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Clinical Psychology & Psychotherapy

WILEY

RESEARCH ARTICLE OPEN ACCESS

A Latent Class Analysis on Indicators of Early Prolonged Grief Disorder and Well-Being Among Dutch Adults Bereaved During the First Year of the COVID-19 Pandemic

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Received: 13 February 2024 | **Revised:** 25 June 2024 | **Accepted:** 26 August 2024

Funding: This study was funded by ARQ National Psychotrauma Centre and by Dutch health insurance companies Delfland, Schieland, Westland (DSW) and Centraal Ziekenfonds (CZ).

Keywords: bereavement | COVID-19 | loss | mental health | prolonged grief | well-being

ABSTRACT

Most studies examining prolonged grief disorder (PGD) in people bereaved during the COVID-19 pandemic are focused on psychopathology. However, mental health encompasses both absence of psychopathology and presence of well-being. This is the first study examining symptom profiles of early PGD and subjective mental well-being in 266 Dutch adults recently bereaved during the pandemic. Early PGD and well-being indicators were assessed with the Traumatic Grief Inventory–Self Report Plus and the World Health Organization–Five Well-Being Index, respectively. Latent class analysis identified four classes: low PGD/high well-being (32%), low PGD/moderate well-being (24%), moderate PGD/high well-being (23%) and high PGD/low well-being class (21%). People in the poorer mental health classes were more likely to be female, lower educated, suffering from a mental disorder, have a poor health status, closer kinship to the deceased, and higher risk of severe COVID-19. Classifying adults according to symptom profiles of negative and positive outcomes provides a more complete picture of mental health in bereaved people and offers potential intervention targets.

1 | Introduction

People vary in how they respond to the loss of a loved one. For most people, grief reactions will naturally decrease over time (Nielsen et al. 2019). However, 10% of people bereaved by a natural cause of death (Lundorff et al. 2017) and 49% bereaved by an unnatural cause of death (Djelantik et al. 2020) develop disabling grief symptoms. These grief symptoms are referred to as prolonged grief disorder (PGD) in the text revision of the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5-TR; American Psychological Association [APA] 2022). PGD is characterized by persistent yearning/longing for the deceased and preoccupation with thoughts or memories of the deceased for at least 12 months after loss. A PGD

Summary

- Early prolonged grief disorder symptoms can co-occur alternatively with well-being among people bereaved during the COVID-19 pandemic.
- Most bereaved people adjust well in response to a loss during the pandemic.
- In treatment, clinicians should not only focus on decreasing prolonged grief disorder symptoms but also consider increasing well-being in bereaved people.

diagnosis is also included in the 11th edition of the International Classification of Diseases (ICD-11; WHO 2018). PGD as defined in the ICD-11 is characterized by distressing and disabling longing for and/or preoccupation with the deceased, accompanied by feelings of guilt, anger and intense emotional pain persisting at least 6 months post-loss. Hereafter, disordered grief symptoms are referred to as PGD symptoms.

With 7 million registered COVID-19 deaths, the pandemic has left an estimated 63 million people worldwide to cope with the loss of a loved one (as of November 2023) (Verdery et al. 2020; World Health Organization [WHO] 2023). Early in the pandemic, an increased risk for PGD was expected due to the potential traumatic characteristics of deaths during the pandemic (Eisma, Boelen, and Lenferink 2020; Kokou-Kpolou, Fernández-Alcántara, and Cénat 2020). Pandemic-related factors that were assumed to increase the risk for PGD included limited opportunities for grieving rituals, social isolation due to quarantine measures, secondary stressors and experiencing multiple losses (Brooks et al. 2020; Cao et al. 2020; Chen 2022; Hengst, Smid, and Laban 2018; Lobb et al. 2010; Mitima-Verloop et al. 2022). Indeed, a meta-analysis indicated that the prevalence of clinically relevant PGD is high (i.e., 46%) in people bereaved during the pandemic (Kustanti et al. 2023) and comparable to unnatural losses. Moreover, a living systematic review demonstrated that the prevalence of clinically relevant PGD is high (i.e., 30%–48%) in people bereaved due to COVID-19 (Reitsma, Killikelly, et al. 2023). They concluded that losses during the pandemic may be associated with an increase in clinically relevant PGD, irrespective of the cause of death. Yet, caution is warranted in interpreting the findings of prior studies regarding PGD severity, because PGD was measured less than 12 months post-loss on average (Reitsma, Killikelly, et al. 2023). Therefore, inferences can only be drawn about early PGD and not about full-blown PGD.

Numerous additional factors (not specific to losses during the pandemic) may increase the risk of PGD in bereaved people. Socio-demographic factors, such as being female or having a practical educational level, loss-related factors, such as experiencing unnatural loss, having a close relationship to the deceased and more recent deaths, and health-related factors, such as a history of mental health issues and being exposed to more potentially traumatic events, are associated with elevated PGD levels (Boelen 2021; Djelantik et al. 2017, 2020; Heeke et al. 2019; Heeke et al. 2022; Lobb et al. 2010).

