Prolonged Grief Symptoms per ICD-11 and DSM-5-TR Criteria and Quality of Life: a longitudinal study

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Abstract

Prolonged Grief Disorder (PGD) has been formally included in the ICD-11 and the DSM-5-TR recently. So far, little research has been conducted that evaluates the validity of PGD criteria per ICD-11 and DSM-5-TR. To assess the test-criterion validity of PGD, aimed to establish if PGD symptoms per ICD-11 and DSM-5-TR criteria predict changes in QoL. A sample of 276 bereaved adults (mean age 54 years, 92% female) filled in a survey at baseline and 6 (n = 142) and 12 (n = 135) months later. The Traumatic Grief Inventory-Self Report Plus was used to measure the independent variables ICD-11 and DSM-5-TR prolonged grief symptoms. The European Health Interview Survey - Quality of Life 8-item index was used to measure the dependent variable QoL. Two simple linear regression analyses demonstrated that T1 ICD-11 and DSM-5-TR prolonged grief symptoms related negatively to T1 QoL, supporting concurrent test-criterion validity. Four hierarchical regression analyses demonstrated that T1 ICD-11 and DSM-5-TR symptoms significantly predict QoL at T2 and T3 whilst controlling for T1 QoL, supporting predictive test-criterion validity. ICD-11 and DSM-5-TR prolonged grief symptoms are negatively associated with quality of life. ICD-11 and DSM-5-TR prolonged grief symptoms predict lower quality of life scores at T2 and T3.

Introduction

Nearly everyone will have to deal with the loss of a loved one at some point in life. According to Bonanno (2004), the death of a loved one is one of the most common unpleasant life events of older age. In general, the grief is most intense instantly after the loss of a loved one and then gradually decreases over time (Shear, 2015). In normal grief, it is assumed that grieving individuals are able to move from acute grief states in the early aftermath of the loss of a loved one, to states of integrated grief. Integrated grief entails that the deceased is more easily called to mind, the reality of the death is acknowledged, and the bereaved person is able to return to pleasant relationships and activities (Maercker & , Lalor 2012). In pathological grief, the difficulties of bereavement continue or grow instead of decrease over time (Jordan & Litz, 2014). Boelen & Prigerson (2007) described pathological grief as a maladaptive adjustment to the loss of a loved one, which consists of extreme grief symptoms that exceed sociocultural and religious norms that cause significant distress in daily life functioning and have been experienced for an extended period of time.

Recently, two different diagnoses termed Prolonged Grief Disorder (PGD) have been formally included in two diagnostic handbooks: in 2019 the World Health Organisation approved of a new diagnosis of PGD to enter the International Classification of Diseased eleventh edition (ICD-11; World Health Organisation, 2019). In 2022 the American Psychiatric Association PGD formally introduced PGD in the Diagnostic Statistic Manual of Mental Disorders 5 Test Revision (DSM-5-TR; American Psychiatric Association, 2022). In the DSM-5-TR, PGD is classified as a trauma and stressor-related disorder. Between the two different types of PGD in the ICD-11 and the DSM-5-TR are some differences in the diagnostic criteria. Criteria-sets differ in number of included symptoms, the content of the symptoms and diagnostic algorithms (Eisma et al, 2020; Lenferink et al, 2021a). Another difference between the two versions of PGD is in time-frame criteria; with the ICD-11 you

can meet the criteria after 6 months, whereas the DSM-5-TR recognizes the possible onset of PGD after 12 months. Table 1 lists all the diagnostic criteria for PGD according to the ICD-11 and the DSM-5-TR.

Before PGD was formally included in the diagnostic handbooks, there were other proposals to describe pathological grief. For example, complicated grief disorder (Horowitz et al, 1993), prolonged grief disorder that deviates from the current proposals of PGD (Prigerson et al, 2009), complicated grief (Shear et al, 2011), and persistent complex bereavement disorder (American Psychiatric Association, 2013).

Previous research has shown pathological grief symptoms to be distinct from depression and Posttraumatic Stress Disorder (PTSD; e.g., Lenferink et al., 2021b; Djelantik et al., 2020; Maercker & Lalor, 2012). Pathological grief was introduced because it was thought to be easier to identify and describe, to avoid confusion with PTSD and to provide key insight into one important feature of pathological grief, the duration of the symptoms (Wagner & Maercker, 2010).

Many international studies (e.g.,; Stroebe et al, 2000; Boelen et al, 2003, Boelen & Prigerson, 2007) proved the clinical importance of a new disorder of pathological grief. Their results indicated that pathological grief is a distinct clinical entity which may require different treatment methods than used with other disorders. Advocates of the inclusion of PGD in the diagnostic handbooks often interpret research on prolonged grief symptoms as evidence in support of the validity of PGD. Eisma (2023) describes that this research is often focused on construct validity (dimensionality of prolonged grief symptoms; e.g., Simon et al, 2011), convergent validity correlations of prolonged grief symptoms with related disorders; e.g., Aoyama et al, 2018), divergent validity (distinctiveness of prolonged grief symptoms from symptoms of related disorders; e.g., Boelen & van den Bout, 2005), and criterion validity

(predictive value of prolonged grief symptoms for other relevant constructs; e.g. Boelen & Prigerson, 2007).

The biggest limitation in past research on pathological grief is the fact that the researchers did not assess the current versions of PGD. Eisma and Lenferink (2018) stated that recent studies on grief disorders are predominantly based on previously proposed criteria for PGD. Because there were so many varieties of proposed grief disorders, the commonly used measures like for example the ICG (The Inventory of Complicated Grief; Prigerson et al., 1995) do not measure current proposals for PGD. This raises a concern about whether the results from past research on pathological grief generalize to the current criteria sets of PGD.

In this research, we want to shed light on test-criterion validity of PGD as defined in ICD-11 and DSM-5-TR. The test-criterion validity of a construct can be measured by ascertaining the degree of accuracy in which the test scores predict criterion performance (American Educational Research Association et al., 2022). We will be looking at two types of criterion validity: predictive validity and concurrent validity. The criterion validity of current versions of PGD is not clear at this point, since it has not been investigated. To assess the criterion validity of PGD, we use the variable Quality of Life (QoL) as a criterion. Specifically, we aim to assess if changes in QoL can be predicted by PGD symptoms per ICD-11 and DSM-5-TR criteria. QoL is an important measure for the degree of health someone is experiencing. Various diseases and disorders are in association with diminished QoL (Mendlowicz & Stein, 2000), it is to be expected this could be the case for PGD as well.

No single definition of QoL is universally accepted (Gill & Feinstein, 1994). According to Dimenas et al. (1990), QoL refers to complex aspects of life that cannot be expressed by using only quantifiable indicators; it describes an ultimately subjective sense of well-being but also objective indicators such as health status and external life situations. (Dimenas et al., 1990). Patrick and Erickson (1993) state QoL is the value assigned to life as

modified by the social opportunities, perceptions, functional states, and impairments that are influenced by disease, injuries, treatments, or policies. Most experts agree that the concept of QoL should be focused on the individual's subjective perception of the quality of his or her own life (Palmore & Luikart, 1972), and that QoL is better approached as a multidimensional construct, which covers a certain number of conventionally defined areas (Gerin et al, 1992).

Multiple prospective studies have shown that high levels of pathological grief pose a raised risk for a variety of mental and physical health problems, even when controlling for the impact of co-morbid anxiety and depression (Chen et al., 1999; Prigerson et al., 1995; Prigerson et al., 1997). Cross-sectional research has shown that, when controlling for depression and anxiety, pathological grief is associated with reduced QoL (Silverman et al., 2000). Furthermore, past research has shown that prolonged grief symptoms predict QoL (Boelen & Prigerson, 2007), yet these associations have not yet been investigated for the current criteria sets of PGD. Furthermore, the longitudinal analysis in past research were not stringent enough as Boelen and Prigerson (2007) did not control for baseline QoL. Because they did not control for baseline QoL, you can say there is correlation between prolonged grief symptoms and QoL, but you can say nothing about the predictive effects of prolonged grief symptoms on QoL, because they did not measure QoL at time point 1. It is important to use baseline measures, because only then we can assess the predictive effects of prolonged grief symptoms on quality of life.

