

Coping and Prognostic Awareness in Patients With Advanced Cancer

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A B S T R A C T

Purpose

Patients' understanding of their illness is key for making informed treatment decisions, yet studies suggest an association between prognostic awareness and worse quality of life (QOL) and mood among patients with advanced cancer. We sought to explore the relationships among prognostic awareness, coping, QOL, and mood in patients with newly diagnosed, incurable cancer.

Methods

We assessed patients' self-reported health status and treatment goal (Prognosis and Treatment Perceptions Questionnaire), coping (Brief COPE), QOL (Functional Assessment of Cancer Therapy-General), and mood (Hospital Anxiety and Depression Scale) within 8 weeks of incurable lung or GI cancer diagnosis. We used linear regression to examine associations and interaction effects among patients' health status and treatment goal, coping strategies, QOL, and mood.

Results

Patients who reported a terminally ill health status had worse QOL (unstandardized coefficient [B] = -6.88 ; $P < .001$), depression ($B = 1.60$; $P < .001$), and anxiety ($B = 1.17$; $P = .007$). Patients who reported their oncologist's treatment goal was "to cure my cancer" had better QOL ($B = 4.33$; $P = .03$) and less anxiety ($B = -1.39$; $P = .007$). We observed interaction effects between self-reported health status and treatment goal and certain coping strategies. Specifically, subgroup analyses showed that greater use of positive reframing was related to better QOL ($B = 2.61$; $P < .001$) and less depression ($B = -0.78$; $P < .001$) among patients who reported a terminally ill health status. Active coping was associated with better QOL ($B = 3.50$; $P < .001$) and less depression ($B = -1.01$; $P < .001$) among patients who acknowledged their oncologist's treatment goal was not "to cure my cancer."

Conclusion

Prognostic awareness is related to worse QOL and mood in patients with newly diagnosed, incurable cancer; however, the use of certain coping strategies may buffer these relationships. Interventions to improve patients' prognostic awareness should seek to cultivate more adaptive coping strategies in order to enhance QOL and mood.

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INTRODUCTION

Patients with advanced cancer prefer that their oncologists disclose their assessment of their prognosis, yet data suggest that most patients inaccurately perceive their illness as curable.¹⁻³ In addition, patients and their oncologists often report discordant illness perceptions, with patients reporting a more optimistic assessment of their prognosis.⁴ Nonetheless, patients with an accurate prognostic understanding of their illness are better able to make informed treatment decisions and to prepare for the future.^{3,5-7} Of importance, research suggests that patient-clinician

communication about prognosis does not take away patients' hope but, rather, improves end-of-life care, such as enabling patients to die in their preferred setting and ensuring bereavement support for their family.⁸⁻¹⁰ Thus, improving patient-clinician communication about illness and prognosis is a priority for enhancing the quality of care for patients with cancer.

Despite the need for improved communication regarding prognosis, prior research has demonstrated that patients with advanced cancer who have accurate prognostic awareness are more likely to experience worse quality of life (QOL), mood symptoms, and survival.^{1-3,6,11,12} However, to date, studies have primarily been

ASSOCIATED CONTENT



Appendix
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correlational in design, which limited the interpretation of the direction of these relationships. For example, patients with advanced cancer who have greater symptom burden and worse QOL may simply be more accurate in their assessment of their disease status and prognosis compared with those with better QOL. In contrast to these correlational studies, a randomized trial of early palliative care integrated with oncology care demonstrated that patients who were assigned to the intervention were more likely to develop or maintain accurate prognostic awareness over time, as well as to report improved QOL and depression symptoms, compared with those who received oncology care alone.^{13,14} Thus, to help reconcile findings from prior studies and to develop strategies that effectively enhance patients' prognostic awareness, further research is needed to elucidate the complex relationships between prognostic awareness, QOL, and mood.

Moreover, factors such as the use of certain coping strategies may influence the relationships between patients' prognostic awareness and their QOL and mood.¹⁵⁻²⁴ After a diagnosis of incurable cancer, patients must cope with numerous stressors, including the need to make urgent treatment decisions, manage adverse effects of the diagnosis and treatment, and tolerate uncertainty regarding their future.²⁵⁻³⁰ The manner in which patients cope with their life-threatening illness likely influences their prognostic awareness and experience with their illness.³¹ For example, some coping strategies may allow patients to better acknowledge the terminal nature of their illness, whereas other coping mechanisms may hinder their ability to tolerate prognosis discussions.³² In addition, research has demonstrated that certain coping strategies may be more adaptive than others with regard to patients' QOL and mood.^{15,18,33} Strategies such as acceptance coping positively correlate with patients' QOL and mood, whereas denial and self-blame negatively correlate with these outcomes.^{15-18,33} However, little is known about the interaction between patients' use of coping strategies and their prognostic awareness, QOL, and mood.

