RESEARCH ARTICLE

Trajectories of depressive symptoms early in the course of bereavement: Patterns, psychosocial factors and risk of prolonged grief

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Abstract

In the context of bereavement, little is known about the mechanisms that differentiate normative adjustment patterns from those that may indicate potential psychopathology. This study aimed to replicate and extend previous work by (1) characterizing the trajectories of depressive symptoms from 3 to 12 months after the loss of a spouse, (2) examining whether (a) childhood maltreatment and attachment style predicted distinct depression trajectories, and (b) different depression trajectories were associated with the risk of prolonged grief at 12 months post-loss. Recently bereaved individuals ($N = 175$) completed self-report assessments at 3, 4, 6, and 12-months post-loss. Trajectories of depressive symptoms were estimated using group-based trajectory modelling. Four distinct trajectories of depressive symptoms were identified: (1) resilience (minimal/no depression across time points; 45%), (2) moderate depression-improved (alleviated to 'mild' by 12 months; 31%), (3) severe depression-improved (alleviated to 'moderate' by 12 months; 15%), and (4) chronic depression ('severe' symptoms across time points; 9%). Higher childhood maltreatment predicted a greater likelihood of belonging to the 'severe depression-improved' and 'chronic depression' groups than the 'resilient' and 'moderate depression-improved' groups. Widow(er)s with higher attachment anxiety were more likely to belong to the 'severe depression-improved' and 'chronic

depression' groups than the 'resilient' group. The trajectory groups with persistent levels of depressive symptoms up until 6 months were more likely to exhibit prolonged grief at 12 months post-loss. Changes from pre-loss functioning cannot be estimated. Our findings provide insight into the early identification of post-loss prolonged grief.

1 | INTRODUCTION

The death of a spouse is a highly stressful event that triggers symptoms of grief and depression. Indeed, the estimated prevalence of depression after a spousal loss was 40.6% in studies that utilized self-report screening tools; these estimates were independent of time since the loss (a meta-analysis by Kristiansen et al., 2019). Most widow(er)s exhibit a pattern of 'resiliency', such that depressive symptoms are initially high but decline over time. However, some widow(er)s have considerable difficulty adapting to the loss and develop complications in grief that persist (e.g., Boerner et al., 2005; Bonanno et al., 2002).

In the present study, we prospectively followed recently widowed older adults in the first year of widowhood to (1) describe distinct trajectories of change in depressive symptoms during the first year after the loss, (2) evaluate whether widow(er)s' previous and current experiences in close relationships, which facilitate the development of 'resiliency', are associated with distinct trajectories in depression, and (3) to examine the association between different trajectories of depressive symptoms and risk of prolonged grief symptoms.

1.1 | Trajectories of depressive symptoms in bereavement

Prior studies have investigated the trajectories of depressive symptoms among older adults, revealing distinctive patterns in the long-term course of depression (reviewed by Musliner et al., 2016). A population-based study conducted over an 8-year period among a nationally representative cohort of middle-aged and older individuals in the United States identified four distinct depression trajectory groups. Group 1 (labelled as 'never'; 85.8%) had no 12-month major depressive episode (MDE) during the study. Group 2 ('increasing'; 6.3%) experienced a slight increase in the risk of 12-month MDE over time. Group 3 ('decreasing'; 3.2%) experienced declining MDE risk, becoming MDE-free at the end of the study. Group 4 ('persistently moderate/high'; 4.7%) maintained a consistently moderate to high risk of 12-month MDE throughout the study period. However, these investigations were conducted within a broader older adult context and did not focus specifically on the unique experience of bereavement (Xiang & Cheng, 2019). Another longitudinal study aimed to examine the course of depressive symptoms in widows and widowers over a 10-year period of annual follow-ups. The sample was categorized into three distinct groups: long-term married, transition to widowhood, and long-term widowed. All groups experienced increases in depressive symptoms over time. Following bereavement, older adults rapidly manifested heightened depression levels in comparison to their long-term married or long-term widowed counterparts. The 'long-term married' group had the least and slowest rise, while the 'long-term widowed' group started high and remained stable with a slight increase during the last few years. The 'transition to widowhood' group increased mid-panel and slightly declined afterwards, ending comparable to the long-term widowed group (Yu et al., 2021). The exploration of heterogeneity in patterns of change in depressive symptoms within the 'transition to widowhood' group remained to be determined.

With a few notable exceptions, most studies that have charted the affective sequelae of bereavement have relied on the frequency in which people meet a predetermined pathological categorization (e.g., major depression), or an average level of a continuous self-report outcome measure (e.g., depressive symptoms) (Bonanno et al., 2011). In recent years, advances in statistical techniques have made it possible to identify clusters of individuals with distinct patterns of change over time. Using these sophisticated statistical techniques, Galatzer-Levy and Bonanno (2012) modelled the longitudinal trajectory of depressive symptoms before the loss and at 6, 18, and 48-months after the loss of a spouse and identified four distinct trajectories of depression. Two-thirds of participants showed little or no depressive symptoms across all time points (labelled as *resilient*), 10% had high pre-loss depression scores, which declined at 6 months after the loss (labelled as *depressed-improved*), nearly 15% had persistently high levels of depression scores from pre-loss to post-loss (labelled as *chronic depression*), and 9% showed a marked increase in their depression scores after the loss, which remained high at 18 months post-loss and was then alleviated by 48 months post-loss (labelled as *chronic grief*). Of note, earlier studies that used less advanced statistical techniques revealed a consistent pattern of emotional responses to the loss (Boerner et al., 2005; Bonanno et al., 2002). Overall, the existing literature provides valuable information on the long-term course of depressive symptoms post-loss. In seeking to both replicate and extend upon these findings, our study aimed to examine the patterns of change in depressive symptoms during the first year following loss. This heightened focus on the early post-loss phase is particularly pertinent, given recent amendments to the Diagnostic and Statistical Manual of

Mental Disorders, 5th edition (DSM-5), which consider 12 months post-loss a critical endpoint for 'prolonged grief'. This extension of our study contributes to a more nuanced understanding of depressive trajectories early in the course of bereavement.