To date, most studies on PGD during the pandemic have focused exclusively on psychopathology (Reitsma, Killikelly, et al. 2023). However, mental health not only encompasses less psychopathology but also increased well-being. The dual-continua model of mental health by Keyes (2005) holds that psychopathology and well-being are related, yet distinct dimensions. Accordingly, the absence of psychopathology does not imply the presence of well-being and vice versa. This is why focusing only on the presence or absence of psychopathology gives an overly one-sided picture of mental health. As postulated by the dual-continua model, four categories of mental health can be distinguished: a group characterized by (1) low psychopathology and high well-being, (2) low psychopathology and low well-being, (3) high psychopathology and high well-being and (4) high psychopathology and low well-being. Indeed, a scoping review summarized evidence for the dual-continua model of mental health (Iasiello, van Agteren, and Cochrane 2020). In addition, psychological disorders have often been studied dichotomously (i.e., absent or present) by reporting on prevalence rates or have been studied using means of symptom levels. These methods ignore the diversity of psychological responses among people. A growing body of research provides evidence that psychological responses vary widely (e.g., Heeke et al. 2023; Kristensen, Dyregrov, and Gjestad 2020; Lenferink et al. 2020; Pociunaite et al. 2023; Sveen et al. 2018). A statistical method that can be used to identify subgroups of people that vary in response patterns is latent class analysis (LCA). LCA classifies people into unobserved subgroups (i.e., latent classes) based on similar response patterns (Hagenaars and McCutcheon 2002; Lazarsfeld 1950).

Most previous studies examining latent classes of indicators of mental health in bereaved people were focused on either negative psychological outcomes (Heeke et al. 2023) or positive psychological outcomes (Wang et al. 2017; Zhang et al. 2016). So far, only three prior latent class analytic studies simultaneously considered negative (e.g., PGD) and positive (i.e., posttraumatic growth) psychological symptom profiles following bereavement (Chen and Tang 2021; Kokou-Kpolou et al. 2022; Zhou et al. 2018). To our understanding, no studies have yet been conducted examining classes of bereaved people in terms of indicators of PGD and psychological well-being. Well-being is different from posttraumatic growth, as the former relates to positive functioning, while the latter focuses solely on positive psychological change following a traumatic event. More research on mental health, comprising of PGD and well-being, is needed to enhance our understanding of the psychological impact of losses during the pandemic.

Our first aim was to examine if latent classes can be identified that differ in terms of the endorsement of indicators of early PGD (i.e., bereaved less than 12 months earlier according to DSM-5-TR) and subjective mental well-being among Dutch people who lost a loved one during the first year of the COVID-19 pandemic. Examining early PGD (and not PGD) is relevant for at least two reasons. First, one of the most robust predictors for the development of clinically relevant PGD is experiencing severe PGD symptoms early in the grieving process (Boelen and Lenferink 2020, 2021). Second, latent trajectory studies indicate that a chronic PGD trajectory can already be detected early in the grieving process (Bonanno and Malgaroli 2020; Djelantik, Robinaugh, and Boelen 2022; Lenferink et al. 2020; Lundorff et al. 2020; Nielsen et al. 2019; Pociunaite et al. 2023; Smith and Ehlers 2020).

As shown in our pre-registration (see: https://osf.io/9435r) and based on prior research and theoretical work (Chen and Tang 2021; Iasiello, van Agteren, and Cochrane 2020; Keyes 2005; Kokou-Kpolou et al. 2022; Zhou et al. 2018), we expected to identify at least three different latent classes: (1) a class characterized by low early PGD and moderate/high well-being, (2) a class characterized by moderate/ high early PGD and moderate/ high well-being and (3) a class characterized by moderate/high early PGD and low well-being. The second aim of this study was to examine whether class membership was associated with several socio-demographic, loss-related, pandemic-related, health-related and trauma-related characteristics. Based on prior research (Boelen 2021; Chen and Tang 2021; Djelantik et al. 2017; Heeke et al. 2022), it was expected that people belonging to classes with poorer mental health were more likely to be female, to have a practical education, to have lost a nuclear family member, to be more recently bereaved, to have a history of mental health issues, to have experienced a traumatic event before or during the pandemic and to be bereaved due to COVID-19. In addition, we exploratively examined the association between class membership and several COVID-19–related factors that may deteriorate positive mental health, including high risk for severe COVID-19, less in-person social contact during the pandemic and poor self-reported current health status.

2 | Method

2.1 | Study Design

This cross-sectional study is part of a longitudinal online study, named CONNECT, evaluating the impact of the COVID-19 pandemic on mental health outcomes in the Dutch general population (Lenferink, Mouthaan, et al. 2022). The CONNECT study is part of a pan-European research collaboration under coordination of the European Society for Traumatic Stress Studies (ESTSS) executed in 11 countries (the ADJUST project; Ajduković, Rezo Bagarić, and Ajduković 2022; Eklund et al. 2022; Gelezelyte et al. 2021; Jernslett et al. 2022; Kenntemich et al. 2022; Lenferink, Mouthaan, et al. 2022; Lotzin et al., 2020, 2021; Lotzin, Ketelsen, Krause, et al. 2022; Lotzin, Ketelsen, Zrnić, et al. 2022; Lotzin, Krause, et al. 2022; Lueger-Schuster, Zrnić Novaković, and Lotzin 2022; Meyer et al. 2022; Zrnić Novaković et al. 2022). Participants in the CONNECT study were assessed at three time points, with 6 months intervals between the time points. The current study used the baseline data of participants who reported to have lost a loved one during the pandemic, which were collected between July 16 and November 16, 2020.

This time period encompassed the first wave and the beginning of the second wave of the COVID-19 pandemic in the Netherlands. The following government measures were implemented to prevent spreading of the coronavirus: (1) the 1.5-m-distance measure, (2) closure of hotels, restaurants and cafes, (3) discouragement of leisure travel, (4) restrictions in the number of visitors at home (a maximum of three people were allowed), (5) in indoor areas a maximum number of 30 people were allowed (i.e., where people were seated) and (6) a nationwide partial lock-down was in effect from October 14, 2020 (Rijksoverheid 2020). The reproduction rate (i.e., the rate of spreading of the coronavirus) fluctuated between 0.83 and 1.44 during this time period (Rijksoverheid 2023). At the time, vaccinations for COVID-19 were not available.