This study will be the first to shed more light on the relationship between prolonged grief symptoms per ICD-11 and DSM-5-TR and QoL. We hypothesize that ICD-11 and DSM-5-TR PGD symptoms are significantly negatively associated with quality of life. We will test this hypothesis in the cross-sectional part of the study, thereby aiming to find evidence for the concurrent test-validity between ICD-11 and DSM-5-TR prolonged grief symptoms and QoL.

We also hypothesize that ICD-11 and DSM-5-TR PGD symptoms significantly predict changes in quality of life over time. This hypothesis will be tested in the longitudinal part of the study, where we aim to find evidence for the predictive test-criterion validity between ICD-11 and DSM-5-TR prolonged grief symptoms and QoL.

Method

Procedure and Design

Data collection was part of a larger longitudinal survey on psychosocial adaptation to bereavement conducted between May 2019 and September 2021. The online platform Qualtrics was used to collect the data. Participants were led to this platform by advertisements presented on Google and via a website containing a grief self-test (www.psyned.nl). Both gave a link to the study's website where potential participants could read information on the study and fill in an online informed consent form. Informed consent was given on a participant information page. Four general themes that were covered were that participation was voluntary, the information was processed in a confidential manner, the research aims, and where to direct possible questions. After giving online informed consent, the participants could start the study. The participants were given a code to ensure anonymity when the data was processed. To be eligible for study participation, people had to be able to read and answer questions in Dutch, had to have experienced the death of a partner, family member, or friend, and be 18 years or older. The Ethical Committee Psychology of the University of Groningen approved the study (registration number: PSY-1819-S-0173).

There were no mandatory breaks while filling out the survey and there was no time limit. Furthermore, the test took around half an hour to finish and was subdivided into several sections. At the end of the first survey (T1), participants were asked if they would be willing to complete two future surveys. Participants who agreed with this were sent an email with a link to the survey 6 (T2) and 12 months (T3) after they completed the first survey.

Participants

Baseline data was collected from 987 bereaved individuals. We excluded 671 people from the data analysis who did not meet the criteria of losing a loved one 12 or more months ago at baseline. Furthermore, 115 people did not give permission to be contacted for completing the second or third questionnaire and some people who did give permission did not complete one or more of the follow-up surveys. Therefore, our final sample consisted of 276 people who completed the QoL questionnaire at T1, 142 in T2, and 135 in T3.

The average age of the participants was approximately 54 years and 92% of the sample reported being female (Table 2 shows baseline sample characteristics). More than half of the participants have completed a college or university education. The majority of the participants had lost a partner, lover and/or spouse (46%), followed by the loss of a parent (28%), child (13%), sibling (9%), or other relationship (4%). Most of the deceased people were male (72%). The median time since loss was 27 months and ranged from 12 months to 5 years or longer. The majority of the participants (45%) indicated that they were between 12 months and 24 months after the loss. Most of the losses were due to a natural cause such as an illness (76%), whereas a minority indicated having experienced a loss due to suicide (16%), an accident (8%), and murder (less than 1%). For most of the participants, the loss was unexpected (55%), while 27% of the participants had expected the loss, and 17% indicated the loss was expected nor unexpected or both.

Measures

We used prolonged grief symptoms as an independent variable and QoL as both an independent and dependent variable. In the T1 survey, participants were asked to fill in a self-constructed questionnaire about socio-demographic characteristics, such as sex, age, and education level. Loss-related characteristics (relationship with the deceased, sex of the deceased, time since loss, cause of death, and expectedness of the loss) were also registered

using a self-constructed questionnaire. All answer categories for the categorical variables are listed in Table 2.

We used QoL assessments at T1, T2 and T3 and prolonged grief symptoms assessments at T1. This study has a longitudinal design, but some of the analyses are on cross-sectional data.

Prolonged Grief Symptoms

Prolonged grief symptoms were measured with the Traumatic Grief Inventory - Self Report Plus (TGI-SR+; Lenferink et al., 2022). The TGI-SR+ is the only validated instrument that is able to screen for prolonged grief symptoms according to both the ICD-11 and DSM-5-TR PGD criteria. This makes it the most appropriate instrument available due to this study thematizing the evolving criteria for prolonged grief and its effect on validity. There is evidence for the concurrent and criterion validity of the TGI-SR+ (Lenferink et al., 2022).

The TGI-SR+ is a 22-item self-report questionnaire using a 5-point Likert scale ranging from 1 (never) to 5 (always). Twelve of these items reflect the ICD-11 criteria while ten reflect the DSM-5-TR criteria. Examples of items for prolonged grief symptoms per DSM-5-TR are: ‘I avoided places, objects, or thoughts that reminded me that the person I lost has died’ and ‘I felt that life is unfulfilling or meaningless without him/her’, and per ICD-11: ‘I had trouble accepting the loss’ and ‘I had negative thoughts about myself in relation to the loss (e.g., thoughts about self-blame)’. Item scores are summed to form two overall total severity scores, with one made up of the twelve items for the ICD-11 criteria and the other consisting of the ten items for the DSM-5-TR criteria.

Internal consistencies were previously examined using McDonalds omega, showing values > .70 (TGI-SR+ scores: ω = .97; ICD-11 criteria: ω = .95; DSM-5-TR criteria: ω = .95). The Cronbach's alpha, using this study's data set were .91 (ICD-11 criteria) and .90 (DSM-5-TR criteria) respectively. Together, these indices suggest very strong internal

consistency for the TGI-SR+.

Quality of Life

QoL was assessed with the European Health Interview Survey - Quality of Life (EUROHISQOL) (Schmidt et al., 2005). This short version of the WHOQOL-100 has 8 items, and answers are given on a Likert scale ranging from 1 (not at all) to 5 (completely), where a higher score indicates a higher QoL. It measures QoL across four different domains, two items each: psychological, social, physical, and environmental. The World Health Organization names the four domains physical health (e.g., “How would you rate your quality of life?”), psychological health (e.g., “Do you have enough energy for everyday life?”), social relationships (e.g., “How satisfied are you with your personal relationships?”), and environmental health (e.g., “Have you enough money to meet your needs?”);Schmidt et al., 2005).

The EUROHIS-QOL 8-item index has strong associations with conceptually related measures, which supports the convergent validity of the EUROHIS-QOL (Schmidt et al., 2005). It was also able to reliably discriminate between ill and healthy individuals supporting its discriminant validity. Cronbach’s alpha for this instrument was .80 (Schmidt et al., 2005), indicating good internal consistency. In this study, a reliability analysis resulted in a Cronbach’s alpha of .84.

Statistical Analyses

We calculated the association between prolonged grief symptoms and QoL for both ICD-11 and DSM-5-TR criteria across three time points. We calculated prolonged grief symptom levels at T1 for both ICD-11 and DSM-5-TR criteria based on the TGI-SR+ (for scoring rules: Lenferink et al., 2022). These ICD–11 prolonged grief symptoms and DSM-5-TR prolonged grief symptoms were computed as new variables for T1 (T1 ICD-11 prolonged grief symptoms and T1 DSM-5-TR prolonged grief symptoms). We checked the assumptions

of our regression analyses (i.e., normality, linearity, homoscedasticity, outliers, and multicollinearity) before running our main analyses.

We ran a drop-out analysis to assess the differences in sample characteristics of people who dropped out and those who did not. The dropouts were categorized into two categories. The first one was for participants that opted to not continue with the study after baseline measurement (T1), who are called dropout group 1. The second category consisted of participants who opted to continue with the study, but did not complete one or two of the follow-up questionnaires in T2 or T3, who are called dropout group 2.

To check if there were significant differences between people who dropped out of the study and those who did not we used independent sample t-tests in the case of continuous variables (i.e., age, T1 ICD-11 prolonged grief symptoms, T1 DSM-5-TR prolonged grief symptoms and T1 QoL) and Chi-Square tests for categorical variables (i.e., sex, education level, time since loss, relationship with the deceased, cause of death, expectedness of death). . For those categorical variables that showed a significant effect, we ran additional Chi-square tests to check which categories were distributed differently between groups. If the assumption of expected values (not less than 5 expected observations in every cell) within the cells was violated for the Chi-Square test, we used the Likelihood Ratio instead of the Chi-square test.