1.2 | The (re)emergence of long-term 'pathological' grief

Acute grief is a natural, time-limited response to the loss of a loved one, but some individuals may experience more severe and prolonged grief symptoms, known as Prolonged Grief Disorder (PGD), which is linked to higher mortality risk from general medical illness and suicide (Shear et al., 2021). Indeed, assessing grief reactions during the first 12 months after the loss is critical, given that there is an ongoing debate on how many months (i.e., 6 vs. 12 months) need to pass after the loss to consider grief reactions as 'maladaptive' to distinguish between natural acute grief reactions and PGD (Prigerson et al., 2021). Of note, a formal diagnosis of 'Prolonged Grief Disorder' (PGD) has been included in Section 2 of the new text revision of DSM-5 (DSM-5-TR) (American Psychiatric Association [APA], 2022). DSM-5 symptoms for PGD include: the death of someone close at least 12 months ago, experiencing intensive yearning/longing, presence of at least 3 of 8 symptoms of identity disruption, a marked sense of disbelief, avoidance, intense emotional pain, difficulty reintegrating into one's relationships and activities, emotional numbness, feeling that life is meaningless, and intense loneliness (APA, 2022). Depression early in bereavement is a risk factor for developing prolonged grief later in bereavement (Guldin et al., 2011). Given that there are differences in how bereaved individuals experience grief symptomology (Bonanno et al., 2007) and that the presence of comorbid depression may contribute to a worse prognosis (APA, 2013), we included multiple assessments across the first year of bereavement and examined whether distinct depression trajectories are associated with differences in grief symptoms up to 12-month post-loss.

1.3 | Experiences in close relationships across the lifespan as an index of risk

In the current paper, we take a lifespan approach to identifying close relationship factors (i.e., childhood maltreatment, adult attachment style), that may be used as an index of depression risk during spousal bereavement.

1.3.1 | Childhood maltreatment

People's experiences in close relationships throughout the lifespan shape how they respond to stressful life events, especially those with an interpersonal component such as loss. According to the stress-sensitization hypothesis, adults who were maltreated or abused by parent-like figures as children develop greater stress-sensitivity than others; thus, they are likely to develop mental health problems after major and minor stressful events than others (Mandelli et al., 2015; Monroe & Harkness, 2005; Wiersma et al., 2009). Approximately 30%–50% of adults report abuse or neglect as children (Walker et al., 1999). Compared with those with healthy parent-child relationships, those with adverse parent-child relationships are more likely to have emotional difficulties when encountering stressful events across their lifespan (Chen et al., 2020). In this study, we expanded on this literature by examining whether childhood maltreatment predicted longitudinal trajectories of depressive symptoms following spousal bereavement.

1.3.2 | Attachment style

According to attachment theory, an individual's relationship history will impact their response to the loss of a loved one. Specifically, people's experiences with important figures in their lives (i.e., 'attachment figures'), determine their attachment style (Bowlby, 1980). Indeed, early caregiving experiences are important factors that can influence attachment style, in adulthood (Mikulincer and Shaver, 2009, 2019). Early life experiences with attachment figures influence what people expect from their relationship partners later in life—for example, the degree to which someone will reliably be there for them in times of need (Mikulincer and Shaver, 2009, 2019; Thompson, 2008). This is particularly relevant to the context of spousal bereavement given that people's long-term romantic partners tend to serve as their primary attachment figure in adulthood and are now, gone (LeRoy et al., 2019; Trinke & Bartholomew, 1997). Throughout their lifespan, individuals will turn to attachment figures as a source of support and emotional security in times of need (Trinke & Bartholomew, 1997). Individuals with a history of reliable and attentive attachment figures, who are able to comfort them during stressful times, should develop a secure attachment orientation. In contrast, those with a history of inconsistent and/or unresponsive attachment figures learn that they cannot depend on others for support. Instead, they develop other emotion regulation strategies to cope with stress, characterized by anxiety and avoidance (Cassidy and Shaver, 2002). When confronted with a stressor, those low on attachment anxiety and avoidance (i.e., secure) are more resilient than those high on attachment avoidance or anxiety. People with high attachment avoidance prefer maintaining emotional distance and primarily cope with stress by suppressing their emotions (Fraley & Shaver, 1997; Mikulincer & Shaver, 2005). This can sometimes, but not always, be adaptive for their own emotional and physical well-being. People high in attachment anxiety catastrophize stressors and exasperate negative emotions (Mikulincer & Shaver, 2019). Attachment anxiety has been linked to poor adjustment to stressful life events, including loss, whereas the data is mixed concerning the adaptive and maladaptive qualities of attachment avoidance (LeRoy et al., 2020). We expanded on this line of research to determine whether attachment style predicted longitudinal trajectories of depressive symptoms following spousal bereavement.

1.4 | Aims

In this study, we aimed to characterize distinct trajectories of change in depressive symptoms from 3 months after the death of a spouse to 12 months post-loss. In addition, we investigated whether childhood maltreatment and attachment style predict an individual's trajectory group membership. Finally, we examined if distinct trajectories of depressive symptoms were related to the development of prolonged grief following 12 months post-loss. We hypothesized that individuals with higher levels of childhood maltreatment and attachment anxiety would be more likely to belong to trajectory groups with persistently high levels of depressive symptoms than trajectory groups with lower levels of depressive symptoms or a declining pattern of change. We also hypothesized that individuals in trajectory groups with persistently high levels of depressive symptoms would be more likely to meet or exceed the threshold for prolonged grief at 12 months post-loss than trajectory groups with consistently low levels of depressive symptoms or a declining pattern of change.

2 | METHODS

2.1 | Participants

This study is part of a larger research project that examines the biobehavioral mechanisms underlying adverse health outcomes among bereaved spouses. We recruited 175 individuals who had lost their spouse recently (no later than 14 weeks before the first visit) from obituaries, support groups, and community events. A detailed description of the study protocol and sample can be found elsewhere (Fagundes et al., 2019). The local Institutional Review Board (IRB) approved all recruitment strategies and study procedures. Written informed consent was obtained from all participants prior to their inclusion in the study. To be eligible for the study, participants had to be married to their partner for at least 3 years before the loss and be fluent in English. Potential participants were excluded if they had an inflammatory-related medical illness (e.g., autoimmune disorders) or significant visual or auditory impairment. Participants were excluded if they had experienced bereavement due to loss of another loved one (besides a spouse) in the last year or if they were divorced within the past year. The current analysis included data from four time points: the baseline visit (approximately at 3 months after the loss) and three follow-up visits at 4, 6, and 12 months after the loss.

