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Coping Strategies of Patients With Advanced Lung or Colorectal Cancer Over Time: Insights From the International ACTION Study

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ABSTRACT

Objective: A comprehensive understanding of coping strategies of patients with advanced diseases can contribute to providing supportive care that meets patients' needs. However, insight into how coping of this population develops over time is lacking. We examined coping strategies of patients with advanced cancer over time and identified distinct trajectories and their predictors.

Methods: Data from 675 patients of the control group from the ACTION cluster-randomized trial were analyzed. Patients with lung or colorectal cancer from six European countries (Belgium, Denmark, Italy, the Netherlands, Slovenia and the United Kingdom) completed questionnaires at baseline, 12 and 20 weeks. Measures included Denial, Acceptance, and Problem-focused coping (COPE, Brief COPE inventory; scores 4–16 per scale). We used linear mixed models to analyze the data and latent class mixed models to identify stable (within patient change < 2) coping strategies.

Results: At baseline, patients reported low use of Denial (6.6) and greater use of Acceptance (12.6) and Problem-Focused coping (12.2). These scores did not significantly change. We found four distinct trajectories for the use of Denial, three for Acceptance and five for Problem-Focused coping strategies. Stable trajectories were found in 513 (77%) patients for Denial, 645

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(96%) for Acceptance and 602 (91%) for Problem-Focused coping. All coping strategies were stable in 447 (68%) patients and two were stable in 181 patients (28%).

Conclusions: Overall, the use of coping strategies was rather stable in the majority of patients with advanced cancer. However, for each of the coping strategies subgroups of patients reported fluctuating coping trajectories.

1 | Introduction

Patients with advanced cancer experience emotional and psychosocial concerns due to the disease, its treatment and prognosis [1]. One way to support patients in an advanced stage of their illness can be to promote coping strategies that can contribute to their well-being [2–4]. Coping is defined as a cognitive and behavioral adaption process to manage individual challenges, For example, the diagnosis of advanced disease [5]. Coping has two main functions [6]. The first function is problem-focused; acting on the challenge itself, for instance, by making a plan for next steps [6]. The second function is emotion-focused; changing how the challenge is experienced [6], for instance, by distracting activities or seeking emotional support. These two coping functions may occur in the same situation [5]. The varying ways of dealing with challenges are termed “coping strategies” [7]. Many coping strategies have been identified and different coping classification systems have been developed [1, 8]. One way of classifying them is into approach-oriented (e.g., Problem-Focused, Acceptance, Active coping) and avoidance-oriented coping (e.g., Denial, Suppression) [9, 10]. Approach-oriented coping is also called engagement coping or adaptive coping, while avoidance-oriented coping is also called disengaged coping. The use of coping strategies has been found to differ across patient groups, for instance, older age was associated with more use of Denial coping and a low WHO performance status with less use of Problem-Focused coping [11]. Studies among patients with advanced cancer have shown that approach-oriented coping tends to be associated with better patient outcomes, such as better quality of life and less distress, than avoidance-oriented coping [1]. For instance, in patients with incurable lung or gastrointestinal cancer, adaptive coping was associated with better quality of life and mood [3, 12]. Similarly in a study among women with ovarian cancer, those who adapted to their reality reported better quality of life than those who used coping strategies indicating denial [13]. Overall, research has shown that patients with advanced cancer mainly use approach-oriented coping [3, 11, 14]. However, coping strategies might vary and might not be mutually exclusive of each other [15]. Patients with advanced cancer often attempt to balance the idea of potential death with simultaneously continuing their life. It positions them between “life engagement and death contemplation” [16], which has been conceptualized as “double awareness” [17]. Having a double awareness can be facilitative for patients to cope with their circumstances more comprehensively [18]. In such a period, for instance, both active coping and coping through denial and avoidance can be useful. Hence, the use of different coping strategies in patients with advanced cancer is often based on a complex interplay of factors.

Additionally, it is not clear yet if coping strategies of patients with advanced cancer fluctuate or change with time. On the one hand, coping strategies could be relatively stable, as it is assumed that patients may have a preferred set of coping strategies, partly formed by their personality [5, 19]. On the other hand, the use of coping strategies may be more dynamic, as the patients' disease, their personal situation and characteristics of their environment might change over time their coping strategies may evolve as well in response to these changes [1, 5, 19]. A study among patients with incurable lung or gastrointestinal cancer indicated that early palliative care resulted in increased use of approach-oriented coping, which was associated with better quality of life and reduced depressive symptoms [4]. Empirical evidence about the stability of coping strategies of patients with advanced cancer is mixed. Longitudinal studies in various cancer populations, mostly women with breast cancer, have shown variations in the use of coping strategies over time [20] while others found that the use of coping strategies remains stable [21, 22].

Considering that distinct approaches to coping are accompanied with advantages and disadvantages for the patient and might change with time, better understanding trajectories of coping of patients with advanced cancer and their predictors may allow tailoring of psychological and supportive care [3]. The research question of this study is: how does the use of Denial, Acceptance and Problem-Focused coping of patients with advanced cancer change over time?

2 | Methods

Previously we reported on the use of coping of 675 patients with advanced cancer [11]. The present study is based on longitudinal data from this ACTION trial, a cluster-randomized trial investigating the effects of an advance care planning intervention compared to care as usual as measured with questionnaires at baseline, follow-up at 12 weeks (T1) and 20 weeks (T2) [23, 24]. Patients with advanced lung or colorectal cancer were recruited in outpatient departments in academic and nonacademic hospitals in Belgium, Denmark, Italy, the Netherlands, Slovenia, and the United Kingdom, between May 2015 and February 2018 [23, 24]. Patients provided written informed consent. Ethical approval was obtained from the Research Ethics Committee of all participating countries [23, 24]. To avoid any impact of the advance care planning intervention, we only included patients from the care-as-usual arm.

2.1 | Measures

2.1.1 | Sociodemographic and Clinical Variables

At baseline, patients completed items about their age, educational level, gender, living situation, and religion. Clinical information about diagnosis, treatment, and performance status according to the World Health Organization (WHO) scale (0-fully active to 3-capable of only limited self-care) were provided by their healthcare providers. Data on patients' survival for 12 months following their inclusion in the ACTION study (date of death) were extracted from the medical files.

