Hope in the Context of Lung Cancer: Relationships of Hope to Symptoms and Psychological Distress

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Abstract

Context—Hope may be important in explaining the variability in how patients adjust to lung cancer.

Objectives—The aim of this study was to examine how hope, as conceptualized by Snyder and colleagues, is associated with multiple indices of adjustment to lung cancer. This theoretical model of hope suggests that people with high levels of hope are able to think about the pathways to goals (pathways) and feel confident that they can pursue those pathways to reach their goals (agency).

Methods—We hypothesized that higher levels of hope, as measured by Snyder et al.'s hope scale, would be related to lower levels of pain and other lung cancer symptoms (i.e., fatigue, cough) and lower psychological distress (i.e., depression). Participants in this study included patients with a diagnosis of lung cancer ($n = 51$). All participants provided demographic and medical information and completed measures of hope, lung cancer symptoms, and psychological distress.

Results—Data analyses found that hope was inversely associated with major symptoms of cancer (i.e., pain, fatigue, cough) and psychological distress (i.e., depression), even after accounting for important demographic and medical variables (i.e., age, cancer stage).

Conclusion—The findings of this cross-sectional study highlight the potential importance of hope in understanding adjustment to lung cancer. Future longitudinal research could help reveal how hope and adjustment interact over the course of cancer survivorship.

Keywords

Hope; lung cancer; pain

Introduction

Lung cancer is one of the leading causes of cancer death in the U.S. In 2008 alone, it was expected that more than 161,800 would die from the disease (1). While many cancers are treatable in the early stages of disease progression, early detection and treatment has not been shown to be as effective in decreasing lung cancer mortality as in other cancers (e.g.,

breast, prostate). Lung cancer prognosis is generally poor, with the one- and five-year survival rates of 41% and 15%, respectively (1). Patients who are diagnosed with lung cancer often undergo aggressive medical treatments that can be associated with pain and fatigue (2). The uncertain diagnosis and aggressive treatments can increase psychological distress (3).

Clinical observations suggest that, despite the multiple challenges of living with lung cancer, some patients are able to maintain hope about the future while others are not. Hope may be important in explaining the variability in how patients adjust to lung cancer.

The construct of hope has received increasing attention over the last two decades (4-7). Studies have found that high levels of hope are related to increased positive mood, better physical health, enhanced ability to cope with illness, and higher tolerance of pain (8-13). In patients with cancer, hope has been associated with positive features of coping with cancer, well-being, and lower anxiety and depression symptoms (14-18). This work suggest that hope in the context of cancer is important, but has been limited in two important ways: 1) it has not examined the relative contribution of hope to physical and psychological adjustment to lung cancer after controlling for important demographic and disease characteristic variables and 2) the assessment of hope in these studies was not linked to a well-delineated theoretical conceptualization of the hope construct.

Snyder and colleagues (5,6,11) have proposed a theory of hope that is receiving growing attention from both researchers and clinicians in both healthy and medically ill individuals (19-23). This theory is based on the notion that people are inherently goal-directed and that, in pursuit of their goals, they engage in two related cognitive processes: a) pathways thinking, which involves thinking about ways to reach goals, and b) agency thinking, which involves thinking about one's ability to initiate and sustain motivation toward a goal (10). According to this theory, people with high levels of hope are those who are able to think about the pathways to goals (pathways) and feel confident that they can pursue those pathways to reach their goals (agency).

Snyder and colleagues' theory of hope is noteworthy for three reasons. First, this theory has an advantage over other conceptualizations of hope because it focuses on aspects of hope that are quite salient in the context of a serious disease. Specifically, it posits that hope involves identifying achievable pathways toward meaningful goals that one can act upon (e.g., spending time with loved ones, enjoying the moment, creating a pleasant environment, acceptance of disease status). This contrasts with conceptualizations of hope that are passive, do not foster specific actions toward a goal, or may be unrealistic in the context of serious disease (e.g., I will wake up and this will all have been a bad dream). Second, this theory of hope has led to the development of a standardized and well-validated measure of hope (i.e., Adult Hope Scale) (5). Among hope assessments measures, the Adult Hope Scale has the most evidence supporting its construct and validity (20). Third, because this theory identifies specific constructs that are linked to higher levels of hope, it has led to interest in the development of interventions to promote hope in people coping with challenging life circumstances (e.g., coping with terminal illness) (24-26), as well as specific hope interventions to increase pain tolerance (27).

