Original Article

Preloss Psychosocial Resources Predict Depressive Symptom Trajectories Among Terminally Ill Cancer Patients' Caregivers in Their First Two Years of Bereavement

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Abstract

Context. Postloss depressive symptom trajectories are heterogeneous and predicted by preloss psychosocial resources, but this evidence was from one old study on caregivers of patients with terminal cancer for whom these issues are highly relevant.

Objectives. To identify depressive symptom trajectories among cancer patients' bereaved caregivers and examine if they are predicted by preloss psychosocial resources while considering caregiving burden.

Methods. Preloss psychosocial resources (sense of coherence and social support) were measured among 282 caregivers. Depressive symptoms were measured by the Center for Epidemiological Studies−Depression scale at one, three, six, 13, 18, and 24 months after loss (Center for Epidemiological Studies−Depression scores ≥16 indicate severe depressive symptoms). Distinct depressive symptom trajectories and their predictors were identified by latent-class growth analysis.

Results. We identified five depressive symptom trajectories (prevalence): endurance (47.2%), resilience (16.7%), transient reaction (20.2%), prolonged symptomatic (11.7%), and chronically distressed (4.2%). Over two years after loss, the endurance group never experienced severe depressive symptoms. Severe depressive symptoms lasted six, seven to 12, and 18 months for the resilience, transient-reaction, and prolonged-symptomatic groups, respectively. The chronically distressed group's severe depressive symptoms persisted. The endurance and chronically distressed groups had the best and weakest psychological resources, respectively. Endurance-group caregivers perceived the greatest social support, whereas the resilience and transient-reaction groups had higher social support than the prolonged-symptomatic group.

Conclusions. Most (84.1%) caregivers' depressive symptoms subsided within one year after loss. Preloss psychosocial resources predicted depressive symptom trajectories for bereaved caregivers. Health care professionals can help caregivers adjust their bereavement by providing support to enhance their sense of coherence and encouraging social contacts while they are providing end-of-life care. J Pain Symptom Manage 2019;58:29−38. © 2019 American Academy of Hospice and Palliative Medicine. Published by Elsevier Inc. All rights reserved.

Introduction

Family caregivers of patients with terminally ill cancer carry heavy caregiving burdens[1] and suffer tremendous emotional distress from anticipating the loss of their beloved.[2,3] Many family caregivers providing end-of-life (EOL) care to patients with cancer (20−73%)[4] suffer severe depressive symptoms that do not end with the patient's death.

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Grieving during bereavement is a dynamic and individualized adjustment process.[5] Bereaved family members' depressive symptom trajectories are heterogeneous[6] and were classified in a systematic review into five groups.[6] The first group (prevalence = 54.2%) endured well the hardship of losing a beloved, as indicated by their depressive symptom levels remaining below the Center for Epidemiological Studies−Depression [CES-D] cutoff score (≤16) for severe depressive symptoms throughout four to five years of bereavement. The second bereaved-caregiver group (8.8%) suffered severe depressive symptoms when they first transitioned into bereavement but quickly recovered within three to six months after loss. Severe depressive symptoms of the third group (7.7%) took seven to 12 months to subside. The final two groups (19.4% and 9.9%) experienced prolonged periods of severe depressive symptoms, which improved gradually only for the fourth bereaved-caregiver group.[6]

Caregiving outcomes are mediated by a complex web of 1) contextual factors, 2) caregiving burden, 3) available psychosocial resources, and 4) appraisal of caregiving.[7] Predictors of bereaved family members' distinct depressive symptom trajectories include their demographics (contextual factors),[8−12] caregiving stress,[8,12] psychological (coping) resources,[8−11,13] and social support.[8−12] Among these predictors, psychosocial resources[8−13] are most often investigated and modifiable. When individuals lose a beloved, they can maintain or rapidly recover their psychological well-being if they have adequate psychosocial resources to cope.[8−18] People with superior psychological resources tend to be more resilient when facing the challenging and stressful event of death of a beloved[8−18] because they are more likely to appraise demands positively, comprehend situations realistically, and mobilize internal and external resources required to resolve difficult circumstances more efficiently, as specified by Antonovsky's sense of coherence (SOC).[19] Therefore, they are likely to experience fewer postloss depressive symptoms throughout bereavement or their severe depressive symptoms subside quickly within six months after loss.[8,9,11] In contrast, family members lacking adequate psychological resources commonly experience prolonged severe depressive symptoms.[9,20] Another factor that may buffer the negative effects of bereavement, thereby reducing the likelihood of severe postloss depressive symptoms, is sufficient social resources.[8,9,11,12] The stronger family members' preloss social support, the greater the likelihood that they have low-level depressive symptom trajectories throughout bereavement.[8,11,12]

However, findings on postloss depressive symptom trajectories from caregivers of chronically ill patients[8−13,16] cannot be directly applied to family members of patients with terminally ill cancer, which was investigated in only one 25-year-old study.[16] The cancer trajectory is characterized by precipitous physical deterioration in the last few months before death,[21] and family caregivers of patients with terminal cancer shoulder great caregiving demands,[1,3,22−24] psychiatric morbidities,[25] and financial responsibilities.[26] In addition, three studies[9−11] focused on family members who might not be as affected as family caregivers by heavy caregiving burdens.