2.2 | Measures

2.2.1 | Depressive symptoms

The Center for Epidemiologic Studies Depression Scale (CESD)-20 was administered at each visit to assess depressive symptoms (Radloff, 1977). The CESD is a self-report assessment tool consisting of 20 items, which ask about the frequency of various symptoms over the last week. Each item is rated on a 4-point scale, '0 (*rarely or none of the time*), 1 (*some or a little of the time*), 2 (*occasionally or a moderate amount of the time*), and 3 (*most or all of the time*)'. For descriptive purposes, scores 0–9 represent minimal depression, 10–15 represent mild depression, 16–24 represent moderate depression, and 25 or greater represent severe depression (Moon et al., 2017). In addition, we used these cut-off scores to assign labels to depression trajectory groups (e.g., moderate depression-improved). A score of 16 or greater on the CESD is considered as the cut-off to identify individuals at risk for clinical depression. Cronbach's alpha for the CESD was consistently high across 4 visits: .91 at 3 and 4 months, .92 at 6 months, and .90 at 12 months.

2.2.2 | Grief

The Inventory of Complicated Grief (ICG) was used at each visit to assess grief-related thoughts and behaviours (Prigerson et al., 1995). The ICG is a self-report assessment tool consisting of 19 grief-related symptoms. An ICG score of 25 or greater was suggested to distinguish between PGD (also called complicated grief) and uncomplicated grief reactions (Prigerson et al., 1995). For this paper, we refer to ICG ≥25 at 12 months post-loss as 'prolonged grief', which is our primary outcome; this time frame is consistent with the timing criterion for PGD that was included in the DSM-5-TR (APA, 2022). In this study, the Cronbach's alpha for the ICG was .91 at 6 months and .90 at 12 months.

2.2.3 | Childhood maltreatment

The Childhood Trauma Questionnaire (CTQ) was administered at baseline to assess childhood adversity. The CTQ provides normative data on experiences of physical abuse, emotional abuse, sexual abuse, physical neglect, and emotional neglect in childhood (Bernstein & Fink, 1998). Participants were asked to respond to each item on the measure using a 5-point scale, '1 (*never true*), 2 (*rarely true*), 3 (*sometimes true*), 4 (*often true*), 5 (*very often true*)'. Each subscale consisted of 5 items, for a total of 25 items, with scores ranging from 5 (no history of abuse and neglect) to 25 (very extreme history of abuse and neglect). A total childhood trauma score was taken by averaging the five subscales. The CTQ has been validated and demonstrated excellent reliability and validity in previous studies (Bernstein et al., 1994, 1997; Fink et al., 1995). In the current sample, Cronbach's alpha for childhood maltreatment was .89.

2.2.4 | Attachment insecurity

Attachment insecurity was assessed at each visit using the Experiences in Close Relationships–Relationship Structures (ECR-RS), which includes 9 items to assess attachment styles (also called attachment orientations) in close relationships (Fraley et al., 2006,

2011). Six items were used to calculate attachment avoidance, and three items were used to calculate attachment anxiety. Each item was measured on a 7-point Likert scale, ranging from 1 (strongly disagree) to 7 (strongly agree). In the current sample, Cronbach's alphas for attachment avoidance and anxiety at baseline were .85 and .89, respectively.

2.3 | Covariates

All the logistic regression models controlled for age, sex, body mass index (BMI), education, antidepressant use, comorbidities, and days since the spouse's death. Childhood maltreatment was also added as a covariate to the model that examined the association between depression trajectory groups and prolonged grief risk. Covariates were chosen as these factors have been shown to impact depressive symptoms and grief symptoms following the loss of a spouse (Chen, et al., 2020; Nielsen et al., 2017; Shear et al., 2013).

Participants provided self-reports of their age, sex, days since the passing of the spouse, antidepressant use, and comorbid health conditions. BMI was calculated after measuring height and weight during each visit. Education was used to measure socioeconomic status, given that some individuals were retired or never worked outside of the home. The Charlson Comorbidity Index was administered at each visit to assess comorbid conditions, which assigns 32 weights to 19 physical health comorbid conditions based on their potential influence on 1-year mortality (D'Hoore et al., 1993). Smoking status was assessed at each visit by asking participants the question, 'Do you currently smoke or use nicotine?' Additional adjustment for smoking status ($n = 6$ smokers) as a covariate did not change the results; thus, this factor was not included in the final analyses.

2.4 | Analytic plan

Data analyses were conducted using SAS, version 9.4 (SAS Institute, Cary, NC). Group-based trajectory modelling was conducted to estimate trajectories of depressive symptoms (measured approximately at 3-, 4-, 6-, and 12-month post-loss) with the PROC TRAJ SAS procedure. While the study's total sample included 201 participants, the current analysis did not include participants who had missing values on depressive symptoms for more than two time points [a method used by previous studies (e.g., Campbell et al., 2007; Galatzer-Levy & Bonanno, 2012)]; thus, we excluded 26 participants that only completed the baseline visit. Participants who remained in the study did not significantly differ from those who dropped out with respect to age, severity of depressive symptoms and grief symptoms ($ps > .20$).

The optimal number of trajectories and shapes of trajectories were determined based on four criteria (see Jones et al., 2001; Nagin, 2005): (1) inclusion of at least 5% of participants in each trajectory, (2) model fit index: the Bayesian information criterion (BIC) was used for model selection. The estimated log Bayes factor values greater than 10 are interpreted as robust evidence in favour of the more complex model, (3) an average posterior probability of at least .70 for each trajectory group. The average posterior probability of group membership serves as an estimate of internal reliability for each trajectory. It is computed by averaging the posterior probabilities of individuals assigned to specific trajectories (for more details see Andruff et al., 2009), and (4) interpretability of the identified trajectories based on theoretical foundations and empirical evidence.

To model the number and shapes of trajectory groups, we followed the steps outlined by Andruff et al. (2009). Given that our data included four time points, we initially tested a single cubic trajectory model. Because this model was significant ($p = .04$), an alternative model with two cubic trajectories was analysed next. The difference in the BIC values of the tested models multiplied by two was calculated as an approximation of the log Bayes factor. For instance, the log Bayes factor for the two-trajectory model versus the one-trajectory model was 273, which strongly supports the more complex model. This process was repeated by increasing the number of trajectories until the best fitting model was identified (Table S1). To determine the shape of each trajectory group, non-significant cubic and quadratic terms were dropped. The linear term was retained even if it was non-significant. Based on these procedures and criteria outlined above, a model with four trajectory groups (characterized by one cubic, two quadratic and one linear function) was selected as the best-fitting model. For the trajectory analysis, time variable was centred at 3 months, which served as the first observation point after the loss.