In the current study, we used baseline data from patients with newly diagnosed, incurable cancer to investigate associations and explore interaction effects among patients' prognostic awareness, coping strategies, QOL, and mood. We studied two constructs of prognostic awareness by assessing patients' self-reported health status and treatment goal. On the basis of prior research, we hypothesized that patients with a more accurate understanding of their health status and treatment goal would report worse QOL and mood, yet their use of certain coping strategies would moderate these relationships.^{1,12}

METHODS

Study Design

We approached patients who were within 8 weeks of diagnosis with incurable cancer to participate in a randomized trial of early palliative care integrated with oncology care versus oncology care alone. Although the parent trial sought to evaluate the effect of early integrated palliative care, the current study uses data before patient random assignment and before the start of the intervention.³⁴ After informed consent, participants completed baseline assessments before random assignment and notification of study arm allocation. The Dana-Farber/Harvard Cancer Care institutional review board approved the study protocol.

Patient Selection

The sample included patients from Massachusetts General Hospital Cancer Center with a confirmed diagnosis of incurable lung or non-colorectal GI cancer with the following characteristics: diagnosis within the previous 8 weeks, not receiving treatment with curative intent, an Eastern Cooperative Oncology Group performance status of 0 to 2, age \geq 18 years, no prior therapy for metastatic disease, planned to receive care at Massachusetts General Hospital, and could read and respond to questions in English or with minimal assistance from family or an interpreter. We excluded patients who were already receiving palliative care services, those who needed immediate referral to palliative care or hospice, or those who had significant psychiatric or other comorbid disease, which the treating clinician believed prohibited informed consent or study participation.

Study Measures

Sociodemographic and clinical factors. Study participants completed a baseline demographic questionnaire to report their race, ethnicity, religion, relationship status, education, presence of dependent children, and annual income. We reviewed electronic health records to obtain participants' age, sex, Eastern Cooperative Oncology Group performance status, and cancer diagnosis, stage, and therapy.

QOL. We used the Functional Assessment of Cancer Therapy-General (FACT-G; version 4) to assess QOL.³⁵ The FACT-G contains 27 items with subscales that measure well-being during the past week across four domains: physical, functional, emotional, and social. Higher scores indicate better QOL.

Depression and anxiety. To assess depression and anxiety symptoms, patients completed the Hospital Anxiety and Depression Scale (HADS).³⁶ The 14-item HADS questionnaire contains two 7-item subscales that measure depression and anxiety symptoms during the past week. Scores on each subscale range from 0 to 21. Higher scores indicate greater distress.

Coping strategies. To evaluate patients' use of certain coping strategies, we administered the 28-item Brief COPE questionnaire. The 28-item Brief COPE questionnaire measures 14 coping strategies using two items for each strategy.³⁷ To minimize questionnaire burden, we solicited feedback from our research and palliative care teams about the coping strategies that were most likely to be influenced by our early palliative care intervention. We chose to exclude items such as self-distraction, substance use, and venting, and limited our evaluation to seven coping strategies that were deemed most relevant for the study: emotional support, positive reframing, active coping, acceptance, self-blame, denial, and behavioral disengagement. Scores for each coping strategy range from 2 to 8, with higher scores reflecting greater use of that specific strategy.

Patient-reported health status and treatment goal. We used the Prognosis and Treatment Perceptions Questionnaire—a survey previously developed to assess patients' prognostic understanding.¹² The Prognosis and Treatment Perceptions Questionnaire asks patients about their primary treatment goal, their oncologist's primary treatment goal, and their current medical status. Specifically, we asked participants to report the primary goal of their current cancer treatment from the following mutually exclusive options: "to lessen my suffering as much as possible," "for me and/or my family to be able to keep hoping," "to make sure I have done everything," "to extend my life as long as possible," "to cure my cancer," "to help cancer research," or "other." Using the same response options, we asked participants to report their oncologist's primary goal of their current cancer treatment. For both questions, we categorized responses as either "to cure my cancer" or "not to cure my cancer," consistent with prior studies.^{12,38} We asked participants to describe their current health status by choosing from the following mutually exclusive options: "relatively healthy," "relatively healthy and terminally ill," "seriously ill and not terminally ill," or "seriously ill and terminally ill." Consistent with prior research, we categorized responses as either "terminally ill" or "not terminally ill."¹²

Statistical analysis. We used descriptive statistics to evaluate the frequencies, means, and standard deviations of study variables. To examine associations between patients' self-reported health status and treatment

goal and their QOL and mood, we used linear regression. To determine the presence of an interaction between patients' self-reported health status and treatment goal and their use of certain coping strategies (measured continuously), we used linear regression with QOL and mood (measured continuously) as outcomes. Specifically, we created an interaction term (health status [1, terminally ill; 0, not terminally ill] × coping strategy [continuous variable]; treatment goal [1, to cure my cancer; 0, not to cure my cancer] × coping strategy [continuous variable]) and included this term, along with both interaction components, as predictors in the models. In all models, we adjusted for variables that were significantly different across groups (Appendix Tables A1 and A2, online only). For each statistically significant interaction ($P < .05$), we performed analyses within the health status and treatment goal subgroups.³⁹ To adjust for multiple testing in subgroup analyses, we corrected the α level by using the Bonferroni method ($\alpha = .05/20 = .0025$). In addition to available case analyses, we used multiple imputations for missing observations to ensure consistent results. In our multiple imputation approach, we used characteristics—age, sex, relationship status, education, cancer type, and presence of dependent children—to build a regression model to impute missing data with 100 imputations. We used SPSS for Windows version 20 (SPSS, Chicago, IL) for statistical analyses.

