



Prolonged grief and depression: A latent class analysis

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ABSTRACT

Recent trends in grief research have been exploring how symptoms of prolonged grief disorder (PGD) and depression co-occur in bereaved individuals using Latent Class Analysis (LCA). However, the PGD criteria have kept undergoing changes and the newest DSM-5 PGD criteria have not been captured in these studies. Also, previous LCA-grief studies have been conducted in Western cultures, focusing more on bereaved adult populations. In this study, we applied LCA on a non-Western sample of bereaved young and middle-aged adults to examine whether the consistently observed 3 latent classes will emerge. We explored if the socio-demographic, loss-related factors, religiousness, spirituality, and continuing bond to the deceased, differentiated the latent classes. We confirmed the 3 latent classes comprising the Resilient class (20.6%), the predominantly PGD class (44.7%), and the combined PGD and Depression class (34.7%). Age, time elapsed since the loss, continuing bond and relationship with the deceased as well as spiritual beliefs were the differential predictors of class membership. This study increases our conceptual and clinical understanding of the predictability of PGD symptomatology outcome, according to the newest DSM-5 criteria following bereavement in a non-Western sample. In addition to the continuing bond which was the strongest correlate, attention should be paid to important sociocultural frameworks in grief management.

1. Introduction

For many decades, symptoms of grief following the death of a loved one have been assimilated into symptoms of depression. Yet, there is sound and accumulating evidence that pathological grief symptoms constitute a bereavement-specific syndrome (Horowitz et al., 1997; Prigerson et al., 2009; see Prigerson, Kakarala, Gang, & Maciejewski, 2021 for review). This clinical syndrome is called “Prolonged Grief Disorder” (PGD), a diagnostic entity now included in the eleventh edition of the International Classification of Diseases (ICD-11) and soon to appear in the text revision of the fifth edition of the Diagnostic and Statistical Manual (DSM-5-TR) (Boelen et al., 2020; Prigerson et al.,

2021; World Health Organization, 2018). Although PGD symptoms may overlap or co-occur with symptoms of depression, anxiety, and post-traumatic stress disorder (PTSD), factor analytic studies have consistently demonstrated that PGD is distinct from these other disorders (Boelen et al., 2010; Boelen and van den Bout, 2005; Dillen et al., 2009; Prigerson et al., 1996; Spuij et al., 2012).

More recent threads in research explore how symptoms of PGD, depression, and PTSD co-occur in bereaved individuals, using latent class analysis (LCA) (Boelen et al., 2017, 2019; Boelen and Lenferink, 2019; Djelantik et al., 2017, 2020; Eisma et al., 2019; Lenferink et al., 2017; Maccallum and Bryant, 2018, 2019; Nickerson et al., 2014). LCA is a person-centered statistical approach that examines the extent to

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which symptoms from different pathological conditions co-occur within individuals, and further, whether there are subgroups (or so-called classes) of individuals who endorse different symptom profiles (Lazarus & Henry, 1968).

To the best of our knowledge, only two prior LCA studies, have examined latent classes of PGD and depression symptoms in bereaved people (Boelen et al., 2016; Maccallum & Bryant, 2018). These two LCA studies identified three classes of bereaved individuals. Boelen et al. (2016) identified three classes in a sample of people confronted with unnatural loss i.e., suicide, accidents, homicide: first, a class of individuals with high prevalence of PGD and depression symptoms; second, a class with a high prevalence of PGD symptoms and low prevalence of depression symptoms; finally, a class that showed low probability of either type of symptoms. In a sample of bereaved persons outnumbered by those grieving deaths as a result of medical conditions (77.3%), Maccallum and Bryant (2018) also identified three classes: a class with a high prevalence of both PGD and depression symptoms, a class with high depression symptoms only, and a class with a low probability of all symptoms. In the study by Boelen et al. (2016) demographics (i.e., age and number of years of education; gender role was not examined) did not predict class membership, however catastrophic misinterpretations of one's own grief-reactions (e.g., "If I express my feelings, I will go mad") predicted both symptomatic classes as compared to a resilient class. In Maccallum and Bryant's (2018) study, bereaved individuals who had lost a spouse or child were more likely to belong to the PGD/Depression class and Depression class compared with the Resilient class and stronger attachment anxiety predicted increased likelihood of belonging to of the PGD/Depression class compared with the other classes.

Indeed, the bulk of LCA studies have been conducted in Western countries, and the extent to which their conclusions are generalizable to non-Western bereaved populations is unknown. The current study has been conducted in a sub-Saharan African (SSA) country, thus enhancing conceptual and empirical understanding of grief in non-Western cultures. Therefore, the current investigation pursued the ambition to fill these gaps in previous research by examining whether the observed classes characterized by the levels and/or the nature of both PGD and depression symptoms (Boelen et al., 2016; Maccallum & Bryant, 2018) would emerge in a bereaved sample from SSA. Furthermore, the study examined the correlates of class-membership as identified through LCA. In previous LCA studies, socio-demographic and loss-related variables were sparsely documented and findings were inconsistent. The only consistent predictor seemed to be the nature of the relationship with the deceased, such that losing a close kin was related to classes with more pervasive symptomatology than a more distantly related loved one (Djelantik et al., 2016; Maccallum and Bryant, 2018).