To test our first hypothesis, we used two simple linear regressions to assess the association between T1 ICD-11 prolonged grief symptoms and T1 QoL and the association between T1 DSM-5-TR prolonged grief symptoms and T1 QoL. For our second hypothesis, we ran two separate regression analyses per time-point to examine the extent to which T1 ICD-11 prolonged grief symptoms and T1 DSM-5-TR prolonged grief symptoms predicted QoL outcomes at T2 and T3 (T2 QoL and T3 QoL), whilst controlling for the baseline QoL (T1). So, we ran four hierarchical multiple regression analyses. In the first step of all regression analyses, we included T1 QoL as a control variable. Next, we added either T1

ICD-11 prolonged grief symptoms or T1 DSM-5-TR prolonged grief symptoms as a predictor of QoL at T2 or T3.

Furthermore, we ran an exploratory analysis comparing the effects of ICD-11 and DSM-5-TR prolonged grief symptoms on QoL. The exploratory analysis allows us to assess evidence for the convergent validity of both ICD-11 and DSM-5-TR prolonged grief symptoms, by comparing the longitudinal relationships each of these constructs has with QoL. We compared the confidence intervals of the standardized beta weights of associations between ICD-11 and QoL and DSM-5-TR and QoL across all relevant time periods, whilst controlling for the T1 QoL in longitudinal analyses. The rule of Cumming (2009) states that if the confidence intervals of the standardized beta weights of the variables overlap less than 50% with each other, the difference between the standardized beta weights is significant.

Results

Dropout analysis

A dropout analysis was run to examine whether there were differences in study completers (*n* = 120; 38%) versus non-completers (*n* = 196; 62%) for the EUROHIS 8-item index in relationship with different variables. More specifically, 36% (*n* = 115) of participants opted to not participate for T2 and T3, i.e., dropout group 1, and 26% (n = 81) of participants said they would continue for T2 and T3 but did not finish, i.e., dropout group 2. We are analyzing these two groups by comparing them with their completer counterparts as specified in the paragraphs below. We tested whether T1 ICD-11 prolonged grief symptoms, T1 DSM-5-TR prolonged grief symptoms, T1 QoL, age, time since loss, sex, education, relationship with deceased, cause of death and expectedness of death was associated with dropping out.

In the first part of the dropout analysis, we compared dropout group 1 with those who opted to continue after T1 (*n* = 201; 64%). No significant differences were found across the

two groups in this comparative analysis (Table 3).

In the second portion of the dropout analysis, we compared dropout group 2 with those who opted to continue after T1 and completed T2 and T3 (n = 120; 38%) (Table 4). Using a Chi-square test, a significant effect was found for sex ($\chi 2$ (1, N = 201) = 5.58, p = .02), with women making up 97% of dropout group 2 and 88% of study completers. Cause of death (natural cause, accident, murder, suicide) also had a significant difference in proportions (LR (3, N = 201) = 13.43, $p < .01$: Table 4) between the two groups compared. Specifically, the group bereaved through suicide was found to have more participants drop out after stating they wanted to continue for T2 and T3 compared with the other subcategories ($\chi 2$ (1, N = 201) = 11.41, $p < .001$). People bereaved through suicide made up 27% of dropout group 2 and 9% of study completers.

Assumption Checks

Details on the assumption checks can be found in Appendix A at the end of the manuscript. To investigate if the model assumptions for the regression analyses testing the first and second hypothesis were met several figures were made and analyses were executed to check for outliers, normality, homoscedasticity, linearity, and an additional analysis to check for multicollinearity was conducted exclusively for the second hypothesis. For both hypotheses, some outliers were found. To check whether these outliers were influential, Cook's Distance was assessed. The Cook's distance values were not larger than one, therefore the outliers were not influential and thus were retained in the dataset. The assumptions for normality, linearity and homoscedasticity were not violated for the analyses on the two hypotheses. Moreover, there was no multicollinearity of predictors in the regression analyses conducted to answer the second hypothesis.

Hypothesis 1

Cross-sectional analysis

Two simple linear regression analyses were conducted to test the first hypothesis: ICD-11 and DSM-5-TR prolonged grief symptoms are both significantly negatively associated with QoL. T1 ICD-11 prolonged grief symptoms were indeed significantly negatively related to T1 QoL ($F(1, 274) = 120.49$, $\beta = -.55$, $p < .001$). This regression was also conducted for T1 DSM-5-TR prolonged grief symptoms and T1 QoL, again yielding a significant negative relationship ($F(1, 274) = 122.46$, $\beta = -.56$, $p < .001$).

Hypothesis 2

Longitudinal analysis

Four hierarchical regression analyses were run to examine if ICD-11 or DSM-5-TR prolonged grief symptoms predicted QoL at T2 and T3, while controlling for baseline QoL (T1) (hypothesis 2: ICD-11 and DSM-5-TR prolonged grief symptoms significantly predict changes in QoL over time). In all regression analyses, T1 QoL was entered as a control variable in step 1. In step 2, either T1 ICD-11 prolonged grief symptoms or T1 DSM-5-TR prolonged grief symptom scores were entered as a predictor of QoL at T2 or T3 (Table 5).

In the first regression analysis, we examined the association between T1 ICD-11 prolonged grief symptoms and T2 QoL. The overall model test was significant ($F(2, 139) = 101.85$, $p = .04$). In the first step of the model, T1 QoL predicted 58% of variance in T2 QoL. Adding T1 ICD-11 prolonged grief symptoms additionally explained 1% of variance in T2 QoL.

In the second regression analysis, we examined the association between T1 ICD-11 prolonged grief symptoms and T3 QoL. The overall model test was significant ($F(2 ,132) = 87.80$, $p = .03$). In the first step of the model, T1 QoL predicted 56% of variance in T3 QoL. Adding T1 prolonged grief symptoms additionally explained 2% of variance in T3 QoL.

In the third regression analysis, we examined the association between T1 DSM-5-TR prolonged grief symptoms and T2 QoL. The overall model test was significant ($F(2, 139) =$

102.64, p = .02). In the first step of the model, T1 QoL predicted 58% of variance in T2 QoL. Adding T1 DSM-5-TR prolonged grief symptoms additionally explained 2% of variance in T2 QoL.

In the fourth regression analysis, we examined the association between T1 DSM-5-TR prolonged grief symptoms and T3 QoL. The overall model test was significant (F(2, 132) = 87.20, p = .04). In the first step of the model, T1 QoL predicted 56% of variance in T3 QoL. Adding T1 DSM-5-TR prolonged grief symptoms additionally explained 2% of variance in T3 QoL.

Exploratory analysis

The exploratory analysis consisted of implementing Cumming´s rule to determine if there was a statistically significant difference between the standardized beta coefficients of the effects of T1 ICD-11 and DSM-5-TR prolonged grief symptoms on EUROHIS for T2 and T3, while controlling for T1 QoL. As seen in Table 5, the confidence intervals overlapped to the degree that significance was not found. The confidence intervals of the standardized beta coefficients of T1 DSM-5-TR prolonged grief symptoms and T1 ICD-11 prolonged grief symptoms on T2 QoL had a 93% overlap and close to 100% overlap on T3 QoL.

Discussion

The aim of this study was to shed light on criterion validity of PGD per ICD-11 and DSM-5-TR criteria, because the criterion validity of pathological grief has not yet been investigated with the current criteria sets of PGD. We assessed evidence for criterion validity by assessing the concurrent and longitudinal association between ICD-11 and DSM-5-TR prolonged grief symptoms and QoL.

The results provide support for our first hypothesis, ‘ICD-11 and DSM-5-TR PGD symptoms are significantly negatively associated with QoL’. The results of the cross-sectional analysis showed a negative correlation, meaning that when participants scored

higher on T1 ICD-11 and DSM-5-TR prolonged grief symptoms, they scored lower on T1 QoL. This aligns with previous research showing that previously proposed pathological grief symptoms were associated with a reduced QoL (Silverman et al, 2000).

To test our second hypothesis: 'ICD-11 and DSM-5-TR prolonged grief symptoms significantly predict changes in QoL over time', we ran four hierarchical regression analyses. The results of these analyses provided support for our second hypothesis: hierarchical regression analysis showed that T1 ICD-11 and DSM-5-TR prolonged grief symptoms predicted significant changes in QoL over time. These results are in line with previous longitudinal research from Boelen & Prigerson (2007). Boelen & Prigerson found in their study that higher prolonged grief symptom levels predicted reduced QoL over time. However, Boelen & Prigerson did not control for baseline QoL. Because this study does control for baseline QoL, we could shed light on the extent to which ICD-11 and DSM-5-TR prolonged grief symptoms predict changes in QoL over time.