To our knowledge, no studies have examined the utility of Snyder's theory of hope in patients with lung cancer. Lung cancer provides a particularly good model in which to examine this theory for several reasons. First, given their multiple symptoms and often poor prognosis individuals with lung cancer may find it challenging to maintain hope. Gum and Snyder (25) suggest that, in the face of a serious illness, individuals with high hope may be better able to adjust their goals and redirect their energies. Second, some lung cancer

patients are able to be flexible in their cognitions about their disease (28), which may increase their ability to formulate pathways to reach their goals (29).

The aim of this study was to examine how hope as conceptualized by Snyder et al. (5) is associated with multiple indices of adjustment to lung cancer. Specifically, we were interested in whether hope would be significantly related to major symptoms commonly experienced by lung cancer patients (i.e., pain, fatigue, coughing) and psychological distress (i.e., depression) after accounting for the contribution of demographic and disease characteristic variables. We hypothesized that higher levels of hope would be related to lower levels of pain and other symptoms and lower psychological distress.

Methods

Participants

The participants in this study were 51 individuals with a diagnosis of lung cancer who were recruited from the Duke University Thoracic Oncology Program and several community oncology clinics in Durham, NC. The time period of patient recruitment was December 2002 to March 2005. Participants in this study were a subset of participants from a larger randomized clinical trial examining a pain coping skills intervention for patients and caregivers. Specifically, the 51 patients with lung cancer included in the current data analyses completed the specific study measure of interest (i.e., Adult Hope Scale), which was added after study recruitment had begun. Patients were eligible for this study if they: 1) were diagnosed with non-small cell lung cancer (NSCLC) stages I to IIIa and IIIb without pleural effusion or limited small cell lung cancer (SCLC), 2) had no other cancers during the past five years, 3) were able to read and speak English, 4) had access to a telephone and were willing to be a part of the psychoeducational intervention, and 5) had a caregiver who was also willing to be a part of the study.

Procedures

All participants in this study completed a telephone survey assessing hope, pain, fatigue, cough, and depression. These data were collected at baseline prior to randomization and treatment. Medical information for the patient was extracted from the patient's medical record. All procedures were approved by the Duke University Medical Center Institutional Review Board and the Duke Comprehensive Cancer Center Protocol Review Committee.

Measures

Hope—Hope was measured using the Adult Dispositional Hope Scale (11). The scale consists of eight questions that measure two constructs: agency (determination to accomplish goals) and pathways (planning strategies to accomplish goals). Responses to questions are on a scale from 1 (definitely false) to 8 (definitely true). The total score was used in this study and is calculated by summing the agency and pathways subscores. Total scores can range from 8 to 64, with higher scores indicating higher levels of hope. Internal consistency for this sample was good (Cronbach's alpha = 0.78).

Pain—Pain was measured using two items from the Brief Pain Inventory (BPI; 30). These items asked patients to rate their usual pain during the past week and their worst pain during the past week on a 1 (no pain) to 10 (pain as bad as you can imagine) scale; while some work uses a 0-10 response scale for the BPI, this 1-10 response scale has been used in a number of past studies as well (3,31,32). The worst and usual BPI pain intensity items have demonstrated good test-retest reliability in a sample of cancer patients (3) and the validity has been supported by studies showing a significant relationship between higher pain ratings and increased analgesic use (33). Because the two ratings of pain were highly correlated (r =

0.88), pain was averaged into a single summary score with higher scores indicating more severe pain..

Fatigue—Fatigue was measured using the Brief Fatigue Inventory (BFI) (34). The BFI has nine items that describe levels of fatigue. First, the current, usual, and worst fatigue over the past day is rated on a 1 (no fatigue) to 10 (fatigue as bad as you can imagine) scale. Next, fatigue's interference with general activity, mood, walking ability, normal work, relations with others, and enjoyment of life over the past day is rated on a 1 (does not interfere) to 10 (completely interferes) scale. Internal consistency of the fatigue measure in this sample was good (Cronbach's alpha = 0.95).

Coughing—Coughing was measured using the European Organization for Research and Treatment of Cancer Quality of Life Questionnaire-Lung Cancer (QLQ-LC13) (35). On the QLQ-LC13, patients rate their experience of cancer symptoms on a 4-point categorical scale ranging from 1 (not at all) to 4 (very much). In this study we used the QLQ-LC13 to assess coughing (one item). The QLQ-LC13 has been found to be a valid and useful tool for assessing disease and treatment-specific symptoms in lung cancer patients (35).

Depression—Depression symptoms were assessed using the Beck Depression Inventory (BDI; 36). The BDI contains 21 self-reported items measuring current degree of depression. These items relate to affective, cognitive, motivational, and physiologic areas of potentially depressive symptoms. Cumulative scores range from 0 to 63. Higher scores denote higher levels of depressive symptoms reported. Internal consistency was good in this sample (Cronbach's alpha = 0.88). The BDI is a well-validated measure that is widely used in cancer samples (e.g., 37-39).

