths & Limitations

The major strength of the study is its originality (Shibayama & Wang, 2020), considering the novelty of the Ukrainian refugee crisis, research concerning the mental health of Ukrainian refugees is scarce, and, in particular, research about PGD within Ukrainian refugees is yet non-existent. This study could provide a valuable basis for research of PGD within Ukrainian refugees, as a validation of the TGI-SR+ could be approved among this particular population. The originality does not only come with the target population but also with the research of the TGI-SR+; it is, as aforementioned, a relatively novel questionnaire and has so far only been validated within Dutch, Pakistani, and French populations (Ashouri & Yousefi, 2023; Koukou-Kpolou et al., 2022; Lenferink et al., 2022). This study could be a sufficient addition to the further research of the TGI-SR+, especially its cross-cultural validity, as well as its validity within refugee populations.

Another strength of the study can be found in its format. Since the study takes place online, the study is relatively easy to conduct and replicate (Wright, 2006), and low obstacles for potential future replication could increase prospective generalizability. The online format contributes a high degree of flexibility and efficiency, as a great number of potential participants can be reached quickly with a low investment of resources; thousands of potential participants could be possibly attained with one post in a relevant Facebook group (see Appendix B). Another positive aspect of the online format is the felt anonymity of answering sensitive and intimate questions considering the participants' bereavement. The participants do not have to interact directly with the researcher and can perform the questionnaire in a comfortable environment, which promotes overall comfort for the participants and perhaps the participants' openness as well. (Lee & Lee, 2012; Mangan & Reips, 2007).

Despite its strengths, there are also several limitations. The major limitation of this study lies within the sample size. The inclusion criteria "refugee" highly limits the sample size as the majority of the participants did not leave their homes or are internally displaced persons. This issue is especially striking for the measurement of the "Gender" effect on PGD symptomatology, as the sample does only include two male individuals. A dominance of female individuals to male individuals has already been anticipated as it is legally forbidden for male Ukrainians to leave Ukraine since the Russian invasion, but such a remarkable minority did not lie within the anticipation. This limitation is also relevant for the measurement of the "Age"-effect, the sample only includes three individuals who are 50+ years old. It is, therefore, not possible to confidently conclude the effect of age on PGD symptomatology, as most individuals in the sample are in a similar age range (ca. 70% 30 - 49

years old). The sample size may also be limited due to the high sensitivity of the topic (O'Brien et al., 2006) and the length of the questionnaire (Roszkowski & Bean, 1990); a significant number of participants started the questionnaire but stopped at some point during the questionnaire, making their data not usable. The limited sample size, in particular the lack of specific groups (50+ years old individuals; male individuals) make the data prone to Type I error and diminish the generalizability (Akobeng, 2016; Faber & Fonseca, 2014).

Another limitation lies within the sampling methodology, as aforementioned are grieving Ukrainian refugees a “hard-to-reach” group (Tourangeau et al., 2014), social media has been used as a convenience sampling methodology to reach these groups. This method made it easy, to some extent just possible, to reach this group, but the downside of this method is, that individuals with specific demographic characteristics use it more frequently than others. Younger individuals mostly use different social media platforms than Facebook (Statista, 2023). Facebook is being used mostly by middle-aged individuals, which form the biggest part of the sample (Datareportal, 2023). Ukrainian Facebook users are, therefore, not representative of the general population. Future research should try to build cooperation with major asylum shelters to get direct contact with the refugee population, as sampling solely through social media may create a sampling bias since social media users are not representative (Culotta, 2014).

