The Relationship of Hope to Goals and Psychological Outcomes in Patients with Advanced Lung Cancer: A Test of Hope Theory

Kelly A. Hyland
University of South Florida

Follow this and additional works at: https://digitalcommons.usf.edu/etd

Part of the Clinical Psychology Commons, and the Oncology Commons

Scholar Commons Citation

This Dissertation is brought to you for free and open access by the USF Graduate Theses and Dissertations at Digital Commons @ University of South Florida. It has been accepted for inclusion in USF Tampa Graduate Theses and Dissertations by an authorized administrator of Digital Commons @ University of South Florida. For more information, please contact digitalcommons@usf.edu.
The Relationship of Hope to Goals and Psychological Outcomes in Patients with Advanced Lung Cancer:

A Test of Hope Theory

by

Kelly A. Hyland

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy
Department of Psychology
College of Arts and Sciences
University of South Florida

Co-Major Professor: Paul B. Jacobsen, Ph.D.
Co-Major Professor: Vicky Phares, Ph.D.
Thomas Brandon, Ph.D.
Kristen Salomon, Ph.D.
Brent Small, Ph.D.

Date of Approval:
March 15, 2021

Keywords: psycho-oncology, emotional well-being, meaning and purpose in life, affect

Copyright © 2021, Kelly A. Hyland
DEDICATION

I would like to express my profound gratitude to my partner, Matt, my parents, Sarah & Mike, my sister, Courtney, and my incredible support network of family and friends. Your love and unwavering support made this project possible.
ACKNOWLEDGMENTS

I would like to express my deepest gratitude to those individuals who have supported me throughout the process of conducting my dissertation study. I would like to thank my mentors, Dr. Paul Jacobsen and Dr. Vicky Phares, for their support and guidance on this project and throughout my graduate education. I would also like to thank Dr. Heather Jim and Christine Marsella for their assistance in conducting this project at Moffitt Cancer Center. Additionally, I would like to thank Dr. Jhanelle Gray and the Moffitt Cancer Center Thoracic Oncology program for their assistance with recruitment and support for this study. I would also like to thank all five members of my dissertation committee for their insight, feedback and flexibility with this project. Most importantly, I would like to thank the participants who shared their time and graciously completed questionnaires and participated in interviews, making this study possible.
TABLE OF CONTENTS

List of Tables ........................................................................................................................................... iii
List of Figures ........................................................................................................................................... v
Abstract ..................................................................................................................................................... vi

Introduction .............................................................................................................................................. 1
  Theoretical Overview of Hope .................................................................................................................... 1
  Hope and Emotional Well-being in Cancer ............................................................................................... 4
  Hope and Meaning and Purpose in Life in Cancer .................................................................................... 5
  Hope and Affect in Cancer ....................................................................................................................... 6
  Goals in Cancer ...................................................................................................................................... 7
  Hope and Goals in Cancer ....................................................................................................................... 9
  Goals, Emotional Well-being, Meaning and Purpose in Life and Affect in Cancer .............................. 11
  Goals as a Mediator of the Relationship between Hope and Well-being ............................................ 12
  Aims of the Current Study .................................................................................................................... 13

Methods ................................................................................................................................................... 15
  Participants ............................................................................................................................................ 15
  Procedure .............................................................................................................................................. 15
  Measures .............................................................................................................................................. 16
  Statistical Analyses ............................................................................................................................... 23

Results .................................................................................................................................................... 27
  Participant Characteristics ....................................................................................................................... 27
  Time 1 Variable Information .................................................................................................................. 29
  Time 2 Variable Information .................................................................................................................. 31
  Analyses Related to Aim 1 ..................................................................................................................... 32
  Analyses Related to Aim 2 ..................................................................................................................... 32
  Analyses Related to Aim 3 ..................................................................................................................... 32
  Analyses Related to Aim 4 ..................................................................................................................... 33
  Analyses Related to Aim 5 ..................................................................................................................... 34

Discussion ............................................................................................................................................... 35
  Descriptive Findings for Hope and Psychological Variables .............................................................. 35
  Findings Related to Aim 1 ..................................................................................................................... 37
  Goal-related Findings ............................................................................................................................. 38
  Findings Related to Aim 2 ..................................................................................................................... 40
  Findings Related to Aim 3 ..................................................................................................................... 41
  Findings Related to Aim 4 ..................................................................................................................... 43
  Findings Related to Aim 5 ..................................................................................................................... 43
  Strengths and Limitations of the Current Study .................................................................................... 44
  Clinical Implications and Future Directions ........................................................................................ 46
References .............................................................................................................................................. 49
Appendix A. Tables ..................................................................................................................................... 63
Appendix B. Figures .................................................................................................................................... 81
Appendix C. Institutional Review Board Approval ...................................................................................... 83
Appendix D. Patient Questionnaires ....................................................................................................... 85
Appendix E. Semi-structured Goal Interview Guides .................................................................................. 106
LIST OF TABLES

