Patterns and influencing factors of savoring in caregivers of advanced cancer patients: a latent profile study

Gui-Ying Yao[1,2], Minghui Deng[1], Xueying Fang[1], Mei Zhang[1,3], Hua Guo[4] and Bing Zhang[5*]

Abstract

Objective Caregivers' positive affect benefits patients' and their well-being. Savoring is one important emotion regulation strategy to manage positive affect. Limited information about patterns of savoring hinders the development of targeted interventions to promote cancer caregivers' emotional well-being. The purpose of this study was to identify latent patterns of savoring and investigate influencing factors associated with the identified patterns among caregivers of people with advanced cancer.

Methods Latent profile analysis was performed to identify savoring patterns based on savoring beliefs and strategies in 404 informal caregivers of patients with advanced cancer. Multinomial logistic regression analysis examined associated factors regarding different savoring profiles.

Results Three latent profiles of savoring were identified. Individuals in high level of savoring (HS, 33.4%) showed the highest level of savoring and positive affect. Compared with HS, caregivers in low level of savoring (LS, 9.4%) and medium level of savoring (MS, 57.2%) showed lower savoring and lower positive affect. Active coping(β_{MS} = -0.109, β_{LS} = -0.252, $p<0.001$)was the strongest protecting factor for both MS and LS, while passive coping ($\beta=0.146$, $p=0.008$) was a risk factor for LS. Non-assistance from others ($\beta=0.677$, $p=0.015$) and unemployment ($\beta=1.287$, $p=0.007$)were the strongest risk factors for the MS and LS subgroup, respectively.

Conclusions Caregivers' savoring patterns appear to vary at different levels. Oncological professionals should pay attention to caregivers with passive coping, unemployment, and lack of assistance for designing targeted savoring training to promote emotional well-being.

Keywords Savoring profiles, Caregiver, Coping strategy, Advanced cancer, Influencing factors

*Correspondence:
Bing Zhang
yanghezhangbing@163.com
[1]School of Nursing, Xinxiang Medical University, Xinxiang 453003, Henan, China
[2]Xinxiang Key Laboratory for Chronic Disease Basic Research and Intelligent Care, Xinxiang 453003, Henan, China
[3]ZhengZhou Central Hospital, Middle Section of Tongbai Road, Zhengzhou City 450000, China
[4]Department of Oncology, Xinxiang Central Hospital, Xinxiang City Hospice Nursing Clinical Practice Skills Key Laboratory, Xinxiang 453000, Henan, China
[5]Department of Gynecology, Wuxi Maternity and Child Health Care Hospital, Affiliated Women's Hospital of Jiangnan University, Wuxi 214002, China

Introduction

Caring for patients with advanced cancer requires substantial energy and time to provide physical, emotional, and spiritual support, as well as to coordinate medical care and help with daily living. These demands lead to negative caregiving consequences such as burden and distress [1]. Caregivers also experience positive aspects such as benefit finding, meaning of life, as well as positive affect which is one important component of psychological well-being [2]. Drawing from broaden and build theory, positive affect may offset negative emotions [3]. In the caregiving process, positive affect could alleviate caregiving stress, promote their well-being, and facilitate continuous caregiving for recipients [4]. Compared with sufficient studies on reducing negative affect of caregivers, limited studies centered on managing caregivers' positive affect [5]. Thus, it is important to explore how to maintain or upregulate positive affect in caregivers of people with advanced cancer who had negative affect simultaneously. Savoring is one important emotion regulation strategy to manage positive affect [6].

Savoring is one primary way to enhance positive affect

Savoring refers to the capacity to regulate positive emotion through increasing or dampening positive feelings to enhance overall enjoyment [6]. Savoring capacity could be measured using the savoring belief inventory (SBI) which assesses individuals' perceived control of managing positive experiences through present enjoyment, anticipation, and reminiscence [6, 7]. Bryant and Veroff summarized ten types of savoring strategies measured using the Ways of Savoring Checklist (C-WOSC) including sharing with others, physical manifestation of positive emotions, counting blessings, self-congratulations, and memory building [6]. Empirical work has revealed that savoring is learnable by training and could enhance positive affect among diverse populations such as individuals with various clinical patients [8, 9], emerging and older adults [10–12], and young adults concurrently using alcohol and cannabis [13]. Until now, only a few studies have explored savoring in an oncology-related context.

Savoring among cancer or cancer caregivers

Research on the associations between savoring and its impact on both physical and psychological well-being have been conducted from various perspectives, including those of cancer patients, their caregivers, and the interdependent relationships between them [14–16]. For example, Hou WK et al. [15] found that lower savoring capacity exaggerated the associations between cancer-specific physical symptoms and depressive symptoms. Garland EL et al. [17] reported that cancer survivors with high levels of savoring had a better quality of life and suffered less emotional distress. Savoring as one component integrated into a mindfulness-oriented recovery enhancement (MORE) intervention could enhance cancer survivors' pleasant experiences derived from natural nonfood rewards [18]. Furthermore, cancer caregivers' savoring not only enhanced patients' life satisfaction but also increased caregivers' positive affect and subjective judgment of life [16]. Additionally, cancer caregivers reported a higher level of ability to enjoy small things in daily life which was consistent with the construct of savoring [19]. Despite the above-mentioned efforts in oncology-related savoring, there is a gap regarding which subgroup of caregivers is more likely to fully amply savoring and which subgroup is deficient in savoring ability and strategies. Addressing these questions will help oncological staff to prioritize emotional well-being interventions for those unable to benefit from savoring.

The patterns and hypotheses of savoring profiles

Prior studies on savoring were primarily explored using the total score of SBI or WOSC [20, 21], in which individuals with scores higher or lower than one standard deviation were considered to belong to the high or low savoring subgroup. However, this variable-centered approach failed to differentiate different subgroups with common characteristics and capture the diverse nature of savoring. To overcome this limitation, a person-centered approach such as cluster analysis, latent profile analysis (LPA), or latent class analysis can be used to divide individuals with heterogenous characteristics into some homogenous subgroup and impel others into distinct subgroups. LPA has been extensively used in cancer caregivers to explore patterns of quality of life and benefit findings profiles [22, 23]. For example, three patterns of health-promoting behaviors of informal caregivers of people with cancer treatment may help tailor interventions to bolster physical health [24]. However, the application of LPA to savoring capacity and strategies in cancer caregivers remains unknown. Compared with the variable-centered approach, we assume at least two savoring subgroups labeled as high and low savoring. Empirical studies revealed that individuals increased attention to positive information when being reminded of mortality [25]. Caregivers of people with advanced cancer who were aware of the upcoming death of their recipients perceived limited life might exhibit good savoring capacity. However, mortality perception can also lead to a high level of subjective caregiving burden which potentially damaged the ability to savor positive experience. As a result, it remains unclear which savoring subgroup the majority of caregivers belong to.