The Wald test was performed using the SAS macro TRAJTEST to determine whether identified trajectories vary in their intercepts (Jones & Nagin, 2007). Chi-square tests and analyses of variance were conducted to compare participant characteristics across trajectory groups. Multinomial logistic regression models were conducted to determine the association between childhood maltreatment and attachment insecurity as a predictor, and depression trajectory groups as a multinomial outcome variable. The 'resilient' group (i.e., trajectory 1) was considered as the primary reference category. In addition, exploratory analyses were conducted to explore the results concerning other emerged trajectory groups (i.e., trajectories 2, 3 and 4) as the reference category. Of note, these additional analyses serve as supplementary investigations to explore potential associations beyond our initial research questions. Childhood maltreatment and attachment insecurity were each treated as a continuous variable. In addition, logistic regression was performed to assess the association between the depression trajectory group as a predictor and experiencing prolonged grief symptoms (ICG scores ≥ 25 vs. <25) at 12 months as a binary outcome. We used the Firth method in PROC LOGISTIC to reduce the small sample bias of the maximum likelihood estimates of logistic regression parameters (see Allison, 2012; Firth, 1993, for more details on this method).

3 | RESULTS

Subject characteristics are shown in Table 1. The study sample at the first visit consisted of 175 bereaved individuals who had lost their spouse recently (no later than 14 weeks before the first visit) with a mean age of 68.4 ± 8.7 years (67% women). The chi-square test revealed no association between the causes of spousal death and depression trajectories ($p = .80$). The mean depression scores in the entire sample changed from 18.1 ± 11.0 at visit 1 to 11.3 ± 9.1 at visit 4, representing a decline from moderate depression to mild depression. Clinical characteristics of the sample are shown in Table 2.

3.1 | Trajectories of depressive symptoms

As shown in Figure 1, we identified the following four trajectories of depressive symptoms from 3 to 12 months post-loss: (1) resilience ($n = 78$, 45%); this group had minimal or no depressive symptoms consistently across the four time points. Trajectory 1 followed a quadratic trend ($\beta_0 = 9.00$, $p < .001$; $\beta_2 = .12$, $p = .018$), in which the average depression score decreased from 9.3 at 3 months to 6.2 at 6 months post-loss and then remained flat or slightly declined by 12 months (mean CESD-20 changed from 6.2 to 5.5), (2) moderate depression-improved ($n = 56$; 31%); trajectory 2 followed a linear trend ($\beta_0 = 18.21$, $p < .001$; $\beta_1 = −.82$, $p < .001$), in which the average depressive symptoms decreased from 'moderate' at 3 months post-loss (mean CESD-20 = 19.3) to 'mild' by 12 months post-loss (mean CESD-20 = 10.9). Of note, participants had high levels of depressive symptoms (i.e., above the cut-score for clinical depression) at both 4- and 6-month post-loss, (3) severe depression-improved ($n = 25$; 15%); trajectory 3 followed a quadratic trend ($\beta_0 = 30.00$, $p < .001$; $\beta_2 = .35$, $p = .002$), in which the average depressive symptoms decreased from 'severe' at 3 months (mean CESD-20 = 30.1) to 'moderate' by 6 months post-loss (mean CESD-20 = 20.5) and then remained flat by 12 months (mean CESD-20 = 20.8), (4) chronic depression ($n = 16$; 9%); this group had a severe level of depressive symptoms across the four time points. Trajectory 4 followed a cubic trend ($\beta_0 = 38.00$, $p < .01$; $\beta_3 = −.28$, $p = .048$), in which the average depression score decreased from 38.1 at 3 months to 33.4 at 4 months and then slightly increased to 37.3 at 6 months, followed by a decline to 29.7 at 12 months post-loss. As presented in Table 1, sex and race composition, BMI, education, smoking status, and days passed since death did not differ across trajectory groups.

TABLE 1 Baseline demographic characteristics of the total sample and by depression trajectory groups.

Demographic characteristic	Overall n = 175	Trajectory 1 n = 78	Trajectory 2 n = 56	Trajectory 3 n = 25	Trajectory 4 n = 16	p
Age, years						
M (SD)	68.4 (8.7)	69.2 (8.1)	69.2 (8.3)	64.4 (11.7)	67.3 (6.6)	.09
BMI						
M (SD)	28.0 (5.9)	27.5 (5.6)	28.3 (6.7)	27.0 (4.2)	30.7 (6.1)	.20
Sex, n (%)						
Females	117 (67)	50 (64)	35 (62)	17 (68)	15 (94)	.11
Race, n (%)						
White	157 (90)	72 (92)	49 (87)	21 (84)	15 (94)	.29
Education, n (%)						
Completed 3 years of college or higher	126 (72)	53 (69)	45 (80)	17 (68)	11 (69)	.45
Antidepressant, n (%)						
Currently taking	39 (22)	11 (14)	13 (24)	8 (33)	7 (47)	.02*
Smoking status, n (%)						
Current smokers	6 (3)	3 (4)	1 (2)	1 (4)	1 (6)	.82
Charlson comorbidity index						
M (SD)	0.31 (0.85)	0.35 (1.10)	0.36 (0.68)	0.17 (0.40)	0.12 (0.34)	.62
Days since death at visit 1						
M (SD)	82.6 (18.0)	84.5 (18.5)	81.5 (17.1)	82.8 (18.0)	76.7 (18.5)	.42

Note: Trajectory 1 was labelled *resilience*; Trajectory 2 was labelled *moderate depression-improved*; Trajectory 3 was labelled *severe depression-improved*; Trajectory 4 was labelled *chronic depression*.

*$p < .05$.

TABLE 2 Clinical characteristics of the total sample and by depression trajectory groups across visits.