Of six studies[8−13] on predictors of depressive symptom trajectories, only one[8] was guided by a theoretical framework. In addition, how caregiving burden and preloss psychosocial resources predict postloss psychological adjustment and bereavement outcomes has been explained by two conflicting models of the caregiving-bereavement relationship (wear-and-tear vs. relief models).[27] The wear-and-tear model posits that caregiving accumulates stress, depleting caregivers' resources for coping with bereavement, whereas the relief model hypothesizes that after the difficulties of caregiving, death of the care recipient brings the caregiver relief and thus better bereavement outcomes.[27] Thus, caregiving context and caregiving demand must be considered when examining which theory is more appropriate in explaining bereaved caregivers' use of psychosocial resources to adjust to bereavement grief. Therefore, the purpose of this study was to identify depressive symptom trajectories among bereaved caregivers of patients with terminally ill cancer and to examine if these trajectories are predicted by preloss psychosocial resources while considering caregiving context and EOL-caregiving burden based on the theoretical framework of cognitive stress, appraisal, and coping.[7,17]

Methods

Study Design and Sample

This study was a secondary analysis of data from a longitudinal study on death and dying for terminally ill cancer patient-family caregiver dyads.[28] Adult patients with cancer were referred by their oncologist who declared them terminally ill when their disease continued to progress and was unresponsive to curative treatments. Eligibility criteria for family caregivers included the following: 1) identified by the patient as the family member most involved with their care without payment; 2) >21 years old; and 3) willing to participate and able to communicate with data collectors. Patient-caregiver dyads were recruited by convenience from March 2009 through December 2012 and followed up through December 2015. The study site's ethics committee approved the study (98-0476B).

Measures

Outcome Variable. Caregivers' depressive symptoms were measured with the 20-item CES-D.[29] Each item (symptom) is rated for its frequency during the past week on a scale from 0 to 3. Total scores range from 0 to 60; scores ≥16 indicate severe depressive symptoms.

Independent Variables. Preloss psychosocial resources were our primary independent variable and other variables were treated as covariates. Of note, caregiving appraisal[7] was not included in this study.

Caregivers' preloss psychological resources (i.e., coping capacity) were measured by the 13-item SOC scale.[19] SOC, an important coping capacity for adjusting to stressors to restore homeostasis,[19] has three components: comprehensibility (a belief that life is structured, rational, and predictable), meaningfulness (life is challenging but worthwhile), and manageability (resources suffice to manage challenges).[19] Total SOC scale scores range from 13 to 91; higher scores indicate stronger SOC. The SOC scale was validated by showing that SOC was a psychological resource that helped family caregivers adjust to EOL-caregiving stresses.[30–33]

Caregivers' social resources were measured by the 19-item Medical Outcomes Study Social Support Survey,[34] which assesses emotional, informational, tangible, and affectionate support, as well as positive social interaction. Total scores are computed, and raw scale scores are transformed to a 0–100 scale; higher scores indicate better perceived social support. The Taiwanese version of the 19-item Medical Outcomes Study Social Support Survey has been used and validated in family caregivers, with good reliability and validity.[35]

Covariates/Contextual Factors. Demographic characteristics included gender, age, financial status, and relationship with the patient (spouse, child, other).

Subjective caregiving burden (impact on schedule, health, and finances, caregiver esteem in providing care [rewarding or causing resentment], and lack of family support) was measured by the 24-item Caregiver Reaction Assessment scale.[36] Responses are rated on five-point Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*). Total score ranges from 24 to 120. Higher scores represent stronger negative caregiving impact.

Objective caregiving load included care tasks, level of care, and daily time spent caregiving. Care tasks and level of care were determined by rating the amount of assistance provided in personal care, homemaking, transportation, and health care on a four-point scale from *none at all* to *a lot.*[37] Time spent caregiving was measured on a six-point scale for <2, 3–5, 6–8, 9–12, 13–16, and 17–24 hours/day. A composite score was calculated for these five items. Scores range from 5 to 22; higher scores indicate greater objective caregiving load.

Data Collection

Caregivers were interviewed by experienced, trained oncology nurses after study enrollment (for their baseline preloss caregiving experience) and approximately every two weeks thereafter until the patient died or they declined to participate. Participants were interviewed in person to minimize their attrition by showing support and validating their responses. Bereaved caregivers were surveyed one, three, six, 13, 18, and 24 months after loss via phone and mail.