2.2 | Participants and Procedure

In total, 2443 participants started filling out the online survey. The inclusion criteria were being: (1) aged ≥ 18 years, (2) resident of the Netherlands at the time of participation and (3) able to read Dutch or English. This study included the data of participants who reported to have lost a loved one during the COVID-19 pandemic. For the latter, the following question was used: 'Have you lost a loved one since March 2020? (yes/no)'. Recruitment of the participants took place through social media platforms (LinkedIn, Twitter, Instagram, Facebook and WhatsApp), mental healthcare institutes and four Dutch universities (i.e., Utrecht University, Leiden University, the University of Groningen and Radboud University Nijmegen). As an incentive for participation, people took part in a raffle to win a voucher of €25. The odds for winning were 1:100. First-year students from the four Dutch universities could participate in return for course credits. Additionally, via a marketing agency, volunteers were recruited from the general population representing certain socio-demographic subgroups (i.e., people with low/middle socio-economic backgrounds, people between 40 and 60 years old, and males) who were underrepresented in this specific study halfway through the first wave of data collection.

Participants provided informed consent prior to filling out the online survey. The online survey took about 20 minutes to complete. This study has been approved by the Faculty Ethics Committee of Utrecht University (20-360), Leiden University (V1-2619), University of Groningen (PSY-1920-S-0517) and Radboud University Nijmegen (ECSW-2020-127).

2.3 | Measures

2.3.1 | Early PGD Symptoms

Early PGD symptoms (i.e., within 12 months post-loss) in accord with the DSM-5-TR criteria were assessed with 11 items that represent the 10 DSM-5-TR PGD symptoms of the Traumatic Grief Inventory–Self Report Plus (TGI-SR+; Lenferink, Eisma, et al. 2022). One PGD DSM-5-TR symptom was assessed with two items. The highest score on one of these two items represents the symptom. Participants indicated how often they had experienced each reaction in the past month in response to the death of their loved one during the COVID-19 pandemic. An example item is: 'I experienced intense emotional pain, sadness, or pangs of grief'. Items are rated on 5-point Likert scales ranging from 1 = *never* to 5 = *always*. A score of ≥ 33 was used as a cut-off for clinically significant PGD DSM-5-TR severity, based on the 10 PGD DSM-5-TR symptoms measured by the TGI-SR+. The TGI-SR+ has shown to be a reliable and valid instrument to assess PGD severity (see Lenferink, Eisma, et al. 2022). Internal consistency of the PGD DSM-5-TR items in this study was high ($\alpha = 0.92$).

2.3.2 | Subjective Mental Well-Being

Subjective mental well-being was measured with the World Health Organization–Five Well-Being Index (WHO-5), derived from the 10-item and 28-item WHO Well-being Questionnaires (Bech 2004). The WHO-5 consists of five items to assess subjective mental well-being during the past 2 weeks on 6-point Likert scales from 0 = *at no time* to 5 = *all of the time*. An example item is: 'I have felt calm and relaxed'. The total score, ranging from 0 to 25, is multiplied by four to represent the final score, with 0 and 100 representing the worst vs. optimal possible well-being, respectively. The WHO-5 has sound psychometric properties (Sischka et al. 2020; Topp et al. 2015). Internal consistency in the current study was high ($\alpha = 0.91$).

2.3.3 | Possible Correlates of Class Membership

Socio-demographic characteristics considered were gender and educational level. Loss-related characteristics included kinship to deceased, time since death in days and cause of death. Pandemic-related characteristics included more time spent at home and in-person social contact. Health-related characteristics consisted of current health status, diagnosis of a mental disorder and risk of severe COVID-19. Pandemic-related and health-related characteristics were assessed with items developed for the ADJUST project (Lotzin et al. 2020). Trauma-related characteristics consisted of having experienced a potential traumatic event before the pandemic. See Table S1 for an overview of how possible correlates of class membership were assessed.

2.4 | Data Analyses

Mplus version 8.3 was used to perform the LCA (Muthén and Muthén 1998-2017). Dichotomized item scores for early PGD and well-being were used as indicators in the LCA. This is in line with prior LCA research (Heeke et al. 2022; Lenferink, Mouthaan, et al. 2022). Early PGD symptoms were considered 'absent' when rated with 1 or 2 and 'present' when rated with 3–5 (Heeke et al. 2022). Similar dichotomizing methods were used for well-being; responses were considered 'low' when scored with 0–2 and 'high' when scored with 3–5, in accord with Lenferink, Mouthaan, et al. (2022).

Latent class models up to six classes were estimated. Based on the fit indices, the model with the best fit was selected. The optimal number of classes was determined by (1) lower values of Akaike's information criterion (AIC) and (sample − size adjusted) Bayesian information criterion ((SSA) − BIC), (2) higher entropy R^2 with values > 0.80 being considered as acceptable (Van De Schoot et al. 2017) and (3) a significant p-value ($p < 0.050$) of the bootstrap likelihood ratio test (BLRt), which demonstrates that the model under consideration has a significantly improved fit compared to the model with one less class (Nylund, Asparouhov, and Muthén 2007). In addition, the interpretability of the class solutions and consistency with prior literature/theory was considered. When statistical fit indices were inconclusive, decisions were based on the BIC value (Van De Schoot et al. 2017). When interpretating LCA outcomes, a symptom probability estimate of < 0.15 was considered as low, ≥ 0.15 and ≤ 0.59 moderate and ≥ 0.60 high (cf. Burstein et al. 2012). The Guidelines for Reporting on Latent Class Analyses were followed, as proposed by Heeke et al. (2023).

