



OPEN Mental health trajectories, resilience and psychosocial factors in palliative care workers frequently exposed to death

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Palliative care (PC) professionals are constantly exposed to patients' suffering and death—potentially traumatic events (PTEs) that are in addition to everyday work and personal stressors. The long-term mental health effects of these experiences are unclear. Additionally, psychosocial factors such as social support, autonomy, psychological demands, empathy, psychological flexibility, mindfulness, and self-compassion have not been studied over the long term among these professionals. This six-month longitudinal study aimed to chart mental health trajectories in palliative care professionals. An online questionnaire was administered twice—November 2022 (t1) and May 2023 (t2)—to PC professionals in France (e.g. doctors, nurses, care assistants, psychologists). Of the initial 379 participants at t1, 280 completed both surveys, resulting in a 26% attrition rate. Chronic stress from ongoing end-of-life care was the strongest predictor of mental health between t1 and t2. Participants followed one of two trajectories: a resilience trajectory (63.21–68.93%) or a chronic distress trajectory (approximately 31.07–36.79%). Among all psychosocial factors measured, higher psychological flexibility significantly increased the odds of a resilience trajectory, as shown by associations with both burnout and well-being scores. Similarly, mindfulness and self-compassion are resilience factors on anxiety and depression scores.

Palliative care (PC) professionals support individuals and their families facing challenges related to life-threatening illnesses, providing physical, psychological, social, and spiritual care. These professionals are essential for the care of forty million people worldwide¹. With the increasing burden of non-communicable diseases and aging populations, this need is expected to grow in the coming years. Thus, maintaining or enhancing the health of PC professionals is a priority. Research suggests that while these professionals are resilient and can experience psychological growth from their work^{2–4}, they also report alarmingly high rates of psychological distress⁵. Psychological disorders such as burnout, anxiety, depression, and compassion fatigue or post-traumatic stress disorder are particularly common among them^{6–9}. However, one limitation of the numerous studies that have explored PC professionals' mental health is that they generally provide single-time well-being measurements. Resilience, a central element in the study of mental health, is defined as “the process of adapting in the face of adversity, trauma, tragedy, threats, or significant sources of stress”¹⁰. The use of the term “adaptation” in the very definition of resilience requires assessing the psychological response to the stressor over a period of time rather than through a single instantaneous measurement. To have a more global view of the mental health of palliative care professionals, it is thus crucial to measure their long-term mental health trajectories¹¹.

The outcome-based definition of resilience, as the maintenance or recovery of mental health during and after adversity, further implies the need to measure the adversity experienced by palliative care professionals. One of the stressors they have to deal with is their repeated exposure to the suffering and death of others⁸. These situations can be considered Potentially Traumatic vicarious Events¹². The relationship between experiencing one or more Potentially Traumatic Events (PTEs), either as a witness or a direct victim, and the development of psychopathologies such as post-traumatic stress disorder (PTSD) is well established^{13–15}. However, most individuals exposed to PTEs do not develop PTSD¹⁶. Following an acute PTE, four possible trajectories can emerge¹⁷: chronic decline in well-being, recovery (initial decline followed by improvement), delayed decline in well-being (emerging later), and resilience (little or no change in well-being). Resilience is the most common trajectory, occurring in over 60% of PTE victims^{18–20}. In the case of a chronic PTE, two trajectories are most

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likely during or after exposure: chronic distress and emergent resilience¹¹. No clear ratio of resilience to distress trajectories has emerged from the literature, as these trajectories depend on time and various environmental and individual factors.

Research also differentiates between the health consequences of acute and chronic stress^{21,22}. For instance, while acute stress is associated with increased cardiovascular reactivity and a higher risk of cardiovascular disease^{23,24}, chronic stress increases the likelihood of chronic illness, mortality, and accelerated biological aging^{25,26}. For PC professionals, the temporality of the multiple stressors they face is not clearly defined. Stressors can be acute if PC professionals face isolated crisis, or chronic if the accumulation of similar daily stressors becomes difficult to manage. Determining whether PC professionals experience acute or chronic stress would then aid in developing effective prevention strategies.

Like other individuals, PC professionals also face additional stressors and develop coping resources. Some of these psychosocial factors (e.g., occupational stressors and psychological resources) have been linked to their mental health. The Job Demand-Control (JDC) model²⁷ is widely used to study occupational stress, proposing that stress arises from an imbalance between job demands and available resources. In palliative care, job demands, social support, and feelings of competence have been linked to job satisfaction and/or distress^{28,29}. A recent literature review on occupational stressors in hospice care professionals³⁰ found strong evidence that high workload, poor workplace relationships, change management, and overall organizational culture negatively impact hospice staff's psychological well-being.

At the individual level, dispositional resources such as empathy³¹, mindfulness³², psychological flexibility³³, and self-compassion³⁴ have been linked to the mental health of PC professionals. While empathy is essential for building therapeutic relationships, excessive sensitivity to patient suffering can lead to compassion fatigue, particularly when professionals start confusing their own emotions with those of the individuals they care for³⁵. In contrast, mindfulness promotes an open and accepting approach to experience, fostering curiosity and non-judgment, a useful attitude in palliative care. Mindfulness practice helps maintain attention regulation³⁶, decrease mental rumination³⁷, and promotes interoceptive awareness and voluntary exposure to internal stimuli^{38,39}. Similarly, self-compassion may play a crucial role in building resilience in PC professionals. Self-compassion is an adaptive form of self-relating characterized by the ability to treat oneself with the same kindness one would offer to others in similar situations⁴⁰. Studies have found a negative correlation between self-compassion and tendencies toward shame⁴¹. Additionally, recognizing shared human experiences can help individuals let go of unrealistic self-expectations, thereby mitigating the harmful effects of perfectionism⁴². The practice of self-compassion could then strengthen PC professionals' ability to cope with suffering and death³⁴. Furthermore, both self-compassion and mindfulness have been associated with psychological flexibility, which refers to the capacity to accept all psychological experiences while allocating resources to present actions⁴³. This ability enables individuals to focus on actions aligned with their values, even when faced with distressing thoughts or emotions. Psychological flexibility has been negatively linked to burnout in geriatric nurses³³. Again, however, the studies which measured the links between these dispositional resources and the mental health of palliative care professionals were conducted at a single point of measurement rather than through longitudinal studies.