Clinical characteristic	Overall n = 175 M (SD)	Traj 1 n = 78 M (SD)	Traj 2 n = 56 M (SD)	Traj 3 n = 25 M (SD)	Traj 4 n = 16 M (SD)
CESD score					
CESD visit 1	18.1 (11.0)	9.3 (5.3)	19.3 (5.7)	30.1 (4.5)	38.1 (5.8)
CESD visit 2	14.4 (9.9)	6.7 (3.7)	16.6 (5.3)	26.2 (5.5)	33.4 (6.9)
CESD visit 3	13.9 (10.5)	6.2 (4.7)	16.2 (6.5)	20.5 (5.9)	37.3 (7.9)
CESD visit 4	11.3 (9.1)	5.5 (3.9)	10.9 (5.0)	20.8 (7.4)	29.7 (9.2)
ICG score					
ICG visit 1	22.2 (12.0)	15.0 (9.2)	23.6 (9.5)	32.1 (9.0)	36.6 (9.8)
ICG visit 2	20.2 (11.9)	12.7 (8.1)	23.3 (9.9)	30.3 (10.0)	37.6 (5.6)
ICG visit 3	18.9 (11.7)	11.6 (7.4)	21.9 (10.2)	25.3 (9.1)	38.3 (8.3)
ICG visit 4	16.5 (10.1)	10.0 (7.3)	18.9 (8.0)	24.4 (8.9)	29.6 (8.0)
CTQ score					
CTQ visit 1	6.8 (2.0)	6.2 (1.6)	6.8 (1.6)	8.4 (2.9)	8.0 (1.9)
Attachment score					
AAnx visit 1	6.7 (3.9)	5.7 (3.2)	6.8 (3.9)	7.8 (3.9)	10.0 (5.3)
AAvo visit 1	17.9 (7.1)	16.8 (6.7)	17.9 (6.1)	18.9 (6.6)	22.0 (10.4)

Note: Trajectory 1 was labelled resilience (minimal/no depression across time points); Trajectory 2 was labelled moderate depression-improved (alleviated to 'mild' by 12 months); Trajectory 3 was labelled severe depression-improved (alleviated to 'moderate' by 12 months); Trajectory 4 was labelled chronic depression ('severe' symptoms across time points).

Abbreviations: AAnx, Attachment Anxiety; AAvo, Attachment Avoidance; CESD, Center for Epidemiological Studies Depression Scale; CTQ, Childhood Trauma Questionnaire; ICG, Inventory of Complicated Grief; Traj, Trajectory.
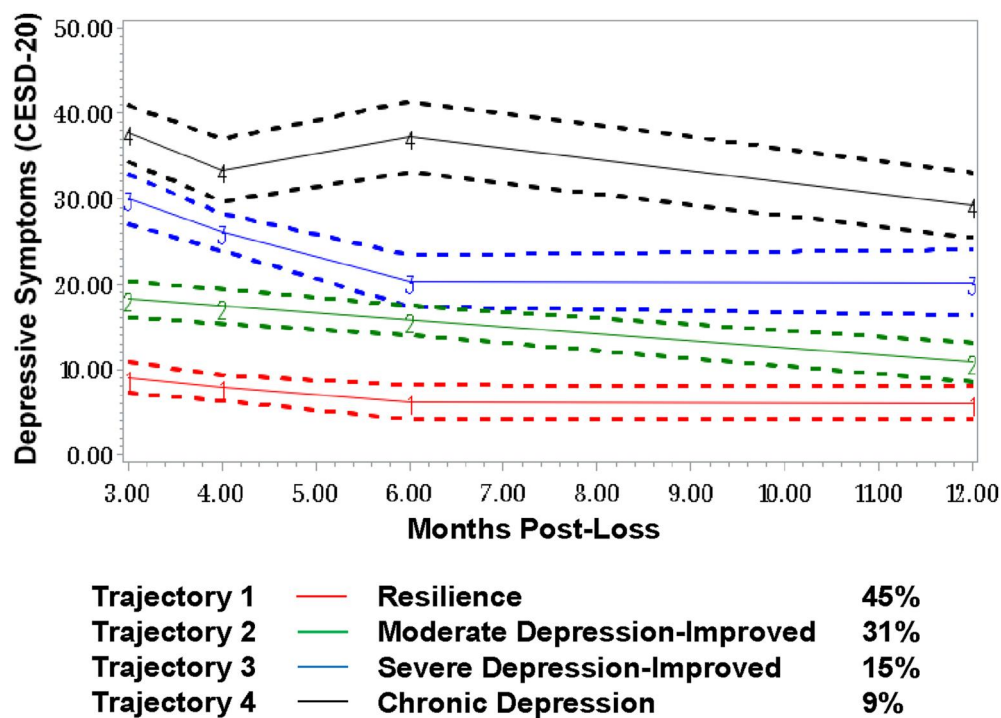
$*p < .05$, $**p < .01$.

FIGURE 1 Trajectories of depressive symptoms across 12 months post-loss. Total sample: at 3 months: $n = 175$; at 4 months: $n = 154$; at 6 months: $n = 153$; at 12 months: $n = 153$.

The average posterior probabilities for trajectory 1, trajectory 2, trajectory 3 and trajectory 4 were .93 (range: .54 to 1.00), .86 (range: .52 to .99), .88 (.58 to .99) and .93 (.65 to 1.00), respectively. Trajectory group 1 had significantly lower intercept (i.e., lower levels of depressive symptoms at visit 1) compared to group 2 ($p = .015$), group 3 ($p < .001$) and group 4 ($p = .009$), and trajectory group 2 had significantly lower intercept compared to trajectory group 3 ($p < .001$) and group 4 ($p = .015$). No significant differences were observed across trajectory groups 3 and 4 in terms of their intercepts ($p = .113$).

3.2 | Associations between childhood maltreatment and depression trajectory groups

Individuals with higher scores on childhood maltreatment were more likely to belong to the 'moderate depression-improved', 'severe depression-improved' and 'chronic depression' groups than the resilient group in the unadjusted model (respectively, OR: 1.32, $p = .022$, 95% [1.04, 1.68]; OR: 1.85, $p < .001$, 95% [1.41, 2.42]; OR: 1.76, $p < .001$, 95% [1.32, 2.35]), and the adjusted model (respectively, OR: 1.32, $p = .030$, 95% [1.02, 1.70]; OR: 1.76, $p < .001$, 95% [1.32, 2.35]; OR: 1.85, $p < .001$, 95% [1.33, 2.56]). Findings are presented in Table 3, section A.