2.1.2 | Coping

Patients' coping strategies were measured at baseline, 12 weeks (T1), and 20 weeks (T2). Given the health status of the study participants, we needed to limit the number of items. We aimed to measure both avoidance-oriented and approach-oriented coping. Focusing on the coping strategies which seemed most applicable for this patient group, we therefore selected the subscales Denial and Acceptance of the COPE inventory [7] and the subscale Problem-Focused coping. The latter is based on the subscales Planning and Active coping of the Brief COPE, as described by Jabbarian et al. [11, 25]. Descriptions of how patients had been coping with their disease during the previous 2 months were rated with a four-point Likert scale from 1 ("I don't do this at all"), 2 ("I do this a little bit"), 3 ("I do this a medium amount") to 4 ("I do this a lot"). See Box 1 for the items per coping subscale. For each subscale, the responses were summed with scores per subscale ranging from 4 to 16; higher scores indicate greater use of the particular coping strategy. To assess the internal consistency, which reflects whether questions refer to the same underlying construct, we used Cronbach's alpha. A result between 0.70 and 0.95 is considered sufficient [26].

BOX 1 | Items of the coping subscales.

Denial	Acceptance	Problem-focused coping
1. I act as though this hasn't even happened.	1. I accept the reality of the fact that this has happened to me.	1. I concentrate my efforts on doing something about my situation.
2. I say to myself "this isn't real"	2. I learn to live with my situation.	2. I take action to try to make my situation better.
3. I pretend that this hasn't really happened to me.	3. I get used to the idea that this has happened to me.	3. I try to come up with a strategy about what to do in my situation.
4. I refuse to believe that this happened to me.	4. I accept that this has happened to me and that it can't be changed.	4. I think hard about what steps to take in my situation.

2.2 | Statistical Methods

Patients' sociodemographic and clinical characteristics were summarized. We calculated means and standard deviations for continuous variables and counts and percentages for categorical variables. Coping subscale scores were included in the analyses if patients responded to all items of a particular subscale.

To describe changes in coping subscale scores over time (baseline vs. 12 weeks, baseline vs. 20 weeks), we used linear mixed models, including a random intercept for patients to adjust for repeated measurements. In these analyses we adjusted for country, age, time of diagnosis of the primary tumor, and time of diagnosis of the advanced stage. A p-value less than 0.05 was considered to indicate a statistically significant change.

To investigate if there was heterogeneity in the trajectory of the used coping strategies, we used latent class mixed models (lcmm). This method allowed us to distinguish groups of patients with distinct trajectories (latent classes) regarding their use of a coping strategy over time (baseline, 12, and 20 weeks). A distinct trajectory consists of a group of individuals who share a common underlying pattern of coping over time [27]. The optimal number of latent classes per coping strategy was evaluated by the model fit statistics Bayesian Information Criterion (BIC), in which lower BIC values indicate a better-fitting model. First, we tried one latent class, then two latent classes, and so on. The optimal number of latent classes is achieved if adding one latent class results in a higher BIC and thus fails to produce a better model fit [28]. Additionally, in selecting the optimal number of latent classes per coping strategy, model fit statistics including Akaike Information Criterion (AIC), log-likelihood and entropy-index were calculated. For each coping strategy, we evaluated whether the characteristics of the patients differed between trajectories. The characteristics we studied were age, gender, country of residence, time since diagnosis of primary tumor, time since diagnosis of advanced stage, and whether patients were still alive at T2. The Pearson's Chi-squared test for categorical variables and the Kruskal-Wallis rank sum test for continuous variables were applied to describe predictors across trajectories. A difference of at least two points between highest and lowest use of a coping scale was considered to indicate an unstable trajectory. To analyze the overall stability of coping per person, a Chi-square analysis was performed. For each of the coping strategies we compared mental health at baseline, as assessed with 10 items of the EORTC mental health item bank, per trajectory. To investigate potential differences in trajectories between country and cancer type we performed interaction tests in linear mixed models where we included time, type of cancer and country and the interaction between time, type of cancer and country. We used SPSS 24 and R 4.1.1, the package lme4 was used to fit mixed models and package lcmm for fitting the lcmm.

3 | Results

3.1 | Sociodemographic and Clinical Characteristics at Baseline

We included 675 patients of the control arm of the ACTION trial for this analysis. Patients' mean age was 66 years and 407 (60%) were male. Half of the included patients were diagnosed with lung cancer stage III or IV (n = 342, 51%). On average, before inclusion in the ACTION trial, patients had been diagnosed with their primary tumor for 1.7 years (SD 2.4) and with their advanced stage for 1.0 years (SD 1.4). At the time of inclusion, 595 (89%) of the patients received systemic anti-tumor

TABLE 1 | Sociodemographic and clinical characteristics at baseline.

	Belgium ($n = 135$)	Denmark ($n = 68$)	Italy ($n = 139$)	Netherlands ($n = 168$)	Slovenia ($n = 25$)	UK ($n = 140$)	Total ($N = 675$)
Age (years), mean (SD)	65.3 (9.5)	65.5 (9.0)	65.5 (9.5)	65.4 (8.1)	71.1 (9.5)	68.5 (11.0)	66.3 (9.6)
Years of education, mean (SD)	13.9 (4.4)	13.5 (5.9)	11.4 (5.2)	13.2 (3.7)	9.9 (3.3)	13.5 (4.7)	12.9 (4.7)
Gender (male), n (%)	91 (67.4)	35 (51.5)	90 (64.7)	111 (66.1)	10 (40.0)	70 (50.0)	407 (60.3)
Living with a spouse, n (%)	106 (79.1)	55 (80.9)	99 (73.9)	129 (78.2)	15 (62.5)	93 (69.9)	497 (75.5)
Having children, n (%)	114 (85.1)	62 (91.2)	118 (86.8)	146 (86.9)	21 (84.0)	122 (89.1)	583 (87.3)
Religion, n (%)							
Not specified	31 (23.8)	9 (13.6)	16 (11.7)	17 (10.1)	2 (8.0)	18 (13.2)	93 (14.0)
Not religious	30 (23.1)	38 (57.6)	24 (17.5)	76 (45.2)	2 (8.0)	58 (42.6)	228 (34.4)
Religious	69 (53.1)	19 (28.8)	97 (70.8)	75 (44.6)	21 (84.0)	60 (44.1)	341 (51.5)
Diagnosis, n (%)							
Lung cancer stage III/IV	79 (58.5)	34 (50.0)	71 (51.1)	76 (45.2)	0 (0.0)	82 (58.6)	342 (50.7)
Colorectal cancer stage IV	56 (41.5)	34 (50.0)	68 (48.9)	92 (54.8)	25 (100)	58 (41.4)	333 (49.3)
Years since diagnosis, mean (SD)	1.5 (1.7)	2.7 (3.2)	2.0 (3.5)	1.9 (1.9)	2.3 (2.4)	0.9 (1.4)	1.7 (2.4)
Years since diagnosis current stage, mean (SD)	1.1 (1.4)	1.6 (2.2)	0.8 (1.1)	1.2 (1.4)	1.3 (1.9)	0.5 (0.8)	1.0 (1.4)
Current systemic treatment,[a] n (%)	127 (96.2)	68 (100.0)	135 (97.1)	139 (83.2)	12 (50.0)	114 (81.4)	595 (88.5)
WHO performance status, n (%)							
3 In bed/sitting for more than half of the day	0 (0.0)	0 (0.0)	0 (0.0)	2 (1.2)	1 (4.0)	5 (3.6)	8 (1.2)
2 Up for more than half of the day	7 (5.5)	1 (1.5)	2 (1.4)	12 (7.1)	13 (52.0)	20 (14.3)	55 (8.2)
1 No heavy physical work	57 (44.5)	40 (58.8)	65 (47.1)	122 (72.6)	10 (40.0)	49 (35.0)	343 (51.4)
0 Fully active	64 (50.0)	27 (39.7)	71 (51.4)	32 (19.0)	1 (4.0)	66 (47.1)	261 (39.1)