The primary aim of this six-month longitudinal study was to identify the mental health trajectories of palliative care professionals. A secondary objective was to determine the stressors or Potentially Traumatic Events (PTEs) most strongly associated with mental health outcomes. Finally, we also wanted to determine the effects of psychological factors such as empathy, self-compassion, mindfulness, or psychological flexibility on the mental health trajectories of PC professionals. These factors would work alongside job demand, job decision latitude (including opportunities for personal skill development and decision-making autonomy), and perceived social support in the work environment.

Method

Participants and procedure

The survey was administered online using Qualtrics software. Participants were recruited primarily by email through the Société Française d'Accompagnement et de soins Palliatifs (SFAP) online directory, which includes contacts for palliative care facilities (around 10 000 professionals) throughout France. The initial sample (t1) included 379 palliative care professionals (e.g., doctors, nurses, nursing assistants, psychologists) working in various settings such as hospitals, medico-social establishments, or at home in France. These participants completed the questionnaire for the first time in November 2022. Six months later, in May 2023 (t2), 280 of them completed the questionnaire again, resulting in an attrition rate of 26%. Descriptive statistics are presented in Table 1. There was no significant statistical difference in the socio-demographic characteristics of the samples between wave 1 and wave 2.

Measures

The questionnaire used at t1 and t2 was identical, except for the socio-demographic variables, which were assessed only at t1. It contained 33 questions in French, evaluating: (i) the stressors experienced by the participants; (ii) various psychosocial factors, including perceived work environment and psychological dispositions; and (iii) their mental health.

Potential stressors

Perceptions of 8 potential stress factors were assessed, including: perception of stress related to working conditions (e.g., "Over the past 6 months, my working conditions have been very stressful"), perceived stress related to relationships with colleagues, perceived stress related to managing the COVID-19 health crisis at personal and professional levels, perceived personal stress, and perceived stress related to end-of-life care in the last 6 months. This stress related to end-of-life care was categorized into acute stress ("One end-of-life care

	Wave 1 (N = 379)		Wave 2 (N = 280) (attrition rates = 26%)		p-value
	n	%	n	%	
Mean age	45,7 (10,4)		45,5 (10,2)		0,49 ^a
Years of experience in the job	10,1 (7,4)		10,0 (7,1)		0,70 ^a
gender					0,91 ^b
woman	328	86,5	242	86,4	
man	51	13,5	38	13,6	
Professional function					0,32 ^b
Nurse	128	33,9	92	32,9	
Doctor	115	30,4	84	30	
Psychologist	69	18,3	58	20,7	
Nursing assistant	22	5,8	15	5,4	
Other function	44	11,6	31	11,1	

Table 1. Socio-demographic characteristics of participants. Notes. ^a Welch's T-Test ; ^b Chi² test.

situation has been particularly stressful for me" or "Several end-of-life care situations have been very stressful for me"), or chronic stress ("The accumulation of end-of-life care situations has been very stressful for me"). Participants rated their agreement on a Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). There were significant statistical differences in the measures of participants' stress related to the COVID-19 crisis between Wave 1 (November 2022) and Wave 2 (May 2023) (see supplementary materials, Table S1).

Psychosocial factors

Perceptions of one's job environment. Four items from Karasek's questionnaire⁴⁴ were selected, relating to three dimensions: job demand, job decision latitude (subdivided into skill discretion and decision authority), and perceived social support, indicating the feeling that people around you facilitate tasks. Additionally, two items concerning identification with one's work and relationships with colleagues were included. Participants provided responses on a Likert scale ranging from 0 (strongly disagree) to 10 (strongly agree) for the first five items. For the last item, participants rated their response on a Likert scale ranging from 0 (very bad) to 10 (excellent).

Four psychological dispositions scales were also selected.

Empathy. The short Basic Empathy Scale: French version (BES)⁴⁵, shortened to 12 items, was used. This scale measures three dimensions of empathy: emotional contagion, cognitive empathy, and emotional disconnection. Participants indicated their agreement with each proposition on a scale from 0 ("strongly disagree") to 4 ("strongly agree"). The scale, validated in French, originally comprises 20 items, but we selected the 12 items with the highest factor loadings⁴⁶ (ω McDonald = 0.75 at t1, see Supplementary Materials, Table S2).

Mindfulness. The 15-Items Five-Facets Mindfulness Questionnaire (FFMQ-15), which has been validated in French, was used; this questionnaire, validated in French in its long version (39 items), is one of the most common for measuring mindfulness or attention to the present moment. This questionnaire measures five dimensions of mindfulness: observing sensations, perceptions, thoughts, and feelings; describing lived experience; acting mindfully; refraining from immediate reactions to inner experiences; and non-judgment of inner experiences. Participants rated their agreement with each item on a scale from 1 ("never or very rarely true") to 5 ("very often or always true"). Initially, the 15 French items from the short version, validated in English⁴⁷, were used. However, one item ("I notice how food and drink influence my thoughts, body sensations, and emotions") did not correlate with the rest of the scale (item-rest correlation = 0.02). Thus, this item has been removed. A new 14-item subscale was used for further analysis, without this item (McDonald's ω = 0.80 in t1) (see supplementary materials, Table S3).