In bereavement research conducted in non-Western societies, the role played by religious beliefs and spirituality has been frequently highlighted. Particularly, in SSA, Schaal et al. (2012) reported that Rwandan bereaved survivors who accorded less importance to religious/spiritual beliefs were more at risk of PGD symptoms. Among a sample of Togolese widowed people, Kokou-Kpolou et al. (2017b) found that negative religious coping (i.e., expressing religious discontent and making punitive religious reappraisals) was associated with complications in grieving spouses' loss. Chukwuorji et al. (2018) showed that rebirth concerns about the deceased person, which are an important component of religious/spiritual beliefs, were associated with higher levels of PGD symptoms among bereaved internally displaced Tiv persons in Nigeria. Rebirth concerns about the deceased person also involve the search for ways of maintaining the attachment with the deceased referred to as "continuing bond" to the deceased (Klass et al., 1996). Accounting for the above-mentioned issues, this study was interested in investigating whether religiousness, spirituality, and continuing bond to the deceased were associated with latent classes based on PGD and depression symptoms. Specifically, religiousness refers to the importance given to institutional religious rituals, practices, and beliefs while

spirituality refers to an inner belief system that a person relies on for strength and comfort (Roussiau, Bailly, & Renard, 2018).

In summary, as mentioned above, growing studies using LCA methods contributed to better understand how symptoms of PGD, depression, and PTSD co-occur in bereaved individuals, and improve interventions that specifically target PGD and comorbidities. However, there were no research addressing these issues in a context of SSA, a region of the world where the mortality rate is very high and consequently bereavement issues are a major health concern. We believe that there is an urgent need for healthcare professionals working with non-Western populations to be well informed about different symptom profiles of clients struggling with bereavement sufferings issues. This will help guide the cross-country and cross-cultural application in clinical practice of DSM-5 and ICD-11 PGD. This study made a modest but significant contribution in this direction using a sample of Togolese bereaved young and middle-aged adults. As highlighted by previous LCA research, investigating if classes of co-occurring PGD and depression symptoms are homogeneous or heterogeneous is an important step to enhance accuracy of screening and intervention efforts in a context of SSA where PGD intervention programs are at their early stages (e.g., Thurman et al., 2018). Further, we extended prior LCA work by considering the potential impact of sociocultural and religious factors on the symptom profiles of the PGD-depression interaction. From both ICD-11 and DSM-5 perspectives, these sociocultural and religious factors were acknowledged as determinant to better understand the expression of PGD symptoms and reduce the risk of pathologizing what can be a non-complicated mourning within some cultural norms. We addressed three primary questions:

- 1 Would similar PGD and depression classes (1- high PGD/depression class, 2- High PGD or High depression class, and 3- a class with low probability of PGD and depression symptoms) emerged from a bereaved sample from SSA as in prior LCA research in Western samples?
- 2 Are the identified classes distinguishable in terms of socio-demographic and loss-related factors?
- 3 Is class membership predicted by religiousness, spirituality, as well as continuing bond to the deceased?

2. Methods

2.1. Procedure and Participants

The data we used sampled Togolese bereaved young and middle-aged adults as part of an ongoing cross-country research project on bereavement. The survey was conducted in compliance with the Declaration of Helsinki of 1975, as revised in 2008, and received a favorable ethical approval from the Institutional Ethics Committee of Universities in the participating countries. The study utilized a cross-sectional approach administering self-report questionnaires to a convenience (non-probability) sample. Participants were included based on up to 5 year postloss experience a significant person. This criteria of bereavement period was defined to maximize the homogeneity of the study sample. In Togo, the data were gathered in 2018 and included undergraduate students in psychology and sociology courses from the two public universities (Lomé and Kara). Following written consent, participants completed anonymously printed questionnaires using pencil-and-paper strategy. The total sample consisted of 230 participants, after removing 4 participants who identified as citizens from other countries. The sample was ethnically diverse owing to the Togo's multi-cultural context. Females represented 54.3% and the mean age was 22.81 years ($SD = 4.37$, range: 16 to 47 years). Deaths following natural anticipated loss represented 60.4%, followed by sudden loss (21.1%) and violent loss (18.5%). The death of parents and siblings was predominantly reported (45.2%), followed by death of grandparents, uncles, aunts (37.4%), and romantic partners, friends and peers

Table 1
Socio-demographic and loss-related characteristics of the study sample.

| Variables | Total sample N=230 |
|---|--------------------|
| Age, <i>M</i> (<i>SD</i>) | 22.81 (4.37) |
| Gender | |
| Males | 105 (45.7%) |
| Females | 125 (54.3%) |
| Religion, <i>M</i> (<i>SD</i>) | 4.08 (0.73) |
| Spirituality, <i>M</i> (<i>SD</i>) | 28.02 (13.26) |
| Relationship | |
| Parent, sibling | 104 (45.2%) |
| Grandparent, aunt, uncle | 86 (37.4%) |
| Friend, peer | 40 (17.4%) |
| Cause of death (N=227) | |
| Natural anticipated loss | 137 (60.4%) |
| Natural sudden loss | 48 (21.1%) |
| Violent loss | 42 (18.5%) |
| Time since loss in months, <i>M</i> (<i>SD</i>) | 21.55 (18.93) |
| Number of loss (N=229) | |
| 1 | 55 (24.0%) |
| 2 | 132 (57.6%) |
| 3 | 32 (14.0%) |
| 4 to 5 | 10 (4.4%) |
| Continuing bond, <i>M</i> (<i>SD</i>) | 13.12 (4.49) |

(17.4%). The average time period since the death was 21.55 months (*SD* = 18.93, *Mdn* = 16). Within the 5-year period, 76% of participants reported at least two losses (*M* = 2.0, *SD* = 0.78, range: 1 to 5). It should be noted that participants received the instruction to keep in mind the most distressing loss when completing the outcome measures. Table 1 presents the sample characteristics.