Statistical Analyses

Descriptive statistics were calculated for demographic variables (i.e., age, sex, race, education), medical variables (i.e., cancer stage, current chemotherapy, current radiation, days since diagnosis), and self-report measures (i.e., hope, pain, fatigue, coughing, depression) (Table 1). Pearson correlations (for continuous variables) and point biserial correlations (for one binary and one continuous variable) were done to identify significant relationship between demographic/medical variables and all other study variables. An ANOVA was performed to examine differences based on lung cancer stage and study variables. Finally, general linear regression analyses were performed to examine the unique association of hope with the outcome variables (i.e., pain, fatigue, cough, depression) after controlling for demographic and medical variables significantly associated with the outcomes based on bivariate analyses. In each regression analysis, relevant demographic variables were entered on step 1 (i.e., age), relevant disease variables on step 2 (i.e., stage), and hope was entered on step 3. Two dummy coded variables were created to represent the cancer staging variables (I, II, III, other); one variable represented stages II and III, one represented the other category. Stage I was the reference group. To reduce the chance of Type I error, we used a procedure recommended by Hochberg and Benjamini (40) when examining the significance for the regression models.

Results

Patient Characteristics

Patient characteristics are presented in Table 1. Fifty-seven percent of the patients were male and the average age of patients was 65 (standard deviation [SD] = 9); 88% of the participants were Caucasian and 12% were African American. For education history, 12% of patients reported less than a high school education, 39% of patients reported their highest

education as high school, 27% of patients reported some college, and 22% of patients reported having at least a college degree.

Medical Background Characteristics

The medical characteristics of the sample are presented in Table 1. Forty-three percent of patients had stage I lung cancer, 14% had stage II, 25% had stage III, and 18% were classified as having another staging classification. Of these, 8% had limited stage small cell cancer and 10% were not assigned a stage. The majority of patients were not undergoing chemotherapy (84%) or radiation (96%) at the time of the study. Patients had been diagnosed with lung cancer about 18 months (mean [M] = 512 days; SD = 653 days).

Descriptive Analyses

Descriptive statistics for hope and the other study variables are presented in Table 1. The mean score on the Hope Scale was toward the upper end of the scale at 50.75 (SD = 7.53). The mean score for pain was on the lower end of the range for the Brief Pain Inventory (M = 2.96; SD = 2.54), though there was substantial variability in pain (i.e., SD = 2.54), with some people experiencing significantly higher levels of pain than others. The mean fatigue score was in the mid-range of the scale (M = 4.15; SD = 2.34). Most patients reported some coughing (M = 2.36; SD = 0.94). Although the mean score for depression was below the clinical cutoff for depression on the BDI (M = 10.40; SD = 8.24), there was substantial variability in these scores (e.g., SD = 8.24), with some patients endorsing many more depressive symptoms than others.

Associations Between Demographic and Medical Status Variables with Outcome Variables

Bivariate analyses were run between continuous demographic/medical variables and outcomes (Table 2) and ANOVAs were run to examine the relationship between lung cancer stage variable and continuous outcome variables. Age was significantly, inversely associated with pain (r = −0.36; $P < 0.01$) and depression (r = −0.41, $P < 0.01$). ANOVA results found that lung cancer stage was associated with days since diagnosis (F[3,47] = 3.37; $P = 0.03$) and cough (F[3,47] = 3.31; $P = 0.03$). There was a trend toward significance between more advanced lung cancer stage and pain (F[3,47] = 2.41; $P = 0.08$). Based on their consistent relationships with the outcome variables, age and lung cancer stage were controlled for in all regression analyses.

Relationship of Hope with Outcome Variables

Regression models accounted for a significant amount of the variance in the outcomes of pain F(4,46) = 3.19; $P = 0.02$, fatigue F(4,46) = 2.56; $P = 0.05$, cough F(4,46) = 4.30; $P = 0.005$, and depression F(4,46) = 5.94; $P = 0.001$ (all $Ps < 0.05$). In each significant model, hope had a significant association with the outcome. As can be seen in Table 3, higher levels of hope were uniquely associated with less pain ($\beta = -0.28$; $P = 0.03$), lower fatigue ($\beta = 0.35$; $P = 0.01$), and less coughing ($\beta = -0.31$; $P = 0.02$). Further, higher levels of hope were associated with less depression ($\beta = -0.42$; $P = 0.001$). Hope was associated with these outcomes even after controlling for the effects of age and cancer stage.