Data Analysis

Latent depressive symptom trajectories during bereavement were identified using latent-class growth analysis with a continuous latent-class indicator (total CES-D scores) using Mplus (version 7.2).[38] The first analysis identified distinct depressive symptom trajectories over caregivers' first two years of bereavement. Each identified trajectory comprised a homogenous group of bereaved caregivers sharing a distinct depressive symptom pattern over the first two years of bereavement.

Model fit to the data was evaluated by minimum values of the Akaike information criterion,[39] Bayesian information criterion,[40] and sample-size adjusted Bayesian information criterion,[40] the entropy measure.[41] The entropy measure, which estimates classification accuracy by summarizing the distinguishability of identified trajectories, ranges from 0 to 1, with values near 1 indicating good overall fit. These criteria, as well as adequate sample size (no less than 5% of the total sample),[42(p.215)] parsimony, and the substantive clinical/theoretical meaningfulness of the latent class identification, were factored in deciding the optimal number of classes.

The proper shape of each trajectory (i.e., linear or quadratic) was tested by fitting polynomial regressions of CES-D scores on linear and quadratic terms of time over the first two bereavement years, based on caregivers in each depressive symptom trajectory. Trajectory shapes were based on significance ($P < 0.05$) of linear and/or quadratic terms of time; the shape was quadratic if the quadratic term was significant, and linear, if the quadratic term was not significant, but the linear term was significant.

The second analysis involved a multinomial logistic regression to test predictors of bereaved caregivers' membership within distinct depressive symptom trajectories. We modeled the latent depressive symptom trajectories with contextual factors, preloss caregiving burden, depressive symptoms, and psychosocial
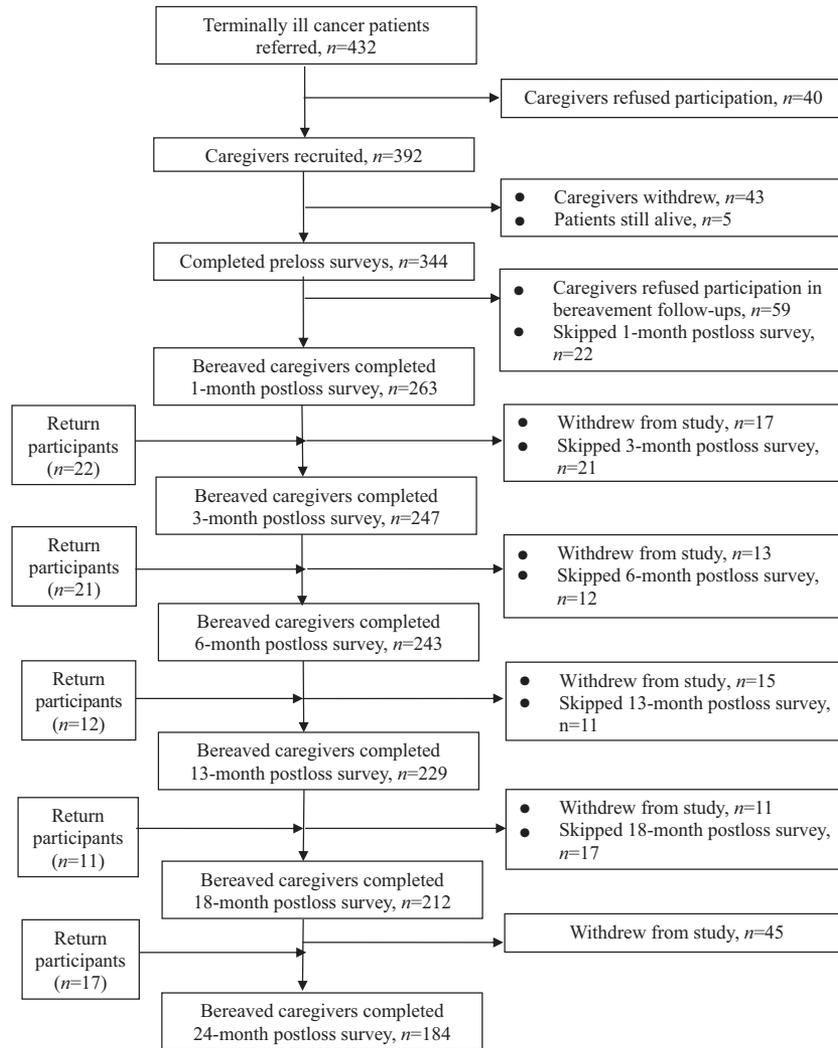
Fig. 1. Case flow chart.

resources. Preloss caregiving burden, depressive symptoms, and social support were measured at the last assessment before bereavement, whereas SOC scores were measured at enrollment.