We found evidence for concurrent test-criterion validity in the cross-sectional analysis, as well as evidence for the predictive test-criterion validity in the longitudinal analysis. Previous research on pathological grief provided evidence for different kinds of validity; for example, research about construct validity that focused on the dimensionality of prolonged grief symptoms (Simon et al, 2011), and research about criterion validity from Boelen and Prigerson (2007) looking at predictive validity of prolonged grief symptoms. These consistent results support the criterion validity of the construct of PGD. Because psychologists and other health care professionals work with the construct of PGD in clinical practice, it is important that we found evidence for the validity of the construct.

To elucidate the convergent validity of both ICD-11 and DSM-5-TR prolonged grief symptoms, we compared the 95% confidence intervals of the standardized beta coefficients of T1 ICD-11 and DSM-5-TR prolonged grief symptoms on QoL scores for T2 and T3 to see

if there was a statistically significant difference between the two. There was a big overlap between T1 ICD-11 and DSM-5-TR prolonged grief symptoms at QoL T2, and a near 100% overlap between T1 ICD-11 and DSM-5-TR prolonged grief symptoms at QoL T3. This analysis showed that the associations of prolonged grief symptoms per ICD-11 with T2 and T3 QoL did not appear to differ from associations of prolonged grief symptoms per DSM-5-TR with T2 and T3 QoL. Thus, there were no statistically significant differences between the associations of ICD-11 prolonged grief symptoms and DSM-5-TR prolonged grief symptoms and QoL at the two timepoints. We therefore don't have to worry about statistically significant differences between the two PGDs, and concerns about generalizability are therefore unfounded. We can conclude that we found evidence for the convergent validity of PGD per ICD-11 and DSM-5-TR. These results are partially consistent with research from Haneveld et al (2022), where they found that there were no significant differences between ICD-11 prolonged grief symptoms (increased to meet the time criterion of 12 months) and DSM-5-TR prolonged grief symptoms.

Strengths, limitations, and future implications

The biggest strength of this research is that we did not only assess a cross-sectional association between ICD-11 and DSM-5-TR symptoms and QoL, but also a longitudinal association to examine the extent to which T1 ICD-11 and T1 DSM-5-TR prolonged grief symptoms predicted changes in QoL at T2 and T3. Although there has been research on longitudinal associations between PGD and QoL in the past (e.g., Boelen & Prigerson, 2007), baseline QoL had not previously been controlled for. Prolonged grief symptoms were measured by the TGI-SR+, which can screen for prolonged grief symptoms per ICD-11 criteria and DSM-5-TR criteria. The association between pathological grief and QoL in previous studies that assumes older criterion sets of pathological grief is now replicated to the latest PGD criterion sets by the ICD-11 and DSM-5-TR. We found out through exploratory

analysis that the associations of ICD-11 prolonged grief symptoms with QoL at T2 and T3 did not appear to differ from associations of DSM-5-TR prolonged grief symptoms with QoL at T2 and T3.'

This study also has a number of limitations. The high attrition rate is the first limitation of this study. Only approximately 40% of baseline participants filled out all three questionnaires. Although the attrition-rate can be seen as a limitation of this study, the analysis of possible differences in the drop-out rates between the study completers and study non-completers can be seen as an investigation into whether the possible differences between the groups possibly cause a biased sample which could influence the data. Our analyses showed that of people who indicated wanting to participate in the longitudinal study, women and people bereaved due to suicide were more likely to drop out. However, our sample consisted of more women than men, so it can only be seen as logical that more women dropped out than men. Research shows that people bereaved through suicide are at increased risk of mental health consequences of the loss, and that they have feelings of guilt (De Groot et al, 2006). Although it is not entirely clear why people bereaved through suicide were more likely to drop out, we can speculate that feelings of guilt and avoidance can be a reason why people at first indicated that they wanted to participate in the longitudinal study but did not finish.

Another limitation of this study were non-representative sample characteristics: 92% of the sample reported being female, and 72% of the deceased were male. This can be because of differences in life expectancy. Sex differences in life expectancy are a worldwide phenomenon, with women outliving men by an average of 7 years in developed nations (United Nations, 2009). Furthermore, females are generally overrepresented in grief research (Eisma & Stroebe, 2021). This may be because females are more likely to seek help (Galdas et al., 2005). Despite females generally living longer than men and being overrepresent in

grief research, this study still used a non-representative sample. A recommendation for future research would be the collection of data from a more heterogeneous sample; this would for example mean that more males would be included in the study.

A third limitation is that we decided to exclude a large group of participants from the sample because of time criteria; we selected participants who lost their loved one more than 12 months ago to meet the DSM-5-TR time criterion for PGD. If we selected participants by ICD-11 time criterion (6 months since loss), we would have had a larger sample. In this study, we thus lost power because of a smaller sample, however, we still got significant results. The exclusion of participants is therefore not a problem.

A fourth and last limitation of this study is that the data was acquired by self-report instruments. Self-reports can contain 'response biases,' a systematic tendency to respond to a range of questionnaire items on some basis other than the specific item content, with for example a socially desirable responding bias (tendency to respond in a way that make them look good in the eyes of the researcher) of an extreme responding bias (answering 'never' or 'always' when the answer can also be somewhere in between) (Paulhus, 1991). For this study, this can for example mean that participants might give an exaggerated answer or may not be entirely truthful. However, self-report measurements are also advantageous in for example that results can easily be interpreted (Paulhus & Vazire, 2007). In the future, more diverse types of measurement instruments could be used: for example, observational measures like a clinical interview.

This research provides support for temporal precedence, which is the second condition for causality in addition to association. Although this study cannot support causality due to possible third variables, our study seems to suggest that a causal relationship may possibly exist between prolonged grief symptoms and QoL. Other studies should also include other constructs than QoL to establish more evidence for criterion validity of the new PGDs. Other

research can for example focus on the criterion validity of PGD on stress, anxiety or worrying.

Conclusion

ICD-11 and DSM-5-TR prolonged grief symptoms are significantly negatively associated with QoL. Furthermore, ICD-11 and DSM-5-TR prolonged grief symptoms significantly predict changes in QoL over time. This study is the first to research the relationship between PGD and QoL using the newest PGD symptom sets while simultaneously controlling for baseline QoL. Whereas previous studies assumed older criterion sets of pathological grief, the negative association between pathological grief and QoL is now also replicated to the latest ICD-11 and DSM-5-TR criterion sets of PGD. This research provides support for the concurrent and predictive test-criterion validity of the latest ICD-11 and DSM-5-TR PGD criteria sets. This research provides the basis for more research into the validity of PGD per ICD-11 and DSM-5-TR.

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Table 1

Diagnostic Criteria for Prolonged Grief Disorder by DSM-5-TR and ICD-11 (American Psychiatric Association, 2022, World Health Organization, 2019)

DSM-5-TR criteria		ICD-11 criteria	
A: Event and time criteria	The death, at least 12 months ago, of a person who was close to the bereaved individual (for children and adolescents, at least 6 months ago).	Event	History of bereavement following the death of a partner, parent, child or other person close to the bereaved
B: Core items	Since the death, the development of a persistent grief response characterized by one or both of the following symptoms, which have been present most days to a clinically significant degree. In addition, the symptom(s) has occurred nearly every day for at least the last month: 1. Intense yearning/longing for the deceased person. 2. Preoccupation with thoughts or memories of the deceased person (in children and adolescents, preoccupation may focus on the circumstances of the death).	Core items	A persistent and pervasive grief response characterized by one of the following symptoms: 1. Longing for the deceased 2. Persistent preoccupation of the deceased
C: Accessory items	Since the death, at least three of the following symptoms have been present most days to a clinically significant degree. In addition, the symptoms have occurred nearly every day for at least the last month: 3. Identity disruption (e.g., feeling as though part of oneself has died) since the death. 4. Marked sense of disbelief about the death. 5. Avoidance of reminders that the person is dead (in children and adolescents, may be characterized by efforts to avoid reminders).	Accessory items	Accompanied by intense emotional pain, e.g., sadness, guilt, anger, denial, blame Difficulty accepting the death Feeling that one has lost a part of one's self An inability to experience positive mood Emotional numbness Difficulty engaging with social or other activities