2.2. Measurement instruments

2.2.1. Outcome measures

2.2.1.1. Symptoms of Prolonged Grief Disorder. The present study relied on the newly proposed DSM-5 PGD criteria which include 10 symptoms (Boelen et al., 2020; American Psychiatric Association 2020). Items to assess DSM-5 PGD symptoms were drawn from the 19-item Inventory of Complicated Grief (ICG; Prigerson et al., 1995), a reliable psychometric measure to evaluate the pattern of persistent grief symptoms (Cronbach's $\alpha = 0.94$). Specifically, eight items were drawn from the ICG that closely match DSM-5 PGD symptom items. These included: yearning, preoccupation about the deceased, marked sense of disbelief about the death, avoidance of reminders that the person is dead, intense emotional pain (e.g., bitterness) related to the death, difficulty moving on with life (e.g., problems engaging with friends, pursuing interests, planning for the future), feeling that life is meaningless, intense loneliness (i.e., feeling alone). The two remaining symptom items (identity disruption and emotional numbness) lacked of closely corresponding ICG items. Items rated on a 5-point scale ranging from 0 (never) to 4 (always). The French version of the ICG was used (Zech, 2006). The selected items to assess DSM-5 PGD symptoms yielded good internal consistency ($\alpha = 0.81$).

2.2.1.2. Symptoms of depression. We used the Center for Epidemiological Studies Depression (CESD) scale (Radloff, 1977) to assess various depressive symptoms including depressed mood, worthlessness, helplessness, hopelessness, loss of appetite, and sleep disturbance. Respondents report the frequency of occurrence of each item during the previous week on a 4-point scale: 0 (rarely; less than 1 day), 1 (some of the time; 1–2 days), 2 (a moderate amount of the time; 3–4 days), and 3 (most or all of the time; 5–7 days). The CESD consists of 20 items, of which 16 items were designed to capture directly responses relative to depressive symptoms and were used in the present LCA. The internal consistency of the 16-item CESD was satisfactory ($\alpha = 0.84$).

2.2.2. Predictors and correlates

2.2.2.1. Continuing bonds with the deceased. The attachment and ongoing relationship to the deceased was measured using four adapted items drawn from the Continuing Bonds Scale (CBS) developed by Field, Gal-Oz and Bonanno (2003). These include: “I have many fond memories of X that bring joy to me (item 1)”, “I like to reminisce with others about X (item 2)”, “I have inner conversations with X (item 3)”, and “I feel the presence of X as continuing to live on through me (item 4)”. The 4-item CBS yielded acceptable internal consistency ($\alpha = 0.73$).

2.2.2.2. Religiousness and spirituality. A single-item scale was designed to assess participants' religiousness. Explicitly, they were requested to answer the question: “To what extent are religious practices important for you in everyday life?” The response was graded on 5 point-Likert scale ranging from 1 = not at all important to 5 = very important. To assess spirituality, we used the Explicit Scale of Areligious Spirituality (ESAS) developed and validated by Roussiau et al. (2018) in a sample of French university students. Example of items are: “My spirituality brings me well-being”, “My spiritual belief gives meaning to the joys and discomforts of my life”, and “My spiritual belief helps me to be stronger in my life”. The total ESAS score has good internal consistency ($\alpha = 0.79$).

2.2.2.3. Sociodemographic and loss-related characteristics. All participants reported information on gender (coded 0-1, 1 being females) and age (in years). They also provided information on loss-related characteristics regarding the relationship to the deceased (1 = immediate family member, i.e., parent, sibling, 2 = extended family member, i.e., grandparent, uncle, aunt, cousin, nephew, and 3 = peers, friend and romantic partner); cause of death (dummy coded: 1 = natural deaths including death in old age or diagnosed advanced terminal illness, 2 = sudden and violent deaths including death by fatal accident, suicide and homicide), time elapsed since loss (in months), and number of losses experienced with the 5-year period.

2.3. Statistical Analyses

After the data preparation and descriptive statistics were performed using SPSS v. 18 (IBM, 2019), LCA was used to model PGD and depression symptoms, using Mplus v. 8 (Muthen and Muthen, 2017). We used the full maximum likelihood (ML) estimation, which is the most commonly used estimation technique for multivariate normal data (Beauducel and Herzberg, 2006) and provides accurate parameter estimates in the presence of missing data (Enders, 2010). There were 2.04% and 0.87% of missing data on outcomes and correlates, respectively. Consistent with prior LCA research, items measuring PGD and depression symptoms were dichotomized because LCA uses binary indicators to identify patterns of responses. Thus, in accordance with previous LCA studies (e.g., Boelen et al., 2016; Boelen and Lenferink, 2020; Eisma et al., 2019), a 5-point Likert scale for DSM-5 PGD is dichotomized as follows: 0 and 1 are considered as indicating absence of symptoms, while 2, 3 and 4 as indicating presence of symptoms. Using a 4-point Likert scale for depression items, 0 and 1 are considered as indicating absence of symptoms, whereas 2 and 3 indicated presence of symptoms. Multiple indices were considered in determining optimal number of classes: Bayesian Information Criterion (BIC), Sample-Size Adjusted Bayesian Information Criterion (SS-BIC), Akaike's Information Criterion (AIC), entropy R^2 (i.e., indication of latent class separation), Bootstrap Likelihood ratio test (BLRT). Lower BIC, SS-BIC and AIC values and higher entropy values ($>.80$) indicate better fit (Muthen and Muthen, 2017). A significant *p*-value of BLRT indicates a better fit of the model compared with a model with one less class (Nylund et al., 2007).