Associated factors of savoring

Few studies have focused on the influencing factors of savoring. Age, gender, and personality traits were

associated with savoring beliefs [7]. Specifically, females had a higher capacity to savor positive experiences than males. Positive association were found between savoring belief and happiness in both young and older age groups. Furthermore, the SBI total score was strongly positively related to extraversion and optimism, and scores on the savoring through anticipation were negatively correlated with neuroticism. Impatience and perfectionism are linked to decreased savoring strategies [26]. Dispositional mindfulness enhances savoring beliefs by cultivating open and accepting awareness of thoughts and feelings [27]. Self-compassion predicted greater savoring after a positive event [28]. Experimental findings showed that individuals in the face of life uncertainty were prone to enhance savoring, while negative affect and catastrophic events attenuated savoring [29]. Thus, we hypothesized that caregiving burden which is considered as a major stress might be a risk factor of savoring. As known, caregiving burden can be divided into subjective burden such as distress, emotional tension, stress, and objective burdens related to time and intensity of caregiving tasks [30]. The more tasks caregivers have, the greater burden they perceive [31]. Little leisure time may damage the opportunity to savor the positive moments [32]. Thus, we hypothesized that the burden of caregiving, which is not only considered a major stress but also limits caregivers' ability to take time to focus on positive moments, might be a risk factor for savoring. Specifically, the more burden felt, the more likely caregivers belong to a low level of savoring profile.

Coping strategies are commonly used as important resources to handle burdens, and reduce negative emotions in facing various stresses. In light of the actor-partner interdependent model, Samios C, et al. [21] demonstrated the partner effect of the impact of tough life events on savoring, suggesting that the more stress one partner felt, the more savoring capacity the other couple member perceived. This finding could be explained similarly as an adaptive complementary coping. Similarly, one couple suffered a stressful event and engaged in mean-making process, the other couple members could use savoring as a "break" to cope with a stressful event. Although Braynt FB demonstrated that savoring is largely independent of beliefs of coping [32], Tao TJ et al. [33] reported that positive coping processes (self-efficacy and positive reappraisal) could impact psychiatric symptoms through the mediating roles of savoring among Chinese individuals during the COVID-19 pandemic. Given the important roles of coping in both patients with advanced cancer and caregivers [34], it was speculated that coping might be an important influencing factor in savoring. Specifically, caregivers who adopted more active coping are more likely to belong to a high level of savoring.

Accordingly, the purpose of this study was twofold: (1) to identify latent patterns of savoring using LPA in terms of savoring capacity and savoring strategies which were measured using SBI and WOSC, respectively (2). To investigate influencing factors underpinning the identified latent patterns. Understanding the patterns of savoring can guide oncological professionals to identify and stratify savoring subgroups with savoring deficiency for tailoring targeted strategies to bolster positive emotions. Exploring how savoring patterns are harnessed and facilitated helps to foster savoring which benefits for meeting the increasing demands of emotional well-being for cancer caregivers.

Methods

Study design and participants
A cross-sectional study was used to identify savoring patterns of caregivers of people with advanced cancer. In this study, convenient sampling was utilized to recruit 404 informal caregivers from a tertiary hospital in Xinxiang, Henan province, China, between August 2022 and February 2023. Before data collection, 45 participants were excluded from the study due to the presence of psychiatric conditions or serious life events that could confound the results. The remaining caregivers provided their information through structured interviews conducted before the investigation commenced. Exclusion criteria were: history of psychiatric, serious life event such as divorce or great brief due to an intimate relative who happened to pass away during the last two months. Inclusion criteria included being informal caregivers who were not paid for the caring support. Patients aged more than 18 years were diagnosed with advanced solid tumors rather than hematologic malignancies. Advanced cancer is defined as metastatic and/or recurrent/progressive stage III or IV cancer [35].

Ethical considerations
This study was proved by the Institutional Review Boards and Ethics Committee of Xinxiang Medical University (XYLL-20220210). All participants signed the written informed consent after understanding the purpose of the study.

Measures

Participant characteristics
Caregivers' social demographics include age (years), gender (male/ female), marital status (married/else), education (primary school and below, high school, college and above), perceived-economic status (low, medium, and high), employment status (Unemployed, part-time employed), assistance from others (only one question used "Whether have you received assistance from others?"), relationships with patients, and cancer types.

Savoring belief

The original Savoring Beliefs Inventory was developed by Bryant FB [7]. The Chinese version of the Savoring Beliefs Inventory (SBI) was to assess individuals' perceived capability of savoring positive emotions among cancer patients and caregivers [16]. The 8-item scale included three subscales corresponding to anticipation, savoring the moment, and reminiscing. Each subscale of savoring was rated on a 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree) [16]. In the present study, the Cronbach's α was 0.825.

Savoring strategies

The original Ways of Savoring Checklist (WOSC) was developed by Bryant, F. B. in 2007 [32]. The Chinese version of the Ways of Savoring Checklist (C-WOSC) consists of six positive and negative savoring strategies [36]. Each item is scored on a 7-point Likert-type scale ranging from 1 (totally disagree) to 7 (totally agree). Sample items are the following: "I looked for other people to share it with." "I told myself how proud I was." and "I reminded myself how lucky I was to have this good thing happen to me...". In the present study, the overall Cronbach's α of C-WOSC was 0.947, Cronbach α for memory building, behavioral expression, temporal awareness, Kill-joy thinking, sharing with others, and self-congratulation was 0.758, 0.837, 0.732, 0.753, 0.798, 0.897, respectively.

Coping strategies

The original Ways of Coping Questionnaire (WCQ) was developed by Folkman and Lazarus in 1988 [37]. Based on WCQ, a Simplified Coping Style Questionnaire (SCSQ) was developed by YN in 1999 to fit Chinese culture [38]. SCSQ is a 20-item scale widely used to assess the individuals' coping style [39]. 12-item active coping reflects the level of the positive coping style, such as "when facing problems, finding several different solutions" or "looking at the good side of things". In contrast, 8-item passive coping reflects the level of negative coping style, such as "when facing problems, escaping troubles by drinking and smoking" or "imagining a miracle will come, and the problem will be addressed". Each item is rated on a four-point Likert scale (0 = never, 1 = seldom, 2 = often, 3 = always). Higher subscale scores indicate a higher level of coping style. Cronbach's α for positive coping and negative coping were 0.89 and 0.78, respectively.

Positive and negative affect

The Chinese version of the positive effect and negative effect schedule (PANAS) was a 20-item self-report questionnaire to examine positive affect (PA) and negative affect (NA) [40]. Each item is rated on a 5-point Likert scale. In the present study, the Cronbach's α of PA and NA were 0.900, and 0.897, respectively.

Zarit caregiver burden interview, ZBI

The original version of Zarit caregiver burden interview (ZBI) was developed by Zarit in 1980 [41]. The Chinese version of the Zarit caregiver burden interview was used to measure caregiver burden widely [42, 43]. ZBI is a five-point Likert scale with two domains including responsible burden and personal burden. The total scores are calculated by adding all 22- items with a range of 0–88. 0～20 indicates a low level of burden, 20～40 indicates mild to moderate burden and ≥41 indicates moderate to severe burden. The Cronbach's α in this study was 0.938.