	6. Intense emotional pain (e.g., anger, bitterness, sorrow) related to the death. 7. Difficulty reintegrating into one's relationships and activities after the death (e.g., problems engaging with friends, pursuing interests, or planning for the future). 8. Emotional numbness (absence or marked reduction of emotional experience) as a result of the death. 9. Feeling that life is meaningless as a result of the death. 10. Intense loneliness as a result of the death.		
D: Impairment criteria	The disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning.	Impairment criteria	The disturbance results in significant impairment in personal, family, social, educational, occupational or other important areas of functioning. If functioning is maintained, it is only through significant additional effort.
E: Cultural features	The duration and severity of the bereavement reaction clearly exceed expected social, cultural, or religious norms for the individual's culture and context.	Cultural and time features	The pervasive grief response has persisted for an atypically long period of time following the loss, markedly exceeding expected social, cultural or religious norms for the individual's culture and context. Grief responses lasting for less than 6 months, and for longer periods in some cultural contexts, should not be regarded as meeting this requirement.
F: Relation to other mental disorders	The symptoms are not better explained by another mental disorder, such as major depressive disorder or posttraumatic stress disorder, and are not attributable to the physiological effects of a substance (e.g., medication, alcohol) or another medical condition		

Table 1

Demographic and Loss-related Characteristics of the Sample (N=276)

Characteristics	Category	Valid *N*	Percentage	Mean	*SD*	Range
Sex	Male	22	8	-	-	-
	Female	254	92	-	-	-
Educational	Higher Education	152	55	-	-	-
level	Lower Education	124	54	-	-	-
Deceased is	Partner, lover, or spouse	126	46	-	-	-
	Parent	78	28	-	-	-
	Child	35	13	-	-	-
	Sibling	25	9	-	-	-
	Other	12	4	-	-	-
Sex of the	Male	199	72	-	-	-
deceased	Female	75	27	-	-	-
Cause of	Natural cause	209	76	-	-	-
death	Accident	23	8	-	-	-
	Suicide	43	16	-	-	-
	Murder	1	0	-	-	-
Death was:	Expected	75	27	-	-	-
	Unexpected	153	55	-	-	-
	Both or neither	48	17	-	-	-

Age in years	-	-	-	53.67	14.02	18-81
Time loss in months	-	-	-	32.29	17.21	12-61

Table 2

Dropout Analysis: Comparison between Dropout Group 1 and Opting to Continue after T1 on Sample Characteristics, T1 QoL, T1 ICD-11 Prolonged Grief Symptoms and T1 DSM-5-TR Prolonged Grief Symptoms

Variables	*t*	Pearson´s Chi-Square	Likelihood Ratio	Mean (dropout)	Mean (not dropout)
T1 ICD-11 prolonged grief symptoms	.45	-	-	38.94	39.61
T1 DSM-5-TR prolonged grief symptoms	.53	-	-	37.13	37.86
T1 QoL	-1.00	-	-	26.35	25.52
Age	.72	-	-	34.94	36.10
Time since loss	-.30	-	-	32.97	32.36
Sex	-	.56	-	-	-
Education	-	-	7.39	-	-
Relationship with deceased	-	4.25	-	-	-
Cause of death	-	-	1.58	-	-
Expectedness of death	-	5.79	-	-	-

Note. * $p < .05$. ** $p < .01$.

Table 3

Dropout Analysis: Comparison between Dropout Group 2 and Study Completers on Sample Characteristics, T1 QoL, T1 ICD-11 Prolonged Grief Symptoms and T1 DSM-5-TR Prolonged Grief Symptoms

Variables	*t*	Pearson´s Chi-Square	Likelihood Ratio	Mean (dropout)	Mean (not dropout)
T1 ICD-11 prolonged grief symptoms	-1.07	-	-	40.68	38.9
T1 DSM-5-TR prolonged grief symptoms	-.57	-	-	38.37	37.50
T1 QoL	1.50	-	-	24.74	26.06
Age	1.81	-	-	33.89	37.60
Time since loss	-1.61	-	-	34.74	30.75
Sex	-	5.58*[a]	-	-	-
Education	-	3.12	-	-	-
Relationship with deceased	-	8.80	-	-	-
Cause of death	-	-	13.43**[b]	-	-
Expectedness of death	-	1.03	-	-	-

Note. [a] Sex (females): 97% in dropout group 2, 88% in study completers; [b] Cause of death (suicide): 27% in dropout group 2, 9% in study completers

* $p < .05$. ** $p < .01$.

Table 4

Longitudinal Analyses of T1 ICD-11 Prolonged Grief Symptoms and T1 DSM-5-TR Prolonged Grief Symptoms on T2 QoL and T3 QoL while Controlling for T1 QoL

QoL	Time 2			Time 3			95% Confidence Interval for β Coefficient at T2		95% Confidence Interval for β Coefficient at T3	
	ΔF	ΔR^2	β	ΔF	ΔR^2	β	Lower	Upper	Lower	Upper
Step 1	194.24	.58	.76	165.62	.56	.75	-	-	-	-
T1 QoL										
Step 2	4.54*	.01	-.14	5.00*	.02	-.15	-.27	-.00[a]	-.30	-.01
T1 ICD-11 prolonged grief symptoms										
Step 1	194.24	.58	.76	165.62	.56	.75	-	-	-	-
T1 QoL										
Step 2	5.20*	.02	-.14	4.47*	.02	-.14	-.27	-.02	-.30	-.01
T1 DSM-5-TR prolonged grief symptoms										

Note. * $p < .05$.

Appendix A

Assumption Checks

Hypothesis 1

To investigate if the model assumptions for the regression analyses on the first hypothesis were met, several analyses were executed to check for normality of residuals, homoscedasticity, linearity, and outliers. To start off with the outliers, the variables were investigated in Supplemental Figure 1 which showed an outlier for the T1 QoL. To check whether this outlier was influential, Cook's Distance was assessed in Supplemental Table 1 (*Cook's Distance* = .004). Since the value is not larger than one, the outlier is not influential and was kept in the data. As for the assumption of normality, multiple values and figures are assessed. Firstly, the data showed to be symmetrical as the skewness values lie within the range of -0.5 and 0.5. Secondly, the kurtosis values lie within the range of -1 and 1. The significance values of the Shapiro-Wilk test show significant values for both T1 DSM-5-TR prolonged grief symptoms (p = .002) and T1 ICD-11 prolonged grief symptoms (p = .005), which means the population of the data is not normally distributed for these variables. A significant Shapiro-Wilk test is common in larger samples as it is sensitive to sample size. However, the reasonably straight lines in Supplemental Figure 2 suggest a normal distribution. Therefore, the assumption of normality is met (see Supplemental Table 2). Finally, Supplemental Figures 2 and 3 indicate that the assumption for homoscedasticity and linearity were met as the data is spread along the lines equally.

Hypothesis 2

To analyze the model assumptions for the second hypothesis, we checked for outliers, normality, homoscedasticity, linearity, and multicollinearity. The outliers of the variables were investigated in Supplemental Figure 4, this shows an outlier for the T2 QoL and T3 QoL. Cook's Distance was assessed in Supplemental Table 1, since the values are not larger than one, the outliers are not influential and were kept in the data. For the assumption of normality multiple values and figures are assessed. Firstly, the skewness values lie within the range of -0.5 and 0.5, except for the T2 QoL

variable. Secondly, the kurtosis values lie within the range of -1 and 1. The significance values of the Shapiro-Wilk test show significant values for both T1 DSM-5-TR prolonged grief symptoms (p = .002), and T1 ICD-11 prolonged grief symptoms (p = .005), T2 QoL (p = .005), and T3 QoL (p = .013) which means the population of the data is not normally distributed for these variables (see Supplemental Table 2). A violation of the assumption of normality for the Shapiro-Wilk test is common in larger samples. The reasonably straight lines in Supplemental Figure 5 and 6 suggest a normal distribution. The assumption of normality is met. The assumption of homoscedasticity is not violated as there is no pattern shown as seen in Supplemental Figure 7 and 8. Similarly, the residuals showed to be spread along the line equally (Supplemental Figures 5, 6 ,7 ,8). Therefore, the assumption of linearity also appears met. Finally, tests used to check for multicollinearity showed that this was not in concern as the correlations are all below 0.7, the VIF levels were below 10 and scores for Tolerance were higher than 0.1 (see Supplemental Table 3 and 4).