Exploratory analyses revealed that when the 'moderate depression-improved' group was considered as the reference category, individuals with higher scores on childhood maltreatment were more likely to belong to the 'severe depression-improved' and 'chronic depression' groups (adjusted model: respectively, OR: 1.33, $p = .02$, 95% [1.03, 1.72]; OR: 1.39, $p = .030$, 95% [1.04, 1.88]; Table 3B). Childhood maltreatment did not predict the membership in the

'chronic depression' group compared to the 'severe depression-improved group (OR: 1.04, $p = .75$, 95% [0.78, 1.40]; see Table 3C).

3.3 | Associations between attachment style and depression trajectory groups

Because attachment anxiety and attachment avoidance have been identified as two orthogonal dimensions of attachment style, both variables were included in the regression models simultaneously, which is standard practice in attachment research (e.g., Fagundes et al., 2014; LeRoy et al., 2020). Individuals with higher attachment anxiety were more likely to belong to the 'severe depression-improved' and 'chronic depression' groups than the resilient group in the unadjusted model (respectively, OR: 1.15, $p = .043$, 95% [1.00, 1.31]; OR: 1.24, $p = .003$, 95% [1.07, 1.43]) and adjusted model (respectively, OR: 1.17, $p = .03$, 95% [1.01, 1.36]; OR: 1.39, $p < .001$, 95% [1.14, 1.68]). Attachment avoidance did not predict the membership in any of the trajectory groups (ORs = 1.01–1.04, p's > .30). Findings are presented in Table 4A.

Exploratory analyses revealed that when the 'moderate depression-improved' group was considered as the reference category, individuals with higher attachment anxiety were more likely to belong to the 'chronic depression' group (adjusted model: OR: 1.23, $p = .02$, 95% [1.03, 1.48]; Table 4B). Attachment anxiety did not predict the membership in the 'chronic depression' group compared to the 'severe depression-improved' group (OR: 1.18, $p = .09$; Table 4C).

Those reporting higher levels of childhood maltreatment had higher levels of attachment anxiety ($r = .29$, $p < .001$) and attachment avoidance ($r = .16$, $p = .03$). To explore further the unique impact of attachment styles and childhood maltreatment on depression

TABLE 3 Multinomial logistic regression for childhood maltreatment predicting the trajectory groups.

A. Reference group = trajectory 1						
Adjusted model[a]	Trajectory 2		Trajectory 3		Trajectory 4	
Variable	OR (95% CI)	p	OR (95% CI)	p	OR (95% CI)	p
Childhood trauma[a]	1.32 [1.02, 1.70]	.03*	1.76 [1.32, 2.35]	<.001**	1.85 [1.33, 2.56]	<.001**
B. Reference group = trajectory 2						
	Trajectory 3			Trajectory 4		
Variable	OR (95% CI)		p	OR (95% CI)		p
Childhood trauma[a]	1.33 [1.03, 1.72]		.02*	1.39 [1.04, 1.88]		.03*
C. Reference group = trajectory 3						
	Trajectory 4					
Variable	OR (95% CI)					p
Childhood trauma[a]	1.04 [0.78, 0.1.40]					.75

Note: Trajectory 1 = resilience; Trajectory 2 = moderate depression-improved; Trajectory 3 = severe depression-improved; Trajectory 4 = chronic depression.

[a]Covariates in the adjusted model: age, BMI, sex, antidepressant use, comorbidities, education, days since passing.

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

TABLE 4 Multinomial logistic regression for attachment style predicting the trajectory groups.

A. Reference group = trajectory 1

Variable	Trajectory 2		Trajectory 3		Trajectory 4	
Adjusted model[a]	OR (95% CI)	p	OR (95% CI)	p	OR (95% CI)	p
AAnx[a]	1.12 [0.99, 1.27]	.06	1.17 [1.01, 1.36]	.03*	1.39 [1.14, 1.68]	<.001**
AAvo[a]	1.01 [0.95, 1.07]	.71	1.03 [0.96, 1.12]	.34	1.04 [0.94, 1.15]	.38

B. Reference group = trajectory 2

Variable	Trajectory 3		Trajectory 4	
Adjusted model[a]	OR (95% CI)	p	OR (95% CI)	p
AAnx[a]	1.05 [0.91, 1.20]	.52	1.23 [1.03, 1.48]	.02*
AAvo[a]	1.02 [0.94, 1.11]	.52	1.03 [0.93, 1.14]	.51

C. Reference group = trajectory 3

Variable	Trajectory 4	
Adjusted model[a]	OR (95% CI)	p
AAnx[a]	1.18 [0.97, 1.43]	.09
AAvo[a]	1.00 [0.90, 1.12]	.89

Abbreviations: AAnx, Attachment Anxiety; AAvo, Attachment Avoidance.

[a]The models included both attachment anxiety and attachment avoidance simultaneously. Covariates included in these models: age, BMI, sex, antidepressant use, comorbidities, education, days since passing.

*p < .05, **p < .01.

trajectories, we included both attachment anxiety and attachment avoidance along with childhood maltreatment in the model. When childhood maltreatment was considered alongside all covariates, individuals with higher attachment anxiety exhibited a greater likelihood of belonging to the 'chronic depression' group compared to the resilient group (adjusted model: OR: 1.13, $p < .01$, 95% [1.08, 1.63]). Moreover, in the model accounting for all covariates and both dimensions of attachment style, higher scores on childhood maltreatment were associated with an increased likelihood of belonging to both the 'severe depression-improved' and 'chronic depression' groups compared to the resilient group (respectively, OR: 1.62, $p < .003$, 95% [1.02, 2.17]; OR: 1.53, $p = .02$, 95% [1.06, 2.21]).

3.4 | Associations between depression trajectories and prolonged grief symptoms

Compared to the resilient group, individuals in depression trajectory groups of 'moderate depression-improved', 'severe depression-improved' and 'chronic depression' were more likely to meet or exceed the cut-off score for prolonged grief at 12 months post-loss in both the unadjusted model (respectively, OR: 6.66, $p = .003$, 95% [1.91, 23.27]; OR: 19.00, $p < .001$, 95% [4.72, 76.51]; OR: 35.89, $p < .001$, 95% [7.19, 179.25]) and the adjusted model (respectively, OR: 7.18, $p = .002$, 95% [2.05, 25.15]; OR: 23.34, $p < .001$, 95% [4.95, 109.95]; OR: 44.75, $p < .001$, 95% [6.75, 296.51]). Results are presented in Table 5A.