Discussion

The current study found that hope could be reliably assessed in a sample of lung cancer patients using the scale developed by Snyder et al. (5). Patients varied in their levels of hope with some patients reporting much higher hope than others. Variations in hope were meaningfully related to major symptoms of lung cancer (i.e., pain, fatigue, coughing) and psychological distress. This study is cross-sectional and thus it is unclear whether or not

hope is causing these less severe symptoms or if patients who have fewer symptoms or psychological distress are more likely to have higher levels of hope. Future studies are needed to study the direction of causality between hope and adjustment to symptoms of lung cancer. Nevertheless, these findings underscore the potential importance of hope in understanding adjustment to lung cancer symptoms.

One of the most interesting findings of this study was the association between hope and symptoms (i.e., pain, fatigue, cough) in lung cancer patients. This suggests that this hope scale may be particularly sensitive to the presence of cancer symptoms. Other hope assessment tools (e.g., Herth Hope Index; 41) have not demonstrated a clear and consistent relationship to the presence of cancer symptoms (42,43,44). In this study, higher levels of hope were found to be significantly associated with lower levels of pain, after controlling for age and disease stage. This result agrees with those of Hsu et al. (44) that lung cancer patients with higher levels of hope report lower levels of pain, as well as with laboratory research suggesting that higher hope individuals demonstrate greater pain tolerance than lower hope individuals (12). However, Chen (43) found that hope was not associated with levels of pain in a mixed cancer sample. Future studies need to examine the degree to which hope is related to with other pain-related outcomes in lung cancer patients (e.g., pain-related disability, pain behavior). Along these lines, Lin et al. (45) found that patients with mixed cancers who had high levels of hope were much more likely to report lower levels of pain disturbance in daily activities.

The association between high levels of hope and lower fatigue observed in this study was also interesting. Fatigue is one of the most common and disabling symptoms experienced by cancer patients (46). Higher levels of hope also were associated with less coughing, which also can be quite a disabling symptom in lung cancer survivors. The traditional medical model of lung cancer views pain, fatigue, and coughing as symptoms of underlying disease. This medical model ignores or minimizes the potential influence of psychosocial factors (such as hope) on these types of symptoms. Thus, patients with more advanced cancer would be expected to have higher levels of pain, fatigue, and coughing (47,48). According to the medical model, if patients with high levels of hope experience lower levels of symptoms, it would be likely explained by the fact that these patients have lower levels of disease activity. The findings of the present study, however, contradict this notion. Specifically, we found that hope was associated with pain, fatigue, and coughing even after controlling for cancer stage. Taken together, these finding suggest that clinicians working with lung cancer patients should consider attending more to the potential role that hope might play in the symptoms that patients experience.

From a psychological perspective, being a survivor of lung cancer can be challenging. Some lung cancer patients report difficulties with depression, which has been associated with lower quality of life in cancer patients (49). Interestingly, the current study found that higher levels of hope were associated with lower levels of depression. These findings are in agreement with prior research suggesting that higher hope is related to less depression in mixed cancer samples (32,17)

The results of this study agree with those of prior studies of hope in cancer patients (51,52) in that hope was not found to be related to demographic variables. The present study, like other studies, also found that cancer patients report relatively high levels of hope (15,51). A major focus of prior studies of hope in cancer patients has been on how hope relates to the use and perceived effectiveness of coping strategies (14,15,18). In general, these studies have found that cancer patients reporting high levels of hope are more likely to make increased use of coping strategies, such as positive reappraisal, and to perceive their coping efforts as more effective. A limitation of these studies is that they have failed to examine the

unique and additive effects of hope and coping variables on cancer symptoms. An important direction for future research would be to examine how hope, as assessed with the hope scale used in this study, and coping variables (i.e., coping strategies and appraisals) are related to cancer symptoms.

This study suggests that hope, as conceptualized by Snyder et al. (5), may be an important construct to address in patients with cancer. Prior studies have suggested that hope can be enhanced through psychosocial interventions (52-54). It is possible that one could develop a module that could be incorporated into existing hope interventions (52-54) or develop a new psychosocial intervention to address hope as conceptualized by Snyder and colleagues. Important components of such a module or intervention might include: 1) discussion of patients understanding of their disease, 2) identification of goals and ordering of importance of goals, 3) identification of realistic short and long terms goals that are achievable within the context of their lung cancer, 4) identification of multiple pathways toward goals and selecting pathways with the highest likelihood of success, and 5) ways to increase agency and monitor their pathway to the goal. According to Snyder's theory, pathways and agency thinking have an iterative impact on one another, such that movement towards goals and accomplishments of subgoals is likely to increase agency.