Note: Missing total: Age ($n = 6$), education ($n = 89$), gender ($n = 1$), living with a spouse ($n = 15$), having children ($n = 6$), religion ($n = 13$), years since diagnosis ($n = 1$), years since diagnosis current stage ($n = 6$), systemic treatment ($n = 24$), WHO performance status ($n = 8$).
Abbreviation: SD = standard deviation.
[a] Includes chemotherapy, immunotherapy, targeted therapy; treatments were not mutually exclusive.

treatment. The number of patients per country ranged from $n = 25$ (Slovenia) to $n = 168$ (Netherlands), see Table 1.

3.2 | Coping at Baseline, 12 weeks (T1), and 20 weeks (T2)

For Denial, Cronbach alphas ranged between 0.856 and 0.850, for Acceptance, they ranged between 0.755 and 0.789, and for Problem-Focused coping between 0.821 and 0.847. These scores all indicate good internal consistency.

Overall, the scores of the three coping strategies of patients with advanced lung or colorectal cancer did not significantly change over time (after 12 and 20 weeks), see Figure 1 and Table 2. At baseline, patients reported low use of Denial (mean score 6.7 on a scale of 4–16) and after 20 weeks this had not significantly changed (mean score 6.6, $p = 0.90$). The baseline scores of Acceptance and Problem-Focused coping were higher, and these did not significantly change either: at baseline, the mean score of Acceptance was 12.8 at baseline and 12.5 after 20 weeks ($p = 0.07$), and the mean score of Problem-Focused coping was 12.2 at baseline and 12.0 after 20 weeks ($p = 0.08$).

3.3 | Trajectories of Coping Strategies

The AIC and BIC indicated the same number of latent classes for denial. While the AIC indicated that models with more latent classes were more appropriate (6 classes for problem-focused and 7 for acceptance), we opted to retain the latent class models indicated by the BIC as these are more parsimonious and the improvement in log-likelihood was relatively limited. The entropy index indicated that the models had a moderate fit (See Supporting Information S1: Appendix 1). The significance of the difference in mental health at baseline between the trajectories was $p < 0.001$ for Acceptance, $p = 0.04$ for Denial and $p = 0.10$ for Problem-focused coping. Interaction

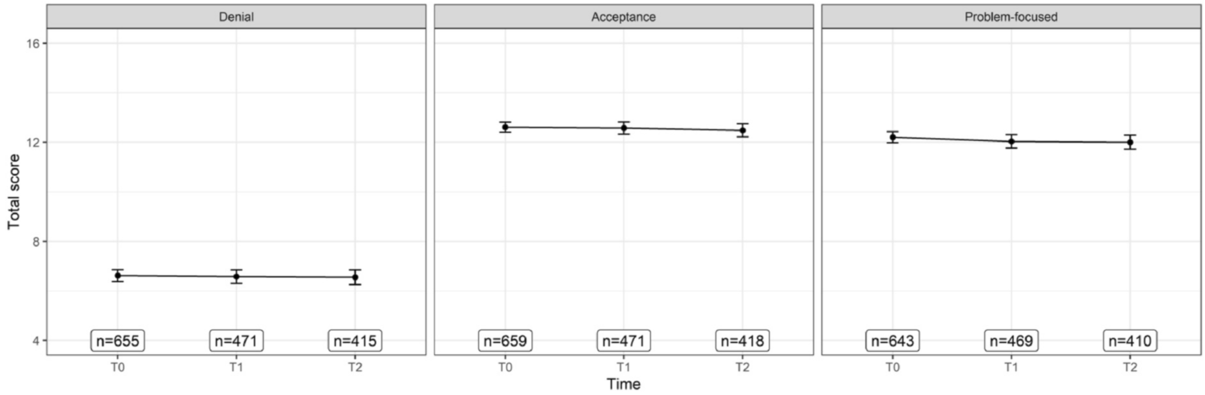

FIGURE 1 | Coping strategies at baseline, 12 weeks (T1) and 20 weeks (T2) * Range of all scales is 4–16. Higher scores indicate more use of the coping strategy.

TABLE 2 | Differences in use of coping strategies over time: baseline versus 12 weeks (T1) and baseline versus 20 weeks (T2), results from linear mixed models.

	Denial			Acceptance			Problem-focused		
Time	**Beta**	**95% CI**	***p*-value**	**Beta**	**95% CI**	***p*-value**	**Beta**	**95% CI**	***p*-value**
Baseline		REF			REF			REF	
T1	−0.01	−0.27, 0.24	> 0.90	−0.14	−0.37, 0.09	0.20	−0.19	−0.43, 0.05	0.12
T2	−0.02	−0.29, 0.25	0.90	−0.22	−0.47, 0.02	0.07	−0.22	−0.47, 0.03	0.08

tests with type of cancer and country were non-significant across all outcomes for both variables, indicating no evidence of differences in trajectories across the different subgroups.

