Received: 29 August 2017 | Revised: 14 December 2017 | Accepted: 15 December 2017

DOI: 10.1002/pon.4629

PAPER

WILEY

Prolonged grief disorder and depression are distinct for caregivers across their first bereavement year

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Funding information
National Science Council, Grant/Award Number: NSC 96-2314-B-182-029-MY2; National Health Research Institutes, Grant/Award Number: NHRI-EX106-10208PI; Chang Gung Memorial Hospital, Linkou, Grant/Award Number: BMRP888; Ministry of Science and Technology, Grant/Award Number: MOST 104-2314-B-182-027-MY3

Abstract

Background: Prolonged grief disorder (PGD) and depression are recognized as distinct emotional-distress disorders for bereaved family caregivers. However, this distinction has been mostly validated in cross-sectional studies, neglecting the dynamic characteristics of bereaved caregivers' emotional distress.

Objective: To validate the distinction between symptoms of PGD and depression across the first bereavement year for family caregivers of terminally ill cancer patients.

Methods: In this descriptive, longitudinal study of 394 bereaved Taiwanese family caregivers, we measured symptoms of PGD and depression by the Prolonged Grief-13 and Center for Epidemiologic Studies Depression (CES-D) scales at 6 and 13 months postloss, respectively. Agreement between cases of PGD and severe depressive symptoms (CES-D score ≥ 16) was analyzed by Cohen's kappa. Structural distinctiveness was longitudinally examined using confirmatory bifactor modeling.

Results: Agreement was poor between cases of PGD and severe depressive symptoms at 6 and 13 months postloss (kappa = .16 [confidence interval = .09, .22] and .12 [confidence interval = .03, .19], respectively). Symptoms of PGD and depression shared a general factor, but were distinct as shown by their significant specific factor loadings at 6 and 13 months postloss. Confirmatory bifactor models showed structural invariance (confirmatory fit index difference < .01 and χ^2 difference $P > .05$) between 6 and 13 months postloss.

Conclusion: Symptoms of PGD and depression were confirmed as distinct across the first year of bereavement. Health care professionals should recognize early in bereavement that symptoms of PGD and depression are distinct, identify high-risk groups, and provide care tailored to caregivers' unique needs to facilitate recovery from bereavement-related emotional-distress disorders.

KEYWORDS

bereavement, cancer, depression, family caregivers, prolonged grief disorder, oncology

1 | INTRODUCTION

Bereavement is a highly stressful life event that profoundly and negatively influences family members.[1] The primary emotional reaction after losing a family member is grief,[2] which is manifested by indicators such as depressive symptoms.[3-6] Bereaved family members, especially spouses, reported severe depressive-symptom rates as high as 12.1% to 73.3%.[1,5,6] The intensity of bereaved family members' depressive symptoms generally and gradually decreases as they slowly adjust to their loss over time.[6,7] However, if the intensity of grief/depressive symptoms does not resolve over time (≥6 months postloss), prolonged grief disorder (PGD) or complicated grief [3,7-9] may develop. Meta-analysis showed a pooled PGD prevalence of 9.8% (95% confidence interval [CI]: 6.8–14.0%).[10]

PGD results from severing a strong, emotionally close attachment as described in Bowlby's attachment theory,[11] whereas depression need not be precipitated by loss and is often the result of long-term social and self-rejection,[12] leading to a cognitive triad of negative thoughts about the self, the world, and the future.[13] PGD and depression share similar characteristics/symptoms of emotional reactions,

loss of energy, and loss of interest in activities. However, PGD is related to a specific event (loss of a loved one) and includes separation anxiety and yearning for the deceased individual.[3,11]

Therefore, the DSM-5 established PGD as an independent mental disorder.[14] PGD was also included as a new mental disorder distinct from depression in *The International Classification of Diseases*, 11th revision (ICD-11).[15] Indeed, symptoms of PGD and depression have been evaluated broadly and identified as distinct,[4,8,16-24] but with some insufficiencies.

The differences between symptoms of PGD and depression have initially and mostly been examined by exploratory factor analysis,[8,16-20] which is inappropriate for examining the distinction between well-developed instruments[25] such as those for PGD and depression. Another approach more commonly used[4,16,20-23] to distinguish symptoms of PGD and depression is confirmatory factor analysis (CFA), which tests whether an instrument's outcomes match its hypothesized factor structure (number of factors/dimensions).[26] However, CFA cannot simultaneously differentiate general and specific[24] factors underlying 2 instruments.

Moreover, both PGD and depression are dynamic bereavement reactions for bereaved individuals, ie, their trends decrease over time.[6,7,10,27] However, these dynamic characteristics have been neglected by mostly cross-sectional studies[4,8,16-21,23] validating their distinctiveness during bereavement, except for 2 studies.[22,24] Furthermore, most of these studies were conducted in Western countries,[4,8,17,19-24] with only 2 from Asia.[16,18] The experience of PGD or depression during bereavement may differ in Asian and Western cultures due to different caregiving approaches[27] and perceptions of caregiving burden.[6,27] To address these insufficiencies, we designed this longitudinal study to validate the distinction between symptoms of PGD and depression in the first year of bereavement for Taiwanese family caregivers of terminally ill cancer patients.