Exploratory analyses revealed that when the 'moderate depression-improved' group was considered as the reference

category, individuals in the 'chronic depression' group were more likely to meet or exceed the cut-off score for prolonged grief at 12 months post-loss in both the unadjusted and adjusted models (adjusted model: OR: 6.23, $p = .026$, 95% [1.23, 31.51]; Table 5B). When the 'severe depression-improved' group was considered as the reference category, no significant associations were observed with respect to the 'moderate depression-improved' and 'chronic depression' groups and prolonged grief risk at 12 months (ps > .05; Table 5C).

We did not include prolonged grief symptoms at 6 months as an outcome in our logistic regression models given that the depression trajectory group, which served as a predictor in this model was characterized by utilizing all four time points; hence, conceptually, it may not be intuitive to treat the presence of prolonged grief symptoms at 6 months as an outcome. For descriptive purposes, we calculated what percent of individuals experienced prolonged grief symptoms in each depression trajectory group at 6 months post-loss (Table S2).

4 | DISCUSSION

4.1 | Trajectories of depressive symptoms

We replicated the work by Galatzer-Levy and Bonanno (2012) by identifying four distinct trajectories of depressive symptoms after spousal loss. Nearly half of the participants in our study were in the resilient trajectory exhibiting consistently minimal or no depressive

TABLE 5 Binary logistic regression for the trajectory groups predicting prolonged grief at 12 months.

A. Reference group = trajectory 1

	Trajectory 2		Trajectory 3		Trajectory 4	
Variable	OR (95% CI)	p	OR (95% CI)	p	OR (95% CI)	p
Prolonged grief (yes vs. no)						
Unadjusted model	6.66 [1.91, 23.27]	.003**	19.00 [4.72, 76.51]	<.001**	35.89 [7.19, 179.25]	<.001**
Adjusted model[a]	7.18 [2.05, 25.15]	.002**	23.34 [4.95, 109.95]	<.001**	44.75 [6.75, 296.51]	<.001**

B. Reference group = trajectory 2

	Trajectory 3		Trajectory 4	
Variable	OR (95% CI)	p	OR (95% CI)	p
Prolonged grief (yes vs. no)				
Unadjusted model	2.85 [0.97, 8.37]	.056	5.39 [1.40, 20.66]	.014*
Adjusted model[a]	3.25 [0.95, 11.11]	.060	6.23 [1.23, 31.51]	.026*

C. Reference group = trajectory 3

	Trajectory 4	
Variable	OR (95% CI)	p
Prolonged grief (yes vs. no)		
Unadjusted model	1.89 [0.43, 8.28]	.399
Adjusted model[a]	1.92 [0.35, 10.56]	.454

Note: Trajectory 1 = resilience; Trajectory 2 = moderate depression-improved; Trajectory 3 = severe depression-improved; Trajectory 4 = chronic depression.

[a]Covariates in the adjusted model: age, sex, BMI, antidepressant use, childhood maltreatment, comorbidities, education, days since passing.

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

symptoms at all time points during the 12 months after the loss. Notably, most resilient individuals (95%) did not develop prolonged grief symptoms at 12-month post-loss. These findings strengthen the notion that resilience in the face of interpersonal loss is common (Bonanno et al., 2004). Previous studies revealed a similar pattern of results in that the resilient trajectory exhibited consistently low levels of depressive symptoms across 48 months (Boerner et al., 2005; Galatzer-Levy & Bonanno, 2012) and 6 years post-loss (Maccallum et al., 2015). These findings suggest that individuals exhibiting no to minimal depressive symptoms during the first year of bereavement are less likely to show a delayed reaction in the long run, although this possibility cannot be supported based only on current findings.

One-third of the widow(er)s in our study (*moderate depression-improved* group) likely represent the 'common grief' (label defined by Bonanno et al., 2002). This trajectory group exhibited moderate levels of depressive symptoms through 6 months post-loss, which improved to mild levels of depressive symptoms by 12 months post-loss. In line with this, Bonanno et al. (2002) found that approximately 11% of bereaved individuals had increased levels of depressive symptoms at 6 months post-loss compared to the pre-loss time point, which fully recovered by 18 months post-loss; however, this study did not include any assessment points at the 3, 4, and 12-month time points after the loss. It should be noted that the 'common grief'

trajectory did not emerge in another study by this group that utilized an advanced statistical technique (Galatzer-Levy & Bonanno, 2012). Future work with more assessments during the first year of bereavement is needed to characterize the *common grief* trajectory group following spousal loss.

Our findings provide valuable information on a subset of bereaved individuals who are more likely to suffer from moderate to severe levels of depressive symptoms throughout 12 months after the loss. Approximately a quarter of the bereaved individuals in our study, which belonged to the *severe depression-improved* group and the *chronic depression* group, had an average CESD score of greater than 16 from 3 to 12 months post-loss, representing those who are at risk for clinical depression. These two groups did not differ significantly in terms of severity of depressive symptoms at baseline (i.e., 3 months post-loss). The *severe depression-improved* group (15%) showed improvement of moderate levels of depressive symptoms at 6 months post-loss with no further improvement from 6 to 12 months post-loss, whereas the *chronic depression* group (9%) reported consistently severe levels of depressive symptoms at all time points. Although our assessment time was shorter to identify grief at 12 months, given the new DSM-V criteria, our data are broadly consistent with Galatzer-Levy & Bonanno's (2012) work following widow(er)s 6, 18, and 48-months post-loss.

4.2 | Experiences in close relationships across the lifespan as index of risk

4.2.1 | Childhood maltreatment

We found that early childhood maltreatment distinguished between the three depression trajectory groups that exhibited moderate to severe levels of depressive symptoms up until 6 months post-loss, but followed a different pattern of change from 6 to 12 months post-loss. Individuals in the 'severe depression-improved' and 'chronic depression' groups had higher childhood maltreatment than the resilient and recovery groups. Our findings add to the literature on how childhood abuse and neglect impacts responses to loss in adulthood, providing additional support to the stress-sensitivity hypothesis. Childhood maltreatment can sensitize the stress response system by enhancing psychological reactivity to subsequent stressors and lowering the threshold for event-related distress later in life (Hammen et al., 2000; Harkness et al., 2006; Hazel et al., 2008; Kendler et al., 2004; Monroe & Simons, 1991). In sum, our findings extend prior work showing that individuals with troubled early parent-child relationships are more vulnerable to developing a persistent trajectory of depressive symptoms at least through 12 months following the loss of a spouse.