The last major limitation considers the questionnaire type. As the participants performed a self-report questionnaire, there is a considerable risk that social norms and social desirability did bias their reporting. The male participants, for example could have thought that admitting vulnerability does not conform to their image of masculinity, which would make the assessment of gender differences more difficult (Buchcik et al., 2023)

Conclusion

In conclusion, this study validated certain aspects of the TGI-SR+ within grieving Ukrainian refugees, the influence of the variables "Gender" and "Age" on the PGD symptomatology have been investigated in addition. The TGI-SR+ fulfils a multitude of validation parameters for both the DSM-5-TR PGD and the ICD-11 PGD models, the items indicate a high internal consistency, the CFA's indicate a good fit for both models and a convergent validity analysis with the PCL-5 approves the measurement of a similar construct. The questionnaire is, therefore, a valid tool to assess PGD symptomatology in grieving Ukrainian refugees. This study could not find a significant effect of "Gender" on the PGD symptomatology in the sample, which aligns with prior research that indicated no significant effect either. The "Gender" effect outcome is not fully deemed as reliable, since the sample

was strongly female-dominated. Further research is necessary on this particular effect. The variable "Age" does not have a significant linear effect on the PGD symptomatology in the sample, despite this finding, significant generational differences between the youngest and the oldest age group on PGD severity could be found. The sample population overall exhibited remarkably higher PGD values than other validation populations; the violent/unexpected losses in the context of the Russian invasion seem to be an important contribution to the exhibited severity. Upcoming research should further investigate the effect of "Gender" on PGD symptomatology, the background of generational differences on PGD symptomatology, and underlying factors for the remarkably higher PGD scoring of Ukrainian refugees.

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Appendices

Appendix A

Text used for participant sampling

Original text

“Вітаємо! Ми набираємо учасників для дослідження, яке проводять університети Твенте та Утрехту (Нідерланди). Ми хочемо дослідити та дізнатись більше про процес скорботи серед українського населення. Це дослідження також має на меті сприяти та посилити психологічну підтримку українських біженців. Хто може взяти участь? Українці за кордоном віком від 18 років, які втратили близьку людину (партнера, члена сім'ї або друга). Якщо ви хочете прийняти участь, ми запрошуємо вас перейти за посиланням нижче та заповнити опитувальник:

https://utwentebbs.eu.qualtrics.com/jfe/form/SV_6L23h3ar86Ks31I Якщо ви візьмете участь ви отримаєте коротку інформацію стосовно вашої реакції горя. Ви також отримаєте загальну інформацію про горе. Більш детальну інформацію Ви можете знайти на сайті www.Вимірюваннягоря.com Будемо вдячні за репост та поширення публікації про наше дослідження.”

Translated version

“Greetings! We are recruiting participants for a study conducted by the universities of Twente and Utrecht (the Netherlands). We want to explore and learn more about the grieving process among the Ukrainian population. This study also aims to promote and strengthen psychological support for Ukrainian refugees. Who can participate? Ukrainians abroad over the age of 18 who have lost a loved one (partner, family member or friend). If you would like to participate, we invite you to follow the link below and fill out the questionnaire:

https://utwentebbs.eu.qualtrics.com/jfe/form/SV_6L23h3ar86Ks31I If you participate, you will be asked to provide brief information about your grief response. You will also receive general information about grief. For more information, please visit www.Вимірюваннягоря.com.

We will be grateful for reposting and sharing the publication of our research.”

Appendix B
Facebook groups used for sampling (only groups which admitted post)

Table 4

Facebook groups used for sampling (only groups which admitted post)

Group name	Country	Group members (June 2023)
Нідерланди для Українців Nederland voor Oekraïners	Netherlands	12.198
Українці у Фінляндії	Finland	36.801
Українці Чикаго	USA	21.074
Українці в Іспанії - Ucrainianos en España	Spain	16.878
Ukrainian Canadians Українці Канади	Canada	135.900
Ukrainian Refugees in the Netherlands / Беженцы из Украины в Голландии	Netherlands	3.037

Appendix C
Interpretation of the Grief Monitor

Table 5*Interpretation of the Grief Monitor***Grief Monitor Interpretation**

Categories	Total TGI-SR+ score
Green category	22- 47
Yellow category	48 - 70
Orange category	71 - 91
Red category	92 - 110