2 | METHODS

2.1 | Research design and sample

For this study, data on preloss caregiving experiences and bereavement adjustment were pooled for family caregivers of terminally ill cancer patients in 2 of the corresponding author's observational studies.[6,27] These Taiwanese caregivers were recruited by convenience from December 2006 through December 2012 and followed through July 2016. Eligible caregivers met these criteria: (1) identified by patients as the person most involved in their daily care without receiving payments, (2) their care recipients had terminal/advanced cancer as judged by their physician, and (3) were ≥20 years old and cognitively competent to communicate. The study site's Institutional Review Boards approved the research protocols (95-1371B, 98-0476B), and each participant signed written informed consent.

2.2 | Measures

Caregivers' PGD symptoms were assessed using the Prolonged Grief Questionnaire (PG-13).[3] PGD diagnostic criteria are emotional reactions to the death of a loved one, including yearning (eg, suffering from wanting to reunite with the deceased) and daily or disabling experience of at least 5 of 9 symptoms: feeling emotionally numb, stunned, or the future is meaningless; experiencing mistrust; bitterness over the loss; difficulty accepting the loss; identity confusion; avoiding the reality of the loss; or difficulty moving on with life. Symptom levels should be high at least 6 months postloss and associated with functional impairment.[3]

Depressive symptoms were measured by the 20-item Center for Epidemiological Studies Depression Scale (CES-D),[28] which assesses symptoms on 4 subscales: positive emotions, depressive emotions, physical activities, and social difficulties. Items are rated from 0 to 3 based on item frequency during the past week. Total scores range from 0 to 60; scores ≥16 suggest clinical depression pending a clinician's diagnosis.[29]

2.2.1 | Data collection

Caregivers were interviewed in person for their baseline preloss caregiving experience (on average 110.00 days (SD: 136.73, median: 62, range: 1–912) before patient death) and approximately every 2 weeks thereafter (at an inpatient ward or clinic) until they declined to participate. Bereaved family caregivers were surveyed 1, 6, and 13 months postloss by mails and phone interviews when necessary.

2.3 | Data analysis

We longitudinally validated the distinction between symptoms of PGD and depression in the first year of bereavement by (1) testing agreement between cases of PGD and severe depressive symptoms, (2) examining whether symptoms of PGD and depression are distinct conceptual structures at 6 and 13 months postloss, and (3) assessing whether the 2 conceptual structures are invariant between 6 and 13 months postloss.

Agreement between cases of PGD and severe depressive symptoms was determined by percentages and the kappa coefficient (with 95% CI). Agreement (kappa coefficient) was determined as poor (≤.20), fair (.21–.40), moderate (.41–.60), substantial (.61–.80), and almost perfect (.81–1.00).[30]

Despite CFA being an appropriate approach to evaluating the distinction between symptoms of PG and depression, which both can be measured by validated instruments, a stronger alternative is confirmatory bifactor modeling.[31,32] Confirmatory bifactor modeling hypothesizes that indicators (instrument items) of 2 or more concepts are influenced not only by a general/common factor, but also specific factors inherent in each concept's latent characteristics. Therefore, confirmatory bifactor modeling is more appropriate than CFA for our study.

The structural distinctiveness of PGD and depressive symptoms was analyzed using confirmatory bifactor modeling in Mplus 7.0. In the bifactor model, every second-order factor is mutually independent with its own specific factor and shares a general factor with the primary factor. Reasonable overall model fit must be confirmed before testing for factor loading and variance.[31,33] The extent to which the estimated model fit the observed data was evaluated by χ^2/df, comparative fit index (CFI), and root mean square error of approximation (RMSEA).[34] Suggested criteria for good model fit are χ^2/df < 2, RMSEA <.05, and CFI > .9.[35,36] The extent to which the general/specific factor influences each instrument's items was tested by general/specific factor loadings. The variance explained by these general/specific

factors for each instrument was determined by squaring factor loadings. Factor loadings >.45 and explained variance ≥20% are acceptable.[37]

To assess whether the 2 conceptual structures established by these procedures were invariant between 6 and 13 months postloss, we examined changes in model fit by invariance testing. That is, we used the theoretical model as a baseline to validate alternative models.[35] These alternative models were formed by adding different constraints, such as factor-loading equivalence, to the baseline model, which was then compared with alternative models by χ^2 difference tests to determine whether the observed data conform better to alternative models with stricter conditions and more constraints. Data passing the χ^2 difference tests (ie, nonsignificant test results) suggest that an alternative model has measurement invariance.[36] However, χ^2 values are sensitive to sample size. For large samples, the χ^2 difference ($\Delta\chi^2$) may achieve significance, leading to falsely rejecting the null hypothesis and suggesting a significant difference between models. Therefore, besides a significant $\Delta\chi^2$ ($P < .05$) indicating that invariance assumptions are not supported, we used the absolute value of CFI difference (ΔCFI) > .05.[37]