Self-compassion. The Short Self Compassion Scale (SCS-SF) was used in a shortened 7-item version. The 7 items with the highest factor loadings from the short version validated in English⁴⁸ were selected. This questionnaire, validated in French in its original version, evaluates five dimensions of self-compassion: self-kindness (1 item), non-judgment of self (2 items), isolation (2 items), mindfulness (1 item) and over-identification (2 items). Participants indicated how often they behave in the suggested manner on a scale from 1 ("almost never") to 5 ("almost always"). McDonald's ω was 0.85 at t1 (see reliability analysis in supplementary materials, Table S4).

Psychological flexibility. The French version of the Multidimensional Psychological Flexibility Inventory, MPFI-24⁴⁹, in a shortened 12-item version, was used. In its complete version, this scale assesses an individual's capacity for acceptance and commitment. Twelve dimensions of flexibility (6 items) and inflexibility (6 items) are assessed: acceptance, contact with the present moment, observer-self abilities, defusion, recognition of one's values, committed action, experiential avoidance, loss of contact with the present moment, self as content, fusion, loss of contact with one's values, and inaction. Participants were asked to answer how often he or she behaves in the way suggested, from 1 ("almost never"), to 7 ("almost always"). To streamline completion time, one item per dimension was selected from the original 24-item version validated in French. However, after an initial internal consistency analysis, item 7 related to experiential avoidance ("I tried to distract myself when I felt unpleasant emotions") showed negative correlations with the rest of the inflexibility component of the scale

(item-rest correlation = -0.33) and was removed. A new 11-item subscale, without this item, was used for further analysis (McDonald's $\omega = 0.84$). The results of the reliability analysis are presented in Supplementary materials, Table S5.

Mental health measures

Mental health. World Health Organisation defines health as “a state of complete physical, mental and social well-being, not merely the absence of disease”⁵⁰. This approach provides a multidimensional definition on well-being focusing not only on the absence of negative emotions such as depression and anxiety, but also on the presence of emotions from the positive end of the spectrum^{51,52}. In line with positive psychology theory, three key components of subjective well-being were assessed: life satisfaction (as “a cognitive evaluation of one's life”⁵³), happiness (characterized by “both immediate contentment and durable inner-peace”⁵⁴), and inner peace (as “a quality of consciousness which underlies and imbues each experience, emotion, and behavior, and allows us to embrace all the joys and the pain with which we are confronted”⁵⁴). To measure their global mental health, participants used five visual analog scales (VAS)⁵⁵. Participants were instructed to indicate their level of depression, anxiety, life satisfaction, happiness, and inner peace over the past few weeks by moving a slider along a continuum from 1 to 7. These measures have been assessed at t1 and at t2. McDonald's ω was 0.84 at t1 (see Table S6) and 0.85 at t2 (Table S7). Paired Sample T-Tests for these five measures are presented in Table S8.

Professional Quality of life. We used the Short Professional Quality of Life scale^{56,57} to assess three dimensions of quality of life for professionals working with individuals in distress: (i) Compassion Satisfaction (CS), defined as “the pleasure of being able to do one's job well” (helping others); (ii) Burnout, defined as “feelings of hopelessness and difficulties in coping with work or performing it effectively”, and, (iii) Compassion Fatigue (CF), considered in this scale as a synonym of secondary traumatic stress (STS) and defined as “a set of difficulties linked to secondary exposure to people who have experienced extremely stressful events”⁵⁸. The scale consists of nine items, with participants rating the frequency of occurrence of various symptoms over the past 30 days on a scale from 1 (never) to 5 (very often). For example, participants might indicate the frequency with which they feel depressed due to the traumatic experiences of the people they help. Reliability analysis of the scale gave an acceptable internal consistency (McDonald's $\omega = 0.82$ at t1, Table S9, McDonald's $\omega = 0.79$ at t2, Table S10). There was a statistically significant difference in the participants' compassion satisfaction scores between wave 1 and wave 2, but no significant difference in their burnout scores or compassion fatigue scores (see supplementary materials, Table S11).

Statistical analysis

Data were expressed in numbers and percentages for categorical variables and as mean $\pm$ standard deviation (SD) for quantitative variables. Statistical significance was considered at 0.05 for all analyses. As none of the data were normally distributed, we used Spearman's rank coefficient to examine correlations between variables⁵⁹. For regression analysis, we used bootstrapping based on 5000 replicates⁶⁰. The survey was designed in such a way that if a question was not answered, the participant would not be able to continue the study (except for free comments). Missing data are therefore not arranged randomly, and the data imputation method is not appropriate in this case⁶¹. The statistical analyses for this survey were thus performed on the 280 participants who entirely filled the questionnaire at t1 and t2.

The five visual analog scales: *life satisfaction*, *anxiety*, *happiness*, *depression*, and *inner peace*, and the three scores from the Short ProQOL scale: *compassion fatigue*, *burnout*, and *compassion satisfaction* consist of eight different mental health measures. As these eight measures are not parts of a global construct, some latent factors could be present within them overall. We had no hypothesis on the number and nature of these potentially latent factors. Thus, an exploratory factor analysis (EFA) was first carried out to identify the number of dimensions of our overall measures, and to reduce the number of variables if necessary⁶².

To identifying the stressors or Potential Traumatic Events (PTEs) most strongly associated with mental health outcomes—we began by analysing the relationships between potential stressors and mental health measures using correlation analyses conducted both within and between t1 and t2. The significance of relationship between stressors and each mental health measure was then evaluated with multiple regression analyses. Specifically, we performed as many multiple bootstrap regression analyses as the number of mental health variables, using as independent variables (IV) the 8 potential stressors experienced in the past six months (assessed at t2), and as the dependent variable (DV), one mental health component measured at t1 and the same component measured at t2.