Statistical methods

All descriptive analysis and multinomial logistic regression analysis were conducted using SPSS 24.0. Descriptive analysis was performed for each variable using mean, SD, and percentage. LPA was conducted to identify savoring profiles by using Mplus 7.0 through the maximum likelihood (ML) estimator. Akaike Information Criterion (AIC), Bayesian Information Criterion (BIC), and sample size-adjusted (aBIC) were commonly used to indicate better model fits. Significant LMR and BLRT indicate a k-profile model is superior to the k-1 one. Entropy was used to measure the classification accuracy. Chi-square test or one-way ANOVA and follow-up post hoc test were used to compare demographic characteristics among different savoring profiles. Multinomial logistic regression analysis was used to examine the associated factors of the latent profile of savoring.

Results

Overall demographics and descriptive characteristics in cancer caregivers with advanced cancer

As shown in Table 1, the average age of caregivers ($N = 404$) ranged from 18 to 77 years. The majority of participants were female (54.5%), married (90.6%), and family members (93.6%). Nearly half of caregivers (48.5%) reported a low level of perceived family economic status. 38.6% of caregivers merely graduated from primary school. Perceived caregiving burden was 29.38 ± 17.06, which belongs to a mild to moderate level. The total score of caregivers' savoring belief was 24.19 ± 3.77, savoring strategies was 103.12 ± 23.16.

Latent profiles of savoring in cancer caregivers with advanced cancer

To explore the profiles of savoring in cancer caregivers with advanced cancer, a latent profile analysis was conducted based on the total scores of savoring beliefs, and the 6 domains of savoring strategies. As shown in Table 2, based on the AIC, BIC, aBIC, the 4 and 5-class models were relatively smaller than those of the other 3 models. However, the number of individuals in the 5-class solution was less than 30 and the LMR was not statistically

Table 1 Demographic and descriptive characteristics (*N*=404)

		N	%
Gender	Male	184	45.5
	Female	220	54.5
Marital status	Marriage	366	90.6
	Else	38	9.4
Education	Primary school and below	156	38.6
	High school	119	29.5
	College and above	129	31.9
Perceived family economic status	Low	196	48.5
	Medium	137	33.9
	High	71	17.6
Employment status	Unemployed	193	47.8
	Part-time employment	211	52.2
Assistance from others	Yes	274	67.8
	No	130	32.2
Relationships with patients			
	Spouse	159	39.4
	Children	207	51.2
	Parents	12	3.0
	Others	26	6.4
Cancer types			
	Lung cancer	96	23.8
	Breast cancer	63	15.6
	Gastric cancer	34	8.4
	Esophagus cancer	32	7.9
	Lymphoma cancer	26	6.4
	Colorectal cancer	35	8.7
	Others	118	29.2

significant. Entropy of the 3-class model was the greatest among the 5-class models, showing the 3-class model could differentiate well from the other models. Figure 1 depicts the pattern of standardized means of savoring across the 3-latent profile. According to the characteristics of the 3 latent profiles. Class 1(38, 9.4%), labeled "Low level of savoring, LS", showed the lowest level of savoring belief and savoring responses. Class 2(135, 33.4%), labeled "high level of savoring, HS", showed the overall highest level of savoring. Class 3(231, 57.2%), labeled "Medium level of savoring, MS", showed a medium level of savoring belief and savoring strategies. Results in Table 3 also suggest good discriminability of the three latent classification. As shown in Table 4, the HS subgroup had the highest level of active coping (23.58±5.98) and

positive affect, while LS subgroup had the highest level of negative affect (25.89±6.77). Interestingly, the MS subgroup had the lowest level of passive coping (9.23±4.52). Regarding perceived caring burden, there were no statistical differences among the three savoring profiles.

To explore the profiles of savoring in cancer caregivers with advanced cancer, a latent profile analysis was conducted based on the total scores of savoring beliefs, and the 6 domains of savoring strategies. As shown in Table 2, based on the AIC, BIC, aBIC, the 4 and 5-class models were relatively smaller than those of the other 3 models. However, the number of individuals in the 5-class solution was less than 30 and the LMR was not statistically significant. Entropy of the 3-class model was the greatest among the 5-class models, showing the 3-class model could differentiate well from the other models. Figure 1 depicts the pattern of standardized means of savoring across the 3-latent profile. According to the characteristics of the 3 latent profiles. Class 1(38, 9.4%), labeled "Low level of savoring, LS", showed the lowest level of savoring belief and savoring responses. Class 2(135, 33.4%), labeled "high level of savoring, HS", showed the overall highest level of savoring. Class 3(231, 57.2%), labeled "Medium level of savoring, MS", showed a medium level of savoring belief and savoring strategies. Results in Table 3 also suggest good discriminability of the three latent classification. As shown in Table 4, the HS subgroup had the highest level of active coping (23.58±5.98) and positive affect (30.84±8.72), while LS subgroup had the highest level of negative affect (25.89±6.77). Interestingly, the MS subgroup had the lowest level of passive coping (9.23±4.52). Regarding perceived caring burden, there were no statistical differences among the three savoring profiles.

Influencing factors of savoring profiles in cancer caregivers with advanced cancer

Table 5 shows no significant difference among the three savoring profiles concerning gender, marriage, and perceived economic status (*P*>0.05) using χ^2 analysis or Fisher's precision probability test. LS subgroup included more caregivers (55.3%) who had merely received education from primary school. Regarding employment status, 76.3% of caregivers belonging to the LS subgroup reported having no work (76.3%). Caregivers belonging

Table 2 Fit indices for seven different latent savoring profiles (*n*=404)

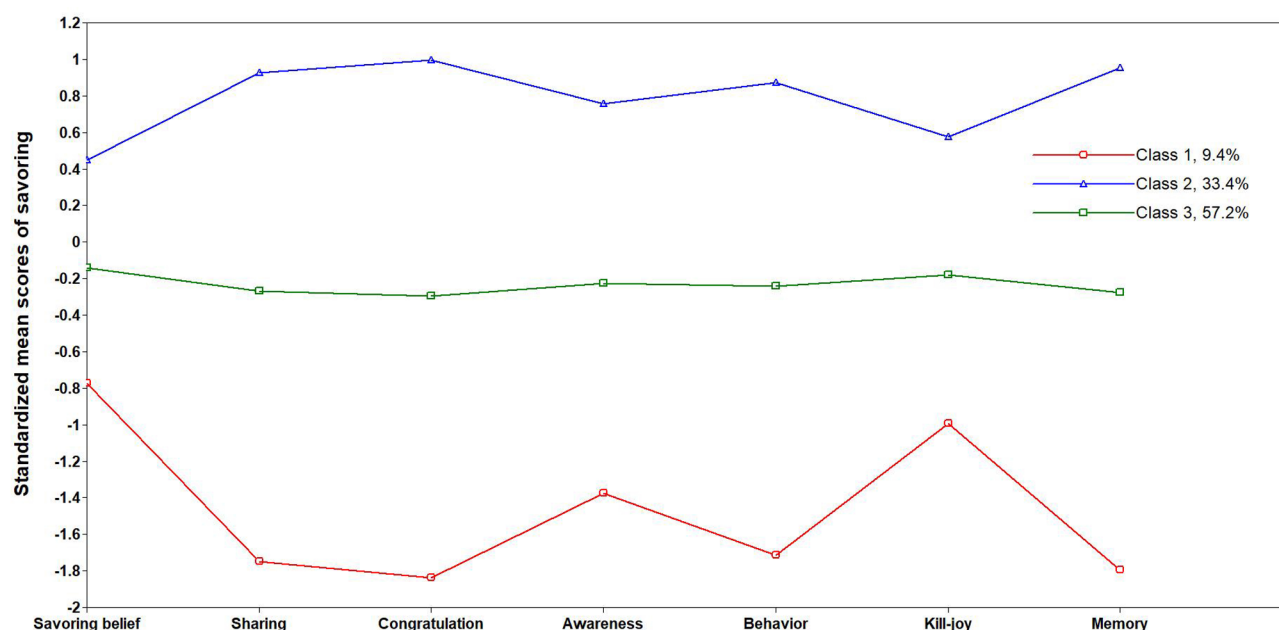|	AIC	BIC	aBIC	Entropy	LMR	BLRT(*p*)
1	8046.508	8102.527	8058.104	-	-	-
2	7239.868	7327.899	7258.091	0.829	0.0045	<0.001
3	6759.407	6879.450	6784.256	0.911	0.0047	<0.001
4	6550.219	6702.273	6581.695	0.891	0.3040	<0.001
5	6449.413	6633.478	6487.515	0.905	0.019	<0.001