3 | RESULTS

3.1 | Participant characteristics

Of 877 eligible caregivers, 88 refused to participate in preloss caregiving-experience surveys primarily due to being busy caregiving for their terminally ill relative or perceiving an emotional burden from participation (Figure 1). Of the 789 caregivers recruited, 599 completed the last

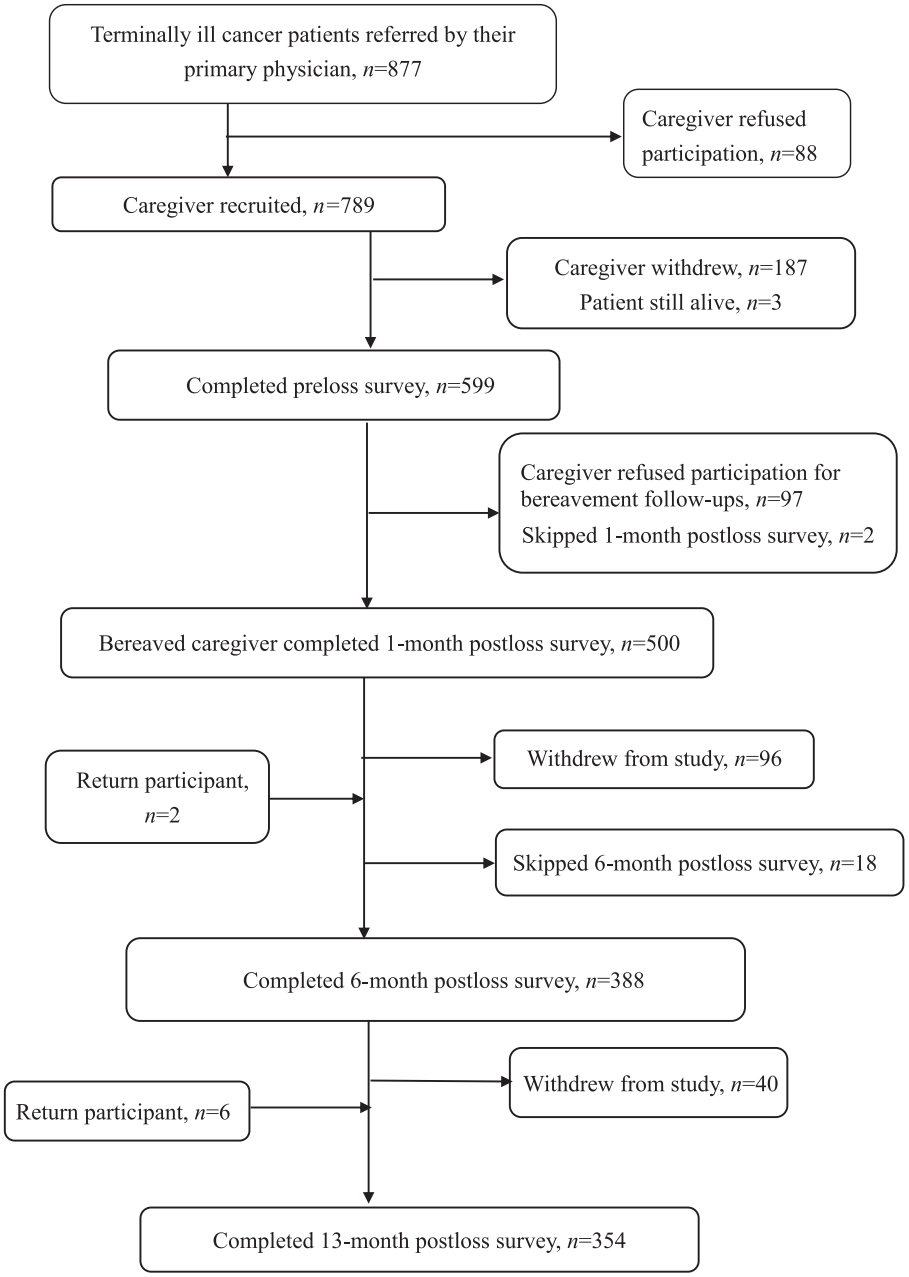

FIGURE 1 Case flow

preloss survey before the patient's death (75.9% preloss-survey participation), with withdrawal primarily for the same reasons earlier. Only 500 bereaved caregivers participated in the first assessment of bereavement-grief experience (83.5% postloss-survey participation). Bereaved caregivers withdrew from postloss surveys primarily due to being busy adjusting to their new life and perceiving a burden in continuously reviewing the loss. Caregivers who completed and withdrew from postloss surveys were similar in demographic characteristics (Supplemental Tables 1–2). However, only 388 and 354 caregivers completed the 6- and 13-month postloss surveys, respectively (77.6% [388/500] and 70.8% [354/500] bereavement follow-up, respectively) (Figure 1). Comparison of the last pre-withdrawal depressive-symptom level and PGD status for caregivers who did and did not complete the 6- or 13-month postloss survey showed that these values did not differ significantly at either time (Supplemental Table 3). The final sample comprised 394 bereaved caregivers (388 at 6 months plus 6 who completed the 1-month survey, skipped the 6-month survey, and returned for the 13-month survey) (Figure 1). Details of caregivers' demographics are in Table 1.