With the aim of exploring the relationships between various perceptions of the work environment, dispositional resources, and mental health in a context of end-of-life care stress, we selected the end-of-life care stressor most correlated with mental health. All subsequent analyses were conducted using this stressor. We performed simple linear regression analyses to determine expected levels of mental health as a function of stress levels among all participants. For each participant, the residual between their expected mental health score (the result of the regression) and their actual score can be interpreted as an under- or over-reaction to the stressor relative to all participants^{63,64}. Following the procedure outlined by Kalisch et al. (2021)⁶⁵, we then operationalised the mental health trajectories of our participants with the trajectories of these residuals between t1 and t2. In that perspective, a resilience trajectory for a participant was calculated as a better well-being trajectory or a less bad distress trajectory than the other participants. If a participant under-reacts on the stressor in relation to the other participants in t1 and in t2, we can conclude that he follows a resilience trajectory. If on the contrary he over-reacts on this stressor in t1 and in t2, we can conclude that he follows a chronic distress trajectory. If a participant under-reacts on the stressor in t1 and over-react in t2, he follows a delayed distress trajectory. Finally, if a participant over-reacts on the stressor in t1 and under-react in t2, he follows a recovery trajectory. To identify the trajectories of our participants, we used the K-means clustering package of Jamovi, with the Hartigan-Wong

algorithm and 10 random starting values, together with the Neighbourhood-based clustering package of JASP. The optimal number of clusters was found by considering the Elbow Method proposed by Jamovi, combined with the average silhouette on JASP⁶⁶.

The links between these mental health trajectories, various perceptions of one’s job environment (job demand, job decision latitude, perceived social support) and psychological dispositions (empathy, self-compassion, psychological flexibility, mindfulness) were then explored using correlation followed by multiple regression analyses. In the latter analyses, the predictive power of dispositional resources in an end-of-life care context has been controlled with other environmental factors likely to influence well-being at work (other significant stressors already identified, psychological demand of work, individual autonomy, decision-making latitude, perceived social support, work time devoted to end-of-life care, number of end-of-life cares).

Results

The dimensionality of mental health measures

We present in Table 2 the results of the exploratory factor analysis (EFA) carried out on the participants’ scores at t1 and at t2. As our data were not normally distributed, we chose the PAF (principal axis factoring) method to extract the factors. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.81 at t1 and 0.82 at t2, and Barlett’s test of sphericity was significant at both waves ($p < .001$). We performed a parallel analysis to select the number of factors to be retained⁶². At both waves, the chi-squared was significant ($p < .001$ at t1 and $p < .05$ at t2). The EFA revealed 3 retained factors, which together explain 57.33% at t1 and 58.50% at t2 of the total variance in the data. This result aligns with commonly accepted standards, as the factor solution is coherent and the factor loadings are clear (> 0.30 , see Table 2).

For further analysis, we calculated three new mental health variables using the mean of the participants’ scores on the different scales. The ‘Well-Being’ variable corresponds to the mean of the scores for the ‘life satisfaction’, ‘happiness’, ‘inner peace’ and ‘compassionate satisfaction’ variables. The ‘Anxiety-Depression’ variable corresponds to the mean of the anxiety and depression scores. The ‘Burnout-CF’ variable corresponds to the mean of the burnout and compassion fatigue scores. There was no significant difference in mental health scores between professions or across different lengths of time in the position in t1 or in t2.

Relationships between stressors and mental health measures

Almost all associations between potential stressors and mental health measures within and between t1 and t2 were significant in the expected direction (see Supplementary materials, Table S12). To test the relevance of each relation between stressors and mental health, we performed three linear bootstrap regression analysis with for IV, the 8 potential stressors experienced in the last 6 months (assessed at t2) and one mental health component in t1, and for DV the same mental health component in t2. For the three mental health factors (Burnout-CF, Anxiety-Depression and Well-Being), all VIFs are below 5, reaching the prerequisites for carrying out these analyses⁶⁷. The results are presented in Table 3. The correlations between t1 and t2 for the three mental health factors were all positive, significant, and of moderate size. Among the 8 proposed sources of stress experienced by participants in the 6 months prior to t2,

- Stress due to working conditions remained positively and significantly related to Burnout-CF in t2 controlling for Burnout-CF in t1, ($\beta = 0.11$; 95% CI:0.03, 0.18) and to Anxiety-Depression in t2 controlling for Anxiety-Depression in t1, ($\beta = 0.24$; 95% CI:0.12, 0.36).
- Personal stress remained negatively and significantly related to Well-Being in t2 controlling for Well-Being in t1 ($\beta = -0.08$; 95% CI:-0.13, -0.04), and positively to Anxiety-Depression in t2 controlling for Anxiety-Depression in t1 ($\beta = 0.10$; 95% CI:0.02, 0.18).
- Stress due to the accumulation of end-of-life care management remained positively and significantly related to Burnout-CF in t2 controlling for Burnout-CF in t1, ($\beta = 0.21$; 95% CI:0.14, 0.30) ($\beta_{c[0.14, 0.30]}$), to Anxiety-Depression in t2 controlling for Anxiety-Depression in t1, ($\beta = 0.13$; 95% CI:0.01, 0.24), and negatively to Well-Being in t2 controlling for Well-Being in t1, ($\beta = -0.08$; 95% CI:-0.15, -0.01). It was the only factor

	Factors loadings					
	Factor 1		Factor 2		Factor 3	
	t1	t2	t1	t2	t1	t2
Life satisfaction	0.80	0.82				
Anxiety			0.66	0.72		
Happiness	0.87	0.86				
Depression			0.67	0.75		
Inner peace	0.39	0.41				
Burn out					0.82	0.79
Compassionate satisfaction	0.43	0.42				
Compassion fatigue					0.67	0.47
% of Variance explained	24.31%	24.70%	15.29%	13.72%	17.73%	20.08%

Table 2. Exploratory factor analysis of the 8 mental health measures on participants ‘score at t1 and t2. Note. ‘Principal axis factoring’ extraction method was used in combination with a ‘oblimin’ rotation.