MPlus uses a robust full-information maximum-likelihood estimation procedure for handling missing data. Full-information maximum-likelihood estimation assumes missing data are unrelated to the outcome variable, that is, missing at random. We evaluated missingness in relation to latent-class patterns and found nonsignificant results for patterns of missingness by class, indicating that no depressive symptom trajectory was associated with missing data at any time point (Appendix). As such, we continued our analyses with the assumption of missing at random.

Results

Participant Characteristics

Of 432 eligible caregivers, 392 were recruited (Fig. 1), but 43 withdrew (due to being too busy

caregiving or perceiving an emotional burden from participation) before completing the last survey before the patient's death. Only 263 bereaved caregivers participated in the one-month postloss assessment (Fig. 1). The 22 bereaved caregivers who skipped the one-month postloss survey returned later ($n = 285$). Three caregivers had incomplete data for the first bereavement year, leaving 282 in our final sample. Caregivers who agreed and refused to complete postloss surveys were similar in demographic characteristics (Table S1), except participants had heavier objective and subjective caregiving burdens and less social support than those who declined. Bereaved caregivers who completed and withdrew from postloss surveys did not differ significantly in the last CES-D score assessed in any postloss survey except at 18 months before the latter caregivers withdrew (Table S2). Bereaved caregivers who completed the 18-month postloss survey had fewer depressive symptoms than those who withdrew 13 months after loss.

Table 1
Model Fit Indices of Distinct Depressive Symptom Trajectories for Bereaved Caregivers

Model Fit	AIC	BIC	SSBIC	Entropy
2 class	9802.97	9857.60	9810.04	0.86
3 class	9733.45	9799.01	9741.93	0.72
4 class	9713.41	**9789.89**	9723.30	0.69
5 class	9708.18	9795.59	9719.49	0.70
6 class	**9705.26**	9803.59	**9717.97**	0.71

AIC = Akaike information criterion; BIC= Bayesian information criterion; SSBIC = sample-size adjusted Bayesian information criterion.
Bold indicates the lowest value. The entropy value for five trajectories was 0.7, indicating moderate overall model fit.

Depressive Symptom Trajectories and Their Prevalence

Five distinct depressive symptom trajectories were identified as optimal, based on model fit indices (Table 1), parsimony, adequate sample size, and clinical/theoretical meaningfulness of class identification. We labeled the five depressive symptom trajectories: endurance, resilience, transient reaction, prolonged symptomatic, and chronically distressed (Fig. 2). Polynomial regression results indicated that the most appropriate shape for each trajectory was linear (Table S3).

Overall depressive symptom levels for all groups were high at the beginning of bereavement and decreased over time, with levels for each group, except the chronically distressed group, dropping below the cutoff score at different follow-up times (Fig. 2). CES-D scores for the endurance group (prevalence = 47.2%) were below the cutoff (CES-D score = 16), slowly decreasing over the two-year study. CES-D scores for the resilience group (prevalence = 16.7%) were above the cutoff for the first three to six months of bereavement and fell thereafter below the cutoff, followed by a slowly downward trending depressive symptom trajectory. CES-D scores were >16 for the transient-reaction group (prevalence = 20.2%) from one to six months after loss and dropped rapidly afterward to below the cutoff. Mean CES-D scores for both the prolonged-symptomatic (prevalence = 11.7%) and chronically distressed (prevalence = 4.2%) groups exceeded the cutoff at 18 months after loss, but the depressive symptom level improved at 24 months after loss for the prolonged-symptomatic group (CES-D score <16; Fig. 2), whereas the chronically distressed group's CES-D scores remained above the cutoff.

Preloss Psychosocial Resources: SOC and Social Support Predict Depressive Symptom Trajectories

Depressive symptom trajectories were predicted by the preloss psychological resource SOC. Among the five groups, the endurance group had the strongest SOC (Tables 2 and 3). The resilience group had stronger SOC than the transient-reaction and chronically distressed groups, with SOC of the transient-reaction and prolonged-symptomatic groups stronger than that of the chronically distressed group. Therefore, the chronically distressed group had the weakest SOC among all groups (Tables 2 and 3).

For social resources, endurance caregivers perceived the best social support (Tables 2 and 3), whereas the resilience and transient-reaction groups perceived higher social support than the prolonged-symptomatic group. Perceived social support did not differ significantly among the other groups.

For contextual factors, the endurance group had fewer female caregivers than the transient-reaction group and was younger than the transient-reaction and prolonged-symptomatic groups (Table 3). For caregiving burden, the endurance group carried a lower objective caregiving load than the resilience and prolonged-symptomatic groups. Perceived subjective caregiving burden was significantly higher for the endurance and transient-reaction groups than the prolonged-symptomatic group (Tables 2 and 3).