3.2 | Agreement between cases of prolonged grief disorder and severe depressive symptoms

At 6 months postloss, 20 (5.2%) and 148 (38.3%) bereaved caregivers met the criteria for PGD and severe depressive symptoms, respectively; at 13 months, 8 (2.4%) and 96 (27%) bereaved caregivers met the criteria for PGD and severe depressive symptoms, respectively (Table 2). Agreement between cases of PGD and severe depressive symptoms was 67.0% and 75.1% at 6 and 13 months postloss, respectively, with kappa values of .16 (95% CI: .09, .22) and .12 (95% CI: .03, .19), respectively, indicating poor agreement between cases of PGD and severe depressive symptoms at 6 and 13 months postloss.

TABLE 1 Caregivers' characteristics (*N* = 394)

Characteristic	*n*	%
Age (years)		
Mean (standard deviation)	48.35	(12.41)
Range	20–83	
Gender		
Male	140	35.5
Female	254	64.5
Relationship with patient		
Spouse	206	52.2
Adult child	124	31.5
Parent/sibling/friend	64	16.3

3.3 | Structural distinctiveness of symptoms of prolonged grief disorder and depression in the first bereavement year

The confirmatory bifactor model had model fit indexes for χ^2/df, RMSEA, and CFI of 1.26, .05, and .81, respectively, suggesting an acceptable fit between the estimated model and observed data.[34-36]

Next, factor loadings were examined for symptoms of PGD and depression (Table 3). Factor loadings for the general factor underlying the PG-13 at 6 and 13 months postloss were .42 to .77 (all *P*-values < .05) and .35 to .81 (all *P*-values < .05), respectively, and those underlying the CES-D at 6 and 13 months postloss were .58 to .82 (all *P*-values < .05) and .60 to .80 (all *P*-values < .05), respectively. After extracting general factor loadings, we identified significant specific factor loadings for both the PG-13 and CES-D. Specific factor loadings for the PG-13 at 6 and 13 months postloss were .32 to .75 and .27 to .77, respectively; for the CES-D, specific factor loadings were .27 to .65 and .14 to .66, respectively. However, specific factor loadings were not significant for 7 items: CES-D item 16 at 6 months postloss; CES-D items 4, 8, 12, 15, and 16 and PG-13 item 8 at 13 months postloss (Table 3). Variances explained were 47% to 81% and 41% to 76% for the PG-13 and 52% to 85% and 53% to 88% for the CES-D at 6 and 13 months postloss, respectively (Table 3).

After establishing distinct factor structures for the PG-13 and CES-D, we examined these models' structural invariance between 6 and 13 months postloss by invariance testing. First, we let factor loadings at 6 and 13 months postloss be freely estimated in bifactor modeling. Second, factor loadings at these 2 times were set as invariance constraints. Last, we calculated $\Delta\chi^2$ and the absolute value of ΔCFI. The results showed CFI = .805 for both models. Therefore, ΔCFI was <.01, and $\Delta\chi^2$ was 79.49 (*P* > .05), indicating that the invariance assumptions could not be rejected.[38] Therefore, the distinct structures established by bifactor modeling for the PG-13 and CES-D were invariant between 6 and 13 months postloss.

4 | DISCUSSION

Our longitudinal study showed that symptoms of PGD and depression are distinct in the first year of bereavement. This conclusion is

TABLE 2 Agreement between cases of prolonged grief disorder and severe depressive symptoms[a] at 6 and 13 months postloss

		6 Months Postloss (*n* = 388) Severe depressive symptoms		13 Months Postloss (*n* = 354) Severe depressive symptoms	
		Yes	No	Yes	No
Prolonged grief disorder	Yes	20	0	8	0
	No	128	240	88	258
Observed agreement (%)		67.0		75.1	
Kappa (95% CI)		.16 (.09, .22)		.12 (.03, .19)	

[a]Severe depressive symptoms: CES-D score ≥ 16.

Abbreviation: CI, confidence interval.