Potential stressors	Unstandardised β (confidence interval 95%)		
	Well-being t2 (controlling for Well-being-t1)	Anxiety-Depression t2 (controlling for Anxiety-depression-t1)	Burnout-CF t2 (controlling for burnout-CF-t1)
Well-being-t1	0.57 [0.46,0.69]	-	-
Anxiety-depression-t1	-	0.45 [0.34,0.56]	-
Burnout-CF-t1	-	-	0.44 [0.32,0.55]
Work conditions t2	-0.06 [-0.13, 0.01]	0.24 [0.12, 0.36]	0.11 [0.03,0.18]
Colleague relations t2	-0.02 [-0.07, 0.04]	0.01 [-0.08, 0.10]	0.03 [-0.03,0.09]
COVID-19 in the professional context t2	0.03 [-0.05, 0.1]	-0.08 [-0.20, 0.02]	-0.06 [-0.14,0.02]
Personal stress t2	-0.08 [-0.13, -0.04]	0.10 [0.02, 0.18]	-0.02 [-0.07,0.03]
COVID-19 in the personal context t2	0.02 [-0.06, 0.01]	0.06 [-0.06, 0.18]	0.01 [-0.08,0.09]
1 EOL care management t2	0.01 [-0.06, 0.07]	0.01 [-0.10, 0.11]	0.05 [-0.02,0.12]
Several EOL care management t2	0.06 [-0.03, 0.15]	-0.11 [-0.28, 0.04]	-0.07 [-0.17,0.02]
Accumulation of EOL care management t2	-0.08 [-0.15, -0.01]	0.13 [0.01, 0.24]	0.21 [0.14,0.30]

Table 3. Linear bootstrap regressions analysis: unstandardised bootstrap coefficient and confidence interval (95%) between various stressors and mental health variables. Note. EOL : end-of-life

that remained significantly related to all three mental health variables in t2 when controlling for the same mental health variables in t1. This stressor was also the only one to specifically target a type of stress related to end-of-life care.

The other EOL stressors (i.e., stress related to one specific EOL care or stress related to several specific EOL care) were not significantly related to mental health variables when the same health variable in t1 was statistically controlled. We therefore focused on the stress due to the accumulation of EOL care for further analysis.

Mental health trajectories in the EOL care chronic stress context

Considering our first results, we selected the stress of accumulation of EOL care during the last six months, a chronic stressor by definition, to study the long-term effect of this stressor on our participants' mental health trajectories. We used the residuals of the simple linear regressions calculating the associations between this stressor and each of the three mental health components in t1 and in t2⁶⁵. We created six new variables named ResBurnout-CFt1, ResBurnout-CFt2, ResAnxiety-Depression1, ResAnxiety-Depression2, ResWell-beingt1 and ResWellBeingt2 as six indicators of the over- or under-reactions of our participants to the chronic stress of EOL care. We operationalised the mental health trajectories of our participants with the trajectories of these residuals between t1 and t2. The cluster analysis was run 3 separate times on each composite DV (with its 2 timepoints). On the three mental health components, the two-clusters model was chosen (on the Well-Being component: best solution from the Gap Statistic method and Silhouette value = 0.44, i.e. acceptable solution; on the Anxiety-Depression component: best solution from the Gap Statistic method and Silhouette value = 0.45, i.e. acceptable solution; on the Burnout-CF component, best solution from the Gap Statistic method and Silhouette value = 0.42, i.e. acceptable solution). The mental health trajectories followed by our participants are presented in Table 4.

Our participants globally follow two mental health trajectories on the three components between t1 and t2:

- A trajectory of under-reaction to the stressor in t1 and t2 (i.e. resilience trajectory, cluster 1; 63.21% $\leq$ size $\leq$ 68.93%).
- A trajectory of over-reaction to the stressor in both t1 and t2 (i.e. chronic distress trajectory, cluster 2; 31.07% $\leq$ size $\leq$ 36.79%).

The mean trajectory plots for each cluster on each composite DV are provided in Supplementary Materials, Figures S1, S2 and S3.

Relationships between mental health trajectories and dispositional resources in the EOL care chronic stress context

Our last objective was to study the relations between these mental health trajectories in a context of chronic stress of EOL care, and psychological factors (empathy, self-compassion, psychological flexibility, mindfulness).