4.2.2 | Attachment style

Individual differences in attachment style predicted longitudinal trajectories of depressive symptoms through 12 months post-loss, such that individuals with high attachment anxiety were more likely to belong to the 'severe depression-improved' and 'chronic depression' groups compared to the resilient group. Attachment anxiety did not differentiate between the resilient trajectory and recovery groups. These findings align with the existing literature showing a link between attachment anxiety and poor adjustment to stressful life events (Fraley & Bonanno, 2004; LeRoy et al., 2020; Meier et al., 2013). Attachment avoidance did not predict the longitudinal patterns of depressive symptoms after the loss. This can be explained by differences in the affect-regulation strategies of anxious and avoidant individuals for coping with stressful life events (Shaver & Mikulincer, 2002). Individuals high on attachment anxiety ruminate on negative thoughts and exaggerate stressors. However, individuals high on attachment avoidance primarily cope with stress by suppressing their emotions, which can *sometimes* be adaptive for their own emotional and physical well-being (Fraley & Shaver, 1997; Mikulincer & Shaver, 2005; Shaver & Mikulincer, 2002). To our knowledge, this is the first study showing that attachment anxiety is associated with longitudinal *trajectories* of severe and persistent depressive symptoms during the first year after the death of a spouse. Hence, these findings corroborate the existing literature that high attachment anxiety can be considered a possible risk factor distinguishing between those likely to show maladaptive versus adaptive grief responses.

4.2.3 | Unique effects of childhood maltreatment and attachment style

Previous studies indicate individual differences in how childhood maltreatment may affect an individual's response to bereavement (Chen et al., 2020, 2022, 2023; Chen & Fagundes, 2022), implying that not all individuals who experience childhood maltreatment experience similar relationship-related thoughts and feelings in adulthood. We found that childhood maltreatment and attachment anxiety can each contribute significantly to predicting depression trajectories beyond the influence of one another. Early experiences in childhood are one important factor that can influence attachment style in adulthood. However, we emphasize that childhood maltreatment and adult attachment style are not synonymous, particularly given how these variables were operationally defined in the current study (Bernstein & Fink, 1998; Fraley et al., 2006, 2011). For example, people's responses on the CTQ (i.e., our measure of childhood maltreatment) reflect the bereaved participants' retrospective report of physical abuse, emotional abuse, sexual abuse, physical neglect, and emotional neglect during childhood (Bernstein & Fink, 1998). In contrast, people's responses to the ECR-RS questionnaire reflect how the bereaved participants relate to and engage with relationship partners, *currently*, in adulthood (Fraley et al., 2006, 2011). Participants' ratings on these items reflect their relationship-related thoughts and feelings in the here and now, which certainly may be influenced by childhood maltreatment (Mikulincer and Shaver, 2009, 2019; Thompson, 2008), but were not highly correlated, as shown in the current study. To understand the underlying mechanisms driving these associations, future research could explore potential mediators or moderators, such as coping strategies or cognitive processing related to depression development. Our findings carry important clinical implications. Mental health professionals should consider assessing attachment styles and childhood maltreatment history when working with individuals experiencing depression after a loss. Tailoring interventions to address specific attachment-related issues or trauma-related experiences may enhance treatment outcomes.

4.3 | Depression trajectories and prolonged grief symptoms

Approximately half of the bereaved individuals in the severe depression-improved trajectory group and two-thirds of widow(er)s in the chronic depression trajectory group who met the cut-off for prolonged grief at 6 months post-loss were still above the cut-off at 12 months post-loss. Our findings suggest that an individual's trajectory of depressive symptoms during the first 6 months after the loss may inform the severity of grief symptoms at least through 12 months. Indeed, bereaved individuals presenting with severe levels of depressive symptoms at 3 months post-loss, with no improvement or partial improvement in depressive symptoms up

until 6 months post-loss, may benefit from early interventions to reduce grief complications. This might be particularly important in bereaved individuals with possible risk factors for PGD (e.g., insecure attachment style).

5 | LIMITATIONS

Given that we did not measure depressive symptoms before loss, changes from pre-loss functioning cannot be estimated, which is a study limitation. Additionally, the widow(er)s in this study were predominately white and female, limiting the generalizability of our findings to other racial and gender groups. It is worth noting, however, that females represent most widow(er)s; thus, we expected to have a higher proportion of females in our sample (Carr & Bodnar-Deren, 2009). Our study acknowledges that excluding individuals based on factors such as language proficiency, inflammatory-related disorders, and visual/auditory impairments may impact the generalizability of our findings. These exclusion criteria may limit the extent to which our results can be applied to the broader population. Due to our study's sample size, conducting separate trajectory analyses for men and women to explore sex differences in depressive trajectories was not feasible. As a result, the examination of potential sex-specific trajectories is limited. Future research with larger samples would be necessary to comprehensively investigate sex differences in depression trajectories and their risk factors.

6 | CONCLUSION

An important strength of our study is that the widow(er)s were initially assessed in the immediate aftermath of the loss (i.e., the first few months) and then were prospectively evaluated multiple times over the first year of widowhood. We characterized four distinct trajectories of depressive symptoms early in spousal bereavement. Furthermore, childhood maltreatment and anxious attachment were associated with an increased risk of adverse mental health trajectories after exposure to a stressful life event (e.g., loss of a loved one) later in life. Identifying risk factors associated with grief, depression, and grief-related complications is critical to design empirically supported interventions targeted and tailored to those widow(er)s who need them. This study demonstrates that widowhood has adverse mental health consequences that persist over the first year for a certain proportion of older adults; the findings highlight the importance of workplaces, insurance companies, and government agencies considering widowhood when formulating policies.

CONFLICT OF INTEREST STATEMENT
The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT
The data that support the findings of this study are available on request from the corresponding author.

ETHICS STATEMENT
This study was conducted in compliance with the American Psychological Association ethical guidelines in the treatment of human participants. The local Institutional Review Board (IRB) approved all recruitment strategies and study procedures. All participants provided written informed consent.

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