TABLE 3 Standard factor loadings and variance explained for PG-13 and CES-D items

Item	6 Months Postloss			13 Months Postloss		
	Factor Loading		Variance Explained	Factor Loading		Variance Explained
	General	Specific		General	Specific	
Prolonged grief questionnaire (PG-13) In the past month,						
1. How often have you felt yourself longing or yearning for the person you lost?	.42**	.75**	.74	.35**	.77**	.71
2. How often have you had intense feelings of emotional pain, sorrow, or pangs of grief related to the lost relationship?	.63**	.63**	.78	.61**	.62**	.75
3. For questions 1 or 2 above, have you experienced either of these symptoms at least daily and after 6 months have elapsed since the loss?	.46**	.51**	.47	.37**	.52**	.41
4. How often have you tried to avoid reminders that the person you lost is gone?	.51**	.55**	.56	.53**	.54**	.57
5. How often have you felt stunned, shocked, or dazed by your loss?	.65**	.61**	.80	.59**	.57**	.67
6. Do you feel confused about your role in life or feel like you don't know who you are (ie, feeling that a part of yourself has died)?	.74**	.38**	.69	.79**	.34*	.73
7. Have you had trouble accepting the loss?	.61**	.61**	.74	.66**	.49**	.68
8. Has it been hard for you to trust others since your loss?	.72**	.32**	.62	.75**	.27	.63
9. Do you feel bitter over your loss?	.69**	.59**	.81	.65**	.54**	.71
10. Do you feel that moving on (eg, making new friends, pursuing new interests) would be difficult for you now?	.75**	.41**	.73	.78**	.33*	.71
11. Do you feel emotionally numb since your loss?	.77**	.33**	.70	.81**	.29*	.74
12. Do you feel that life is unfulfilling, empty, or meaningless since your loss?	.75**	.41**	.73	.78**	.41*	.76
13. Have you experienced a significant reduction in social, occupational, or other important areas of functioning (eg, domestic responsibilities)?	.69**	.33**	.58	.68**	.34**	.59
Center for Epidemiological Studies-Depression (CES-D)						
1. I was bothered by things that usually don't bother me.	.65**	.65**	.84	.66**	.66**	.88
2. I did not feel like eating; my appetite was poor.	.76**	.31*	.68	.70**	.47**	.70
3. I felt that I could not shake off the blues even with help from my family	.82**	.33**	.78	.80**	.40**	.80
4. I felt I was just as good as other people.	.62**	-.53*	.66	.74**	-.19	.59
5. I had trouble keeping my mind on what I was doing.	.76**	.47**	.80	.73**	.52**	.80
6. I felt depressed.	.80**	.46**	.85	.76**	.52**	.84
7. I felt that everything I did was an effort.	.76**	.27*	.64	.75**	.26*	.63
8. I felt hopeful about the future.	.59**	-.63**	.74	.73**	-.37	.67
9. I thought my life had been a failure.	.76**	.44*	.77	.71**	.50*	.75
10. I felt fearful.	.70**	.46**	.69	.69**	.57**	.80
11. My sleep was restless.	.73**	.32**	.63	.70**	.43**	.68
12. I was happy.	.69**	-.40*	.63	.74**	-.19	.58
13. I talked less than usual.	.78**	.31**	.70	.77**	.34**	.71
14. I felt lonely.	.76**	.31**	.67	.78**	.42**	.78
15. People were unfriendly.	.58**	.43*	.52	.63**	.38	.53
16. I enjoyed life.	.69**	-.27	.52	.78**	-.14	.63
17. I had crying spells.	.68**	.41**	.63	.64**	.48**	.64
18. I felt sad.	.72**	.53**	.79	.68**	.56**	.77
19. I felt that people dislike me.	.64**	.48**	.64	.60**	.59**	.71
20. I could not get "going."	.72**	.53**	.80	.70**	.57**	.80

**$P < .001$.

*$P < .05$.

supported by 3 observations: (1) low agreement between cases of PGD and severe depressive symptoms; (2) symptoms of PGD and depression (measured by the PG-13 and CES-D, respectively) had distinct specific factors in the best fit confirmatory bifactor model, although the 2 instruments shared a general factor; and (3) the 2 emotional-distress disorders demonstrated a reliable and stable bifactor model structure between 6 and 13 months postloss.

We found that at 6 and 13 months postloss, agreement between cases of PGD and severe depressive symptoms was poor (kappa = .16 [95% CI: .09, .22] and .12 [95% CI: .03, .19], respectively), in contrast

with a previous report (kappa = .34).[8] However, 14% of participants in that study had both PGD and severe depressive symptoms,[8] whereas our caregivers' likelihood of having both PGD and severe depressive symptoms was merely 2.4% to 5.2% (Table 2). This low prevalence could have caused symmetrical imbalance during categorization and underestimated our kappa values.[39] Estimated prevalence-adjusted kappa values for our study were .34 (95% CI: .04, .64) and .50 (95% CI: .22, .78) at 6 and 13 months postloss, respectively, comparable to the previously reported agreement level (kappa = .34).[8] Therefore, agreement between cases of PGD and severe depressive symptoms in our bereaved caregivers was at best fair to moderate, considering the prevalence of PGD and severe depressive symptoms.