	Well being		Anxiety-Depression		Burnout-CF		
	Cluster 1	Cluster 2	Cluster 1	Cluster 2	Cluster 1	Cluster 2	
Silhouette	0.44		0.45		0.42		
Between sum of squares	258.1		272.36		253.28		
Within sum of squares	148.51	151.40	128.57	157.07	149.86	154.85	
Size (N)	193	87	177	103	183	97	
Size (%)	68.93	31.07	63.21	36.79	65.36	34.64	
Cluster Mean (SD)	t1	0.47	-1.05	-0.47	0.80	-0.47	0.89
	t2	0.44	-0.97	-0.59	1.02	-0.51	0.96

Table 4. Clustering tables for Well-being, Anxiety-Depression and Burnout-CF. Note. The models are optimized with respect to the silhouette value.

predictor		Clustering Well-Being		Clustering Anxiety-Depression		Clustering burnout-CF	
		Estimate bootstrap coefficients [95% IC]	Odd ratios [95% bca* CI]	Estimate bootstrap coefficients [95% CI]	Odd ratios [95% bca* CI]	Estimate bootstrap coefficients [95% IC]	Odd ratios [95% bca* CI]
Significant stressors	Stress of works conditions t1	-	-	-0.33 [-0.61,0.01]	0.72 [0.54, 1.01]	-0.37 [-0.61, -0.09]	0.69 [0.55, 0.93]
	Personal stress t1	-0.21 [-0.37, -0.03]	0.80 [0.70, 0.98]	-0.24 [-0.38,-0.03]	0.78 [0.68, 0.97]	-	-
Perceived work environment factors	feeling of being able to develop one's skills at work t1	0.37 [0.03, 0.66]	1.45 [1.02, 1.91]	0.20 [-0.13, 0.45]	1.22 [0.87, 1.56]	0.27 [-0.05, 0.56]	1.32 [0.95, 1.71]
	decision latitude t1	-0.12 [-0.33,0.13]	0.89 [0.71, 1.14]	-0.22 [-0.43, 0.06]	0.81 [0.66, 1.04]	0.13 [-0.13,0.32]	1.14 [0.87, 1.39]
	Job demand t1	0.01 [-0.25, 0.25]	1.01 [0.79, 1.29]	0.26 [-0.02, 0.51]	1.29 [0.99, 1.65]	-0.17 [-0.39, 0.11]	0.85 [0.67, 1.12]
	feeling that people make the task easier at work t1	0.15 [-0.13, 0.40]	1.16 [0.87, 1.51]	0.12 [-0.18, 0.41]	1.12 [0.84, 1.50]	0.13 [-0.13,0.38]	1.14 [0.86, 1.45]
	identification with one's work t1	-0.08 [-0.28, 0.12]	0.92 [0.75, 1.12]	0.06 [-0.16, 0.26]	1.07 [0.86, 1.28]	-0.06 [-0.22,0.12]	0.94 [0.80, 1.14]
	quality of relationship with colleagues t1	0.19 [-0.15, 0.46]	1.21 [0.85, 1.58]	-0.08 [-0.39, 0.28]	0.93 [0.67, 1.31]	-0.12 [-0.41,0.19]	0.89 [0.66, 1.20]
Psychological dispositions	Mindfulness t1	0.02 [-0.05, 0.08]	1.02 [0.95, 1.09]	0.10 [0.02, 0.17]	1.11 [1.02, 1.18]	0.02 [-0.05, 0.08]	1.01 [0.95, 1.09]
	Self-compassion t1	0.02 [-0.06, 0.10]	1.02 [0.94, 1.11]	0.15 [0.04, 0.22]	1.16 [1.04, 1.25]	0.02 [-0.06, 0.09]	1.02 [0.94, 1.10]
	Psychological flexibility t1	0.11 [0.02, 0.17]	1.11 [1.03, 1.18]	0.04 [-0.04, 0.10]	1.04 [0.96, 1.11]	0.08 [0.01, 0.14]	1.08 [1.01, 1.15]
	Empathy t1	-0.00 [-0.07, 0.07]	1.00 [0.94, 1.05]	-0.09 [-0.15, -0.01]	0.91 [0.86, 0.99]	-0.04 [-0.09, 0.03]	0.96 [0.91, 1.02]
		Note. The estimate represents the log odds of "Clustering Well-Being resilience" vs. "Clustering Well-being chronic distress".		Note. The estimate represents the log odds of "Clustering Anxiety Depression resilience" vs. "Clustering Anxiety Depression chronic distress".		Note. The estimate represents the log odds of "Clustering BO-STs resilience" vs "Clustering BO-STs chronic distress".	

Table 5. Estimate bootstrap coefficients with confidence intervals and odd ratios from the binomial logistic regressions. Notes. Bootstrapping based on 5000 successful replicates. Coefficient estimate is based on the median of the bootstrap distribution. *bias corrected accelerated

In these latter analyses, the predictive power of dispositional factors in an EOL care context has been controlled with the other significant stressors on each mental health component (work conditions on Anxiety-Depression and Burnout-CF mental health components and personal stress on Well-being and Anxiety-Depression components, see Table 3) and with other environmental factors likely to influence well-being at work (other significant stressors already identified, psychological demand of work, individual autonomy, decision-making latitude, perceived social support, work time devoted to end-of-life care, number of end-of-life cares). These relations were explored using 3 binomial logistic regressions. Stress factors, perceptions of one's job environment and dispositional factors in t1 were used as predictors of the trajectories between t1 and t2. All VIFs are below 3. Results of the binomial logistic regressions are presented in Table 5.

- Personal stress at t1 significantly decreased the likelihood of following a resilience trajectory on the Well-Being component ($OR = 0.80$; 95% CI: 0.70, 0.98), and on the Anxiety-Depression component ($OR = 0.78$; 95% CI: 0.68, 0.97).
- Stress of work conditions in t1 significantly decreased the likelihood of following a resilience trajectory on the Burnout-CF component ($OR = 0.69$; 95% CI: 0.55, 0.93).
- The feeling of being able to develop one's skills at work in t1 significantly increased the likelihood of following a trajectory of resilience on the Well-Being component ($OR = 1.45$; 95% CI: 1.02, 1.91). It is the only perceived work environment factor significantly related to a mental health trajectory when controlling for other significant factors on each mental health measures.

The other factors significantly linked to a trajectory were psychological ones.