RESULTS

Participant Sample

Of 480 eligible patients between May 2011 and July 2015, 350 (72.9%) enrolled in the study. As shown in Table 1, participants (mean age ± standard deviation, 64.9 ± 10.9 years) were primarily white (92.3%), married (69.7%), and educated beyond high school (62.6%). Approximately one half were female (46.0%) and had lung cancer (54.6%).

Patient-Reported Health Status and Treatment Goal

Nearly one half of participants (49.4%) reported their current health status as “terminally ill” (Fig 1). Approximately one third (33.1%) reported their primary treatment goal was “to cure my cancer” (Fig 2). Yet within this subgroup who reported their primary treatment goal was “to cure my cancer,” 44.9% acknowledged that their oncologist’s goal was not “to cure my cancer.” Among all participants, 22.8% reported that their oncologist’s primary treatment goal was “to cure my cancer” (Fig 3).

Relationship Between Patient-Reported Health Status and Treatment Goal, QOL, and Mood

Patient report of a terminally ill health status was associated with worse QOL (unstandardized coefficient [B], -6.88 ; standard error [SE], 1.63; 95% CI, -10.08 to -3.68 ; $P < .001$) as well as greater depression (B, 1.60; SE, 0.43; 95% CI, 0.74 to 2.45; $P < .001$) and anxiety (B, 1.17; SE, 0.43; 95% CI, 0.32 to 2.01; $P = .007$). A patient report that his or her primary treatment goal was “to cure my cancer” was not significantly associated with QOL (B, 2.79; SE, 1.79; 95% CI, -0.74 to 6.31; $P = .12$), depression (B, -0.27 ; SE, 0.47; 95% CI, -1.21 to 0.66; $P = .56$), or anxiety (B, -0.72 ; SE, 0.46; 95% CI, -1.62 to 0.19; $P = .12$); however, a patient report that his or her oncologist’s primary treatment goal was “to cure my cancer” was associated with better QOL (B, 4.33; SE, 2.00; 95% CI, 0.41 to 8.26; $P = .03$) and lower anxiety (B, -1.39 ; SE, 0.51; 95% CI, -2.40

Table 1. Baseline Characteristics of Study Participants (N = 350)

Characteristic	Value
Age, years, mean (SD)	64.9 (10.9)
≥ 65	176 (50.3)
Sex, No. (%)	
Male	189 (54.0)
Female	161 (46.0)
Race, No. (%)	
White	323 (92.3)
African American	10 (2.9)
Asian	8 (2.3)
American Indian or Alaska Native	4 (1.1)
Other	5 (1.4)
Hispanic or Latino	9 (2.6)
Cancer type, No. (%)	
GI	159 (45.4)
Lung	191 (54.6)
ECOG performance status, No. (%)	
0	88 (25.1)
1	231 (66.0)
2	31 (8.9)
Initial cancer therapy, No. (%)	
Chemotherapy	278 (79.4)
Radiation*	67 (19.1)
Chemoradiotherapy	3 (0.9)
No treatment	2 (0.6)
Religion, No. (%)	
Catholic	201 (57.4)
Protestant	62 (17.7)
Jewish	16 (4.6)
Muslim	3 (0.9)
None	41 (11.7)
Other	26 (7.4)
Missing data	1 (0.3)
Relationship status, No. (%)	
Married	245 (70.0)
Divorced	36 (10.3)
Widowed	35 (10.0)
Single	34 (9.7)
Have dependent children, No. (%)	44 (12.6)
Education level, No. (%)	
≤ High school	131 (37.4)
> High school	219 (62.6)
Income Level, USD, No. (%)	
≤ 50,000	133 (38.0)
> 50,000	189 (54.0)
Missing data	28 (8.0)

Abbreviations: ECOG, Eastern Cooperative Oncology Group; SD, standard deviation.
*One patient who received transarterial chemoembolization as initial cancer therapy is included in the radiation category.

to -0.38 ; $P = .007$), but not with depression (B, -0.68 ; SE, 0.53; 95% CI, -1.72 to 0.36; $P = .20$).