This study has some limitations. First, it is cross-sectional in design and we cannot identify causal relationships between hope and measures of adjustment. Future work should be designed to examine the influence of hope prospectively over the course of a cancer diagnosis. Second, this study was conducted in a relatively small sample of lung cancer patients. Future studies should aim to examine these questions in a larger sample of patients. Third, this sample was limited to lung cancer patients. Future studies should examine the relationship between hope and adjustment in other cancer samples (e.g., prostate, gastrointestinal cancer). Fourth, we do not examine how the two dimensions of hope (i.e., pathway and agency) might be related to cancer symptoms and psychological distress. Future work should be designed (e.g., larger sample size) to examine how these two dimensions differentially influence cancer symptoms and psychological distress. Finally, participants in our study were primarily Caucasian and the findings obtained may not generalize to more ethnically diverse populations. Since hope may be influenced by cultural norms and ideals, future studies should examine hope in more ethnically diverse samples of cancer patients.

In sum, this study was the first study to examine Snyder's construct of hope in a sample of lung cancer patients. The results suggest that hope may be important in understanding symptoms and psychological adjustment in lung cancer.

Acknowledgments

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Table 1

Descriptive Statistics for Study Variables

	Mean (SD)	%(*n*)
Age	65 (8.56)	
Sex		
Female		43(22)
Male		57(29)
Race		
African American		12(6)
Caucasian		88(45)
Highest Education		
Less than high school		12(6)
High school		39(20)
Some college		27(14)
College or more		22(11)
Cancer Stage		
I		43(22)
II		41(7)
III		25(13)
Other[a]		18(9)
Current Chemotherapy		
No		84(43)
Yes		16(8)
Current Radiation		
No		96(49)
Yes		4(2)
Days since diagnosis	512.29 (652.94)	
Self-Report Measures		
Hope	50.75 (7.53)	
Fatigue	4.15(2.34)	
Pain	2.96(2.54)	
Coughing	2.36(0.94)	
Depression	10.40(8.13)	

[a] Of those classified as other, 8% had a diagnosis of limited small cell cancer and 10% were not assigned a staging category.

Table 2

Correlations of Demographic and Medical Status Variables with Outcome Variables

	Age	Education	Race [a]	Sex [b]	Current Chemotherapy[c]	Diagnosis Time
Pain	−0.36 [d]	−0.17	0.01	0.21	−0.09	−0.24
Fatigue	−0.14	−0.09	−0.07	0.04	0.08	−0.06
Cough	−0.05	−0.06	−0.15	−0.02	−0.18	−0.05
Depression	−0.41 [d]	−0.14	0.01	0.08	0.03	−0.22
Hope	0.08	0.16	−0.14	0.18	0.01	0.09

*Correlation is significant at the .03 level as indicted by Bonferonni adjustment.

[a] Race is coded as 0 = African American and 1 = White

[b] Sex is coded as 0 = female and 1 = male.

[c] Chemotherapy is coded as 0 = No and 1 = Yes.

[d] Correlation is significant at the 0.01 level.

Table 3

Hierarchical Linear Regression Analyses Step by Step ($n = 51$)

Steps and Variables		Statistics by Step		Statistics by Variable		
		Total R^2	R^2 change	Final std. β	t-value	P-value
Outcome	*Pain*					
1.	Age	0.13		−0.32	−2.36	0.02
2.	Stage II,III	0.13	0.01	−0.02	−0.12	0.90
	Stage other			−0.09	−0.63	0.53
3.	Hope Total	0.21	0.08	−0.28	−2.17	0.03
Outcome	*Fatigue*					
1.	Age	0.02		−0.09	−0.61	0.54
2.	Stage II, III	0.06	0.04	0.22	1.55	0.13
	Stage other			0.11	0.74	0.46
3.	Hope Total	0.18	0.12	−0.35	−2.64	0.01
Outcome	*Cough*					
1.	Age	0.01		0.14	1.03	0.31
2.	Stage II, III	0.18	0.17	−0.18	−1.28	0.21
	Stage other			−0.44	−3.18	0.003
3.	Hope Total	0.27	0.10	−.31	−2.47	.02
Outcome	*Depression*					
1.	Age	0.16		−.36	−2.94	0.005
2.	Stage II, III	0.16	0.01	0.04	0.31	0.76
	Stage other			0.01	0.07	0.95
3.	Hope Total	0.34	0.18	−0.42	−3.50	0.001

Note. Staging variables were dummy coded; stage 1 was the referent variable.