Possible correlates of class membership were examined using the three-step approach implemented in Mplus. By doing this, the classification error was taken into account, resulting from assigning people to classes with the highest probability estimate. Possible correlates were first examined separately in univariate logistic regression analyses. Next, all significant correlates were examined simultaneously in a multinomial logistic regression analysis. The variable gender originally consisted of three categories (male, female, other), but since no participants identified themselves as 'other', gender was dichotomized into 0 = male, 1 = female. In addition, the following variables were recoded for the analyses: educational level (0 = ≤ practical education, 1 = college/university), kinship to deceased (0 = other than nuclear family member [originally categories 1–7], 1 = nuclear family member [originally categories 8–10]), cause of death (0 = COVID-19, 1 = other), spent more time at home (0 = no [originally category 1], 1 = yes [originally categories 2–5]), in-person social contact (0 = no in-person contact [originally category 1], 1 = in-person contact [originally categories 2–6]) and current self-reported health status (0 = good [originally categories 1–3], 1 = poor [originally categories 4–5]).

There were no missing data on PGD and well-being items. A total of 7 responses (2.6%) were missing on the possible correlate time since death. There were no missing data on the other possible correlates of class membership. Multiple imputation was used to handle missing data on possible correlates of class membership. One hundred imputed datasets were created (Graham, Olchowski, and Gilreath 2007; Little et al. 2014).

2.5 | Open Science Practices

A pre-registration of this study (https://osf.io/9435r) can be found on the Open Science Framework (OSF). The study was pre-registered after the completion of data collection. An overview of all measures is available online on the OSF (https://osf.io/qeba5/). In contrast to the study pre-registration, we excluded the possible correlate having experienced a potential traumatic event during the pandemic, because, as per the inclusion criterion in the current study, all participants had been exposed to death due to loss of a loved one during the pandemic, which could be considered a potential traumatic event. Therefore, accurate measurement of this correlate was not attainable.

3 | Results

3.1 | Sample Characteristics

In total, 275 participants reported to have lost a loved one during the pandemic. However, because two people reported a date of death before March 2020 and seven people had no data on early PGD and well-being indicators, analyses were performed on data of 266 participants. The participants' age ranged from 18 to 82 ($M = 40.50$, $SD = 18.85$) years. Most participants were female (73.3%), and the majority of participants completed 10–13 years of education (35.3%). Concerning loss-related characteristics,

most people lost a distant family member (87.6%) not due to COVID-19 (75.6%). The time since death ranged between 0 and 266 ($M = 114.77$, $SD = 66.79$) days. Concerning health-related characteristics, 44.0% reported their current health as good. Additionally, most participants were not at risk for severe COVID-19 (75.2%) and had never been diagnosed with a mental disorder (69.5%). Regarding trauma-related characteristics, most participants had experienced a traumatic event before the pandemic (74.8%). Table 1 displays the sample characteristics.

3.2 | Model Fit of Latent Classes

Fit indices for the one to six class models are shown in Table 2. All models yielded acceptable entropy R^2 values (> 0.80) and significant BLRt p-values ($p < 0.050$), indicating that all models had a significantly improvement in fit compared to a model with one less class. When increasing the number of classes, the AIC and SSA-BIC values kept decreasing. This also applied to the BIC value, except for the six-class model. Although the five-class solution had the lowest BIC value and acceptable values on the other fit indices, the addition of a fifth class was not deemed relevant compared to the four-class model, based on prior literature and research on the dual-continua model of mental health (Iasiello, van Agteren, and Cochrane 2020; Keyes 2005). Considering the acceptable indices and consistency with prior theory/literature, the four-class model was selected as optimal class solution.

3.3 | Latent Classes of Early PGD and Well-Being

Figure 1 illustrates the probability estimates of the four-class solution. Figures of the probability estimates for the other class solutions are depicted in Figures S1–S5. The largest class included 86 people (32.3%) and was characterized by low probabilities of 6 out of 10 early PGD symptoms and high probabilities of all well-being indicators. This class was labelled as the 'low PGD/high well-being class'. The second class consisted of 64 people (24.0%) and had low probability estimates for 6 out of 10 early PGD symptoms and moderate probabilities on 4 of the 5 well-being indicators. We therefore labelled this class as the 'low PGD/moderate well-being class'. The third class comprised 60 people (22.6%) and was characterized by moderate probabilities of 5 out of 10 early PGD symptoms and high probabilities of 4 out of 5 well-being indicators. We marked this class as the 'moderate PGD/high well-being class'. The fourth and smallest class included 56 people (21.1%) with high probabilities of 7 out of 10 early PGD symptoms and low probabilities of 4 out of 5 well-being indicators. Therefore, this class was named the 'high PGD/low well-being class'. Table S2 shows the probability estimates of early PGD and well-being indicators for each class.

3.4 | Correlates of Early PGD and Well-Being Classes

3.4.1 | Significant Correlates in Univariate Analyses

Univariate analyses indicated that gender (i.e., being female), education level (i.e., ≤ practical education), kinship to the deceased (i.e., being a nuclear family member), health status (i.e., poor current health status), diagnosis of a mental disorder (i.e., currently suffering from a mental disorder), risk of severe COVID-19 (i.e., being at risk for severe COVID-19 symptoms) and trauma before the pandemic (i.e., having experienced a potential traumatic event before the pandemic) were significantly associated with class membership. Categories of certain variables contained few people, that is, time spent at home (i.e., no time spent at home; $n = 24$) and in-person social contact (i.e., no in-person social contact; $n = 12$). We therefore excluded these variables from the analyses examining correlates of class membership. See Table S3 for the results of the univariate correlates of class membership.