After selecting the best-fitting class model, we tested if the latent classes significantly differed in the total PGD and depression scores separately, by using the three-step approach implemented in Mplus

(Muthen and Muthen, 2017). In the first step of this approach, a latent class model is built based on indicator variables. In the second step, participants are assigned to classes. In the third step, associations between covariates and classes are modelled, while taking into account the classification error as a result of assigning participants to classes (Ver-munt, 2010).

Lastly, the sociodemographic and loss-related variables, religiousness, spirituality, and continuing bond to the deceased were added simultaneously as covariates to the latent class model using the three-step approach, in order to examine which of the variables distinguished best between classes, when taking into account the shared variance between the variables.

3. Results

3.1. Selection of the optimal latent class solution

Table 2 presents the goodness-of-fit statistics for the one-to-five latent class solutions. Entropy values were all high and BLRT p-values were all significant. The five-class solution presented the lowest AIC and SS-BIC value; however, the three-class solution presented the lowest BIC estimate. Therefore, the three-class solution was selected as the most optimal model given that the BIC value is the most recommended fit index (Muthen and Muthen, 2017; van de Schoot et al., 2017) and due to the fact that the class solution was congruent with most previous LCA research (Boelen et al., 2016; Boelen and Lenferink, 2020; Maccallum

and Bryant, 2018). The three-class solution comprised a class with low probability of PGD and depression symptoms (labelled the “Resilient class”; 20.6%), a class with predominantly PGD symptoms (the “PGD class”; 44.7%), and a class with high probability of PGD and depression symptoms (the “combined PGD and Depression class”; 34.7%).

3.2. Symptom severity across the latent classes

Table 3 and Fig. 1 present symptom prevalence rates and conditional probabilities of symptoms in the three-class solution, representing the percentage of participants in each class exhibiting each of the PGD and depression symptoms. In keeping with recent LCA research (Boelen and Lenferink, 2020; Maccallum and Bryant, 2019), we considered values of ≥ 0.60 as representing high, values ≤ 0.59 and ≥ 0.16 as representing moderate, and values of ≤ 0.15 as representing low symptom probabilities. Resultantly, the Resilient class was characterized by low and moderate probabilities of endorsing PGD and depression symptoms, except only one depression symptom (“effortful”) which did not discriminate classes (i.e., high probability across the three classes). The predominantly PGD class, which was the largest, evidenced high probabilities of endorsing all PGD symptoms and moderate probabilities of most of the 16 symptoms of Depression items. Finally, the combined PGD and Depression (PGD/DEP) class evidenced a high probability of the presence of all PGD items and 12 of 16 Depression items.

Table 2
Goodness-of-fit statistics for one- to five-class models.

| | Loglikelihood | AIC | BIC | SS-BIC | Entropy (R^2) | BLRT | BLRT p-value |
|---------|---------------|----------|----------|----------|-------------------|--------|--------------|
| 1 Class | -3482.146 | 7012.291 | 7094.805 | 7018.739 | | | |
| 2 Class | -3185.572 | 6469.144 | 6637.61 | 6482.309 | 0.85 | 593.15 | < 0.001 |
| 3 Class | -3091.967 | 6331.934 | 6586.352 | 6351.816 | 0.86 | 187.21 | < 0.001 |
| 4 Class | -3040.464 | 6278.929 | 6619.299 | 6305.528 | 0.88 | 103.01 | < 0.001 |
| 5 Class | -3006.427 | 6260.854 | 6687.176 | 6294.171 | 0.88 | 88.00 | < 0.001 |

AIC = Akaike information criterion, BIC = Bayesian information criterion, SS-BIC = sample size-adjusted Bayesian information criterion, BLRT = bootstrapped likelihood ratio test.

Table 3
Probability of PGD and Depression symptom-items in the latent classes.