Our findings from confirmatory bifactor modeling indicated that the PG-13 and CES-D shared a general factor but were distinguished by significant specific factor loadings for these 2 instruments at 6 and 13 months postloss. Therefore, the 2 emotional-distress disorders of PGD and depression cannot replace one another. This conclusion is consistent with the findings of previous cross-sectional studies.[4,23] In the former study,[4] CFA was used to distinguish symptoms of depression, PGD, and posttraumatic stress. The latter study[23] identified 3 distinct syndromes: PGD, depression, and anxiety. Moreover, our general factor loadings for the PG-13 and CES-D were .35 to .82, consistent with previous moderate-to-high correlation coefficients (.53–.78).[4,24] Therefore, our and previous results[4,24] support that, despite their distinctiveness, PGD and depression share commonalities.

Furthermore, we found that the PG-13 and CES-D had invariant structures between 6 and 13 months postloss; namely, both tools shared and had distinct characteristics over time. Our longitudinal results extend previous cross-sectional findings[4,8,16-21,23] to demonstrate that although both PGD and depression are persistent emotional-distress disorders for bereaved family caregivers of terminally ill cancer patients, these disorders possess specific and distinct characteristics. Therefore, health care professionals must recognize the distinction between symptoms of PGD and depression early in bereavement (as early as 6 months postloss, as suggested[15]) to avoid missing bereaved caregivers with PGD by focusing only on depression and provide precise interventions tailored to the needs of bereaved caregivers with these different disorders.

Nevertheless, significance was not achieved for specific factor loadings of several items: CES-D item 16 at 6 months postloss; CES-D items 4, 8, 12, 15, and 16 and PG-13 item 8 at 13 months postloss. These findings mean that, after extracting general factor loadings, these items had no meaningful specific factor loadings. Of these 5 CES-D items, 4 (4, 8, 12, and 16) were positively stated (eg, I felt hopeful; I was happy; I enjoyed life), with item 15 (People were unfriendly) and PG-13 item 8 (Has it been hard for you to trust others since your loss?) being negative. The positive CES-D items were probably nonsignificant because of Taiwanese culture. Indeed, in Asian cultures, death is a taboo topic,[40] and expressing grief reactions is discouraged.[28,40] When a death occurs in a Taiwanese family, individuals must refrain from visiting places of entertainment and avoid attending celebrations and exhibiting happiness in public,[40] to honor the memory of the deceased, particularly during the mourning period and within the first year of bereavement.

5 | STRENGTHS AND LIMITATIONS OF THIS STUDY

The strengths of this study lie in its longitudinal approach in the first year of bereavement, its large sample (>300 participants), and use of advanced statistics (confirmatory bifactor analysis) to distinguish PGD and depression as distinct bereavement-related emotional-distress disorders. The finding of invariant structures for symptoms of PGD and depression between 6 and 13 months postloss makes this an important contribution to the field, especially given the debate about the 6-month (eg, ICD-11)[15] vs 12-month (eg, DSM-5)[14] diagnostic criteria. However, the representativeness of the target population may have been limited by convenience sampling of caregivers from an oncology ward in Taiwan. Our study findings cannot be generalized across cultures, particularly concerning death, a taboo and private topic.[28,40] Therefore, our findings from Taiwan need to be validated for bereaved family caregivers in other countries whose cultural and societal characteristics may substantially differ. Furthermore, only 77.6% and 70.8% of bereaved caregivers who participated in bereavement follow-ups completed the 6- or 13-month postloss surveys, respectively. The extent to which our study findings can be generalized to bereaved caregivers who withdrew from continuous participation is uncertain despite their last-assessed depressive-symptom levels and PGD status not differing significantly from those of caregivers who continuously participated. This study was limited to the first year of bereavement; thus, our results cannot be generalized to longer periods postloss. Future studies should extend the postloss period to at least 24 months[6] to validate the distinctiveness of the 2 emotional-distress disorders during bereavement.

6 | CONCLUSION AND CLINICAL IMPLICATION

Our findings not only confirm that PGD and depression are distinct bereavement-related emotional-distress disorders, but also validate that their distinct structures are stably maintained for at least 1 year during bereavement. Insights from our findings can give health care professionals confidence that PGD and depression are distinct disorders. Health care professionals should recognize the distinction between symptoms of PGD and depression early in bereavement, identify high-risk groups, and provide care tailored to these patients' unique needs to facilitate recovery from bereavement-related emotional distress.

ACKNOWLEDGEMENTS

This work was supported by National Science Council (NSC 96-2314-B-182-029-MY2), National Health Research Institute (NHRI-EX106-10208PI), Chang Gung Memorial Hospital, Linkou (BMRP888), and Ministry of Science and Technology (MOST 104-2314-B-182-027-MY3).