Appendix D
Demographics & contextual information overview

Table 6
Demographics & contextual information overview

Variable	n (%)
Total observations	
Gender	
female	77 (97.5)
male	2 (2.5)
Age	
<i>Age groups</i>	
18 - 29	22 (27.8)
30 - 49	54 (68.3)
50+	3 (3.7)
PGD	
<i>Percentage above cut-off score (ICD-11)</i>	53 (67.1)
<i>Percentage above cut-off score (DSM-5-TR)</i>	45 (56.9)
Country fled to	
European (without Russia)	62 (78.4)
Americas	9 (11.3)
Other	2 (2.5)
No response	6 (7.6)
Cause of death	
Physical illness	41 (51.9)
Accident	6 (7.6)
Suicide	3 (3.8)
Murder or manslaughter (<i>not related to</i>	4 (2.5)

Russian invasion)

Murder or manslaughter (related to Russian invasion) 19 (24)

Disappearance 4 (5)

Other 4 (5)

Years passed since loss (*approx.*)

0 21 (26.6)

1 23 (29.1)

2 10 (12.6)

3 3 (3.8)

4+ 22 (27.8)

Appendix E
Correlational Matrix – ICD-11 PGD

Table 7*Correlational Matrix – ICD-11 PGD*

	PCL_5_1	PCL_5_2	PCL_5_3	PCL_5_3.1	PCL_5_4	PCL_5_5	PCL_5_6
TGISRplus_1	0.2514415	0.2056583	0.21834672	0.21834672	0.2892126	0.3530852	0.1388799
TGISRplus_2	0.2528570	0.3581210	0.18899356	0.18899356	0.2056459	0.2827019	0.3330902
TGISRplus_3	0.1445046	0.2907993	0.01348806	0.01348806	0.0982748	0.3059985	0.3934160
TGISRplus_5	0.1097208	0.3352393	0.10051214	0.10051214	0.2488625	0.2144615	0.3827140
TGISRplus_8	0.1573994	0.2156344	0.06563096	0.06563096	0.1980402	0.2568508	0.3214867
TGISRplus_9	0.2884728	0.4388406	0.27567057	0.27567057	0.4551783	0.4510706	0.5057567
TGISRplus_10	0.2827952	0.3732490	0.19544685	0.19544685	0.4150458	0.4351620	0.4718222
TGISRplus_13	0.3674534	0.3818384	0.22582081	0.22582081	0.2613665	0.4627144	0.4003985
TGISRplus_16	0.2086813	0.3642206	0.26021723	0.26021723	0.2265503	0.2309295	0.1732903
TGISRplus_19	0.3040732	0.4118518	0.23528430	0.23528430	0.2157715	0.3093354	0.2936257
TGISRplus_20	0.2113033	0.2472151	0.08528242	0.08528242	0.1837992	0.3242789	0.3160087
TGISRplus_21	0.3650952	0.4963366	0.28285462	0.28285462	0.3478543	0.3471058	0.3601244
TGISRplus_22	0.3804869	0.5411299	0.33987853	0.33987853	0.4179994	0.4597017	0.4886095