Discussion

We identified five distinct depressive symptom trajectories (prevalence) for bereaved family caregivers of patients with terminally ill cancer: endurance (47.2%), resilience (16.7%), transient reaction (20.2%), prolonged symptomatic (11.7%), and chronically distressed (4.2%). Over the first two years of bereavement, the endurance group never experienced severe depressive symptoms, whereas the resilience, transient-reaction, and prolonged-symptomatic groups' severe depressive symptoms lasted six, seven to 12, and 18 months, respectively. The chronically distressed group's severe depressive symptoms persisted. These depressive symptom trajectories were predicted by caregivers' preloss psychosocial resources, SOC and social support. The endurance group had the strongest SOC and best perceived social support followed by the resilience group, whereas the chronically distressed group had the weakest SOC and the prolonged-symptomatic group perceived the lowest social support of all groups (Tables 2 and 3). These findings go beyond previous studies[32,33,43] by showing that preloss psychosocial resources not only help family caregivers of patients with terminal cancer adjust to the stress of EOL caregiving for a beloved but also facilitate their bereavement adjustment by increasing the likelihood of being in groups that adjusted well throughout the first two years of bereavement or quickly recovered within the first six months after loss.

The overall prevalence for the endurance, resilience, and transient-reaction groups was 84.1%, consistent with the conclusion of a systematic review[6] that 70%−85% of bereaved individuals' grief reactions
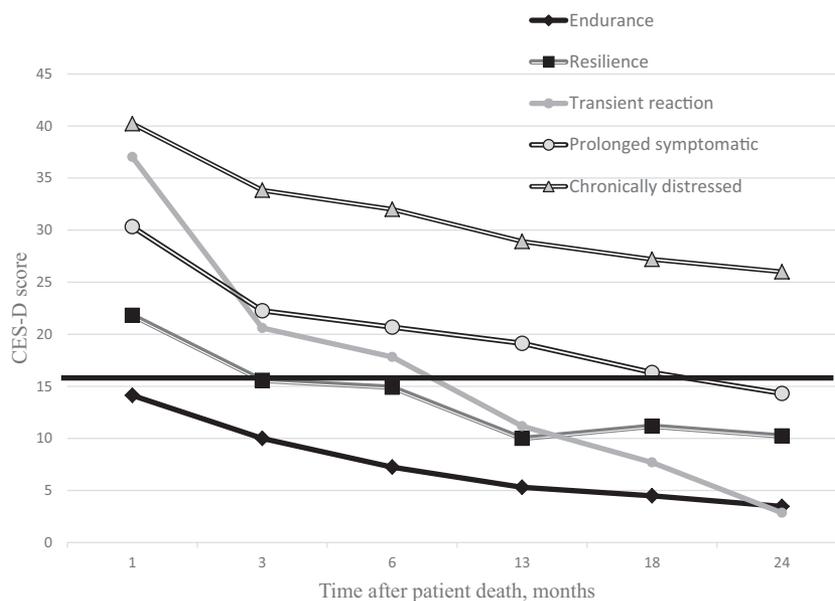
Fig. 2. Caregivers' depressive symptom trajectories over the first two years of bereavement. Note: Solid black line (CES-D score = 16) indicates cutoff score for severe depressive symptoms. CES-D = Center for Epidemiological Studies−Depression Scale.

return to normal at six to 12 months after their relative's death. The summed prevalence (15.9%) of the prolonged-symptomatic (11.7%) and chronically distressed (4.2%) groups was also similar to the 10% −30% prevalence of chronic-depressive groups reported to persist past the first year of bereavement.[6,9,10,13,14,20] However, the prevalences of our endurance and resilience groups were lower and higher, respectively, than those reported in a prospective

study[9] and a six-study review.[6] These differences may be due to the long postloss follow-up intervals for those studies.[8−10] Our study collected data at one, three, six, 13, 18, and 24 months after loss, whereas Bonanno et al.[9] only collected data at six and 18 months after loss, leading to their resilience group being classified as endurance.

Our finding that endurance-group caregivers had the best psychosocial resources (the highest SOC