| Variables | Overall frequency | | Class 1: Resilient class (n = 47, 20.6%) | | Class 2: Predominantly PGD class (n = 103, 44.7%) | | Class 3: Combined PGD and Depression class (n = 80, 34.7%) | |
|----------------------------------|-------------------|-------------|--|------|---|------|--|------|
| | N | Probability | Probability | SE | Probability | SE | Probability | SE |
| <i>PGD symptoms</i> | | | | | | | | |
| Yearning | 136 | 0.60 | 0.00 | 0.00 | 0.72 | 0.08 | 0.81 | 0.06 |
| Preoccupation | 162 | 0.71 | 0.27 | 0.08 | 0.83 | 0.05 | 0.84 | 0.05 |
| Disbelief | 158 | 0.72 | 0.30 | 0.10 | 0.76 | 0.05 | 0.89 | 0.06 |
| Avoidance of reminders | 148 | 0.65 | 0.24 | 0.08 | 0.71 | 0.05 | 0.81 | 0.07 |
| Intense emotional pain | 172 | 0.76 | 0.48 | 0.08 | 0.83 | 0.05 | 0.85 | 0.05 |
| Difficulty moving on with life | 135 | 0.60 | 0.03 | 0.05 | 0.73 | 0.06 | 0.78 | 0.06 |
| Feeling that life is meaningless | 172 | 0.76 | 0.43 | 0.10 | 0.83 | 0.04 | 0.88 | 0.05 |
| Intense loneliness | 126 | 0.56 | 0.12 | 0.05 | 0.64 | 0.06 | 0.72 | 0.07 |
| <i>Depression symptoms</i> | | | | | | | | |
| Bothered | 77 | 0.34 | 0.16 | 0.07 | 0.26 | 0.05 | 0.53 | 0.09 |
| Poor appetite | 86 | 0.37 | 0.16 | 0.08 | 0.28 | 0.07 | 0.62 | 0.08 |
| Blues | 57 | 0.25 | 0.08 | 0.07 | 0.13 | 0.05 | 0.50 | 0.10 |
| Difficulty concentrating | 118 | 0.51 | 0.19 | 0.08 | 0.36 | 0.09 | 0.90 | 0.09 |
| Depressed | 96 | 0.42 | 0.23 | 0.09 | 0.20 | 0.08 | 0.81 | 0.11 |
| Effort | 166 | 0.72 | 0.58 | 0.09 | 0.72 | 0.05 | 0.81 | 0.07 |
| Failure | 51 | 0.22 | 0.07 | 0.07 | 0.06 | 0.07 | 0.52 | 0.08 |
| Fearful | 83 | 0.36 | 0.20 | 0.09 | 0.18 | 0.13 | 0.69 | 0.06 |
| Talkless | 88 | 0.38 | 0.12 | 0.07 | 0.24 | 0.05 | 0.72 | 0.14 |
| Lonely | 105 | 0.46 | 0.41 | 0.09 | 0.30 | 0.07 | 0.69 | 0.08 |
| Insomnia | 137 | 0.60 | 0.37 | 0.08 | 0.46 | 0.08 | 0.90 | 0.07 |
| Unfriendly | 74 | 0.32 | 0.15 | 0.06 | 0.32 | 0.05 | 0.43 | 0.07 |
| Crying spells | 112 | 0.49 | 0.18 | 0.06 | 0.42 | 0.08 | 0.75 | 0.07 |
| Sad | 143 | 0.62 | 0.29 | 0.07 | 0.55 | 0.11 | 0.91 | 0.04 |
| People dislike me | 68 | 0.30 | 0.11 | 0.05 | 0.15 | 0.06 | 0.59 | 0.10 |
| Could not get going | 75 | 0.33 | 0.14 | 0.05 | 0.20 | 0.06 | 0.60 | 0.10 |

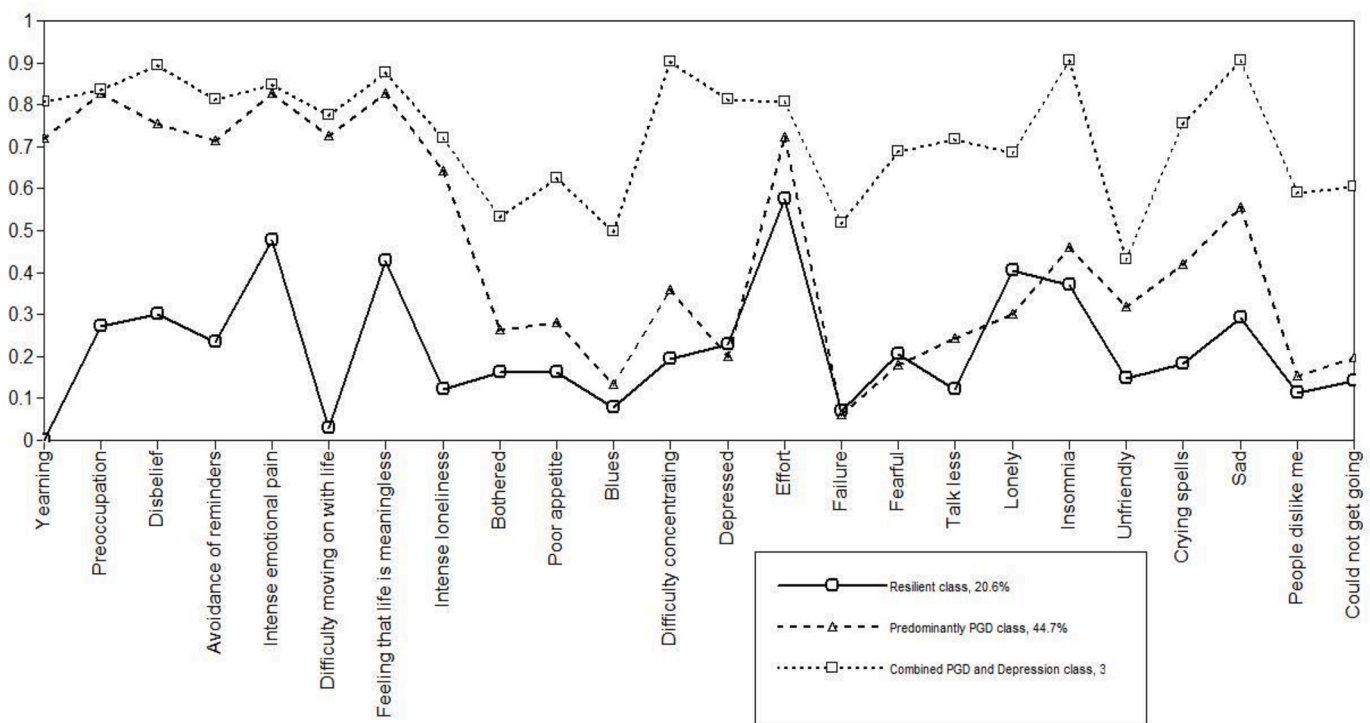


Fig. 1. Estimated symptom prevalence for the three-class models.