Fig. 1 The plot of the standardized mean scores of savoring belief and savoring strategies across the three identified latent savoring profiles among caregivers of people with advanced cancer. Abbreviations: Sharing, sharing with others, Congratulation, self-congratulation, Awareness, temporal awareness, Behavior, behavioral expression, Kill-joy, kill-joy thinking, Memory, Memory-building

Table 3 Average latent class probabilities for the most likely latent class membership (row) by latent class (column) (*n* = 404)

Latent	1 Low savoring (LS, *n* = 267)	2 High savoring (HS, *n* = 373)	3 Medium savoring (MS, *n* = 813)
1	0.939	0.000	0.061
2	0.000	0.962	0.038
3	0.005	0.028	0.967

to the HS subgroup were more likely to get assistance (80%) than others.

Multinomial logistic regression analysis

As shown in Table 6, all variables with *P*<0.05 and confounding variables such as age and gender in bivariate analyses were included in multinomial logistic regression analysis. Using the high savoring subgroup as a reference,

results showed active coping (*β* = -0.109, *p*<0.001) and high school education (*β* = -1.683, *p* = 0.007) were the strongest protecting factors for MS, and LS, respectively. Non-assistance (*β* = 0.677, *p* = 0.015), and unemployment (*β* = 1.287, *p* = 0.007) were the strongest risk factors for the MS and LS subgroups, respectively. Of note, passive coping (*β* = 0.146, *p* = 0.008) was merely a significant risk factor for individuals belonging to LS when compared to HS.

Discussion

The present study extends previous findings by identifying three latent profiles of savoring and exploring the related influencing factors among caregivers of advanced cancer patients. Specifically, cancer caregivers with a high level of savoring (HS, 33.4%) showed the highest level of

Table 4 Mean, standard deviation of savoring profiles among caregivers

	Class1 LS (*n* = 38)	Class 2 HS (*n* = 135)	Class 3 MS (*n* = 231)	F	*p*	Post hoc
Age(years)	58.68 ± 12.62	64.45 ± 12.12	62.92 ± 10.10	4.061	0.018	C1< C3< C2
SBI total	21.18 ± 4.34	25.94 ± 3.91	23.67 ± 3.06	33.482	<0.001	C1< C3< C2
Ways of Savoring	66.05 ± 17.10	145.14 ± 12.07	109.21 ± 11.21	717.001	<0.001	C1< C3< C2
Passive coping	11.07 ± 5.17	10.96 ± 4.79	9.23 ± 4.52	6.989	0.001	C3< C1, C3< C2
Active coping	16.87 ± 8.44	23.58 ± 5.98	19.41 ± 5.52	28.468	<0.001	C1< C2, C3< C2
Perceived burden	33.08 ± 19.05	28.35 ± 16.93	29.39 ± 16.71	1.140	0.321	
Negative affect	25.89 ± 6.77	22.38 ± 8.27	22.78 ± 7.60	3.159	0.044	C2< C1, C3< C1
Positive affect	25.63 ± 6.39	30.84 ± 8.72	27.47 ± 7.01	11.258	<0.001	C1< C2, C3< C2

Abbreviations: LS, Low level of savoring subgroup, MS, medium level of savoring subgroup, HS, high level of savoring subgroup. Results of the post hoc tests are all statistically significant (*P*<0.05)

Table 5 Demographic characteristics among caregivers from different savoring profiles

		LS (*n* %)	HS (*n* %)	MS(*n* %)	χ^2	*p*
Gender	Male	16(42.1)	62(45.9)	103(45.9)	0.200	0.905
	Female	22(57.9)	73(54.1)	125(54.1)		
Marital status	Marriage	32(84.2)	122(90.4)	212(91.8)	2.331[a]	0.302
	Other	6(15.8)	13(9.6)	19(8.2)		
Education	Primary school and below	21(55.3)	34(25.2)	101(43.7)	18.372	0.001
	High school	6(15.8)	51(37.8)	62(52.1)		
	College and above	11(28.9)	50(37)	68(29.4)		
Perceived- economic status	Not enough	19(50)	54(40.0)	123(53.2)	6.152	0.189
	Partly enough	13(34.2)	54(40.0)	70(30.3)		
	Enough	6(15.8)	27(20.0)	38(16.5)		
Employment status	Unemployed	29(76.3)	58(43.0)	106(45.9)	13.989	0.001
	Part-time employed	9(23.7)	77(57.0)	125(54.1)		
Assistance from others	Yes	16(42.1)	108(80.0)	150(64.9)	21.572	<0.001
	Non assistance	22(57.9)	27(20.0)	81(35.1)		

[a] represents Fisher's precision probability test

Table 6 Multiple logistic regression for latent savoring patterns

Models	Variables	B	SE	Wald	*p*	OR	95% CI	
Class 3	MS							
	Intercept	3.777	0.913	17.119	<0.001			
	age	-0.013	0.011	1.513	0.219	0.987	0.966	1.008
	AC	-0.109	0.024	20.402	<0.001	0.897	0.856	0.940
	PC	-0.032	0.030	1.104	0.293	0.969	0.914	1.028
	Primary	0.449	0.304	2.182	0.140	1.567	0.863	2.846
	High school	-0.409	0.295	1.925	0.165	0.664	0.372	1.184
	Unemployed	0.136	0.248	0.298	0.585	1.145	0.704	1.864
	Non assistance	0.677	0.278	5.920	0.015	1.968	1.141	3.395
Class 1	LS							
	Intercept	-5.125	1.480	11.985	0.001			
	age	-0.037	0.019	3.840	0.050	0.965	0.929	1.000
	AC	-0.252	0.043	34.103	<0.001	0.777	0.714	0.846
	PC	0.146	0.055	6.954	0.008	1.158	1.038	1.291
	Primary	-0.304	0.525	0.335	0.563	0.738	0.264	2.064
	High school	-1.683	0.624	7.283	0.007	0.186	0.055	0.631
	Unemployed	1.287	0.475	7.335	0.007	3.623	1.427	9.197
	Non assistance	1.284	0.446	8.297	0.004	3.612	1.507	8.654

Note. The reference class is Class 2, high level of savoring subgroup (HS). Abbreviations: LS, Low level of savoring subgroup, MS, medium level of savoring subgroup, HS, high level of savoring subgroup. PC, passive coping, AC, active coping

savoring and positive affect. Compared with HS, caregivers with low levels of savoring (LS, 9.4%) and medium levels of savoring (MS, 57.2%) showed lower savoring and lower positive affect. Active coping was the strongest protecting factor for both MS and LS, while passive coping was a risk factor for LS. Non-assistance from others and unemployment were the strongest risk factors for the MS and LS subgroups, respectively. Clinical oncological professionals should identify potential caregivers who can benefit from savoring and provide them with personalized savoring interventions to bolster emotional well-being.