Interactions Between Patient-Reported Health Status and Treatment Goal and Coping Strategies

We found interactions between a patient report of a terminally ill health status and the use of certain coping strategies for QOL and mood outcomes. For QOL (FACT-G), we observed significant interactions between a report of a terminally ill health status and positive reframing (B, -1.87 ; SE, 0.88; 95% CI, 0.13 to 3.60; $P = .04$) and denial coping (B, -2.35 ; SE, 1.00; 95% CI, -4.33 to -0.38 ; $P = .02$). For HADS-Depression, we found interactions between a patient report of a terminally ill health status and

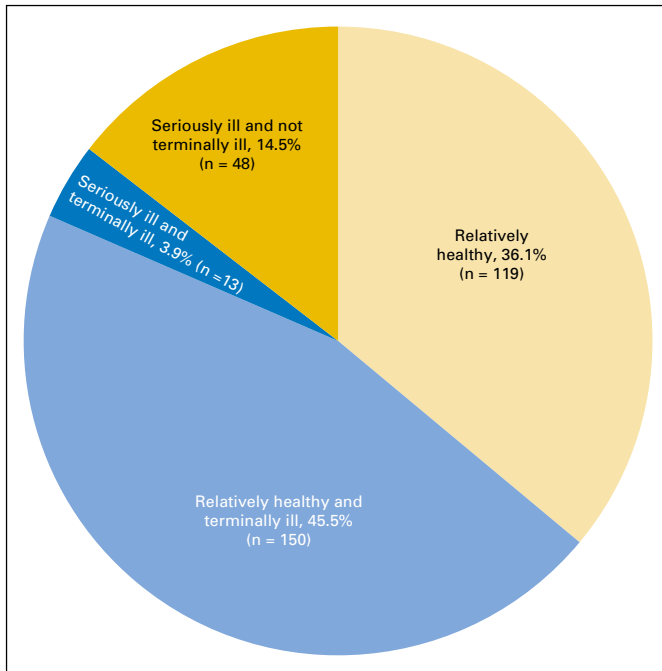


Fig 1. Patient report of his or her current health status. Displays patient responses to the question, “How would you describe your current medical status?”

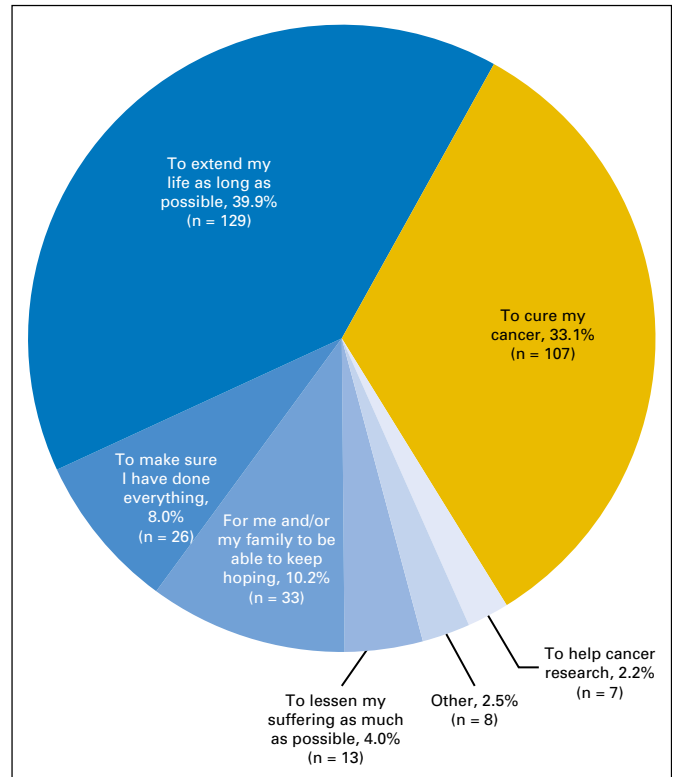


Fig 2. Patient report of his or her primary goal of current cancer treatment. Displays patient responses to the question, “If you had to choose one, what would you say is your primary goal of your current cancer treatment?”

positive reframing (B, -0.47 ; SE, 0.23 ; 95% CI, -0.93 to -0.02 ; $P = .04$) and behavioral disengagement coping (B, 1.30 ; SE, 0.53 ; 95% CI, 0.27 to 2.33 ; $P = .01$). For HADS-Anxiety, we found significant interactions between a patient report of a terminally ill health status and positive reframing (B, -0.66 ; SE, 0.24 ; 95% CI, -1.13 to -0.19 ; $P = .006$) and emotional support coping (B, -1.04 ; SE, 0.49 ; 95% CI, -2.01 to -0.08 ; $P = .03$). We obtained similar results in our models that used multiple imputations (Appendix Tables A3 and A4, online only).

To interpret these interactions, we conducted subgroup analyses of the associations between these coping strategies and patients' QOL and mood outcomes by patient report of a terminally ill health status (Table 2). These analyses demonstrated that positive reframing coping was associated with better QOL and mood outcomes among patients who reported a terminally ill health status, but not consistently in those who did not acknowledge their terminal illness. Within the subgroup that reported a terminally ill health status, we found that behavioral disengagement correlated with greater depression, whereas emotional support correlated with less anxiety.