3.3.1 | Trajectories of Denial

Based on the optimal fit of the BIC, we identified four latent classes (distinct trajectories) for Denial (see Figure 2, Supporting Information S1: Appendix 1). Most patients ($n = 513$, 77%) had a stable trajectory: they reported low use of Denial at baseline, and this did not change over time (trajectory 1). Three latent classes, with 155 patients in total (23%), showed variations in the use of Denial over time. In one of these classes ($n = 73$), trajectory 2, the use of denial was rather high at baseline, decreased at 12 weeks to bounce back at 20 weeks. In trajectory 3 ($n = 49$), baseline use was similar to trajectory 2, but its use decreased at 12 and at 20 weeks. Trajectory 4 ($n = 33$), finally, was characterized by a low use at baseline, followed by an increase at 12 weeks, to remain stable until 20 weeks. A predictor of dynamic trajectories of Denial was age: younger people reported low use of Denial and were more likely to have trajectory 1.

3.3.2 | Trajectories of Acceptance

For Acceptance, we identified three latent classes (see Figure 3, Supporting Information S1: Appendix 1). Most of the patients reported either high use of Acceptance ($n = 513$, 76%) at baseline, 12 and 20 weeks (trajectory 1) or intermediate use ($n = 132$, 20%) at baseline, 12 and 20 weeks (trajectory 2). A small group ($n = 25$, 4%) did not have a stable trajectory: they reported high use of Acceptance at baseline, and this decreased over time. The Acceptance-coping trajectories were not associated with patient characteristics.

3.3.3 | Trajectories of Problem-Focused Coping

For Problem-Focused coping, we identified five latent classes based on the optimal fit of the BIC (see Figure 4, Supporting Information S1: Appendix 1). The majority of patients ($n = 504$, 76%) were found in one latent class; they reported high use of Problem-Focused coping on all three measurements. A smaller group, latent class 2, continuously reported moderate use of Problem-Focused coping ($n = 98$, 15%). Three latent classes, with 61 people (9%) in total, represented variable patterns of the use of Problem-Focused coping over time. Problem-Focused coping was less likely to change among patients who were closer to death compared to patients who were still alive at the end of the study.

3.3.4 | Stability of Trajectories Across Coping Strategies

The majority of patients had stable trajectories for all three coping strategies ($n = 447$, 68%), 181 patients had two stable coping trajectories (28%), 28 patients (4%) had one and 1 patient had no stable coping strategies (see Supporting Information S1: Appendix 2).

4 | Discussion

In this study, we investigated how the reported use of Denial, Acceptance, and Problem-Focused coping of patients with

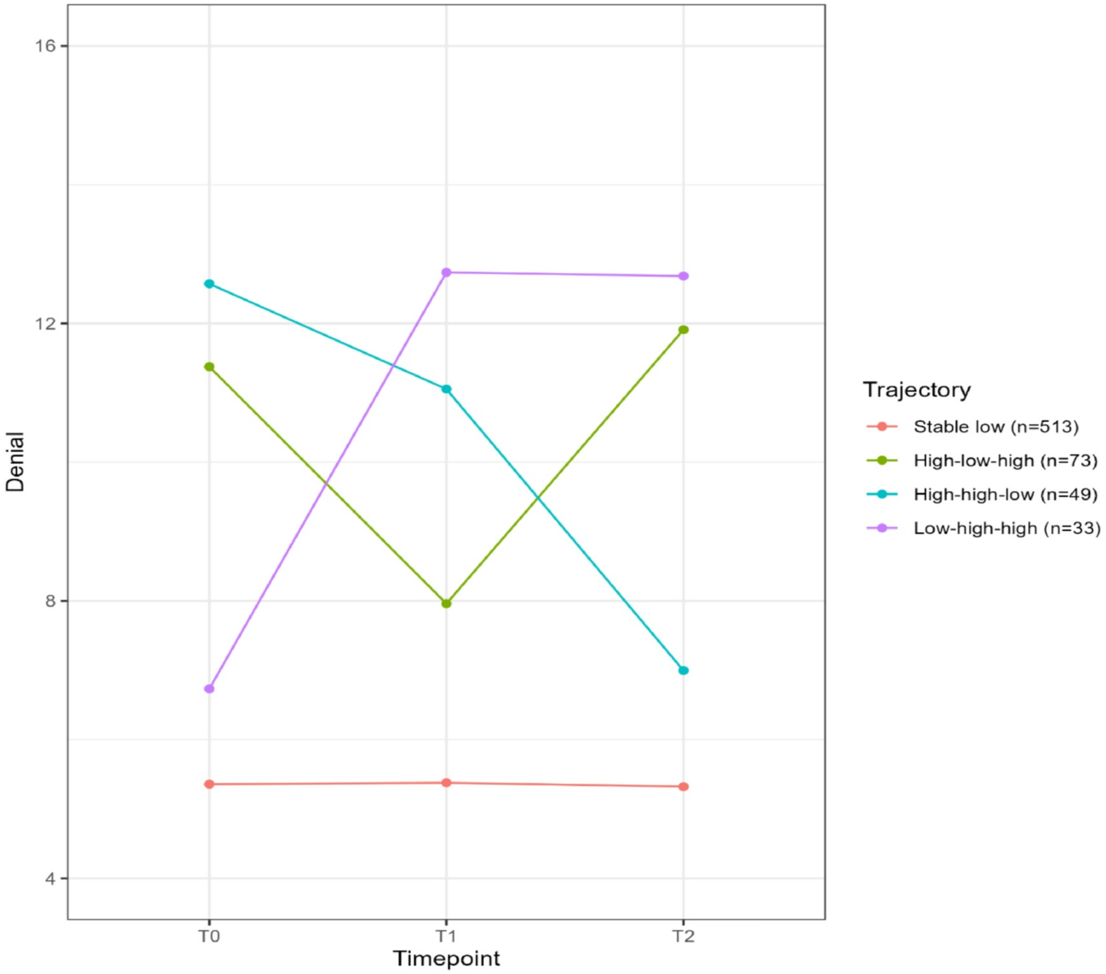

FIGURE 2 | Trajectories (latent classes) of the use of Denial at baseline (T0), 10 weeks later (T1) and 20 weeks later (T2).

advanced lung or colorectal cancer changed over time, identified distinct trajectories and explored whether these are associated with patient characteristics. During the initial assessment, patients mainly used Acceptance and Problem-Focused coping and little Denial coping. Overall, there were no statistically significant changes in the use of these coping strategies after 12 and 20 weeks.