Three savoring profiles among caregivers of people with advanced cancer

Consistent with previous cancer caregivers-related studies using LPA [22, 24], this study also confirms that LPA is an effective approach in identifying homogeneous savoring subgroups. Three savoring patterns from a person-centered approach suggest both savoring beliefs and savoring strategies tended to go together, extending Bryant's [32]previous findings that profiles of savoring among college students using scores of ten types of savoring strategies.

Although different from our hypothesis, the HS subgroup, accounting for 33.4% of carers was not the largest subgroup that had the highest level of savoring

characterized by the highest level of savoring strategies (i.e., self-congratulation, sharing with others, and memory building) among the three profiles. Consistent with prior studies that sharing the good news with intimate cancer partners which is one of the most used savoring strategies enhanced well-being regardless of sharing bad news [44], caregivers with a high score of sharing with others belong to the HS subgroup. According to the Broaden and Build theory, individuals with high savoring had more positive effects at least due to the following three reasons [3]. First, savoring the positive experience bears the potential to mitigate negative effects and counteract other negative emotional consequences of adverse events [45]. Second, positive effects such as joy and contentment induced by savoring could broaden individuals' thought-action repertoires. Caregivers with high savoring could broaden narrowed attention-related to cancer and related stress, leading to the regulation of negative emotions. Third, savoring-induced positive emotion fuels psychological resiliency which enhances individuals' ability to bounce back from adversity. Furthermore, savoring such as sharing with others might increase social support and help-seeking behaviors, rendering a positive psychological function [46].

Caregivers in the LS subgroup (9.4%) with the lowest level of savoring were lack of confidence in savoring and had difficulty in using savoring strategies, hindering the restoration of positive affect [47]. More attention should be placed on caregivers in LS subgroups which had the lowest level of positive affect and the highest level of negative affect. Interestingly, the majority of cancer caregivers (57.2%) in the MS subgroup reported both low levels of negative affect and positive affect which had a non-statistically significant difference from that in the LS subgroup. Although the evidence showed that individuals with low levels of positive affect were prone to implement savoring strategies to upregulate positive affect to a certain level according to the affect baseline theory [47], positive experience derived from the moderated level of savoring in the MS subgroup might be primarily used to offset negative feelings during cancer caregiving, resulting in dampening positive affect [37]. This explanation was supported by evidence that individuals deployed more savoring strategies in facing critical events to exert adaptive function [48]. Whether and when savoring as a resource prioritize buffering adversity and then promoting well-being warrants further studies.

Of note, some findings showed the notion that positive affect induced in cognitive-behavioral treatment could be related to increased savoring beliefs and savoring the moment [49], indicating the relationships between savoring and positive affect could be bidirectional. How and to what extent the promotion role of positive affect

on savoring and vice versa should be explored in future studies.

The association between caregiving burden and savoring profiles

It is noteworthy that the effect of caregivers' burden on three different savoring profiles was nonsignificant, indicating caregiving burden does not hinder the savoring of caregivers of patients with advanced cancer, providing possibilities to make the most of savoring to boost emotional well-being despite caregiving burden. Although contrary to our hypothesis and previous findings that the more caregivers engaged in caregiving, the more deeply inverse relationship between caregiving burden and savoring was exaggerated [20], the result was consistent with findings from different populations. Specifically, caring burdens and positive aspects of caregiving coexist yet were unrelated in caregivers of a family member with schizophrenia [39]. Moreover, drawing from two-factor model of caregiving appraisal and psychological well-being, the caregiving burden did not impair positive affect in spouse's caregiving due to partially independent processes and roles concerning positive and negative affect [50]. The result that profiles of caregivers' savoring ability and skills were independent of caregiving burden underscored that savoring could be a possible avenue to enhance emotional well-being regardless of perceived caregiving stress. The findings once again highlight that merely fighting against caregiving burden was not enough for overall emotional well-being for caregivers of people in advanced cancer. Furthermore, the relationship between caregiving burden and belonging to different savoring profiles might be indirect and mediated by irrational beliefs. Under caregiving burden, carers' irrational self-evaluation or demoralization might deepen savoring because irrational beliefs (i.e., such as self-downing) were found associated with lower savoring, rendering depression and loss of joy [51]. Further studies are needed to explore whether caregivers with more negative self-evaluation on caregiving burden might be involved in the low-savoring subgroup.

The association between coping strategies and savoring profiles

Aligned with previous findings that positive coping (i.e. mainly refers to self-efficacy and positive reappraisal) directly influenced savoring, contributing to reduced psychiatric symptoms [33], current results that active coping was the strongest protecting factor for both MS and LS, but passive coping was associated with LS subgroup supported the hypothesis. Stress adaptation includes recovery from negative psychological distress through using resources such as coping, and sustainability which refer to gaining and promoting positive psychological health

[52]. Active coping strategies such as solving problems enabled both patients with advanced cancer and caregivers to buffer stress [53], during which savoring occurs best due to less stress [32]. Our findings extended previous studies associated with coping and savoring, revealing differential roles of active coping (i.e., beyond positive reappraisal, seeking help, striving for changing situations.) and passive coping strategies (i.e. avoidance, venting anger in unhealthy ways such as drinking, smoking.) in distinct savoring subgroups. Oncological professionals should take teaching effective coping strategies such as problem-solving coping strategies, emotion-oriented coping strategies into account when designing savoring interventions. For example, Samami E [54] demonstrated that a supportive program including cancer-related education, progressive muscle relaxation, stress management, emotional coping, problem-solving strategies can be used to effectively target coping strategies to reduce stress among women with breast cancer. In addition, a meta-analysis [55] showed that psychoeducation interventions were effective in improving problem-solving skills and social support both immediately and 3 months post-intervention. For caregivers in the LS subgroup, reducing negative coping was not enough, enhancing positive coping simultaneously through profession consultation, and peer-mediated approaches was needed to foster savoring in caregivers of people with advanced cancer.

The association between employment and savoring profiles

Different from prior studies full-time employment compromised social and psychological well-being due to conflict in balancing career and cancer caregiving [56]. Our finding showed unemployment was a risk factor for caregivers in the LS subgroup. Possible reasons might be related to the fact that unemployment undermined the respite from caregiving [57], increased household debt, and mental stress in cancer caregivers than non-cancer caregivers [58]. Employment could be considered as a psychological detachment to ameliorate caregivers' anxiety and depressive symptoms, and promote savoring positive moments in life during the non-caregiving time for cancer caregivers [20]. Therefore, oncological professionals should encourage caregivers to increase social ties such as part-time employment to enhance savoring.