3.3. Predictors and correlates of class membership

Pertaining to the tests for differences between the classes as function of the sum scores on the PGD scale and CESD, the results indicated that both mean scores differed significantly between all three latent classes and were straightforwardly ordered such that Resilient class < predominantly PGD class < combined PGD/DEP class (all p s < .01). These results are shown in Appendix A.

Table 4

Parameter estimates for the latent class model with covariates.

| Covariates | Resilient class vs. Combined PGD/DEP class | | | Resilient class vs. PGD class | | |
|---|--|------------|-----------------|-------------------------------|------------|-----------------|
| | <i>B</i> | Std. Error | <i>p</i> -value | <i>B</i> | Std. Error | <i>p</i> -value |
| Univariate analyses | | | | | | |
| PGD mean scores | 0.65 | 0.29 | 0.02 | 0.69 | 0.30 | 0.01 |
| Depression mean scores | 0.37 | 0.28 | 0.04 | 0.30 | 0.29 | 0.05 |
| Multivariate analyses | | | | | | |
| Age | -0.12 | 0.08 | 0.07 | -0.05 | 0.06 | 0.40 |
| Gender | 0.76 | 0.49 | 0.12 | 0.48 | 0.45 | 0.29 |
| Religion | -0.03 | 0.44 | 0.94 | -0.19 | 0.37 | 0.60 |
| Spirituality | -0.02 | 0.02 | 0.35 | -0.03 | 0.02 | 0.04 |
| Relationship ^a (ref = peers, friend, romantic partner) | | | | | | |
| Immediate family member | 0.97 | 0.76 | 0.01 | 0.23 | 0.74 | 0.75 |
| Extended family member | -1.01 | 0.68 | 0.14 | -0.33 | 0.57 | 0.57 |
| Cause of death ^b | 0.62 | 0.53 | 0.24 | 0.76 | 0.48 | 0.12 |
| Time since loss | -0.02 | 0.02 | 0.25 | -0.02 | 0.01 | 0.09 |
| Number of loss | 0.41 | 0.37 | 0.26 | 0.58 | 0.37 | 0.12 |
| Total CBS score | 0.30 | 0.06 | 0.00 | 0.24 | 0.05 | 0.00 |

Note:

^a dummy coded as follows: 1 = immediate family member, i.e., parent, sibling, 2 = extended family member, i.e., grandparent, uncle, aunt, cousin, nephew, and 3 = peers, friend and romantic partner;

^b dummy coded as follows: 1 = natural deaths including death in old age or diagnosed advanced terminal illness, 2 = sudden and violent deaths including death by fatal accident, suicide and homicide.

Table 4 presents tests for differences between the classes in terms of sociodemographic and loss-related factors, religiousness, spirituality, and continuing bond to the deceased when entered simultaneously into the model. The Resilient class was used as reference. The results showed that younger people were also more likely to belong to the PGD/DEP class ($B = -0.12$, $SE = 0.07$, $p = .07$) as well individuals who had lost parent or sibling ($B = 0.97$, $SE = 0.76$, $p < .01$).

Higher CBS scores were significantly associated with the PGD/DEP class ($B = 0.30$, $SE = 0.06$, $p < .001$). On the another hand, members of the predominantly PGD class were more likely to be recently bereaved ($B = -0.02$, $SE = 0.01$, $p = .09$) and report lower levels of spirituality ($B = -0.03$, $SE = 0.02$, $p = .04$). Higher CBS scores were also found to predict the predominantly PGD class membership ($B = 0.24$, $SE = 0.05$, $p < .001$). See Table 5.

4. Discussion

To the best of our knowledge, this LCA research is the first attempt at examining patterns in symptoms of PGD, using the newest DSM-5 PGD criteria, and bereavement-related depression in a sample of bereaved individuals from a SSA country; a part of the globe which is under-represented in the contemporaneous bereavement research. In line with most of previous LCA research (Boelen et al., 2016; Maccallum and Bryant, 2018), a 3-class solution was the most optimal solution. We identified a resilient class (20.6%), predominantly PGD class (44.7%), and combined PGD/Depression class (34.7%). Furthermore, the results showed that age, time elapsed since the loss, continuing bond and relationship with the deceased, as well as spirituality were the differential predictors of class membership.