3.4.2 | Significant Correlates in Multivariate Analyses

Outcomes of the multinomial analyses demonstrated that people in the moderate PGD/high well-being class were twice as likely to be female (vs. male) and twice as likely to have completed practical education (vs. college/university), compared to people in the low PGD/high well-being class. Compared to people in the low PGD/high well-being class, people in the high PGD/low well-being class were five times more likely to be female (vs. male), seven times more likely to be a nuclear family member of the deceased (vs. other), eight times more likely to have a poor current health status (vs. good health status) and 20 times more likely to currently suffer from a mental disorder (vs. no mental disorder). Compared to people in the low PGD/moderate well-being class, people in the high PGD/low well-being class were 10 times more likely to be a nuclear family member of the deceased (vs. other) and three times more likely to have a risk of severe COVID-19 symptoms (vs. no risk). Lastly, people in the high PGD/low well-being class were six times more likely to have a risk of severe COVID-19 symptoms (vs. no risk), relative to people in the moderate PGD/high well-being class. Table 3 illustrates the observed means and frequencies for all correlates in each class. Table 4 shows the results of the multinomial correlates of class membership.

4 | Discussion

To the best of our knowledge, this is the first study simultaneously examining patterns of indicators of PGD (according to the newest DSM-5-TR criteria) and well-being in bereaved people. In doing so, we relied on survey data collected among 266 Dutch adults who lost a loved one during the COVID-19 pandemic on average less than 4 months earlier. So far, most of the research on the psychological impact of bereavement in general (Heeke et al. 2023), and in particular during the pandemic, focused on the presence of acute mental illness, such as early PGD and depression (Reitsma, Killikelly, et al. 2023). One prior study focused on both negative (e.g., PGD) and positive (i.e., posttraumatic growth) psychological consequences of bereavement due to COVID-19 (Chen and Tang 2021). Yet, it can be argued whether posttraumatic growth is a positive or negative psychological response after a stressful life event, such as bereavement. While some view posttraumatic growth as a positive response (e.g., Tedeschi and Calhoun 2004), others consider posttraumatic growth to be a negative response impeding recovery

TABLE 1 | Participant characteristics and acute PGD and well-being indicators ($N = 266$).

Socio-demographic characteristics		
Age in years, *M* (*SD*)	40.50	(18.85)
Gender, *N* (%)		
Male	71	(26.7)
Female	195	(73.3)
Educational level, *N* (%)		
< 6 years	2	(0.8)
6–9 years	19	(7.1)
10–13 years	94	(35.3)
Practical education	68	(25.6)
College/university	80	(30.1)
Doctorate	3	(1.1)
Loss-related characteristics		
Kinship to deceased, the deceased is my ..., *N* (%)		
Partner	6	(2.3)
Father	10	(3.8)
Mother	12	(4.5)
Son	0	(0.0)
Daughter	1	(0.4)
Brother	1	(0.4)
Sister	3	(1.1)
Other family member	137	(51.5)
Friend	54	(20.3)
Other	53	(20.0)
Time since death in days, *M* (*SD*)[a, b]	114.77	(66.79)
Cause of death, *N* (%)		
COVID-19	53	(19.9)
Not due to COVID-19	201	(75.6)
Unknown	12	(4.5)
Pandemic-related characteristics		
Spent more time at home, *N* (%)		
No	24	(9.0)
Yes, social distancing	220	(82.7)
Yes, self-isolation	4	(1.5)
Yes, quarantine	8	(3.0)
N/a	10	(3.8)
In-person social contact, *N* (%)		
No contact	12	(4.5)

(Continues)

TABLE 1 | (Continued)

Pandemic-related characteristics		
< Once a week	44	(16.5)
Once a week	39	(14.7)
1–2 times a week	67	(25.2)
3–6 times a week	49	(18.4)
Every day	55	(20.7)
Health-related characteristics		
Current health status, *N* (%)		
Very good	51	(19.2)
Good	117	(44.0)
Satisfactory	68	(25.6)
Poor	30	(11.3)
Very poor	0	(0.0)
At risk for severe COVID-19, *N* (%)		
Yes	66	(24.8)
No	200	(75.2)
Diagnosis of mental disorder, *N* (%)		
Yes, currently affected	38	(14.3)
Yes, recovered	43	(16.2)
No	185	(69.5)
Trauma-related characteristics		
Potential traumatic event before pandemic, *N* (%)[c]		
Yes	80	(74.8)
No	27	(25.2)
Acute PGD and well-being severity		
Acute PGD, *M* (SD)	20.82	(8.28)
Well-being, *M* (SD)	49.88	(23.64)

Abbreviations: *M* = mean; N/a = not applicable; PGD = prolonged grief disorder; *SD* = standard deviation.
[a]*N* = 259 due to missing data on this variable.
[b]For *N* = 39, the month of death was reported instead of the exact date of death. Therefore, we used estimates based on the reported date to calculate the time since death (e.g., early April = April 1, mid-April = April 15, late April = April 30).
[c]*N* = 107, because this question was a conditional question related to a previous question.

TABLE 2 | Fit indices for one to six class models (*N* = 266).