Different from prior studies full-time employment compromised social and psychological well-being due to conflict in balancing career and cancer caregiving [56]. Our finding showed unemployment was a risk factor for caregivers in the LS subgroup. Possible reasons might be related to the fact that unemployment undermined the respite from caregiving [57], increased household debt, and mental stress in cancer caregivers than noncancer

caregivers [58]. Employment could be considered as a psychological detachment to ameliorate caregivers' anxiety and depressive symptoms, and promote savoring positive moments in life during the non-caregiving time for cancer caregivers [20]. Therefore, oncological professionals should encourage caregivers to increase social ties such as part-time employment to enhance savoring.

The association between assistance and savoring profiles

Our results that non-assistance was another key risk factor for caregivers belonging to the LS and MS subgroups support the notion that oncological health care staff might instruct caregivers to find other ways such as assistance from others to take time out for themselves. This result also confirmed previous views proposed by Braynt FB that social support serves to enhance both coping with negative and savoring of positive experiences [32]. With respite, financial or informational, and emotional support from others, caregivers were more likely to meet their desire for "time out" and disengage in caregiving mentally and behaviorally, creating more possibilities to appreciate tiny positive events. Stressor-detachment model suggest that sustained stress could damage mental and physical health even when stressor is not present. Psychological detachment from stressor could reduce stress responses. In the context of cancer caregiving, if a caregiver could mentally and physically detach from their caregiving tasks during non-caring time with the help of others, stress such as caregiving burden could be reduced [20]. The more "time out" was available, the more individuals could savor [32]. Compared to family members, oncological professionals should encourage assistance from non-family members such as neighbors, friends, and previous colleagues who are also more supportive and accessible given the increasing social mobilization.

Clinical implications

Since distress screening had been recommended as one regular step to meet the need for cancer caregivers beyond recipients, given one referral strategy for distressed caregivers versus 90.6% who had at least one referral strategy for recipients [59]. Our results underscored the importance of integrating savoring screening into regular assessment for meeting the emotional well-being needs for caregivers beyond distress and caregiving burden screening. Three distinct savoring subgroups using LPA provide an approach for screening individuals incapable of effectively managing positive affect through savoring and those who can fully enjoy the benefits of positive affect. Oncological providers could empower individuals in the HS subgroup as role models by sharing the benefits of savoring with other peer caregivers despite confronting caregiving burdens and distress. For those with difficulties in savoring, professionals could design

targeted savoring interventions for those in urgent need to improve savoring and emotional well-being. For forging savoring, oncological professionals should pay more attention to caregivers especially with low education, unemployed, non-assistance from others, and negative coping strategies. Respite care, active coping strategies training, and building social support networks are beneficial to boost caregivers' savoring. Oncology clinical care staff are well placed to take advantage of accessible digital devices such as apps and websites to conduct self-help online savoring interventions or to integrate savoring into internet-based positive psychology interventions for cancer caregivers in the LS and MS subgroup due to several advantages of technology assistance such as being cost-effective, non-geographical barriers, and less time-consuming [12, 60].

Limitation and future direction

Although the merits of this study such as it is the first to identify savoring patterns and influencing factors among caregivers of patients with advanced cancer whose unmet emotional well-being increasingly acquired more attention, some limitations should be acknowledged. First, the fact that participants were merely recruited using convivence sampling from one hospital under Chinese culture limits the generalization of results. Whether similar savoring patterns existed in other sociocultural contexts need for further explorations. Second, the stability of savoring patterns among caregivers with advanced cancer was not explored due to cross-section design. Thus, future follow-up assessment is encouraged to address this question, especially since savoring patterns might change as the situations of caregiving recipients worsen. Third, according to an actor-partner interdependence model, cancer patients' savoring the moment was positively related to family caregivers' positive affect, and caregivers' savoring the moment was also positively related to patients' life satisfaction [16]. It is necessary to explore patterns and influencing factors of savoring from dyads of cancer patients' and caregivers' lens to effectively promote dyads' emotional well-being. Fourth, the cross-sectional nature limits the clarification of the causal relationship between coping strategies and savoring. For example, Tao TJ et al. [33] found that situation-focused coping strategies (i.e., self-efficacy and positive reappraisal) also influenced savoring, leading to better mental health, therefore further longitudinal design and cross-lagged model could be used to explore the association between coping styles and savoring. Fifth, other factors concerning the context factors (e.g. start of treatment, different active treatments, follow-up, end of life) and associated caregiver roles (e.g. tasks, demands) might also influence the results and should be taken into account in future studies.

Conclusion

Using LPA, this is the first study to identify three distinct patterns of savoring in caregivers of people with advanced cancer. A substantial proportion of caregivers with low or medium savoring were more likely to experience a low level of positive affect. Hence, this study may have utility for oncological professionals when screening cancer caregivers who may have low savoring capacity and lack of savoring strategies but are in need of support for emotional well-being. Associated factors also may help identify the likelihood of being a particular class of savoring. Facing cancer, savoring may encourage cancer caregivers to appreciate their best lives albeit being affected by caregiving burdens and distress. This study underscored the importance of savoring being integrated into supportive care for caregivers to promote psychological adjustment and emotional well-being.

Abbreviations

LPA	Latent profile analyses
HS	High savoring
MS	Medium savoring
LS	Low level of savoring subgroup
MS	Medium level of savoring subgroup
HS	High level of savoring subgroup
PC	Passive coping
AC	Active coping

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s40359-025-02526-1.

Supplementary Material 1

Data availability

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Declarations

Ethics approval and consent to participate

This study was proved by the Institutional Review Boards and Ethics Committee of Xinxiang Medical University (XYLL-20220210). All procedures performed in this study were following the ethical standards of the ethical committees and the 1964 Helsinki declaration. Informed consent was obtained from all participants. All participants signed the written informed consent after understanding the purpose of the study.