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REFERENCES

1. Nielsen MK, Neergaard MA, Jensen AB, Vedsted P, Bro F, Guldin MB. Predictors of complicated grief and depression in bereaved caregivers: a nationwide prospective cohort study. *J Pain Symptom Manage*. 2017;53(3):540-550. https://doi.org/10.1016/j.jpainsymman.2016.09.013
2. Stroebe MS, Folkman S, Hansson RO, Schut H. The prediction of bereavement outcome: development of an integrative risk factor framework. *Soc Sci Med*. 2006;63(9):2440-2451. https://doi.org/10.1016/j.socscimed.2006.06.012
3. Prigerson HG, Horowitz MJ, Jacobs SC, et al. Prolonged grief disorder: psychometric validation of criteria proposed for DSM-V and ICD-11. *PLoS Med*. 2009;6(8):e1000121. https://doi.org/10.1371/journal.pmed.1000121
4. Spuij M, Reitz E, Prinzie P, Stikkelbroek Y, de Roos C, Boelen PA. Distinctiveness of symptoms of prolonged grief, depression, and post-traumatic stress in bereaved children and adolescents. *Eur Child Adolesc Psychiatry*. 2012;21(12):673-679. https://doi.org/10.1007/s00787-012-0307-4
5. Allen JY, Haley WE, Small BJ, Schonwetter RS, McMillan SC. Bereavement among hospice caregivers of cancer patients one year following loss: predictors of grief, complicated grief, and symptoms of depression. *J Palliat Med*. 2013;16(7):745-751. https://doi.org/10.1089/jpm.2012.0450
6. Kuo SC, Chou WC, Chen JS, et al. Longitudinal changes in and modifiable predictors of the prevalence of severe depressive symptoms for family caregivers of terminally ill cancer patients over the first two years of bereavement. *J Palliat Med*. 2017;20(1):15-22. https://doi.org/10.1089/jpm.2016.0116
7. National Cancer Institute. Grief, bereavement, and coping with loss (PDQ®): health professional version. https://www.cancer.gov/about-cancer/advanced-cancer/caregivers/planning/bereavement-hp-pdq. Accessed August 7, 2017.
8. Prigerson HG, Frank E, Kasl SV, et al. Complicated grief and bereavement-related depression as distinct disorders: preliminary empirical validation in elderly bereaved spouses. *Am J Psychiatry*. 1995;152(1):22-30. https://doi.org/10.1176/ajp.152.1.22
9. Tomita T, Kitamura T. Clinical and research measures of grief: a reconsideration. *Compr Psychiatry*. 2002;43(2):95-102.
10. Lundorff M, Holmgren H, Zachariae R, Farver-Vestergaard I, O'Connor M. Prevalence of prolonged grief disorder in adult bereavement: a systematic review and meta-analysis. *J Affect Disord*. 2017;212:138-149. https://doi.org/10.1016/j.jad.2017.01.030
11. Prigerson HG, Shear MK, Frank E, et al. Traumatic grief: a case of loss-induced trauma. *Am J Psychiatry*. 1997;154(7):1003-1009. https://doi.org/10.1176/ajp.154.7.1003
12. Vance D. Towards a general theory of social psychology—understanding human cruelty, human misery, and, perhaps, a remedy (a theory of the socialization process), by Wendy Treynor. *J Relig Spiritual Aging*. 2011;23(3):272-273.
13. Beck AT. *Depression: Causes and Treatment*. Philadelphia: University of Pennsylvania Press; 1967.
14. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders (5th edition)*. Arlington, VA: American Psychiatric Association; 2013.
15. World Health Organization, 2016. ICD-11 beta draft—(mortality and morbidity statistics). https://icd.who.int/dev11/l-m/en#/http%3a%2f%2fid.who.int%2ficd%2fentity%2f1183832314, Accessed November 24, 2017.
16. Li J, Prigerson HG. Assessment and associated features of prolonged grief disorder among Chinese bereaved individuals. *Compr Psychiatry*. 2016;66:9-16. https://doi.org/10.1016/j.comppsych.2015.12.001
17. Prigerson HG, Bierhals AJ, Kasl SV, et al. Complicated grief as a disorder distinct from bereavement-related depression and anxiety: a replication study. *Am J Psychiatry*. 1996;153(11):1484-1486. https://doi.org/10.1176/ajp.153.11.1484
18. Tsutsui T, Hasegawa Y, Hiraga M, Ishiki M, Asukai N. Distinctiveness of prolonged grief disorder symptoms among survivors of the great east Japan earthquake and tsunami. *Psychiatry Res*. 2014;217(1-2):67-71. https://doi.org/10.1016/j.psychres.2014.03.001
19. Boelen PA, van den Bout J, de Keijser J. Traumatic grief as a disorder distinct from bereavement-related depression and anxiety: a replication study with bereaved mental health care patients. *Am J Psychiatry*. 2003;160(7):1339-1341. https://doi.org/10.1176/appi.ajp.160.7.1339