Table 2
Participants' Baseline (Enrollment) Characteristics

Characteristic	Total (N = 282)	Depressive Symptom Trajectory				
		Endurance (n = 133)	Resilience (n = 47)	Transient Reaction (n = 57)	Prolonged Symptomatic (n = 33)	Chronically Distressed (n = 12)
Gender (%)						
Male	39.0	40.6	40.4	28.1	51.5	33.3
Female	61.0	59.4	59.6	71.9	48.5	66.7
Relationship with patient (%)						
Spouse	55.3	53.4	61.7	56.1	51.5	58.3
Adult children	28.4	31.6	21.3	26.3	36.4	8.3
Others	16.3	15.0	17.0	17.5	12.1	33.3
Financially sufficient (%)						
Yes	73.1	80.0	74.4	64.9	69.7	41.7
No	19.4	15.4	14.9	21.1	24.2	58.3
Refused to answer	7.5	4.6	10.6	14.0	6.1	0.0
Age, yrs (mean [SD])	48.35 (11.98)	45.69 (11.63)	49.70 (12.24)	51.79 (12.73)	51.15 (10.31)	48.58 (10.94)
CRA (mean [SD])	66.31 (12.25)	65.65 (13.32)	66.68 (10.11)	67.75 (12.89)	65.27 (9.29)	71.92 (11.31)
Objective caregiving load (mean [SD])	16.85 (4.81)	16.29 (4.99)	16.94 (4.34)	17.21 (4.85)	18.03 (4.47)	17.75 (5.14)
CES-D score (mean [SD])	22.73 (12.31)	20.23 (11.96)	22.89 (12.23)	25.54 (11.97)	22.27 (10.36)	37.58 (11.44)
SOC score (mean [SD])	50.41 (7.61)	54.67 (6.68)	50.64 (6.71)	45.58 (5.86)	47.03 (5.94)	40.22 (3.77)
Social support score (mean [SD])	55.04 (18.64)	61.59 (15.74)	54.31 (15.69)	51.58 (20.99)	43.20 (18.06)	47.81 (24.21)

SD = standard deviation; CRA = Caregiver Reaction Assessment; CES-D = Center for Epidemiological Studies−Depression Scale; SOC = sense of coherence.

Table 3
Preloss Predictors of Individual Postloss Depressive Symptom Trajectories

Potential Predictor[a]	Adjusted Odds Ratio (95% Confidence Interval)									
	Endurance vs.				Resilience vs.			Transient Reaction vs.		Prolonged Symptomatic vs.
	Resilience	Transient Reaction	PS	CD	Transient Reaction	PS	CD	PS	CD	CD
Psychosocial resources										
SOC	1.10[b] (1.04−1.18)	1.24[b] (1.15−1.33)	1.17[b] (1.08−1.26)	1.45[b] (1.16−1.45)	1.12[b] (1.23−1.71)	1.06 (0.98−1.14)	1.32[b] (1.28−1.55)	0.94 (0.87−1.02)	1.17[c] (1.00−1.37)	1.25[b] (1.06−1.47)
Social Support	1.03[c] (1.01−1.06)	1.04[b] (1.02−1.07)	1.08[b] (1.04−1.12)	1.07[c] (1.01−1.12)	1.01 (0.91−1.12)	1.05[b] (0.01−1.08)	1.03 (0.98−1.08)	1.04[c] (1.00−1.07)	1.02 (0.97−1.07)	0.9 (0.94−1.04)
Contextual Factors										
Gender										
Female[d]	0.60 (0.26−1.42)	0.29[c] (0.11−0.79)	0.46 (0.17−1.27)	1.36 (0.21−8.98)	0.17 (0.48−1.34)	1.24 (0.422−3.65)	2.26 (0.35−14.81)	2.60 (0.86−7.85)	4.74 (0.74−30.36)	1.82 (0.27−12.33)
Age, yrs	0.98 (0.94−1.01)	0.95[c] (0.91−0.99)	0.95[c] (0.91−0.96)	0.97 (0.89−1.06)	0.97 (0.93−1.01)	0.97 (0.93−1.02)	0.99 (0.91−1.08)	1.00 (0.96−0.05)	1.02 (0.94−1.11)	1.02 (0.93−1.11)
Caregiving demand										
Subjective caregiving burden	1.03 (0.99−1.07)	1.02 (0.976−1.06)	1.07[c] (1.02−1.13)	1.07 (0.97−1.19)	0.99 (0.95−1.03)	1.04 (0.99−1.10)	1.05 (0.95−1.16)	1.05[c] (1.00−1.11)	0.91 (0.72−1.15)	1.00 (0.91−1.11)
Objective caregiving load	0.92[c] (0.84−1.01)	0.93 (0.84−1.02)	0.82[b] (0.72−0.94)	0.85 (0.67−1.07)	1.01 (0.91−1.12)	0.90 (0.79−1.03)	0.92 (0.73−1.17)	0.89 (0.78−1.02)	1.06 (0.96−1.16)	1.023 (0.80−1.31)

PS = prolonged symptomatic; CD = chronically distressed.
[a]We controlled not only for the aforementioned significant confounders but also for three nonsignificant confounders: caregiver-patient relationship, financial sufficiency, and preloss depressive symptoms.
[b]$P < 0.01$.
[c]$P < 0.05$.
[d]Male as reference.

and social support) echoes reports that personal psychological resources facilitate bereavement adjustment.[8,9,11-13,15] Although the endurance caregivers were providing EOL care and facing the loss of their beloved, they had the strongest SOC to help them attribute meaning to these stresses, understand their challenges, and use internal and external resources to manage these stresses, thereby maintaining psychological well-being throughout the first two years of bereavement.