References

1. Alam S, Hannon B, Zimmermann C. Palliative care for family caregivers. J Clin Oncol. 2020;38(9):926–36. https://doi.org/10.1200/JCO.19.00018
2. Kroemeke A, Sobczyk-Kruszelnicka M. Meaning-reconstruction factors and well-being in cancer survivor-caregiver dyads: daily associations and mechanisms. Health Psychol. 2023;42(11):800–9. https://doi.org/10.1037/hea0001319
3. Fredrickson BL. The role of positive emotions in positive psychology. The broaden-and-build theory of positive emotions. Am Psychol. 2001;56(3):218–26. https://doi.org/10.1037//0003-066x.56.3.218
4. Rezaei M, Keyvanloo Shahrestanaki S, Mohammadzadeh R, Aghili MS, Rajabi M, Abbasi M, et al. Caregiving consequences in cancer family caregivers: a narrative review of qualitative studies. Front Public Health. 2024;12:1334842. https://doi.org/10.3389/fpubh.2024.1334842
5. Daniel KE, Glazer JV, Le T, Reilley MJ, Jameson MJ, Chow PI, et al. Associations between context and affect within the daily lives of cancer caregivers. Support Care Cancer. 2023;31(9):542. https://doi.org/10.1007/s00520-023-08006-9
6. Bryant FB. Current progress and future directions for theory and research on savoring. Front Psychol. 2021;12:771698. https://doi.org/10.3389/fpsyg.2021.771698
7. Bryant FB. Savouring beliefs inventory (SBI): a scale for measuring beliefs about savouring. J Mental Health. 2003;12(2):175–96. https://doi.org/10.1080/0963823031000103489
8. LaFreniere LS, Newman MG. Savoring changes novel positive mindset targets of GAD treatment: optimism, prioritizing positivity, kill-joy thinking, and worry mediation. Behav Res Ther. 2024;177:104541. https://doi.org/10.1016/j.brat.2024.104541
9. Finan PH, Hunt C, Keaser ML, Smith K, Lerman S, Bingham CO, et al. Effects of savoring meditation on positive emotions and pain-related brain function: a mechanistic randomized controlled trial in people with rheumatoid arthritis. J Pain. 2024;25(7):104478. https://doi.org/10.1016/j.jpain.2024.01.343
10. Wallimann M, Peleg S, Pauly T. Time-savoring moderates associations of solitude with depressive mood, loneliness, and somatic symptoms in older adults' daily life. Appl Psychol Health Well Being. 2024. https://doi.org/10.1111/aphw.12538
11. Chen DF, Huang KW, Ho WS, Cheng YC. Savoring belief, resilience, and meaning in life as pathways to happiness: a sequential mediation analysis among Taiwanese university students. Behav Sci (Basel). 2024;14(5). https://doi.org/10.3390/bs14050388
12. Villani D, Pancini E, Pesce F, Scuzzarella L. Savoring life during pandemic: an online intervention to promote well-being in emerging adults. BMC Psychol. 2023;11(1):196. https://doi.org/10.1186/s40359-023-01225-z
13. Trinh CD, Girard R, Schick MR, Spillane NS. Positive psychological interventions on alcohol use and consequences: pilot randomized trial in a young adult cannabis-using sample. J Subst Use Addict Treat. 2024;158:209241. https://doi.org/10.1016/j.josat.2023.209241
14. Ruan Y, Le JDV, Reis HT. How can I help? Specific strategies used in interpersonal emotion regulation in a relationship context. Emotion. 2024;24(2):329–44. https://doi.org/10.1037/emo0001272
15. Hou WK, Lau KM, Ng SM, Cheng AC, Shum TC, Cheng ST, et al. Savoring moderates the association between cancer-specific physical symptoms and depressive symptoms. Psychooncology. 2017;26(2):231–8. https://doi.org/10.1002/pon.4114
16. Hou WK, Liang L, Lau KM, Hall M. Savouring and psychological well-being in family dyads coping with cancer: an actor-partner interdependence model. Eur J Cancer Care (Engl). 2019;28(4):e13047. https://doi.org/10.1111/ecc
17. Garland EL, Thielking P, Thomas EA, Coombs M, White S, Lombardi J, et al. Linking dispositional mindfulness and positive psychological processes in cancer survivorship: a multivariate path analytic test of the mindfulness-to-meaning theory. Psychooncology. 2017;26(5):686–92. https://doi.org/10.1002/pon.4065
18. Thomas EA, Mijangos JL, Hansen PA, White S, Walker D, Reimers C, et al. Mindfulness-oriented recovery enhancement restructures reward processing and promotes interoceptive awareness in overweight cancer survivors: mechanistic results from a stage 1 randomized controlled trial. Integr Cancer Ther. 2019;18:1534735419855138. https://doi.org/10.1177/1534735419855138
19. de Camargos MG, Paiva BSR, de Oliveira MA, de Souza Ferreira P, de Almeida VTN, de Andrade Cadamuro S, et al. An explorative analysis of the differences in levels of happiness between cancer patients, informal caregivers and the general population. BMC Palliat Care. 2020;19(1):106. https://doi.org/10.1186/s12904-020-00594-1
20. Hou WK, Lau KM, Ng SM, Lee TM, Cheung HY, Shum TC, et al. Psychological detachment and savoring in adaptation to cancer caregiving. Psychooncology. 2016;25(7):839–47. https://doi.org/10.1002/pon.4019
21. Samios C, Khatri V. When times get tough: savoring and relationship satisfaction in couples coping with a stressful life event. Anxiety Stress Coping. 2019;32(2):125–40. https://doi.org/10.1080/10615806.2019.1570804
22. Wang H, Deng T, Cao C, Feng D. Distinct dyadic quality of life profiles among patient-caregiver dyads with advanced lung cancer: a latent profile analysis. Support Care Cancer. 2023;31(12):704. https://doi.org/10.1007/s00520-023-08182-8
23. Lin X, Chen Z, Zhao Q, Zhou X. Benefit-finding profiles and comparison of caregiving ability among informal caregivers of patients with lung cancer: a latent profile analysis. Asia Pac J Oncol Nurs. 2024;11(5):100480. https://doi.org/10.1016/j.apjon.2024.100480
24. Son EH, Wallen GR, Flynn S, Yang L, Lee LJ. Patterns of health-promoting behaviors and associated factors in family caregivers of people receiving cancer treatment: a latent class profile analysis. Psychooncology. 2023;32(7):1038–47. https://doi.org/10.1002/pon.6145
25. Kelley NJ, Tang D, Schmeichel BJ. Mortality salience biases attention to positive versus negative images among individuals higher in trait self-control. Cogn Emot. 2014;28(3):550–9. https://doi.org/10.1080/02699931.2013.840269
26. Smith JL, Bryant FB, Jijow. Are we having fun yet? Savoring, type a behavior, and vacation enjoyment. IJW. 2013;3:1–19. https://doi.org/10.5502/ijw.v3i1.1
27. Differences ARYMCBMCYNJP. Dispositional mindful awareness and savoring positive experiences: a prospective test of cognitive reappraisal as a mediator. Pers Individ Dif. 2020;163:110050. https://doi.org/10.1016/j.paid
28. Envelope BJISaP ABS, Differences BDSBASSAAQJP. i. Good times, bad times: a closer look at the relationship between savoring and self-compassion. Pers Individ Dif. 2022; 198:111807. https://doi.org/10.1016/j.paid
29. Gregory AL, Quoidbach J, Haase CM, Piff PK. Be here now: perceptions of uncertainty enhance savoring. Emotion. 2023;23(1):30–40. https://doi.org/10.1037/emo0000961
30. Van Ryn M, Sanders S, Kahn K, van Houtven C, Griffin JM, Martin M, et al. Objective burden, resources, and other stressors among informal cancer caregivers: a hidden quality issue? Psychooncology. 2011;20(1):44–52. https://doi.org/10.1002/pon
31. Siminoff LA, Wilson-Genderson M, Chwistek M, Thomson M. The cancer caregiving burden trajectory over time: varying experiences of perceived versus objectively measured burden. Oncologist. 2024;29(7):629–37. https://doi.org/10.1093/oncolo/oyae069
32. Bryant FB, Verof J. Savoring: a new model of positive experience. New York: Psychology. 2007. https://doi.org/10.4324/9781315088426
33. Tao TJ, Yung YYY, Lau AYT, Liu H, Liang L, Bryant FB, et al. Savoring mediates the mental health benefits of positive coping processes: a prospective population-based analysis. Appl Psychol Health Well Being. 2024;16(1):158–78. https://doi.org/10.1111/aphw.12476
34. Greer JA, Applebaum AJ, Jacobsen JC, Temel JS, Jackson VA. Understanding and addressing the role of coping in palliative care for patients with advanced cancer. J Clin Oncol. 2020;38(9):915–25. https://doi.org/10.1200/JCO.19.00013
35. Dionne-Odom JN, Azuero A, Taylor RA, Wells RD, Hendricks BA, Bechthold AC, et al. Resilience, preparedness, and distress among family caregivers of patients with advanced cancer. Support Care Cancer. 2021;29(11):6913–20. https://doi.org/10.1007/s00520-021-06265-y
36. Pan Y. The research on Hangzhou City residents' savoring psychology and its relationships with well-being. Dissertation, Nanchang University. 2013.
37. Folkman S, Moskowitz JT. Positive affect and the other side of coping. Am Psychol. 2000;55(6):647–54. https://doi.org/10.1037//0003-066x.55.6.647