Model	LL	BIC	SSA-BIC	AIC	Entropy R^2	BLRt *p*	Class sizes
1 class	−2404.07	4891.89	4844.33	4838.14			266
2 class	−2019.73	4212.54	4114.25	4101.45	0.876	< 0.001	163/103
3 class	−1898.59	4059.60	3910.58	3891.18	0.873	< 0.001	115/82/69
4 class	−1843.78	4039.33	3839.58	3813.57	0.859	< 0.001	86/64/60/56
5 class	−1793.98	4029.06	3778.59	3745.97	0.882	< 0.001	76/60/47/46/37
6 class	−1767.19	4064.82	3763.62	3724.39	0.887	< 0.001	65/62/45/45/30/19

Abbreviations: AIC = Akaike information criterion; BIC = Bayesian information criterion; BLRt = Bootstrap likelihood ratio test; LL = loglikelihood; SSA-BIC = sample size adjusted–Bayesian information criterion.

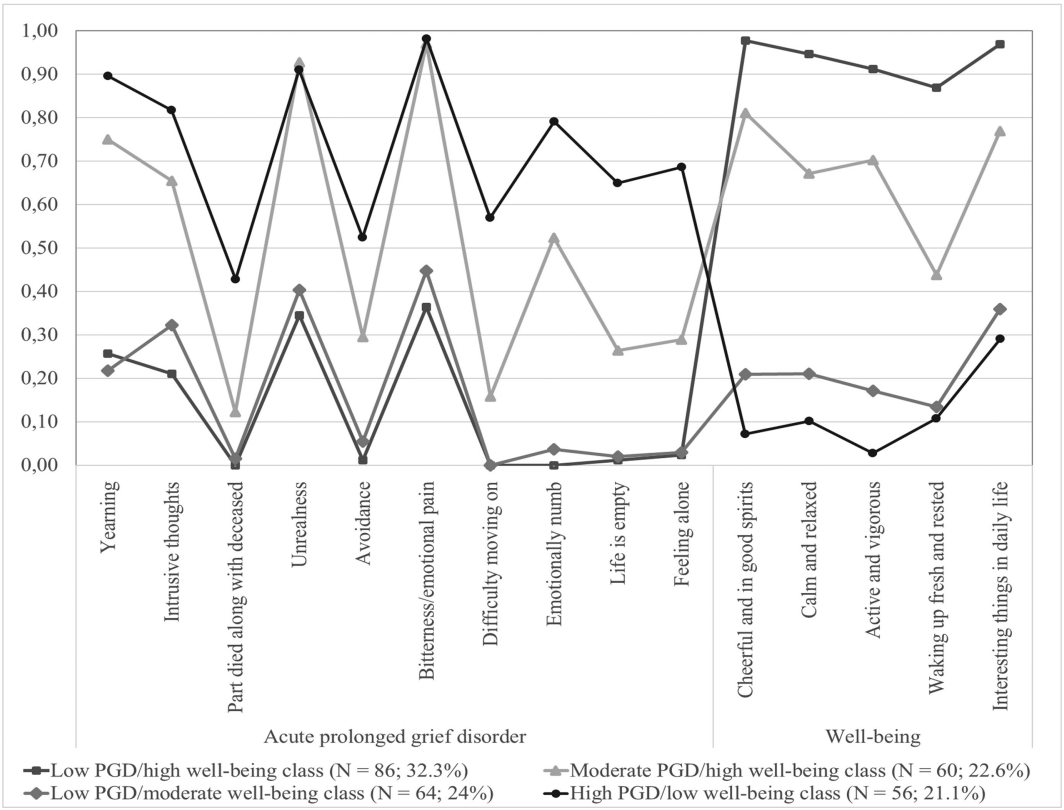

FIGURE 1 | Probability estimates of acute prolonged grief disorder (PGD) and well-being indicators for the four-class solution ($N = 266$).

(e.g., Boals and Schuler 2019; Frazier et al. 2009; Zoellner and Maercker 2006). Moreover, Eisma et al. (2019) found that posttraumatic growth was not predictive of later PGD and vice versa. Therefore, well-being may more accurately capture positive mental health following loss compared to posttraumatic growth. Further expanding our focus from mental illness to mental health, by including indicators of both early PGD and well-being, may provide a more comprehensive picture of the psychological impact of the loss of a loved one during the pandemic.

In the present study, four distinct classes were identified. The largest class was a low PGD/high well-being class (32%), including people with low probabilities of most early PGD symptoms and high probabilities of all well-being indicators. This finding is consistent with prior LCA studies (Heeke et al. 2023) and trajectory studies (Bonanno and Malgaroli 2020; Djelantik, Robinaugh, and Boelen 2022; Kristensen, Dyregrov, and Gjestad 2020; Lenferink et al. 2020; Lundorff et al. 2020; Nielsen et al. 2019; Pociunaite et al. 2023; Smith and Ehlers 2020; Sveen et al. 2018) on PGD demonstrating that the majority of people adjusts well after the loss of a loved one. The current study adds that not only do most bereaved people experience low early PGD symptoms but they also experience high well-being. Therefore, most people bereaved during the pandemic likely will not need professional support to cope with their loss.

The smallest class was a high PGD/low well-being class (21%), including people with high probabilities of most early PGD symptoms and low probabilities on all well-being indicators. This is also consistent with prior research demonstrating that a minority of bereaved people are at risk to develop poor mental health outcomes after a loss (Lundorff et al. 2017). This group may benefit from an early grief treatment, such as online grief-specific cognitive behavioural therapy (CBT) (Reitsma, Boelen, et al. 2023). Online grief-specific CBT has shown to yield large effects in reducing PGD symptoms, as well as moderate effects in reducing posttraumatic stress and depression symptoms in people bereaved during the pandemic compared with no treatment (Reitsma, Boelen, et al. 2023).