However, several distinct trajectories could be identified for the three coping strategies. While most patients had stable trajectories for all or two out of three coping strategies, some patients varied in their use of the coping strategies over time. Instabilities in coping strategies can also be connected to the concept of double awareness [17]. Addressing this can be facilitative for care communication in advanced cancer, as it provides insight into the patient's psychological adaptation to their new reality [16]. Rodin et al. developed an intervention for individuals with advanced cancer, in which various topics such as symptoms management and future-oriented concerns are covered [29]. They found that this was beneficial to reduce anxiety and depression in patients with advanced cancer who experienced some psychological distress [29]. Thus, placing focus on changing coping strategies is relevant for advanced cancer care to support the patients in their individual journey. Furthermore, some individual characteristics were more likely to be connected with a specific coping strategy. To illustrate, younger patients were more likely to have a stable strategy of using little Denial coping, and patients who were closer to death were less likely to change their level of Problem-Focused coping compared to patients who were still alive by the end of the study period. Hence, this suggests there is variability in the use of coping strategies of advanced cancer patients and their stability.

Currently, longitudinal studies reporting on coping among patients with advanced cancer are scarce. The results of this 5-month long study among people with advanced cancer showed that the reported use of coping strategies seems to be stable for most of the participating patients. This contrasts with research on the development of coping strategies among women with newly diagnosed breast cancer [20, 30, 31] and men with curatively treated prostate cancer [32]. These studies reported changes in coping strategies over time (3–12 months) in populations at different stages (post-diagnosis) or types (curatively treated) of cancer. However, Vos and colleagues found that the use of Denial changed in the first 4 months after patients' diagnosis with lung cancer and then remained rather stable until 8 months later [33]. It is possible, that coping strategies of

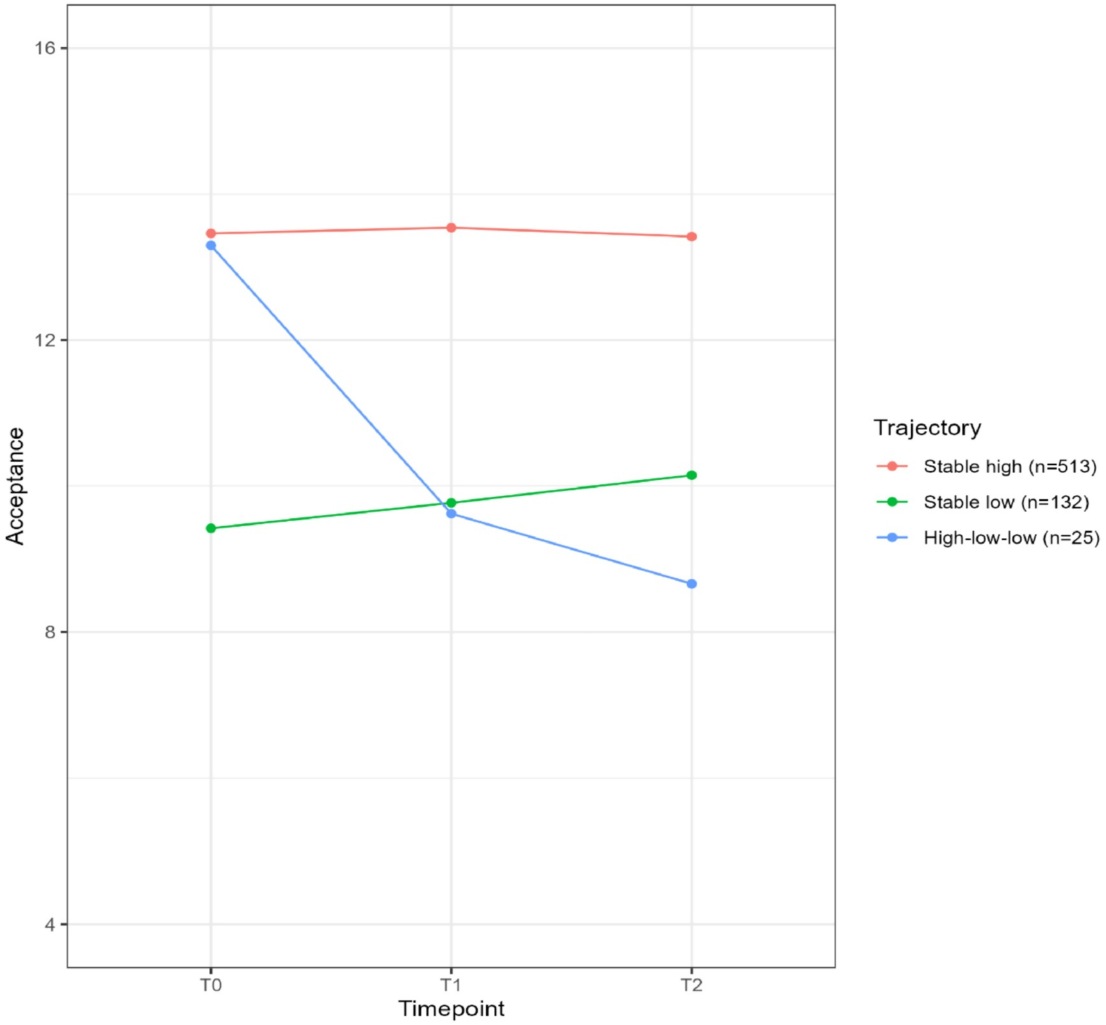

FIGURE 3 | Trajectories (latent classes) of the use of Acceptance at baseline (T0), 10 weeks later (T1) and 20 weeks later (T2).

the patients with advanced cancer in our study had changed during earlier disease stages and stabilized by the time patients were diagnosed with more advanced stages.