We also identified interactions between a patient report of his or her oncologist's primary treatment goal and use of certain coping strategies for QOL and mood outcomes. With QOL (FACT-G), we found significant interactions between a patient report of his or her oncologist's treatment goal and use of active (B, -4.78 ; SE, 1.47 ; 95% CI, -7.68 to -1.88 ; $P = .001$) and acceptance coping (B, -2.81 ; SE, 1.18 ; 95% CI, -5.13 to -0.49 ; $P = .02$). For HADS-Depression, we found an interaction between a patient report of his or her oncologist's treatment goal and active coping (B, 1.02 ; SE, 0.39 ; 95% CI, 0.25 to 1.78 ; $P = .009$). For HADS-Anxiety, we observed a significant interaction between a patient report of his or her oncologist's treatment goal and acceptance coping (B, 0.97 ; SE, 0.32 ; 95% CI, 0.34 to 1.61 ; $P = .003$).

Given these interactions, we conducted subgroup analyses of the associations between these coping strategies and patients' QOL and mood outcomes by patient report of his or her oncologist's treatment goal (Table 3). Among patients who acknowledged that their oncologist's primary treatment goal was not “to cure my cancer,” the use of active coping was associated with better QOL and less depression. In addition, acceptance coping correlated with better QOL and less anxiety among patients who reported that their oncologist's primary treatment goal was not “to cure my cancer.”

We did not observe additional significant interactions between patients' self-reported health status and treatment goal and any remaining coping styles. We also did not find significant interactions between patient report of his or her primary treatment goal and any coping strategies for QOL and mood outcomes.

DISCUSSION

We investigated the relationships between patients' prognostic awareness, coping strategies, QOL, and mood. Using two constructs of prognostic awareness—patient-reported health status and treatment goal—we found that a substantial proportion of patients reported inaccurate prognostic understanding. More than one half of patients indicated that their current health status was not terminal and nearly one third noted that their primary treatment goal was “to cure my cancer.” Patients with an accurate understanding of their health status and treatment goal reported

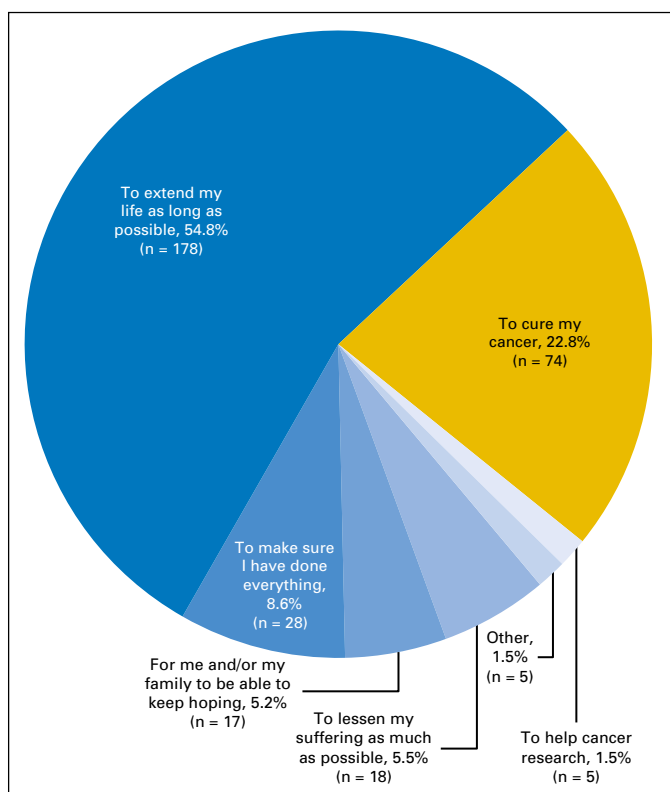


Fig 3. Patient report of his or her oncologist's primary goal of current cancer treatment. Displays patient responses to the question, "If you had to choose one, what would you say is your oncologist's primary goal of your current cancer treatment?"

worse QOL and mood. Of note, we observed interaction effects between patients' use of certain coping strategies and the relationships among their self-reported health status and treatment goal, QOL, and mood. Collectively, these findings provide important new evidence that patients' coping strategies represent a key factor that may influence the relationship between patients' prognostic awareness and their QOL and mood.

Subgroup analyses revealed that the significant relationships between patients' use of certain coping strategies and their QOL and mood existed primarily among patients with accurate prognostic

understanding. For example, among patients who accurately reported a terminally ill health status, positive reframing correlated with better QOL and less depression. Similarly, active coping was associated with better QOL and less depression among patients who accurately reported that their oncologist's primary treatment goal was not to cure their cancer. Clinically, our findings suggest that use of adaptive coping behaviors, such as positive reframing (eg, looking for something good in what is happening), active coping (eg, taking action to try to make the situation better), acceptance (eg, accepting the reality of the fact that it happened), and seeking emotional support, provide a means for enhancing QOL and mood among patients who accurately acknowledge their poor prognosis. Future interventions designed to improve patients' prognostic understanding should seek to foster the use of adaptive coping skills in this population.