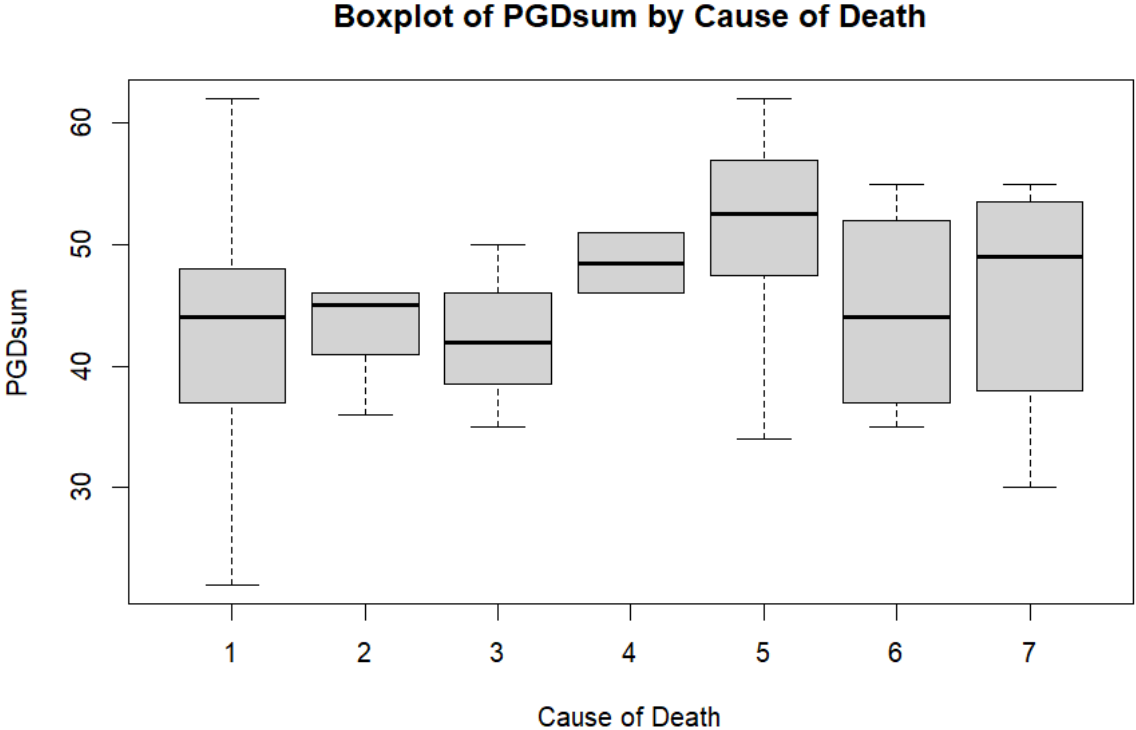
Appendix F
Correlational Matrix – DSM-5-TR PGD

Table 8*Correlational Matrix – DSM-5-TR PGD*

	PCL_5_1	PCL_5_2	PCL_5_3	PCL_5_3.1	PCL_5_4	PCL_5_5	PCL_5_6
TGISRplus_1	0.2514415	0.2056583	0.21834672	0.21834672	0.2892126	0.3530852	0.1388799
TGISRplus_2	0.2528570	0.3581210	0.18899356	0.18899356	0.2056459	0.2827019	0.3330902
TGISRplus_3	0.1445046	0.2907993	0.01348806	0.01348806	0.0982748	0.3059985	0.3934160
TGISRplus_6	0.3605477	0.4553368	0.66998586	0.66998586	0.6976151	0.3121087	0.3410829
TGISRplus_9	0.2884728	0.4388406	0.27567057	0.27567057	0.4551783	0.4510706	0.5057567
TGISRplus_10	0.2827952	0.3732490	0.19544685	0.19544685	0.4150458	0.4351620	0.4718222
TGISRplus_11	0.3426134	0.4103096	0.18814919	0.18814919	0.2930686	0.3189378	0.3915697
TGISRplus_18	0.2214066	0.3094919	0.18387000	0.18387000	0.2714545	0.3309346	0.3090470
TGISRplus_19	0.3040732	0.4118518	0.23528430	0.23528430	0.2157715	0.3093354	0.2936257
TGISRplus_21	0.3650952	0.4963366	0.28285462	0.28285462	0.3478543	0.3471058	0.3601244

Appendix G
Boxplot of PGD scores by Cause of Death

Figure 4
Boxplot of PGD scores by Cause of Death



Legend: 1 = Physical illness; 2 = Accident; 3 = Suicide; 4 = Murder / manslaughter (not related to Russian invasion); 5 = Murder / manslaughter (related to Russian invasion); 6 = Disappearance; 7 = Other