4.1 | Clinical Implications

Addressing coping strategies for advanced disease stages and providing adequate support, for example, as an element of palliative care for patients with advanced cancer, is associated with improved quality of life [4]. Palliative care is aimed at relieving symptom burden, improving quality of life, ensuring psychosocial, spiritual and bereavement support and facilitating communication about illness, prognosis and death with patients, family caregivers and healthcare professionals. Early integration of palliative care into oncological care tends to have positive effects on the quality of life of people with advanced disease [34–37] and results in a more optimized timing of final chemotherapy administration and transition to hospice services [38]. To understand the mechanisms by which early integration of oncology and palliative care results in better patient outcomes, researchers explored the potential role of supporting patients' coping strategies [1]. They established that integrated palliative and oncology care increased the use of approach-oriented coping, which in turn led to better quality of life and reduced depressive symptoms [1]. Therefore, the authors conclude that palliative care may improve patient outcomes by providing them with the skills to cope effectively with advanced illness [1].

Furthermore, the stability of the individuals coping strategies can be informative for interventions. In our study, coping strategies of most patients with advanced lung or colorectal cancer did not change during a period of 5 months. Such stability may be helpful when these strategies seem to benefit the patient. However, if strategies are not beneficial, interventions may be needed because most people will not spontaneously adapt their coping strategies. Additionally, it could be that instabilities in coping strategies of people with advanced illness are associated with double awareness [15]. Such double awareness can be helpful for people who aim to cope with the idea of their approaching death while continuing their life. For them, both active coping and coping through denial and avoidance can be useful. Awareness of this phenomenon can support care communication.

Tailoring medical communication about patients' advanced illness, prognosis and death to their individual coping strategies and adapting interventions to patients' needs is at the core of

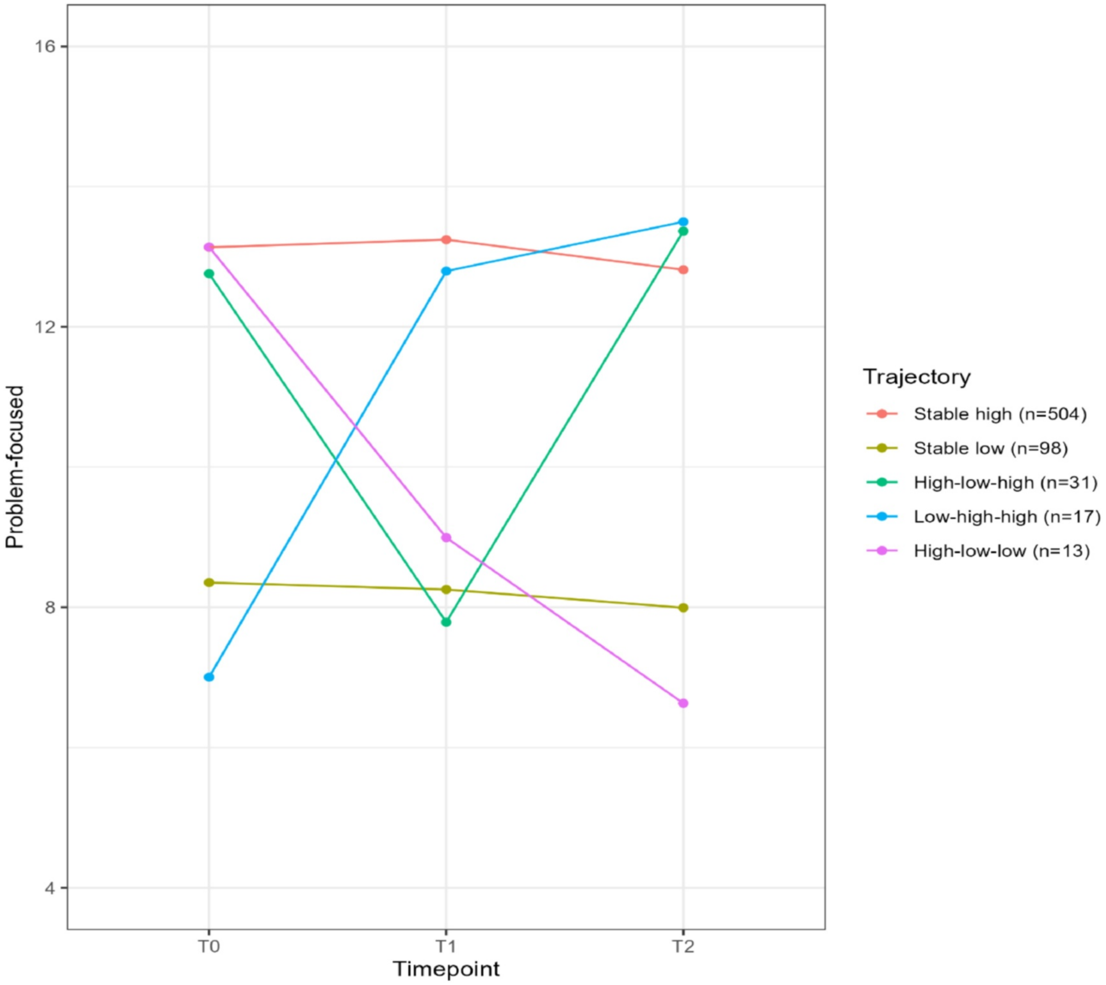

FIGURE 4 | Trajectories (latent classes) of the use of Problem-Focused at baseline (T0), 10 weeks later (T1) and 20 weeks later (T2).

palliative care. We therefore conclude that early integration of palliative care into oncology care is necessary and effective, at least in part due to its impact on coping.

4.2 | Strengths

This research was based on a large set of longitudinal data of patients with an advanced stage of cancer in six European countries. Further, the patients were affected with two common types of cancer. Thus, the study encompasses a wide range of data. Furthermore, the research specified different subpopulations rather than relying on the general trend of stability.

4.3 | Study Limitations

There are certain limitations to this study. First, the research only focused on three coping strategies in connection to patients with advanced cancer. This choice was made to reduce the burden on participants, who were severely ill, by decreasing the complexity and length of the questionnaire. Potentially, the chosen measures were not sensitive to change and the addition of measurements for other coping strategies could have affected the results. For instance, including meaning-based coping, which focuses on efforts to maintain positive well-being, could have provided additional insights [1, 39]. Second, the target group was limited to patients with advanced lung or colorectal cancer, and their experiences may not be generalizable to those of patients with other types of cancer or to patients with other diseases than cancer. Third, the study only encompassed a 5-month time frame and cannot account for changes in coping prior to or after this period. Considering that the participants are in their last stage of life, an extension of the study length was not feasible and might have been burdensome for the patients. In addition, several of the trajectories include only 2%–4% of the sample, while it has been argued that a minimum proportion of 5% is appropriate. However, differences between the latent groups were sufficiently large to justify the current results. Lastly, changes in coping strategies might be explained by changes in clinical processes. However, we do not have insight into the clinical trajectories.