Of interest, we discovered a lack of concordance between patients' report of their own primary treatment goal and their report of their oncologist's goal. Although prior studies have demonstrated patient-oncologist prognostic discordance, few have evaluated patients' perceptions of their oncologists' treatment goal.^{4,41} We found that among patients who reported their own treatment goal was to cure their cancer, nearly one half acknowledged that their oncologist's goal differed. This discordance between patients' understanding for themselves versus their perceptions of their oncologists' treatment goal may reflect the presence of cognitive and emotional dissonance.⁴² When asked to report their primary treatment goal, patients may actually be reporting their hopes or wishes, rather than their true understanding. This disconnect may also reflect patients' difficulty responding to questions regarding their treatment goal. Many patients may endorse that their goal or wish is to be cured, even if they simultaneously understand their cancer is incurable. Future studies that involve patients' understanding of their illness should consider the potential role of cognitive dissonance and the need to ask patients about their prognostic awareness in various ways to gain deeper insight into their true understanding.

To our knowledge, our work represents the largest study to date to highlight that patients who acknowledge their poor prognosis report worse QOL and mood. A more comprehensive understanding of the associations among patients' understanding of their health status and treatment goal, QOL, and mood can be instrumental in clarifying their prognostic awareness and helping

Table 2. Relationship Between Patients' Use of Coping Strategies and Their Quality of Life and Mood Outcomes by Patient Report of Their Current Health Status

Coping Strategy	Patient Report of Their Current Health Status					
	Not Terminally Ill			Terminally Ill		
	B (SE)	95% CI	P	B (SE)	95% CI	P
Quality of life (FACT-G)						
Positive reframing	0.74 (0.57)	-0.38 to 1.87	.194	2.61 (0.68)	1.27 to 3.95	< .001
Denial	-2.20 (0.71)	-3.60 to -0.80	.002	-4.56 (0.71)	-5.95 to -3.16	< .001
HADS-Depression						
Positive reframing	-0.31 (0.15)	-0.61 to -0.01	.042	-0.78 (0.18)	-1.13 to -0.43	< .001
Behavioral disengagement	0.07 (0.37)	-0.67 to 0.80	.859	1.36 (0.37)	0.63 to 2.10	< .001
HADS-Anxiety						
Positive reframing	0.26 (0.16)	-0.05 to 0.57	.102	-0.40 (0.18)	-0.75 to -0.05	.026
Emotional support	-0.05 (0.35)	-0.73 to 0.64	.888	-1.09 (0.35)	-1.77 to -0.41	.002

Abbreviations: FACT-G, Functional Assessment of Cancer Therapy-General; HADS, Hospital Anxiety and Depression Scale.

Table 3. Relationship Between Patients' Use of Coping Strategies and Their Quality of Life and Mood Outcomes by Patient Report of Their Oncologist's Primary Goal of Current Cancer Treatment

Coping Strategy*	Patient Report of Their Oncologist's Primary Goal of Current Cancer Treatment					
	To Cure My Cancer			Not to Cure My Cancer		
	B (SE)	95% CI	P	B (SE)	95% CI	P
Quality of life (FACT-G)						
Active	-1.41 (1.31)	-4.03 to 1.22	.288	3.50 (0.62)	2.31 to 4.70	< .001
Acceptance	1.40 (1.08)	-0.75 to 3.55	.199	4.32 (0.52)	3.29 to 5.36	< .001
HADS-Depression						
Active	-0.08 (0.38)	-0.67 to 0.83	.832	-1.01 (0.16)	-1.32 to -0.70	< .001
HADS-Anxiety						
Acceptance	0.04 (0.30)	-0.56 to 0.63	.907	-0.91 (0.14)	-1.19 to -0.63	< .001

Abbreviations: FACT-G, Functional Assessment of Cancer Therapy-General; HADS, Hospital Anxiety and Depression Scale.

*All models adjusted for Eastern Cooperative Oncology Group performance status.

them cope with the physical and psychological effects of their terminal illness; understanding how prognostic awareness can influence patients' decision-making and approach to end-of-life care; and in identifying ways to foster prognostic awareness while enhancing patients' QOL and mood.

Our study has several limitations. First, we conducted this study at an academic cancer center in a relatively homogeneous sample; thus, our findings may not generalize to other, more diverse populations in different geographic areas. Second, we lack information about patient-clinician communication and, therefore, cannot distinguish the amount or quality of information provided to patients about their cancer. Finally, our study design allows us to comment on associations, but we cannot state the directionality of these relationships. In addition, our cross-sectional design prohibits our ability to determine how these relationships change over time. Future research should include longitudinal assessments with audio-recorded visits to provide objective information about prognostic disclosure and the effect of patient-clinician communication on patients' prognostic awareness, coping strategies, QOL, and mood.