- Mindfulness in t1 significantly increased the likelihood of following a trajectory of resilience on the Anxiety-Depression component ($OR = 1.11$; 95% CI: 1.02, 1.18).
- Self-compassion in t1 significantly increased the likelihood of following a trajectory of resilience on the Anxiety-Depression component ($OR = 1.16$; 95% CI: 1.04, 1.25).
- Empathy in t1 decreases the likelihood of following a resilience trajectory on the Anxiety-Depression component ($OR = 0.91$; 95% CI: 0.86, 0.99).
- Finally, Psychological flexibility significantly increased the likelihood of following a trajectory of resilience on the Burnout-CF component ($OR = 1.08$; 95% CI: 1.01, 1.15) and on the Well-Being component ($OR = 1.11$; 95% CI: 1.03, 1.18).

Discussion

This longitudinal study, conducted over six months with two measurement points, examined the mental health of palliative care (PC) professionals in relation to their experience of stress, perceptions of their work environment, and various psychological dispositions.

Among the eight stressors measured, chronic stress resulting from the accumulation of end-of-life (EOL) care management was the strongest predictor of mental health issues over time. In contrast, acute EOL stressors, related to specific situations, had weaker correlations when controlling for other factors. Personal stress significantly impacted well-being and anxiety-depression, while work conditions stress affected anxiety-depression and burnout. These findings confirm the chronic nature of stress in PC professionals. This deeper understanding of the nature of stressors faced by PC professionals will aid in developing targeted interventions to enhance stress resilience²¹.

Another important finding of our study is the mental health trajectories that our participants followed in relation to the chronic end-of-life care management stressor they subjectively experienced. Our analyses revealed that our participants followed two main mental health trajectories in the face of this chronic stress: a resilience trajectory and a chronic distress trajectory. These findings are consistent with the existing resilience literature¹¹. Emergent resilience has been observed in contexts such as chronic poverty, parental bereavement, civil war, and natural disasters. Our resilience rates range from 63 to 69% and our chronic distress trajectory concerns 31–37% of our participants, based on the mental health measures used. There is very little statistical research on trajectories of resilience during chronic stress due to the difficulty of conducting such studies. However, our findings align with the existing literature on resilience in the context of acute stress. In their review of studies on resilience, Galatzer-Levy et al. (2018)¹⁷ found that among the four trajectories identified following acute stress, the resilient trajectory had the highest mean prevalence rate, observed on average in the majority of participants (65.7%), followed by the recovery (20.8%), chronic (10.6%), and delayed-onset (8.9%) trajectories. In the context of chronic stress, the findings are somewhat different. Hobfoll et al. (2011)⁶⁸ found increased trajectories of distress rather than patterns of resilience in a population exposed to chronic political violence and mass casualties. In contrast, military personnel exposed to war were more likely to be resilient (75%) than other populations¹⁷. One explanation proposed by the authors for these latter findings is that military personnel have higher rates of resilience due to the training they receive to prepare for potential trauma, as well as the support they receive following PTE. High rates of resilience have also been observed in police and firefighters who receive similar preparation and care²⁰. PC professionals are also a population accustomed to and prepared for daily confrontation with suffering and death. Familiarity with stress among caregivers can therefore be considered both a health risk factor and a protective factor. It is a risk factor because our study shows that the accumulation of stress in end-of-life care is the main stressor for the mental health of our participants, and it is a protective factor because the experience could help professionals preserve themselves compared to non-professionals facing the same care stressor. It would be interesting to study in more detail how chronic stress has both protective and detrimental effects on careers.

Some hypotheses can be put forward to explain the adoption of one trajectory rather than the other. First, for professionals who manage to adopt a trajectory of resilience, compassion satisfaction could be a central element³². The positive emotions experienced when a caregiver successfully helps a patient generate feelings of gratification and accomplishment. These emotions serve as an important source of motivation, particularly when improvements are observed in patients and their families and may explain resilience trajectories. Empathy, defined as the ability to understand and to feel the emotions of others, is a key prerequisite for compassionate behaviours. Our research nevertheless shows that excessive empathy in a context of chronic stress related to end-of-life care is a factor leading to a trajectory of distress. While empathy is essential for building trust with patients and facilitating their care, it can also become a vulnerability⁵⁸. For example, meta-analyses on empathy for pain studies have revealed that the pain-related areas in the brain were consistently activated, both during the experience of pain as well as when vicariously feeling with the suffering of others⁶⁹. Thus, the sharing of

suffering can at times be difficult, especially when the self–other distinction becomes blurred. One hypothesis derived from our study is that a context of chronic stress related to EOL care could lead to a loss of the necessary distance between oneself and others, triggering a reduction in compassion in favor of emotional contagion. This imbalance might result in a spiral of stress, emotional exhaustion, and deteriorating mental health. A limitation of our study is that we did not measure this aspect directly. This point seems interesting to assess and address among palliative care professionals in future studies.