Supplemental Table 1

Cook's Distance Values for T1 QoL, T2 QoL, and T3 QoL with T1 ICD-11 Prolonged Grief Symptoms and T1 DSM-5-TR Prolonged Grief Symptoms

Variables	T1 QoL	T2 QoL	T3 QoL
T1 ICD-11 prolonged grief symptoms	.00	.01	.01
T1 DSM-5-TR prolonged grief symptoms	.00	.01	.01

Supplemental Table 2

Skewness, Kurtosis, and Shapiro-Wilk Values for T1 QoL, T2 QoL, and T3 QoL with T1 ICD-11 Prolonged Grief Symptoms and T1 DSM-5-TR Prolonged Grief Symptoms

Variables	*N*	Skewness		Kurtosis		Shapiro-Wilk	
	Statistic	Statistic	Std. Error	Statistic	Std. Error	Statistic	Sig.
Time_since_loss_1=1 (FILTER)	316	.	.	.	.	.	.
T1 QoL	276	-.10	.15	-.26	.29	.99	.18
T2 QoL	142	-.62	.20	.72	.40	.97	.01
T3 QoL	135	-.48	.21	.39	.41	.98	.01
T1 ICD-11 prolonged grief symptoms	288	-.16	.14	-.67	.29	.99	.01
T1 DSM-5-TR prolonged grief symptoms	288	-.29	.14	-.50	.29	.98	.00
Valid *N* (listwise)	276						

Supplemental Table 3

Pearson's Correlations between Variables T2 QoL and T1 ICD-11 Prolonged Grief Symptoms, T3 QoL and T1 ICD-11 Prolonged Grief Symptoms, T2 QoL and T1 DSM-5-TR Prolonged Grief Symptoms and T3 QoL and T1 DSM-5-TR Prolonged Grief Symptoms

Variables	T2 QoL	T3 QoL
	Correlation	Correlation
T1 ICD-11 prolonged grief symptoms	-.50	-.47
T1 DSM-5-TR prolonged grief symptoms	-.50	-.46

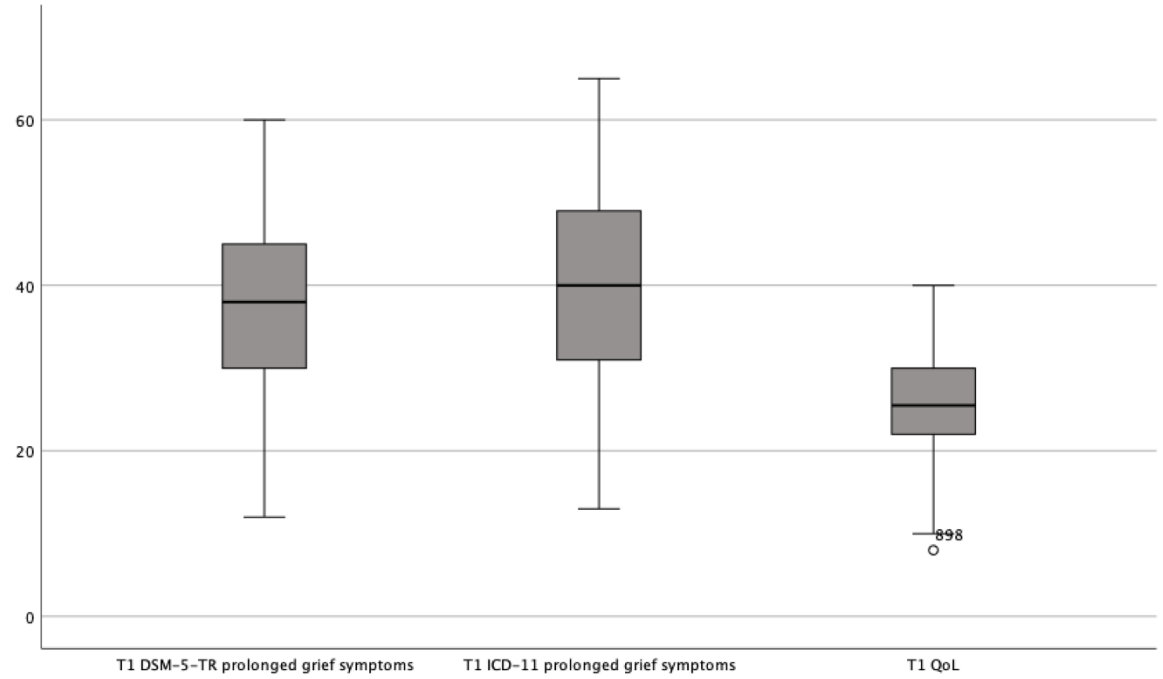
Supplemental Table 4

Tolerance and VIF Scores for the Variables T2 QoL, T3 QoL, T1 ICD-11 Prolonged Grief Symptoms and T1 DSM-5-TR Prolonged Grief Symptoms

Variables	T2 QoL		T3 QoL	
	Tolerance	VIF	Tolerance	VIF
T1 ICD-11 prolonged grief symptoms	.72	1.39	.77	1.30
T1 DSM-5-TR prolonged grief symptoms	.73	1.36	.78	1.28

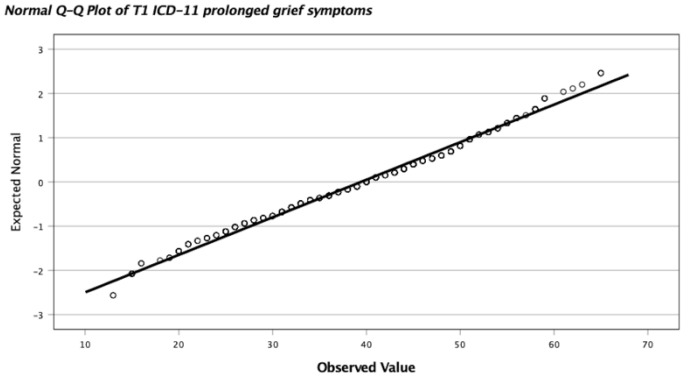
Supplemental Figure 1

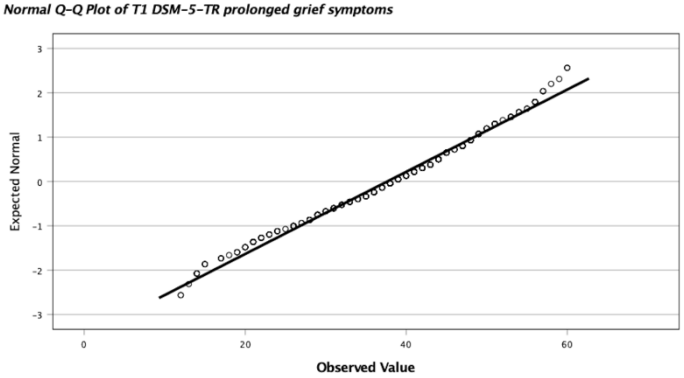
Boxplots for T1 DSM-5-TR Prolonged Grief Symptoms, T1 ICD-11 Prolonged Grief Symptoms, and T1 QoL

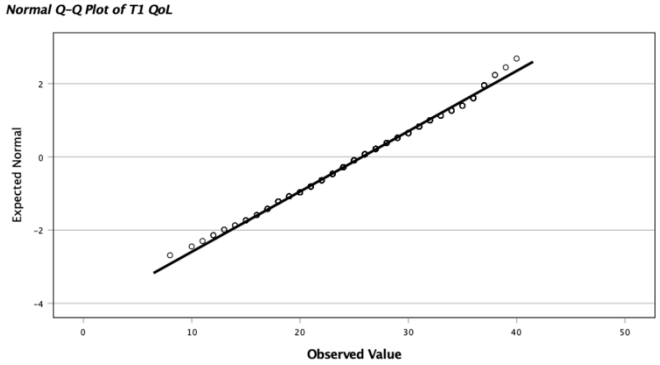


Supplemental Figure 2

Normal QQ-plots for T1 QoL, T1 ICD-11 Prolonged Grief Symptoms, and T1 DSM-5-TR Prolonged Grief Symptoms