Our study provides novel insights into the relationships between patients' prognostic awareness and their QOL and mood. We discovered interaction effects with patients' use of certain coping strategies on these relationships, which underscores the importance of promoting the use of more adaptive coping strategies, particularly among patients with accurate prognostic understanding. Efforts to cultivate more adaptive coping among patients when disclosing prognosis include assessing patients' prognostic understanding and coping mechanisms, determining their readiness and clinical urgency, and delivering prognostic

information that is tailored to their needs.^{43,44} Future research is needed to develop and test interventions to enhance patients' prognostic awareness and to support effective end-of-life decision-making. Such efforts would ideally address patients' QOL and psychosocial needs while facilitating the use of more adaptive coping behaviors.

AUTHORS' DISCLOSURES OF POTENTIAL CONFLICTS OF INTEREST

Disclosures provided by the authors are available with this article at jco.org.

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Final approval of manuscript: All authors

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Appendix

Table A1. Characteristics of Study Participants by Patient Report of Their Current Health Status

Clinical Characteristic	Not Terminally Ill (n = 167)	Terminally Ill (n = 163)	P
Age, years, mean (SD)	65.80 (10.58)	63.88 (11.22)	.111
≥ 65	89 (53.3)	77 (47.2)	.322
Sex, No. (%)			
Male	96 (57.5)	82 (50.3)	.224
Female	71 (42.5)	81 (49.7)	
Race, No. (%)			
White	149 (89.2)	156 (95.7)	.101
African American	6 (3.6)	3 (1.8)	
Asian	7 (4.2)	1 (0.6)	
American Indian or Alaska Native	1 (0.6)	2 (1.2)	
Other	4 (2.4)	1 (0.6)	
Hispanic or Latino	7 (4.2)	2 (1.2)	.174
Cancer type, No. (%)			
GI	71 (42.5)	76 (46.6)	.506
Lung	96 (57.5)	87 (53.4)	
ECOG performance status, No. (%)			
0	43 (25.7)	42 (25.8)	.965
1	109 (65.3)	105 (64.4)	
2	15 (9.0)	16 (9.8)	
Initial cancer therapy, No. (%)			
Chemotherapy	133 (79.6)	130 (79.8)	.944
Radiation*	32 (19.2)	30 (18.4)	
Chemoradiotherapy	1 (0.6)	2 (1.2)	
No treatment	1 (0.6)	1 (0.6)	
Religion, No. (%)			
Catholic	98 (59.0)	91 (55.8)	.632
Protestant	29 (17.5)	29 (17.8)	
Jewish	9 (5.4)	6 (3.7)	
Muslim	0 (0.0)	2 (1.2)	
None	18 (10.8)	23 (14.1)	
Other	12 (7.2)	12 (7.4)	
Relationship status, No. (%)			
Married	115 (68.9)	117 (71.8)	.095
Divorced	24 (14.4)	11 (6.7)	
Widowed	12 (7.2)	19 (11.7)	
Single	16 (9.6)	16 (9.8)	
Have dependent children, No. (%)	21 (12.6)	22 (13.5)	.871
Education level, No. (%)			
≤ High school	60 (35.9)	65 (39.9)	.497
> High school	107 (64.1)	98 (60.1)	
Income level, USD, No. (%)			
≤ 50,000	69 (45.1)	58 (38.4)	.247
> 50,000	84 (54.9)	93 (61.6)	

Abbreviations: ECOG, Eastern Cooperative Oncology Group; SD, standard deviation.

*One patient who received transarterial chemoembolization as initial cancer therapy is included in the radiation category.

Table A2. Characteristics of Study Participants by Patient Report of Their Oncologist's Primary Goal of Current Cancer Treatment

Clinical Characteristic	Oncologist Goal Not to Cure (n = 251)	Oncologist Goal is to Cure (n = 74)	P
Age, years, mean (SD)	64.81 (10.88)	64.39 (11.17)	.774
≥ 65	127 (50.6)	35 (47.3)	.692
Sex			
Male	133 (53.0)	41 (55.4)	.791
Female	118 (47.0)	33 (44.6)	
Race			
White	235 (93.6)	65 (87.8)	.294
African American	6 (2.4)	3 (4.1)	
Asian	6 (2.4)	2 (2.7)	
American Indian or Alaska Native	2 (0.8)	1 (1.4)	
Other	2 (0.8)	3 (4.1)	
Hispanic or Latino	6.0 (1.9)	3.0 (0.9)	.428
Cancer type			
GI	110 (43.8)	34 (45.9)	.791
Lung	141 (56.2)	40 (54.1)	
ECOG performance status			
0	74 (29.5)	11 (14.9)	.022
1	158 (62.9)	53 (71.6)	
2	19 (7.6)	10 (13.5)	
Initial cancer therapy			
Chemotherapy	195 (77.7)	63 (85.1)	.429
Radiation*	51 (20.3)	11 (14.9)	
Chemoradiotherapy	3 (1.2)	0 (0.0)	
No treatment	2 (0.8)	0 (0.0)	
Religion			
Catholic	135 (54.0)	52 (70.3)	.110
Protestant	49 (19.6)	8 (10.8)	
Jewish	15 (6.0)	1 (1.4)	
Muslim	1 (0.4)	1 (1.4)	
None	31 (12.4)	8 (10.8)	
Other	19 (7.6)	4 (5.4)	
Relationship status			
Married	179 (71.3)	51 (68.9)	.594
Divorced	24 (9.6)	9 (12.2)	
Widowed	26 (10.4)	5 (6.8)	
Single	22 (8.8)	9 (12.2)	
Have dependent children	34 (13.5)	9 (12.2)	.847
Education level			
≤ High school	91 (36.3)	32 (43.2)	.279
> High school	160 (63.7)	42 (56.8)	
Income level, USD			
≤ 50,000	92 (39.7)	32 (47.8)	.261
> 50,000	140 (60.3)	35 (52.2)	

NOTE. Data are given as No. (%) unless otherwise noted.