The low PGD/moderate well-being class (24%) was characterized by people with low probabilities of most early PGD symptoms and moderate probabilities of most well-being indicators. Additionally, the moderate PGD/high well-being class (23%) is marked by moderate probabilities of most early PGD symptoms and high probabilities of most well-being indicators. Both of these classes are consistent with the dual-continua model of mental health (Iasiello, van Agteren, and Cochrane 2020; Keyes 2005), postulating that mental illness and positive mental health can co-occur. Correspondingly, our findings suggest that mental health in bereaved people is comprised not only of less early PGD symptoms but also of increased indicators of well-being.

Our second aim was to examine correlates of class membership. In line with prior research (Boelen 2021; Djelantik et al. 2017; Heeke et al. 2022), we found that identifying as female and having a practical education level were associated with membership of the poorer mental health classes. Moreover, we found that being a nuclear family member of

TABLE 3 | Descriptives of acute PGD and well-being for each class in multinomial logistic regression model ($N = 266$).

	Low PGD/high well-being class ($N = 86$, 32.3%)	Low PGD/moderate well-being class ($N = 64$, 24.0%)	Moderate PGD/high well-being class ($N = 60$, 22.6%)	High PGD/low well-being class ($N = 56$, 21.1%)
Gender, *N* (%)				
Male	34 (39.5)	16 (25.0)	12 (20.0)	9 (16.1)
Female	52 (60.5)	48 (75.0)	48 (80.0)	47 (83.9)
Educational level, *N* (%)				
≤ Practical education	55 (64.0)	41 (64.1)	48 (80.0)	39 (69.6)
College/university	31 (36.0)	23 (35.9)	12 (20.0)	17 (30.4)
Kinship to deceased, *N* (%)				
Other	81 (94.2)	61 (95.3)	51 (85.0)	40 (71.4)
Nuclear family member	5 (5.8)	3 (4.7)	9 (15.0)	16 (28.6)
Health status, *N* (%)				
Good	83 (96.5)	57 (89.1)	57 (95.0)	39 (69.6)
Poor	3 (3.5)	7 (10.9)	3 (5.0)	17 (30.4)
Diagnosis of mental disorder, *N* (%)				
No	70 (81.4)	40 (62.5)	46 (76.7)	29 (51.8)
Yes, currently affected	2 (2.3)	12 (18.8)	8 (13.3)	16 (28.6)
Risk of severe COVID-19 symptoms, *N* (%)				
Yes	20 (23.3)	15 (23.4)	7 (11.7)	24 (42.9)
No	66 (76.7)	49 (76.6)	53 (88.3)	32 (57.1)
Potential traumatic event before pandemic, *N* (%)[a]				
Yes	19 (49.4)	16 (64.0)	22 (95.7)	23 (85.2)
No	13 (40.6)	9 (36.0)	1 (4.3)	4 (14.8)

Abbreviation: PGD = prolonged grief disorder.
[a]$N = 107$, because this question was a conditional question related to a previous question.

TABLE 4 | Multinomial logistic regression model of correlates of class membership using the three-step approach ($N = 266$).

	Low PGD/high well-being vs. Low PGD/moderate well-being class				Low PGD/high well-being vs. Moderate PGD/high well-being class				Low PGD/high well-being vs. High PGD/low well-being class				Low PGD/moderate well-being vs. Moderate PGD/high well-being class				Low PGD/moderate well-being vs. High PGD/low well-being class				Moderate PGD/high well-being vs. High PGD/low well-being class			
	OR	**B**	**SE**	***p***	**OR**	**B**	**SE**	***p***	**OR**	**B**	**SE**	***p***	**OR**	**B**	**SE**	***p***	**OR**	**B**	**SE**	***p***	**OR**	**B**	**SE**	***p***
Gender (0 = male)	2.42	0.88	0.46	0.057	2.41	1.23	0.57	**0.030**	5.33	1.67	0.64	**0.009**	1.42	0.35	0.63	0.578	2.20	0.79	0.68	0.241	1.55	0.44	0.72	0.539
Education (0 = practical education)	0.85	−0.16	0.42	0.702	0.85	−1.32	0.63	**0.037**	0.71	−0.35	0.49	0.477	0.31	−1.16	0.59	0.051	0.83	−0.19	0.47	0.695	2.65	0.97	0.60	0.102
Kinship to deceased (0 = other)	0.76	−0.28	1.36	0.838	0.37	−1.01	1.09	0.351	7.44	2.01	0.87	**0.02**	3.64	1.29	1.07	0.225	9.83	2.29	0.96	**0.017**	2.70	0.99	0.72	0.164
Health status (0 = good)	2.39	0.87	1.00	0.383	2.37	0.17	1.44	0.909	8.35	2.12	0.94	**0.024**	0.49	−0.71	1.20	0.557	3.49	1.25	0.64	0.050	7.08	1.96	1.11	0.077
Diagnosis of mental disorder (0 = no)																								
Yes, currently affected	15.23	2.72	1.39	0.051	16.00	2.22	1.46	0.129	19.95	2.99	1.36	**0.028**	0.61	−0.50	0.65	0.437	1.31	0.27	0.53	0.611	2.16	0.77	0.62	0.210
Risk of severe COVID-19 (0 = no)	0.90	−0.12	0.57	0.836	0.88	−0.79	0.72	0.272	2.76	1.02	0.56	0.068	0.51	−0.67	0.77	0.385	3.11	1.13	0.57	**0.047**	6.08	1.81	0.78	**0.021**
Potential traumatic event before pandemic (0 = no)	0.83	−0.19	0.68	0.781	0.85	−1.42	0.84	0.093	3.08	1.12	0.87	0.199	4.99	1.61	0.91	0.077	3.72	1.31	0.76	0.085	0.74	−0.30	0.96	0.759

Note: Values in bold represent statistically significant *p*-values.
Abbreviations: OR = odds ratio; PGD = prolonged grief disorder; SE = standard error.

the deceased (Chen and Tang 2021), currently suffering from a mental disorder and a bad current health status were the strongest correlates of membership of the poor mental health classes. Furthermore, we found that high risk of severe COVID-19 symptoms increased the probability of membership of the classes with poorer mental health. Our findings suggest that these correlates render a person prone to experience adverse mental health outcomes following the loss of a loved one.