Moreover, although bereaved family caregivers in the endurance and transient-reaction groups perceived heavier subjective caregiving burdens than prolonged-symptomatic caregivers (Table 3), they were helped in adjusting to their bereavement grief by their superior perceived social support, both practical and psychological, from family members as commonly practiced in Asian cultures.[44-46] These results support the relief model of the relationship between EOL caregiving and bereavement.[27] Under heavy subjective caregiving burdens, caregivers with stronger social resources (e.g., social support) not only experience the death of their beloved as relieving the difficulties/stresses of EOL caregiving but also adjust more rapidly to the loss. Thus, their psychological well-being returns to normal notably quicker than for caregivers in the prolonged-symptomatic group.

Furthermore, endurance-group caregivers were significantly younger than those in the transient-reaction and prolonged-symptomatic groups and their objective caregiving load was less than that of the resilience and prolonged-symptomatic groups (Tables 2 and 3). Younger bereaved caregivers tend to have more internal and external resources to help them adjust to bereavement grief,[9] and caregivers with lower objective caregiving loads have better psychological adjustment during bereavement.[8,12]

The resilience and transient-reaction groups both recovered within the time frame recognized as normal grief (CES-D scores dropped below 16 within six to 12 months after loss).[6,9,15] In Asian cultures, after family members complete funeral ceremonies, social norms pressure them to not immerse themselves in sadness; expressions of grief are not encouraged. Mourning in public is considered inappropriate.[44,46] In addition, Asian family members facing the death of a relative are influenced by Confucianism to support each other.[44,46] Compared with individualistic Western families, Asian families provide stronger support, including practical assistance and psychological support, to help bereaved caregivers adjust more quickly to their grief reactions.[44,45] Therefore, although the normal resolution of grief for caregivers from Western cultures is within six to 12 months after loss,[15] bereaved people in Asian cultures usually adapt to the grieving response within six months,[45]

suggesting that our transient-reaction group had an atypical depressive symptom trajectory pattern for bereaved Taiwanese family caregivers. However, the resilience and transient-reaction caregivers mourned differently (in term of initial depressive symptom levels and the time needed for these levels to subside below the CES-D cutoff score) because of having the second best and second weakest psychological resources (SOC) among the five groups, respectively (Tables 2 and 3).

The two groups with long-lasting depressive symptoms, prolonged symptomatic and chronically distressed, were differentiated only by the strength of psychological resources (SOC). Both groups carried the heaviest objective caregiving loads among the five groups but perceived the lowest social support (Table 2), as reported,[8,12] supporting the wear-and-tear model of caregiving[27] for their prolonged/chronic severe depressive symptoms. However, the stronger SOC of those in the prolonged-symptomatic group (ranked third highest) might have helped them to better comprehend the challenges of the grieving process and to mobilize more internal and external resources to find new meaning and value in their situation than those in the chronically distressed group. Thus, the prolonged-symptomatic group might have slowly recovered from their grief, taking over two years to return to their normal psychological state. However, being embedded in difficult caregiving circumstances and lacking the benefits of inner strength (i.e., SOC), bereaved family caregivers in the chronically distressed group failed to find meaning in their situation,[9,13,20] clearly comprehend, and appropriately manage grieving demands, probably contributing to their highest depressive symptom level.

Study Limitations

Our sample of family caregivers of patients with terminally ill cancer was recruited by convenience from a hospital in Taiwan, limiting the generalizability of our results to national and international targets. Future studies should be replicated in different hospitals, countries, regions, and cultures to enhance the applicability of our findings. A substantial proportion of bereaved caregivers withdrew from postloss surveys; bereaved caregivers who completed the 18-month postloss survey had fewer depressive symptoms at 13 months after loss than those who withdrew. Whether our findings are applicable to those dropouts remains unknown, but we found that postloss data were missing at random. The reliability of our classification into five depressive symptom trajectories might have been limited, especially for the small number of caregivers in the chronically distressed group. Our study findings should be validated in larger samples. Caregivers' depressive symptom patterns and potential

preloss predictors (measured only at baseline or the last assessment before the patient's death) were explored only over the first two years of bereavement. Thus, our findings do not adequately capture depressive symptom patterns of bereavement, comprehensively identify predictors of distinct depressive symptom trajectories for bereaved family caregivers (e.g., preloss factors measured further away from the patient's death), or account for the roles of other potentially modifiable factors (e.g., EOL care quality, health care professional support) in predicting the depressive symptom trajectories. We recommend increasing the number of preloss and postloss data collection times to understand how depressive symptom trajectories are impacted by EOL-caregiving experiences beyond the first two years of bereavement.