4.4 | Conclusions

We found that coping strategies of most patients with advanced lung or colorectal cancer did not change during a period of 5 months. Still, for each of the coping strategies we also found subgroups with dynamic trajectories.

For Denial coping, older age was found to be associated with less stable coping trajectories whereas Problem-focused coping tended to be more stable for patients who were closer to death. Overall, placing focus on the coping strategies in advanced cancer patients can be facilitative to personalize the provision of adequate support and care.

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Data Availability Statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

References

1. J. A. Greer, A. J. Applebaum, J. C. Jacobsen, J. S. Temel, and V. A. Jackson, "Understanding and Addressing the Role of Coping in Palliative Care for Patients With Advanced Cancer," *Journal of Clinical Oncology* 38, no. 9 (2020): 915–925, https://doi.org/10.1200/jco.19.00013.

2. S. Kaasa and J. H. Loge, "Quality of Life in Palliative Care: Principles and Practice," *Palliative Medicine* 17, no. 1 (2003): 11–20, https://doi.org/10.1191/0269216303pm662ra.

3. R. D. Nipp, A. El-Jawahri, J. N. Fishbein, et al., "The Relationship Between Coping Strategies, Quality of Life, and Mood in Patients With Incurable Cancer," *Cancer* 122, no. 13 (2016): 2110–2116, https://doi.org/10.1002/cncr.30025.

4. J. A. Greer, J. M. Jacobs, A. El-Jawahri, et al., "Role of Patient Coping Strategies in Understanding the Effects of Early Palliative Care on Quality of Life and Mood," *Journal of Clinical Oncology* 36, no. 1 (2018): 53–60, https://doi.org/10.1200/jco.2017.73.7221.

5. T. G. Thomsen, S. Rydahl-Hansen, and L. Wagner, "A Review of Potential Factors Relevant to Coping in Patients With Advanced Cancer," *Journal of Clinical Nursing* 19, no. 23–24 (2010): 3410–3426.

6. R. S. Lazarus, "Coping Theory and Research: Past, Present, and Future," *Psychosomatic Medicine* 55, no. 3 (1993): 234–247.

7. C. S. Carver, M. F. Scheier, and J. K. Weintraub, "Assessing Coping Strategies: A Theoretically Based Approach," *Journal of Personality and Social Psychology* 56, no. 2 (1989): 267–283, https://doi.org/10.1037/0022-3514.56.2.267.

8. C. S. Carver and J. Connor-Smith, "Personality and Coping," *Annual Review of Psychology* 61, no. 1 (2010): 679–704, https://doi.org/10.1146/annurev.psych.093008.100352.

9. S. E. Taylor and A. L. Stanton, "Coping Resources, Coping Processes, and Mental Health," *Annual Review of Clinical Psychology* 3, no. 1 (2007): 377–401, https://doi.org/10.1146/annurev.clinpsy.3.022806.091520.

10. J. A. Litman, "The COPE Inventory: Dimensionality and Relationships With Approach-and Avoidance-Motives and Positive and Negative Traits," *Personality and Individual Differences* 41, no. 2 (2006): 273–284, https://doi.org/10.1016/j.paid.2005.11.032.

11. L. J. Jabbarian, I. J. Korfage, B. Červ, et al., "Coping Strategies of Patients With Advanced Lung or Colorectal Cancer in Six European Countries: Insights From the ACTION Study," *Psycho-Oncology* 29, no. 2 (2020): 347–355, https://doi.org/10.1002/pon.5259.

12. I. Henoch, B. Bergman, M. Gustafsson, F. Gaston-Johansson, and E. Danielson, "The Impact of Symptoms, Coping Capacity, and Social Support on Quality of Life Experience Over Time in Patients With Lung Cancer," *Journal of Pain and Symptom Management* 34, no. 4 (2007): 370–379, https://doi.org/10.1016/j.jpainsymman.2006.12.005.

13. V. L. Beesley, D. D. Smith, C. M. Nagle, et al., "Coping Strategies, Trajectories, and Their Associations With Patient-Reported Outcomes Among Women With Ovarian Cancer," *Supportive Care in Cancer* 26, no. 12 (2018): 4133–4142, https://doi.org/10.1007/s00520-018-4284-0.

14. H. W. M. van Laarhoven, J. Schilderman, G. Bleijenberg, et al., "Coping, Quality of Life, Depression, and Hopelessness in Cancer Patients in a Curative and Palliative, End-of-Life Care Setting," *Cancer Nursing* 34, no. 4 (2011): 302–314, https://doi.org/10.1097/ncc.0b013e3181f9a040.

15. N. S. Endler, N. L. Kocovski, and S. D. Macrodimitris, "Coping, Efficacy, and Perceived Control in Acute vs Chronic Illnesses," *Personality and Individual Differences* 30, no. 4 (2001): 617–625, https://doi.org/10.1016/s0191-8869(00)00060-x.

16. M. H. McConnell, M. Miljanovski, G. Rodin, and M.-F. O'Connor, "Measuring Double Awareness in Patients With Advanced Cancer: A Preliminary Scale Development Study," *Palliative & Supportive Care* (2023): 1–6, https://doi.org/10.1017/s1478951523001669.

17. G. Rodin and C. Zimmermann, "Psychoanalytic Reflections on Mortality: A Reconsideration," *Journal of the American Academy of Psychoanalysis and Dynamic Psychiatry* 36, no. 1 (2008): 181–196, https://doi.org/10.1521/jaap.2008.36.1.181.

18. U. S. Schuler and B. Hornemann, eds., *Hope and Double Awareness in Palliative Oncology. Forum* (Berlin: Springer, 2020).

19. R. H. Moos and C. J. Holahan, "Dispositional and Contextual Perspectives on Coping: Toward an Integrative Framework," *Journal of Clinical Psychology* 59, no. 12 (2003): 1387–1403, https://doi.org/10.1002/jclp.10229.

20. P. Roussi, V. Krikeli, C. Hatzidimitriou, and I. Koutri, "Patterns of Coping, Flexibility in Coping and Psychological Distress in Women Diagnosed With Breast Cancer," *Cognitive Therapy and Research* 31, no. 1 (2007): 97–109, https://doi.org/10.1007/s10608-006-9110-1.