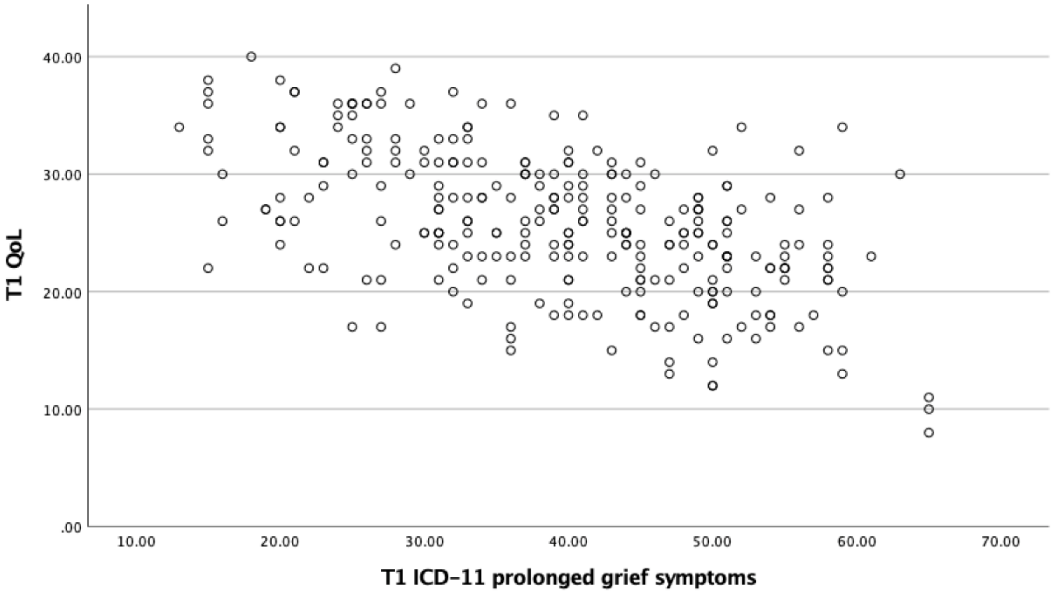


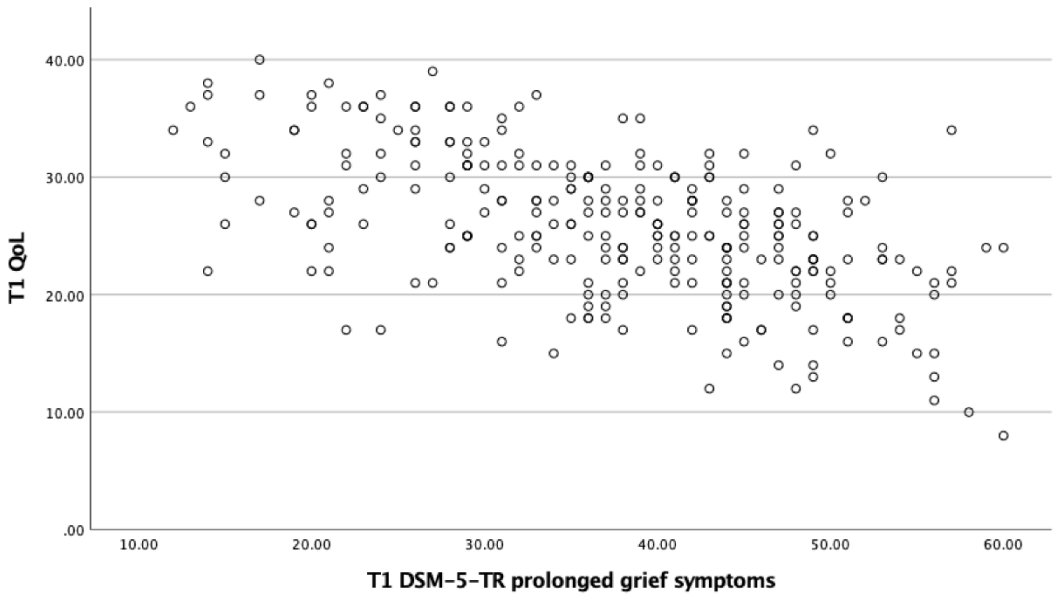




Supplemental Figure 3

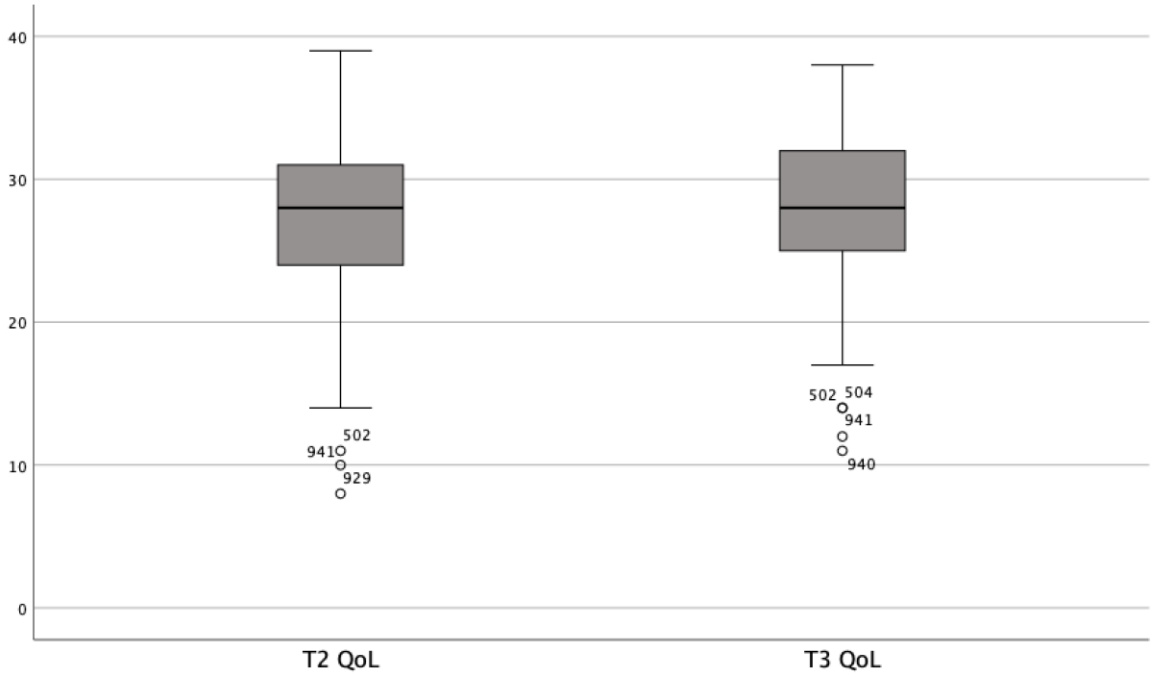
Scatterplots Showing the Relationship between T1 ICD-11 Prolonged Grief Symptoms and T1 QoL, and between T1 DSM-5-TR Prolonged Grief Symptoms and T1 QoL