Conclusion

Five distinct depressive symptom trajectories were identified by their initial levels and rates of change in depressive symptoms for bereaved caregivers over their first two years of bereavement. Distinct depressive symptom trajectories were predicted by preloss psychosocial resources (i.e., SOC and perceived social support). Health care professionals should become aware of bereavement-grief patterns for family caregivers of terminal patients and factors predisposing these caregivers to differing postloss depressive symptom trajectories while the patients are still alive. Health care professionals should be alert to caregivers whose initial extraordinarily high depressive symptom levels are sustained over the first two years of bereavement and refer them for appropriate management.[47] Early identification of psychosocially vulnerable groups would enable professionals to provide appropriate interventions to enhance psychological resources (e.g., their SOC) and to mobilize social support for high-risk groups while providing EOL caregiving, thus facilitating bereaved caregivers' adjustment to bereavement grief and avoiding becoming prolonged symptomatic or chronically distressed.

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Appendix

Approach for Handling Missing Data in Relation to Latent-Class Growth Analysis in MPlus

MPlus uses a robust full-information maximum-likelihood (FIML) estimation procedure for handling missing data[1]. The appropriateness of FIML is widely endorsed[2,3]. FIML assumes missing data are unrelated to the outcome variable, that is, missing at random. Maximum-likelihood estimators have been shown in simulation studies to provide unbiased estimates when data are missing at random, that is, missingness may occur with some level of predictability but that predictability is not related to the study focus, unlike the assumption that data are missing completely at random. Even when the assumption of missing at random does not hold up, strong evidence indicates that using maximum-likelihood estimators provides more accurate estimates than removing data listwise.[1] Thus, we used a set of analyses tailored to assess missingness in relation to latent-class patterns. This analysis revealed nonsignificant results for patterns of missingness by class, indicating that no pattern of depressive symptom outcomes was more likely to be missing data at any time point (Little's Missing Completely at Random test: chi-square = 53.84, df = 59, Sig. = 0.67). As such, we felt confident and continued our analysis with the assumption of missing at random.

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Table S1
Comparison of Bereaved Caregivers Who Completed vs. Withdrew From Surveys (N = 344)

Characteristic	Completed ($n = 282$)	Withdrew ($n = 62$)	χ^2/F	P
Gender, %			0.06	0.807
Male	38.7	40.3		
Female	61.3	59.7		
Relationship with patient, %			1.76	0.414
Spouse	54.4	45.1		
Adult children	29.2	15.5		
Other	16.4	19.4		
Financially sufficient, %			4.47	0.107
Yes	73.0	82.2		
No	19.2	8.1		
Refused to answer	7.8	9.7		
Age (yrs), mean (SD)	48.48 (11.92)	46.77 (13.52)	0.99	0.322
Subjective caregiving burden, mean (SD)	16.78 (4.82)	14.42 (5.60)	3.38	0.001
Objective caregiving load, mean (SD)	66.06 (12.28)	62.21 (10.53)	2.29	0.023
Preloss CES-D score, mean (SD)	22.96 (12.04)	19.71 (10.53)	1.94	0.053
Preloss SOC score, mean (SD)	50.41 (7.61)	51.18 (7.62)	−0.65	0.515
Preloss social support score, mean (SD)	55.04 (18.64)	65.65 (14.38)	−3.85	<0.001

SD = standard deviation; CES-D = Center for Epidemiological Studies−Depression Scale; SOC = sense of coherence.

Table S2
Comparison of Mean CES-D Scores for Bereaved Caregivers Who Completed and Withdrew From the Study at Different Postloss Times

Postloss Time, months	Completed Mean (SD)	Withdrew Mean (SD)	t	P
3	23.22 (12.65)	21.60 (12.65)	0.55	0.582
6	17.30 (10.12)	13.31 (9.73)	1.53	0.127
13	14.99 (10.71)	15.06 (11.23)	−0.03	0.980
18	10.66 (7.43)	18.00 (11.40)	−3.42	0.001
24	9.52 (7.27)	14.09 (12.35)	−1.90	0.060

SD = standard deviation; CES-D = Center for Epidemiological Studies−Depression Scale.

Table S3
Trajectory Shapes Determined by Fitting Polynomial Regressions of CES-D Scores on Linear and Quadratic Terms

Class	Intercept	Linear Estimate	Linear SE	Quadratic Estimate	Quadratic SE
Endurance	15.16[a]	−5.94[a]	0.79	−3.42	2.02
Resilience	20.43[a]	−5.64[a]	1.37	−2.87	0.00
Transient reaction	35.51[a]	−15.95[a]	1.28	−5.31	10.09
Prolonged symptomatic	28.70[a]	−7.25[a]	1.39	−0.78	14.14
Chronically distressed	40.65[a]	−8.46[a]	2.09	−1.78	1.719

SE = standard error; CES-D = Center for Epidemiological Studies−Depression Scale.
[a]$P < 0.01$.