In our study, caregivers who follow a resilience trajectory exhibit psychological flexibility. Psychological flexibility is indeed recognized as a key component of stress resilience and forms the basis of Acceptance and Commitment Therapy (ACT)^{70,71}. The ACT model targets six core processes—acceptance, cognitive defusion, being in the present moment, self as context, values, and engaged action—to develop psychological flexibility. All these processes refer to individuals changing their relationships with private events (i.e., thoughts, feelings, and bodily sensations), not the events themselves. They indeed seem particularly relevant for maintaining psychological resilience in a chronically stressful context such as palliative care. The acceptance approach is essential for palliative care professionals to adopt when confronting their own fears, sadness, feelings of helplessness or failure, or simply when facing the limits of life. Defusion allows for creating distance between oneself and others, or between oneself and one's thoughts, which protects the caregiver from the suffering of others while maintaining the desire to alleviate it. Contact with the present moment is fundamental to create an authentic relationship with oneself, as well as with one's patient and their loved ones, and to contribute to healthy and calming communication. The “self as context” element of psychological flexibility is metacognitive in nature and remains useful in any environment to maintain the necessary perspective on one's own experiences. The “values” factor of psychological flexibility is strongly linked to the search for the meaning of life, with values here being considered as the compass for individuals that guide the direction of their lives. In palliative care, in order to experience their work positively, professionals must also clearly engage in alleviating physical pain and relieving the suffering of their patients and their families. The committed action also relates to the professionals' own needs, such as a necessary shift in attitude toward death. The ACT model, validated and recommended by the American Psychological Association (APA), has been the subject of numerous studies demonstrating the positive relationship between psychological flexibility and maintenance and development of resilience in the context of stress^{72–74}. Studies have already been conducted to examine the effects of ACT therapy on the well-being of palliative care professionals^{75,76}. A meta-analysis⁷⁷ on the effectiveness of ACT in healthcare professionals found that ACT interventions are effective in improving general distress and work-related distress in healthcare professionals. However, a recent scoping review⁷⁵ on palliative care highlights a lack of reliable studies on the effectiveness of ACT for PC professionals. Our research helps address this gap by providing new insights into ACT's potential benefits in this field.

Among psychological flexibility, mindfulness and self-compassion also enhanced the resilience of palliative care professionals. The notion of competency in dealing with death^{78–80} and the feeling of helplessness felt by PC professionals^{80–82} shed light on these results. One key skill in coping with death is recognizing the personal emotional impact of end-of-life care⁸³. This self-awareness is also central to mindfulness practice, which encourages acknowledging and understanding one's emotions while intentionally and non-judgmentally focusing on the present moment⁸⁴. By practicing mindfulness, palliative care professionals may enhance their sense of competence in supporting patients at the end of life. This perceived competence, in turn, strengthens their resilience and promotes better mental health outcomes. Self-compassion is also a valuable resource for coping with feelings of helplessness, allowing professionals to maintain warmth and care even in the presence of suffering⁸⁵. Rather than feeling guilt over their perceived powerlessness, those who cultivate self-compassion develop a sense of self-kindness—an essential tool for managing distress. Effective programmes already exist to foster these resources, such as Mindfulness-Based Cognitive Therapy (MBCT)⁸⁶, Mindfulness-Based Stress Reduction (MBSR)⁸⁷, and Compassion-Focused Therapy (CFT)⁸⁸, and could be integrated into palliative care teams.

In our study, when controlling for all resources, psychological flexibility was the only resource linked to a resilience trajectory in relation to burnout, compassion fatigue, and well-being. On the anxiety and depression components of mental health, self-compassion and mindfulness played a greater role, while psychological flexibility had no significant impact. This distinction is novel, as existing literature does not clearly differentiate how these resources influence specific aspects of mental health. One possible explanation for these differences lies in the interconnection between these resources⁸⁹. For example, Mindfulness, a core process in Acceptance and Commitment Therapy (ACT), is itself a component of psychological flexibility. A deeper understanding of how psychological flexibility, mindfulness, and self-compassion interact will help PC professionals better navigate their demanding work environment.

Some limitations of our method should be noted. A major constraint is our two-time-point design, which restricts our ability to capture the trajectory and timing of resilience processes. Previous research indicates that psychological adaptation rarely follows a linear path¹¹. Resilience processes often involve changes in individual characteristics and stem from complex and dynamic adaptation⁹⁰. Future studies should incorporate: (1) high-frequency measurements (e.g., ecological momentary assessments) to capture micro-level fluctuations, (2) extended follow-ups to distinguish transient vs. enduring changes, and (3) person-centered analyses (e.g., growth mixture modeling) to identify subgroups with divergent trajectories. Such approaches could help determine whether early interventions genuinely shape long-term resilience pathways or simply postpone distress. A more general limitation is that our sample consisted mainly of female participants, but this reflects the reality of the profession in France. It would be important to see if the results could be replicated with male participants and in other cultures.

In conclusion, this study underscores the importance of addressing the confrontation with suffering and death as a central aspect of the mental health of palliative care professionals. Our findings indicate that

repeated exposure to suffering and death serve as a significant chronic stressor for these professionals. Over time, they tend to follow two distinct mental health trajectories: a resilience trajectory and a distress trajectory. Additionally, our study highlights psychological flexibility, mindfulness and self-compassion as key processes that foster resilience, regardless of the work environment or individual context. Palliative care professionals would benefit from implementing existing programs designed to cultivate these resources in their departments. By promoting these essential skills, we can create a more resilient palliative care workforce, ultimately ensuring improved quality of life for PC professionals and better care for patients.

Data availability

Data generated and/or analyzed during the current study are stored in a database that meets the quality criteria of CIC 1431. Only the investigator who led the conduct of the study can store the link between the anonymization code and the full identity of the participants. The rest of the data is available from the corresponding author upon reasonable request.

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Author contributions

Isabelle Cuchet, Michael Dambrun and Axelle Maneval developed the study concept. Isabelle Cuchet and Michael Dambrun contributed to the study design. Isabelle Cuchet and Michael Dambrun worked on the data analysis and on the main manuscript text. All three authors reviewed the manuscript and approved the final version of the manuscript submission.

Declarations

Competing interests

The authors declare no competing interests.

Accordance and approval statements

This study was approved by the IRB-UCA Research Ethics Committee (IRB00011540-2022-30) in accordance with French data protection policies and in line with the Declaration of Helsinki. Participants provided written informed consent before completing the questionnaire.

Additional information

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