20. Boelen PA. Symptoms of prolonged grief, depression, and adult separation anxiety: distinctiveness and correlates. *Psychiatry Res*. 2013;207(1-2):68-72. https://doi.org/10.1016/j.psychres.2012.09.021
21. Boelen PA, van de Schoot R, van den Hout MA, de Keijser J, van den Bout J. Prolonged grief disorder, depression, and posttraumatic stress disorder are distinguishable syndromes. *J Affect Disord*. 2010;125(1-3):374-378. https://doi.org/10.1016/j.jad.2010.01.076
22. Boelen PA, Prigerson HG. The influence of symptoms of prolonged grief disorder, depression, and anxiety on quality of life among bereaved adults: a prospective study. *Eur Arch Psychiatry Clin Neurosci*. 2007;257(8):444-452. https://doi.org/10.1007/s00406-007-0744-0
23. Boelen PA, Van Den Bout J. Complicated grief, depression, and anxiety as distinct postloss syndromes: a confirmatory factor analysis study. *Am J Psychiatry*. 2005;162(11):2175-2177. https://doi.org/10.1176/appi.ajp.162.11.2175
24. Bonanno GA, Neria Y, Mancini A, Coifman KG, Litz B, Insel B. Is there more to complicated grief than depression and posttraumatic stress disorder? A test of incremental validity. *J Abnorm Psychol*. 2007;116(2):342-351. https://doi.org/10.1037/0021-843x.116.2.342
25. Thompson B. Exploratory and confirmatory factor analysis: understanding concepts and applications. American Psychological Association, 2004.
26. Hahn EA, Devellis RF, Bode RK, et al. Measuring social health in the patient-reported outcomes measurement information system (PROMIS): item bank development and testing. *Qual Life Res*. 2010;19(7):1035-1044. https://doi.org/10.1007/s11136-010-9654-0
27. Tsai WI, Prigerson HG, Li CY, Chou WC, Kuo SC, Tang ST. Longitudinal changes and predictors of prolonged grief for bereaved family caregivers over the first 2 years after the terminally ill cancer patient's death. *Palliat Med*. 2016;30(5):495-503. https://doi.org/10.1177/0269216315603261
28. Radloff LS. The CES-D scale: a self-report depression scale for research in the general population. *Appl Psychol Measur*. 1977;1(3):381-401. https://doi.org/10.1177/014662167700100306
29. Vodermaier A, Linden W, Siu C. Screening for emotional distress in cancer patients: a systematic review of assessment instruments. *J Natl Cancer Inst*. 2009;101(21):1464-1488. https://doi.org/10.1093/jnci/djp336
30. Cohen J. A coefficient of agreement for nominal scales. *Educ Psychol Meas*. 1960;20(1):37-46. https://doi.org/10.1177/001316446002000104
31. Chen FF, West SG, Sousa KH. A comparison of bifactor and second-order models of quality of life. *Multivariate Behav Res*. 2006;41(2):189-225. https://doi.org/10.1207/s15327906mbr4102_5
32. DeMars CE. Application of the bi-factor multidimensional item response theory model to testlet-based tests. *J Educ Meas*. 2006;43(2):145-168. https://doi.org/10.1111/j.1745-3984.2006.00010.x
33. Bollen KA. *Structural Equations with Latent Variables*. New York: Wiley; 1989.
34. Vandenberg RJ, Lance CE. A review and synthesis of the measurement invariance literature: suggestions, practices, and recommendations for organizational research. *Organ Res Meth*. 2000;3(1):4-69. https://doi.org/10.1177/109442810031002
35. Bagozzi RP, Yi Y. On the evaluation of structural equation models. *Acad Market Sci*. 1988;16(1):74-94. https://doi.org/10.1177/009207038801600107

36. Hu L, Bentler PM. Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *Struc Equ Modeling*. 1999;6(1):1-55. https://doi.org/10.1080/10705519909540118

37. Tabachnick BG, Fidell LS. *Using Multivariate Statistics*. 5th ed. Boston, MA: Allyn and Bacon; 2007.

38. Fornell C, Larcker DF. Evaluating structural equation models with unobservable variables and measurement error. *J Market Res*. 1981;18(1):39-50. https://doi.org/10.2307/3151312

39. Feinstein AR, Cicchetti DV. High agreement but low kappa: the problems of two paradoxes. *J Clin Epidemiol*. 1989;43(6):543-549. https://doi.org/10.1016/0895-4356(90)90158-L

40. Tsai PJ. Pattern of grief expression in Chinese families. *Taiwan Counsel Quar*. 2012;4:16-38.

SUPPORTING INFORMATION

Additional Supporting Information may be found online in the supporting information tab for this article.

How to cite this article: Tsai W-I, Kuo S-C, Wen F-H, Prigerson HG, Tang ST. Prolonged grief disorder and depression are distinct for caregivers across their first bereavement year. *Psycho-Oncology*. 2018;27:1027–1034. https://doi.org/10.1002/pon.4629