Abbreviations: ECOG, Eastern Cooperative Oncology Group; SD, standard deviation.

*One patient who received transarterial chemoembolization as initial cancer therapy is included in the radiation category.

Coping and Prognostic Awareness

Table A3. Interactions Between Coping and Patient Report of Their Current Health Status Using Available Case Analyses and Multiple Imputations

Interaction Term	Available Case Analysis		Multiple Imputations	
	B	P	B	P
FACT-G				
Active × prognosis terminal	1.907	.095	1.461	.179
Denial × prognosis terminal	-2.354	.019	-2.104	.036
Emotional support × prognosis terminal	3.181	.077	2.866	.086
Behavioral disengagement × prognosis terminal	-3.258	.100	-2.756	.155
Positive reframing × prognosis terminal	1.867	.035	1.482	.093
Self-blame × prognosis terminal	-1.785	.144	-1.339	.272
Acceptance × prognosis terminal	1.162	.229	1.050	.254
HADS-Depression				
Active × prognosis terminal	-0.551	.069	-0.498	.084
Denial × prognosis terminal	0.147	.598	0.136	.617
Emotional support × prognosis terminal	-0.908	.060	-0.720	.102
Behavioral disengagement × prognosis terminal	1.299	.014	1.039	.043
Positive reframing × prognosis terminal	-0.472	.043	-0.415	.068
Self-blame × prognosis terminal	0.521	.112	0.393	.227
Acceptance × prognosis terminal	-0.195	.451	-0.223	.358
HADS-Anxiety				
Active × prognosis terminal	-0.423	.167	-0.269	.339
Denial × prognosis terminal	0.238	.366	0.165	.511
Emotional support × prognosis terminal	-1.041	.034	-0.783	.078
Behavioral disengagement × prognosis terminal	0.737	.150	0.589	.226
Positive reframing × prognosis terminal	-0.659	.006	-0.482	.038
Self-blame × prognosis terminal	-0.210	.505	-0.135	.663
Acceptance × prognosis terminal	-0.491	.062	-0.399	.103

Abbreviations: FACT-G, Functional Assessment of Cancer Therapy-General; HADS, Hospital Anxiety and Depression Scale.

Table A4. Interactions Between Coping and Patient Report of Their Oncologist's Primary Goal of Current Cancer Treatment Using Available Case Analyses and Multiple Imputations

Interaction Term*	Available Case Analysis		Multiple Imputations	
	B	P	B	P
FACT-G				
Active × oncologist goal cure	-4.777	.001	-4.268	.004
Denial × oncologist goal cure	0.754	.571	0.710	.592
Emotional support × oncologist goal cure	-2.450	.371	-2.002	.459
Behavioral disengagement × oncologist goal cure	0.513	.817	0.167	.940
Positive reframing × oncologist goal cure	-0.282	.785	-0.209	.841
Self-blame × oncologist goal cure	0.065	.963	0.275	.846
Acceptance × oncologist goal cure	-2.812	.018	-2.160	.068
HADS-Depression				
Active × oncologist goal cure	1.015	.009	0.873	.025
Denial × oncologist goal cure	0.055	.878	0.005	.989
Emotional support × oncologist goal cure	-0.042	.953	-0.026	.971
Behavioral disengagement × oncologist goal cure	-0.471	.421	-0.326	.577
Positive reframing × oncologist goal cure	0.072	.790	0.024	.930
Self-Blame × oncologist goal cure	0.182	.630	0.103	.784
Acceptance × oncologist goal cure	0.592	.060	0.423	.178
HADS-Anxiety				
Active × oncologist goal cure	0.285	.479	0.261	.517
Denial × oncologist goal cure	-0.256	.460	-0.291	.383
Emotional support × oncologist goal cure	0.059	.937	0.139	.848
Behavioral disengagement × oncologist goal cure	0.661	.251	0.567	.329
Positive reframing × oncologist goal cure	0.221	.429	0.204	.467
Self-blame × oncologist goal cure	0.699	.054	0.633	.084
Acceptance × oncologist goal cure	0.971	.003	0.779	.017

Abbreviations: FACT-G, Functional Assessment of Cancer Therapy-General; HADS, Hospital Anxiety and Depression Scale.

*All models adjusted for Eastern Cooperative Oncology Group performance status.