Our 3-class model was identical to the one found by Boelen et al. (2016), similarly based on PGD and depression outcomes. In particular, the identification of a combined PGD/DEP class in this sample links up with and reinforces previous LCA-studies (Boelen et al., 2016; Maccallum and Bryant, 2018) that evidenced the existence of a subgroup of bereaved individuals who deal with constellations of PGD and bereavement-related depression symptoms. The probabilities of

Table 5
Socio-demographic and loss-related characteristics across latent classes.

| Variables | Total sample N=230 | Class 1: Resilient class (n = 47, 20.6%) | Class 2: Predominantly PGD class (n = 103, 44.7%) | Class 3: Combined PGD and Depression class (n = 80, 34.7%) |
|---|-----------------------|---|--|---|
| PGD severity | 23.61 (6.38) | 14.60 (3.88) | 24.86 (3.88) | 27.03 (5.20) |
| Depression severity | 24.49 (9.56) | 16.53 (7.33) | 20.40 (5.34) | 34.25 (6.33) |
| Age, <i>M(SD)</i> | 22.81 (4.37) | 23.53 (5.19) | 22.87 (3.96) | 22.31 (4.34) |
| Gender | | | | |
| Males | 105 (45.7%) | 27 (25.7%) | 46 (43.8%) | 32 (30.5%) |
| Females | 125 (54.3%) | 20 (16.0%) | 56 (44.8%) | 49 (39.2%) |
| Religion, <i>M (SD)</i> | 4.08 (0.73) | 4.13 (0.97) | 4.07 (0.68) | 4.07 (0.65) |
| Spirituality, <i>M (SD)</i> | 28.02 (13.26) | 30.89 (14.17) | 26.49 (12.18) | 28.27 (13.89) |
| Relationship | | | | |
| Parent, sibling | 104 (45.2%) | 15 (14.4%) | 38 (36.5%) | 51 (49.01%) |
| Grandparent, aunt, uncle | 86 (37.4%) | 24 (27.9%) | 45 (52.3%) | 17 (19.8%) |
| Friend, peer | 40 (17.4%) | 8 (20.0%) | 19 (47.5%) | 13 (32.5%) |
| Cause of death (N=227) | | | | |
| Natural anticipated loss | 137 (60.4%) | 32 (23.4%) | 58 (42.3%) | 47 (34.3%) |
| Natural sudden loss | 48 (21.1%) | 6 (12.5%) | 23 (47.9%) | 19 (39.6%) |
| Violent loss | 42 (18.5%) | 7 (16.7%) | 21 (50.0%) | 14 (33.3%) |
| Time since loss in months, <i>M (SD)</i> | 21.55 (18.93) | 25.07 (20.99) | 18.62 (17.11) | 23.28 (19.58) |
| Number of loss (N=229) | | | | |
| 1 | 55 (24.0%) | 15 (27.3%) | 21 (38.2%) | 19 (34.5%) |
| 2 | 132 (57.6%) | 25 (19.9%) | 59 (44.7%) | 48 (36.4%) |
| 3 | 32 (14.0%) | 5 (15.6%) | 17 (53.1%) | 10 (31.3%) |
| 4 to 5 | 10 (4.4%) | 1 (10.0%) | 5 (50.0%) | 4 (40.0%) |
| Continuing bond, <i>M(SD)</i> | 13.12 (4.49) | 9.75 (3.70) | 13.51 (4.22) | 14.59 (4.28) |

Note: Cause of the death and number of loss were not recategorized.

endorsing all PGD symptoms, thereby including core symptoms known as intense yearning for the deceased and preoccupying memories and thoughts, were high in both symptomatic classes. However, what appeared novel here was that yearning for the deceased did differentiate bereaved individuals in the Resilient class from those in both symptomatic classes. This result is in partial contrast with those reported by Boelen et al. (2016) indicating the high presence of yearning for the deceased in all distinct latent classes. This result may reflect the cultural beliefs in many Togolese communities which encourage self-expression of yearning through specific mourning rituals during the first two years postloss as a means to come to terms with grief related pain (Kokou-Kpolou et al., 2017). Almost similar considerations were developed by Schaal et al. (2009) who found among Rwandan widowed genocide survivors, that items related to “yearning” did not correlate with many other PGD items including the item of impaired functioning. Taken together, we believed that under certain conditions “yearning” may not be problematic for all subgroups of African bereaved individuals.

Further, what seems perhaps little surprising was the high

prevalence of both symptomatic classes (44.7% for the predominantly PGD class and 34.7% for the combined PGD and Depression class) when compared to previous LCA research. Also, the prevalence of the predominantly PGD class was two time higher than that reported in Togolese widowed persons (Kokou-Kpolou et al., 2020b). With respect to our sample characteristics, the relatively short bereavement-period set as a criterion for participation (i.e., a maximum of 5 year post-loss) may explain the elevated prevalence rates of the predominantly PGD class.

With regard to the predictors of class membership, it has been shown in this sample that age distinguished between the classes, particularly between the Resilient and combined PGD/Depression class. Younger people were found to be more at-risk to endorse pervasive symptomatology. Among loss-related variables, time elapsed since the loss and kinship were predictive of class membership. Specifically, compared with people in the resilient class, more recently bereaved individuals were likely to belong to PGD class and those who mourned the death of immediate family member were more likely to belong to the combined PGD/Depression class. These findings are consistent with attachment theory and the bereavement literature, foregrounding that the nature of the relationship to the deceased is central in the grieving process and determines the outcomes of bereavement and health (e.g., Fernández-Alcántara & Zech, 2017 (Holland and Neimeyer, 2011; Kokou-Kpolou et al., 2020a). These findings also confirmed some previous LCA studies that found that kinship was predictive of pervasive combined classes including a PGD/Depression class vs. a Resilient class (Maccallum and Bryant, 2018) and PGD/PTSD or PTSD/PGD class vs. a Resilient class (Eisma et al., 2019; Djelantik et al., 2016).