Contrary to our expectations, being more recently bereaved and having lost a loved one due to COVID-19 were not significantly related to class membership. The little variation in time since loss might explain the non-significant associations with class membership. The way cause of death was operationalized (i.e., COVID-19 vs. non-COVID-19) may have prevented us from detecting significant associations with class membership, since non-COVID-19 cases may have included people who experienced an unnatural, traumatic loss (e.g., homicide). Research shows that these people are at high risk for developing PGD symptoms (Eisma et al. 2021; Eisma and Tamminga 2022; Lenferink and Boelen 2023).

Multiple strengths of the current study can be noted. First, this study was based on data collected from the Dutch general population during the first wave and the beginning of the second wave of the COVID-19 pandemic in the Netherlands. For this reason, our study sample does not consist of a self-selected grief sample, which increases the representativeness of our findings to general bereaved people. Moreover, our sample is homogeneous regarding exposure to COVID-19 measures, as data were collected in a short period of time (i.e., July–November 2020). Another strength includes the assessment of early PGD symptoms as captured by the latest DSM-5-TR criteria. Lastly, almost 70% of people in our sample completed a practical education, while typically theoretically (i.e., [applied] university) educated people participate in bereavement research (for reviews, see Eisma and Stroebe 2021; Komischke-Konnerup et al. 2021). This renders our findings more representative of the Dutch general population.

However, several limitations should be considered when interpreting the findings. First, a brief validated measure was used to assess well-being (i.e., the WHO-5). Although this limited time burden for participants, this instrument measures well-being as a unidimensional construct, whereas research shows that well-being consists of multiple dimensions (i.e., emotional, psychological and social well-being) (Keyes and Waterman 2003). Future research could use the Mental Health Continuum–Short Form (Iasiello et al. 2022; Lamers et al. 2011) to further investigate whether and how PGD is differentially related to these well-being dimensions. Second, only conclusions can be drawn about increased early PGD symptoms and not about full-blown PGD, since all participants lost a loved one less than 12 months ago, which is the time criterion for a PGD DSM-5-TR diagnosis (APA 2022). Yet, research demonstrates that early PGD is one of the strongest predictors for developing clinically-relevant PGD (Boelen and Lenferink 2020, 2021) and therefore early screening and treatment seem warranted (Reitsma, Boelen, et al. 2023). Third, only 22% of bereaved people lost a nuclear family member; this likely explains the relatively low early PGD levels found in our sample, impeding generalizability of the results to people who lost a nuclear family member during the pandemic. Fourth, by dichotomizing the item scores of the indicators in our LCA, we discard information concerning symptom-levels, which may have affected our results (cf. Achterhof et al. 2019). Moreover, we assessed latent classes of early PGD and well-being cross-sectionally. Consequently, it is unknown how stable these classes are over time. The latter could be addressed by using latent transition analysis. Fifth, despite our recruitment efforts to include men, who are typically underrepresented in scientific research, our sample was still largely composed of women (73%). Thus, caution is warranted when generalizing our findings to men. Although this is not uncommon in bereavement research (Johannsen et al. 2019), future work should aim to include more men.

The findings of our study may have important clinical implications. In treatment, clinicians should not only focus on decreasing PGD symptoms but also consider increasing indicators of well-being. Iasiello, van Agteren, and Cochrane (2020) suggested in their scoping review on the dual-continua model of mental health that acceptance and commitment therapy (ACT) may be used to reduce psychopathological vulnerabilities and build resources to enhance positive mental health. Although CBT is the treatment of choice for PGD (Boelen and van den Bout 2017; Doering and Eisma 2016; Rosner et al. 2015), it may be valuable to implement aspects of ACT to enhance positive psychological outcomes in bereaved people (Davis et al. 2020).

To conclude, in this study, we identified four distinct classes differing in early PGD and well-being indicators in 266 Dutch adults bereaved during the COVID-19 pandemic. Our findings underline that most bereaved people adjust well in response to a loss, also during a pandemic. The results provide further evidence for the dual-continua model on mental health, suggesting that early PGD symptoms can co-occur alternatively with indicators of well-being among people bereaved during the pandemic. In addition, correlates of class membership shown in previous studies were found in our results to a considerable extent. In summary, we need to adopt a more balanced perspective on grief after loss. It is important to focus not only on mitigating negative psychological outcomes but also on enhancing positive psychological outcomes. Lastly, it is highly relevant to enhance our understanding about the factors involved in maintaining a sound level of well-being in the face of grief.

Acknowledgements

This study was funded by ARQ National Psychotrauma Centre and by Dutch health insurance companies Delfland, Schieland, Westland (DSW) and Centraal Ziekenfonds (CZ).

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

Data are available upon reasonable request.

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Supporting Information

Additional supporting information can be found online in the Supporting Information section.