21. K. Baumstarck, O. Chinot, E. Tabouret, et al., "Coping Strategies and Quality of Life: A Longitudinal Study of High-Grade Glioma Patient-Caregiver Dyads," *Health and Quality of Life Outcomes* 16, no. 1 (2018): 1–10, https://doi.org/10.1186/s12955-018-0983-y.

22. M. S. Vos, H. Putter, H. C. van Houwelingen, and H. C. J. M. de Haes, "Denial in Lung Cancer Patients: A Longitudinal Study," *Psycho-Oncology* 17, no. 12 (2008): 1163–1171, https://doi.org/10.1002/pon.1325.

23. J. A. C. Rietjens, I. J. Korfage, L. Dunleavy, et al., "Advance Care Planning–A Multi-Centre Cluster Randomised Clinical Trial: The Research Protocol of the ACTION Study," *BMC Cancer* 16, no. 1 (2016): 1–8, https://doi.org/10.1186/s12885-016-2298-x.

24. I. J. Korfage, G. Carreras, C. M. Arnfeldt Christensen, et al., "Advance Care Planning in Patients With Advanced Cancer: A 6-Country, Cluster-Randomised Clinical Trial," *PLoS Medicine* 17, no. 11 (2020): e1003422, https://doi.org/10.1371/journal.pmed.1003422.

25. C. S. Carver, “You Want to Measure Coping but Your Protocol'too Long: Consider the Brief Cope,” *International Journal of Behavioral Medicine* 4, no. 1 (1997): 92–100, https://doi.org/10.1207/s15327558ijbm0401_6.

26. C. B. Terwee, S. D. M. Bot, M. R. de Boer, et al., “Quality Criteria Were Proposed for Measurement Properties of Health Status Questionnaires,” *Journal of Clinical Epidemiology* 60, no. 1 (2007): 34–42, https://doi.org/10.1016/j.jclinepi.2006.03.012.

27. Muthén B. and D. Kaplan, *Handbook of Quantitative Methodology for the Social Sciences*. (Newcastle upon Tyne: Sage, 2004).

28. K. L. Nylund, T. Asparouhov, and B. O. Muthén, “Deciding on the Number of Classes in Latent Class Analysis and Growth Mixture Modeling: A Monte Carlo Simulation Study,” *Structural Equation Modeling: A Multidisciplinary Journal* 14, no. 4 (2007): 535–569, https://doi.org/10.1080/10705510701575396.

29. G. Rodin, C. Lo, A. Rydall, et al., “Managing Cancer and Living Meaningfully (CALM): A Randomized Controlled Trial of a Psychological Intervention for Patients With Advanced Cancer,” *Journal of Clinical Oncology* 36, no. 23 (2018): 2422–2432, https://doi.org/10.1200/jco.2017.77.1097.

30. S. C. Danhauer, S. L. Crawford, D. F. Farmer, and N. E. Avis, “A Longitudinal Investigation of Coping Strategies and Quality of Life Among Younger Women With Breast Cancer,” *Journal of Behavioral Medicine* 32, no. 4 (2009): 371–379, https://doi.org/10.1007/s10865-009-9211-x.

31. M.-S. Paek, E. H. Ip, B. Levine, and N. E. Avis, “Longitudinal Reciprocal Relationships Between Quality of Life and Coping Strategies Among Women With Breast Cancer,” *Annals of Behavioral Medicine* 50, no. 5 (2016): 775–783, https://doi.org/10.1007/s12160-016-9803-y.

32. O. McSorley, E. McCaughan, G. Prue, K. Parahoo, B. Bunting, and J. O'Sullivan, “A Longitudinal Study of Coping Strategies in Men Receiving Radiotherapy and Neo-Adjuvant Androgen Deprivation for Prostate Cancer: A Quantitative and Qualitative Study,” *Journal of Advanced Nursing* 70, no. 3 (2014): 625–638, https://doi.org/10.1111/jan.12224.

33. M. S. Vos, H. Putter, H. C. van Houwelingen, and H. C. J. M. de Haes, “Denial and Social and Emotional Outcomes in Lung Cancer Patients: The Protective Effect of Denial,” *Lung Cancer* 72, no. 1 (2011): 119–124, https://doi.org/10.1016/j.lungcan.2010.07.007.

34. J. S. Temel, J. A. Greer, A. Muzikansky, et al., “Early Palliative Care for Patients With Metastatic Non–Small-Cell Lung Cancer,” *New England Journal of Medicine* 363, no. 8 (2010): 733–742, https://doi.org/10.1056/nejmoa1000678.

35. J. S. Temel, J. A. Greer, A. El-Jawahri, et al., “Effects of Early Integrated Palliative Care in Patients With Lung and GI Cancer: A Randomized Clinical Trial,” *Journal of Clinical Oncology* 35, no. 8 (2017): 834–841, https://doi.org/10.1200/jco.2016.70.5046.

36. M. Bakitas, K. D. Lyons, M. T. Hegel, et al., “Effects of a Palliative Care Intervention on Clinical Outcomes in Patients With Advanced Cancer: The Project ENABLE II Randomized Controlled Trial,” *Journal of the American Medical Association* 302, no. 7 (2009): 741–749, https://doi.org/10.1001/jama.2009.1198.

37. C. Zimmermann, N. Swami, M. Krzyzanowska, et al., “Early Palliative Care for Patients With Advanced Cancer: A Cluster-Randomised Controlled Trial,” *Lancet* 383, no. 9930 (2014): 1721–1730, https://doi.org/10.1016/s0140-6736(13)62416-2.

38. J. A. Greer, W. F. Pirl, V. A. Jackson, et al., “Effect of Early Palliative Care on Chemotherapy Use and End-of-Life Care in Patients With Metastatic Non–Small-Cell Lung Cancer,” *Journal of Clinical Oncology* 30, no. 4 (2011): 394–400, https://doi.org/10.1200/jco.2011.35.7996.

39. K. R. Ellis, M. R. Janevic, T. Kershaw, C. H. Caldwell, N. K. Janz, and L. Northouse, “Meaning-Based Coping, Chronic Conditions and Quality of Life in Advanced Cancer & Caregiving,” *Psycho-Oncology* 26, no. 9 (2017): 1316–1323, https://doi.org/10.1002/pon.4146.

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