Another key contribution of this study was that the continuing bond with the deceased differentiated class membership. Specifically, individuals who belonged to the PGD and combined PGD/Depression classes in comparison to those in the Resilient class had higher levels of continuing bond with the deceased. This finding aligns with the extant literature showing the associations between bereavement complications and high levels of post-loss attachment to the deceased (Boulware and Bui, 2016; Neimeyer et al., 2006). Given that the bereaved individuals in the resilient class reported lower levels of continuing bonds to the deceased, we argue that experiences of more intense continuing bonds could be conceptualized as common vulnerability or covariates to co-occurring PGD and depression symptom severity.

Our results also add to the LCA work on PGD and depression interaction by showing that lower levels of spiritual beliefs were associated with the predominantly PGD class compared to the Resilient class. Although previous empirical studies from SSA (Chukwuorji et al., 2018; Kokou-Kpolou et al., 2017b) suggested the role of spiritual beliefs in mourning process, this is the first time spiritual beliefs as measured using a reliable instrument, were found to be associated with grief. Our findings showed that lower levels of spiritual beliefs might associated with difficulty in accepting the loss and finding meaning to the loss. Pending to replication in future studies, these findings are consistent with arguments that spirituality, whether expressed in theistic religious system or a philosophical system, may offer comfort and consolation at time of loss, and facilitate the mourning process (e.g., Doka, 2002; Wada and Park, 2009).

The current study results should be interpreted with some limitations in mind. First, it should be noted that although previous studies from SSA countries have used the ICG to assess prolonged grief symptomatology, none have formally validated this measure. Also, although the CESD has been used in previous research in French-speaking SSA countries, there is a lack of rigorous validation of this version of the scale which underwent a significant revision by Eaton et al. (2004) and has recently been validated among Nigerian Young adults (Kokou-Kpolou et al., 2021). However, the two measures demonstrated a good internal consistence in our sample. Second, as far we are informed, this is the first LCA study which explicitly relied on the proposed PGD criteria in the revised DSM-5 (Boelen et al., 2020). It should be noted that, except the

22-item Traumatic Grief Inventory-self report plus which is recently developed by Boelen and colleagues (2019), any standardized grief measures did not fully cover the PGD symptom items as defined either in the recently proposed changes to DSM-5 PGD or by ICD-11 (Tremblay et al., 2020). In this vein, the ICG items tailored for the purpose of this paper lacked to cover the set of the DSM-5 PGD symptomatology: 8 out of 10 symptom items were covered. Thirdly, the results relied on self-report data using a convenience limited-size sample. Therefore, associations between the study variables could be inflated because of shared variance effects. Fourthly, the cross-sectional design used precludes inferences of directionality and causality between study variables. There is ample empirical evidence showing high prevalence rates for depression symptoms among university students (Auerbach et al., 2018; Liu et al., 2019; Peltzer and Pengpid, 2015; Kokou-Kpolou et al., 2021). Thus, the preexisting depression symptomatology could be a risk factor for prolonged grief or serve as risk factors for one another. Future LCA-research using a prospective longitudinal design paired with clinician ratings would be of further value. Lastly, it should be noted that the study relied on a non-clinical population and most participants were bereaved less than 12 months. However, for a formal DSM-5 PGD diagnosis, symptoms must exceed 12 months after the loss (APA, 2019).

Despite these limitations, our results have several conceptual and clinical implications. They underscore the clinical need to screening for co-occurring PGD and depression symptoms among African bereaved individuals rather than focusing on a single psychopathology construct. If future studies confirm in these populations the existence of a combined class, highly dominated by PGD and depression symptoms, both in clinical and non-clinical populations, clinicians should allocate attention to the discourse of their patient on how these symptoms are intertwined. An adequate initial evaluation is important to identify whether therapists are faced with a PGD profile or if the appearance of intense depressive symptoms are important in the treatment. The emergence of a combined PGD/DEP class with high levels of severity, indicates that clinicians may benefit from using a transdiagnostic treatment protocol targeting co-occurring symptom patterns (Doering and Eisma, 2016; Johannsen et al., 2019; Shear et al., 2016; Bryant et al., 2017). Such treatment protocols would additionally demonstrate their effectiveness from targeting the severity of the ongoing attachment to the deceased and including spiritual resources as a therapeutic lever to facilitate adjustment to loss. Another important point to remind in clinical work is the role of attachment figures, including those pertaining to the immediate family (i.e. parent or sibling) and the bond established with them.

In conclusion, the results reveal in a sample from SSA that co-occurring prolonged grief and depression symptoms are heterogeneous and suggest that differences between clusters must be recognized when assessing psychopathology following bereavement. The also provide a preliminary basis to implementing evidence-based prevention and intervention programs for grief complications. The effectiveness of these programs should accord importance to sociocultural and spiritual heritages of bereaved individuals in need of professional help.

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CRediT authorship contribution statement

Cyrille Kossigan Kokou-Kpolou: Conceptualization, Investigation, Investigation, Methodology, Software, Formal analysis, Writing - original draft. **Sunyoung Park:** Methodology, Software, Formal analysis. **Lonneke I. M Lenferink:** Methodology, Data curation, Writing - review & editing, Validation, Visualization. **Steven Kotar Iorfa:** Writing - original draft, Writing - review & editing. **Manuel Fernández-Alcántara:** Data curation, Writing - review & editing, Validation, Visualization. **Daniel Derivois:** Writing - review & editing, Validation,

Visualization, Supervision. **Jude Mary Cénat:** Conceptualization, Writing - original draft, Validation, Visualization, Supervision.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:[10.1016/j.psychres.2021.113864](https://doi.org/10.1016/j.psychres.2021.113864).

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