38. YN. Simplified coping style questionnaire. Chin Mental Health J. 1999;13(Suppl):122–4.

39. Liu YE, Cao G, Li TX, Xi SJ, Yu Y. Caregiving burden and positive aspects of caregiving among family caregivers of people living with schizophrenia: two sides of the same coin. Appl Nurs Res. 2022;67:151619. https://doi.org/10.1016/j.apnr.2022.151619

40. Kim M, Wang Z. Factor structure of the PANAS with bayesian structural equation modeling in a Chinese sample. Eval Health Prof. 2022;45(2):157–67. https://doi.org/10.1177/0163278721996794

41. Zarit SH, Reever KE, Bach-Peterson J. Relatives of the impaired elderly: correlates of feelings of burden. Gerontologist. 1980;20(6):649–55. https://doi.org/10.1093/geront/20.6.649

42. Zhu S, Yang C, Mei W, Kang L, Li T, Li J, et al. Caregiver burden for informal caregivers of patients after surgical treatment of early-stage lung cancer. J Clin Nurs. 2023;32(5–6):859–71. https://doi.org/10.1111/jocn.16424

43. Wang L, Yang XT, Hou Z, Feng QL, Wan JYE. Application and evaluation of Chinese version of Zarit caregiver burden interview. Chin J Public Health. 2006;22(8):970–2. https://doi.org/10.11847/zgggws2006-22-08-47.

44. Otto AK, Laurenceau JP, Siegel SD, Belcher AJ. Capitalizing on everyday positive events uniquely predicts daily intimacy and well-being in couples coping with breast cancer. J Fam Psychol. 2015;29(1):69–79. https://doi.org/10.1037/fam0000042

45. Boelen PA. Do savoring beliefs predict posttraumatic stress symptoms following stressful life events? Anxiety Stress Coping. 2024;37(2):192–204. https://doi.org/10.1080/10615806.2023.2226871

46. Straszewski T, Siegel JT. From writing tasks to a public service announcement: experimentally assessing savoring as a means of increasing help-seeking for depression. Soc Sci Med. 2021;287:114362. https://doi.org/10.1016/j.socscimed.2021.114362

47. Colombo D, Pavani JB, Fernandez-Alvarez J, Garcia-Palacios A, Botella C. Savoring the present: the reciprocal influence between positive emotions and positive emotion regulation in everyday life. PLoS ONE. 2021;16(5):e0251561. https://doi.org/10.1371/journal.pone.0251561

48. Monteiro SDDT, Marques Pinto AJEJW, Psychology O. Reporting daily and critical events: journalists' perceptions of coping and savouring strategies, and of organizational support. Eur J Work Organ Psychol. 2017;26(3):468–80. https://doi.org/10.1080/1359432X.2017.1296832

49. Wilner Tirpak J, Cassiello-Robbins C, Ametaj A, Olesnycky OS, Sauer-Zavala S, Farchione TJ, et al. Changes in positive affect in cognitive-behavioral treatment of anxiety disorders. Gen Hosp Psychiatry. 2019;61:111–5. https://doi.org/10.1016/j.genhosppsych.2019.06.008.

50. Lawton MP, Moss M, Kleban MH, Glicksman A, Rovine M. A two-factor-model of caregiving appraisal and psychological well-being. J Gerontol. 1991;46(4):P181–9. https://doi.org/10.1093/geronj/46.4.p181

51. Cznescu DG, Tecuta L, Cndea DM, Szentagotai-Ttar AJSU. Savoring as mediator between irrational beliefs, depression, and joy. J Rat-Emo Cognitive-Behav Ther. 2019;37:84–95. https://doi.org/10.1007/s10942-018-0304-8

52. Zautra AJ, Hall JS, Murray KE, Resilience. A new definition of health forpeople and communities. Handbook of adult resilience. New York; The Guilford, 2010;3–29.

53. Walshe C, Roberts D, Appleton L, Calman L, Large P, Lloyd-Williams M, et al. Coping well with advanced cancer: a serial qualitative interview study with patients and family carers. PLoS ONE. 2017;12(1):e0169071. https://doi.org/10.1371/journal.pone.0169071

54. Samami E, Elyasi F, Mousavinasab SN, Shojaee L, Zaboli E, Shahhosseini Z. The effect of a supportive program on coping strategies and stress in women diagnosed with breast cancer: A randomized controlled clinical trial. Nurs Open. 2021;8(3):1157–67. https://doi.org/10.1002/nop2.728

55. Phiri L, Li WHC, Cheung AT, Phiri PGMC. Effectiveness of psychoeducation interventions in reducing negative psychological outcomes and improving coping skills in caregivers of children with cancer: A systematic review and meta-analysis. Psychooncology. 2023;32(10):1514–27. https://doi.org/10.1002/pon.6208

56. Hastert TA, Ruterbusch JJ, Nair M, Noor MI, Beebe-Dimmer JL, SchwartzK, et al. Employment outcomes, financial burden, anxiety, and depression among caregivers of African American cancer survivors. JCO Oncol Pract. 2020;16(3):e221–33. https://doi.org/10.1200/JOP.19.00410

57. Xu J, Hebdon M, Beck A, Cloyes KG, Mooney K, Reblin M, et al. Moderating effect of work on burden and hospice family caregiver well-being. JPalliat Med. 2023;26(7):941–50. https://doi.org/10.1089/jpm.2022.0395

58. Bradley CJ, Kitchen S, Owsley KM. Working, low income, and cancer caregiving: financial and mental health impacts. J Clin Oncol. 2023;41(16):2939–48. https://doi.org/10.1200/JCO.22.02537

59. Nightingale CL, Snavely AC, McLouth LE, Dressler EV, Kent EE, Adonizio CS, et al. Processes for identifying caregivers and screening for caregiver and patient distress in community oncology: results from WF-1803CD. J Natl Cancer Inst. 2024;116(2):324–33. https://doi.org/10.1093/jnci/djad198

60. Yu SC, Sheldon KM, Lan WP, Chen JH. Using social network sites to boost savoring: positive effects on positive emotions. Int J Environ Res Public Health. 2020;17(17):6407. https://doi.org/10.3390/ijerph17176407

Publisher's note