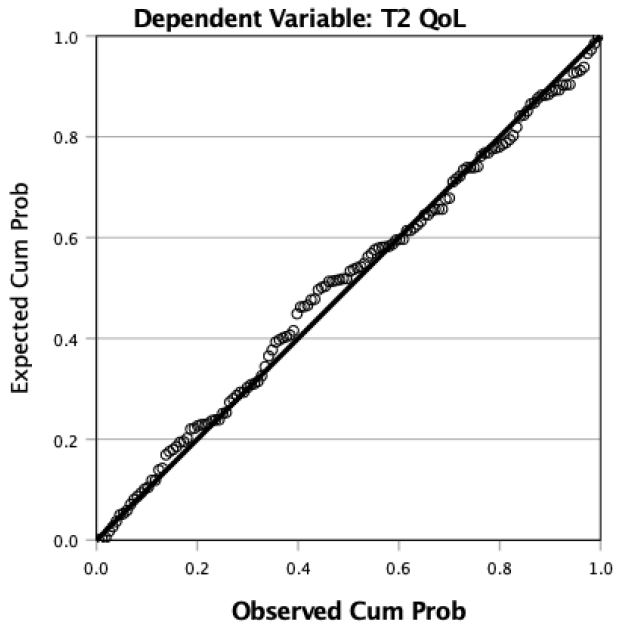
Supplemental Figure 4

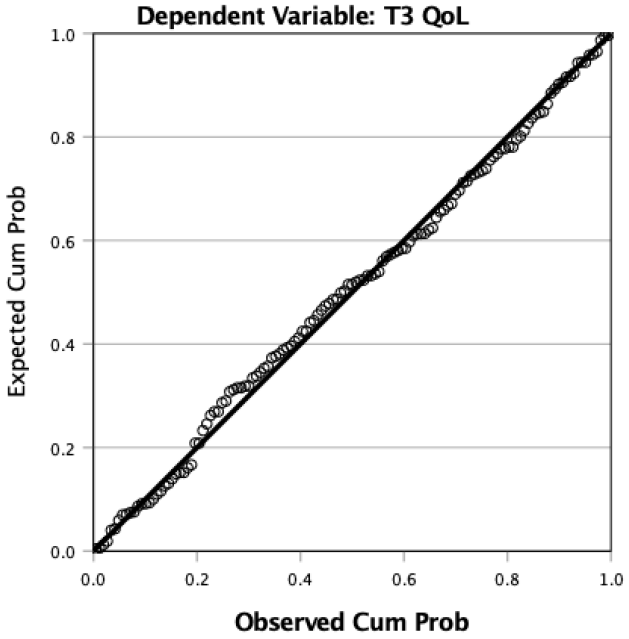
Boxplots for T2 QoL and T3 QoL



Supplemental Figure 5

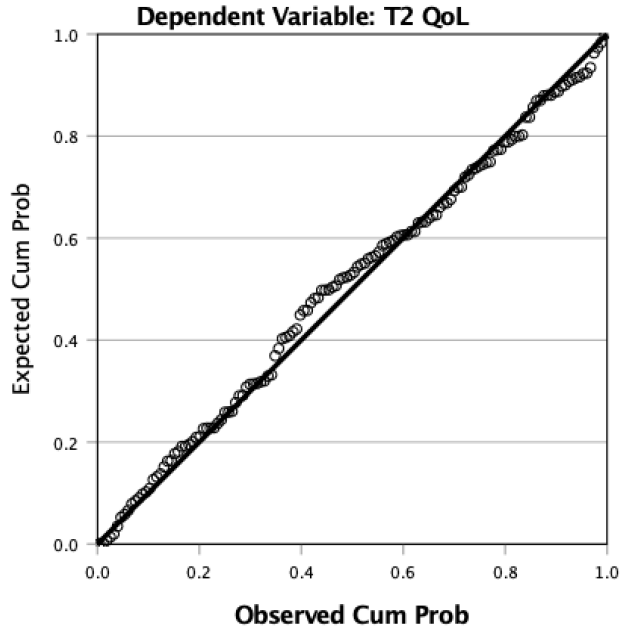
Normal PP-plots for T2 QoL and T3 QoL with T1 ICD-11 Prolonged Grief Symptoms

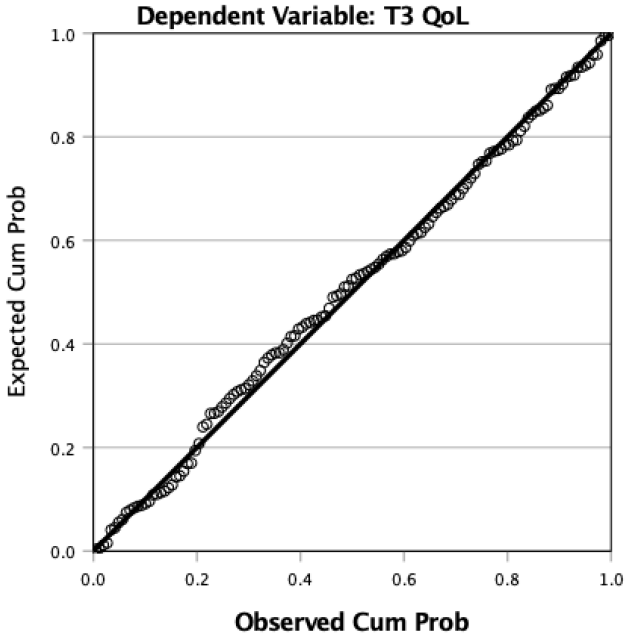




Supplemental Figure 6

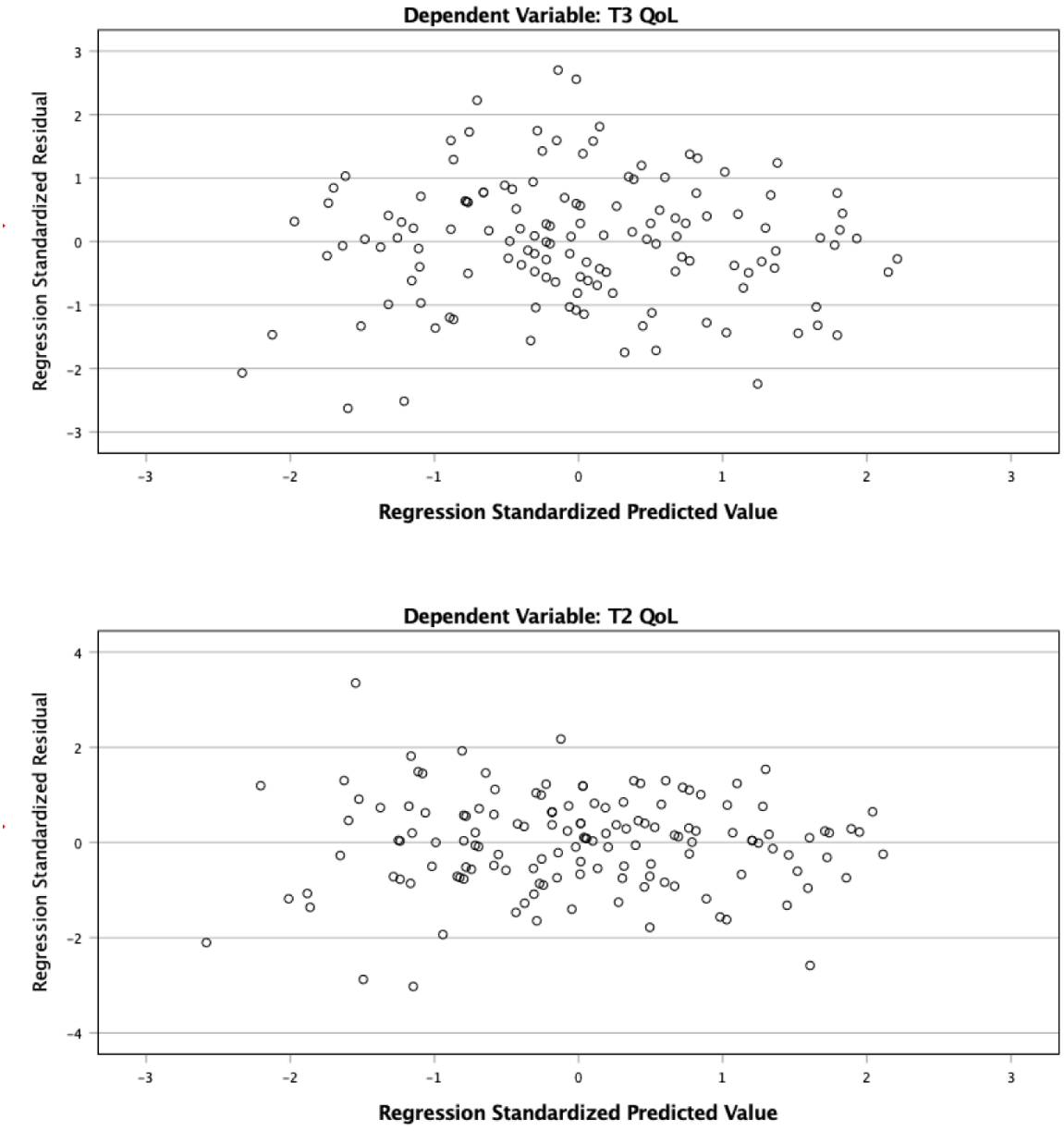
Normal PP-plots for T2 QoL and T3 QoL with T1 DSM-5-TR Prolonged Grief Symptoms





Supplemental Figure 7

Scatterplots of the Standardized Residuals for T2 QoL and T3 QoL with T1 ICD-11 Prolonged Grief Symptoms



Supplemental Figure 8

Scatterplots of the Standardized Residuals for T2 QoL and T3 QoL with T1 DSM-5-TR Prolonged Grief Symptoms