Table 1. Measures Collected ........................................................................................................ 63
Table 2. Sociodemographic Characteristics .............................................................................. 64
Table 3. Clinical Characteristics ................................................................................................. 65
Table 4. Cancer Information Preferences and Prognostic Perception ........................................ 66
Table 5. Lifestyle Characteristics ................................................................................................. 67
Table 6. Hope, Meaning and Purpose in Life, Affect and Quality of Life at Time 1 ..................... 68
Table 7. Correlations among Psychological Variables at Time 1 ............................................... 69
Table 8. Goal Descriptive Data at Time 1 .................................................................................... 70
Table 9. Goal Domains, Definitions and Examples ..................................................................... 71
Table 10. Goal Domain Descriptives ......................................................................................... 72
Table 11. PANAS “Right Now” Administered Post-Time1 Interview ........................................... 73
Table 12. Paired Samples T-tests for PANAS Positive and Negative Affect “In General” versus “Right Now” ........................................................................................................... 73
Table 13. Hope, Meaning and Purpose in Life, Affect and Quality of Life at Time 2 (N=65) ....... 74
Table 14. Goal Descriptive Data at Time 2 .................................................................................. 75
Table 15. Hope at Time 2 and Psychological Outcomes at Time 2 ......................................... 76
Table 16. Goal Descriptives at Time 2 and Psychological Outcomes at Time 2 ....................... 76
Table 17. Two-step Hierarchical Linear Regression Treating Emotional Well-being at Time 2 as the Dependent Variable .................................................................................. 76
Table 18. Correlations of Hope with Positive Psychological Factors ......................................... 77
Table 19. Correlations of Hope with Goal Characteristics ......................................................... 77
Table 20. Correlations of Goal Characteristics with Positive Psychological Factors .................... 77
Table 21. Bootstrapped Estimates and Confidence Intervals for Tests of Indirect Effects of Goal Characteristics as Mediators of the relationship between Hope and Emotional Well-being................................................................. 78

Table 22. Bootstrapped Estimates and Confidence Intervals for Tests of Indirect Effects of Emotional Well-being as a Mediator of the relationship between Hope and Goal Characteristics (Reverse Mediation) .................................................................................. 79

Table 23. Bootstrapped Estimates and Confidence Intervals for Tests of Indirect Effects of Patient-reported Progress Toward Goals in the Short-term as a Mediator of the relationship between Hope at Time 1 and Emotional Well-being at Time 2 ............... 80
LIST OF FIGURES

Figure 1. Model of Goal Characteristics Mediating the Relationship between Hope and Emotional Well-being at an Initial Assessment ......................................................... 81

Figure 2. Model of Goal Progress Mediating the Relationship between Hope at an Initial Assessment and Emotional Well-being at Follow-up Assessment ......................................... 81

Figure 3. Participation Consort Diagram ........................................................................................................... 82
ABSTRACT

Background. Hope is an important positive psychological construct that may help to explain how individuals cope in the context of life-threatening illness. Snyder’s hope theory states that humans are goal-oriented, and that goals link hope to psychological outcomes. The purpose of the current study was to investigate the relationship of hope to emotional well-being, meaning and purpose in life, and positive and negative affect in a sample of patients with advanced stage lung cancer. The study also sought to identify how hope relates to patients’ goals and to explore whether goal characteristics and progress in achieving goals mediated the relationship between hope and emotional well-being.

Methods. Patients receiving first-line treatment for advanced stage lung cancer were recruited from the Moffitt Cancer Center Thoracic Oncology Clinic to participate in a mixed methods study. Participants completed questionnaires including measures of hope (Adult Hope Scale), emotional well-being (FACT-L emotional well-being subscale), meaning and purpose in life (PROMIS meaning and purpose scale), and positive and negative affect (PANAS) at baseline (Time 1) and approximately one month later (Time 2). At Time 1 participants also underwent a semi-structured interview to elicit patient goals and characteristics of their goals (e.g., perceived attainability, perceived control over reaching goals, anticipated progress in the short-term); at Time 2 participants also underwent a brief follow-up interview about perceived progress toward goals, actions in relation to goals, and barriers to progress.

Results. Participants ($N = 75$, $M$ age = 65.14 years, 59% female) endorsed high levels of hope thinking, with values comparable to other samples of patients with advanced cancer. As expected, hope was positively correlated with meaning and purpose in life and positive affect. Contrary to predictions, hope was not correlated with emotional well-being or negative affect. Consistent with hope theory, hope was positively correlated with goal characteristics (e.g., perceived attainability, perceived control over reaching goals), and these characteristics were associated with psychological outcome variables in the
anticipated direction (e.g., emotional well-being, meaning and purpose in life, positive and negative affect). Two goal characteristics (perceived attainability, perceived control over reaching goals) mediated the relationship between hope at Time 1 and emotional well-being at Time 1; reverse mediation analyses did not yield evidence of mediation. Perceived progress toward goals over the follow-up period did not mediate the relationship between hope at Time 1 and emotional well-being at Time 2.

**Conclusions.** Findings confirming predictions about the relationships among hope, goal characteristics, and psychological outcomes warrant replication and extension in larger samples of patients with advanced stage lung cancer using longer, longitudinal follow-up windows.
INTRODUCTION

An estimated 229,000 individuals in the United States were diagnosed with lung cancer in 2020 (American Cancer Society, 2020). Unfortunately, the majority of these patients were diagnosed with advanced stage disease for which the five-year survival rate has historically been poor (5%) (American Cancer Society, 2020). A central goal of care for cancer patients with advanced disease is to promote the best possible quality of life. However, there are a host of factors that may negatively impact patient well-being, including high physical symptom burden and functional limitations imposed by cancer and its treatment (Braun, Gupta & Staren, 2011; Buzaglo et al., 2014; Chen, Yu & Yang, 2008; Cooley, 2000; Esbensen, Osterlind, Roer & Hallberg, 2004; Lehto, 2017; Tishelman, Lövgren, Brogerber, Hamberg, & Sprangers, 2010). Patients with advanced disease must also grapple with uncertainty about the future in the context of a limited life expectancy, which may inhibit their ability to achieve their goals.

While a significant body of literature has focused on factors that detract from patient well-being, considerably less research has focused on identifying factors that are associated with better well-being in patients with advanced cancer. Hope is an important positive psychological construct that may help to explain how individuals adapt in the context of life-threatening illness. The purpose of the current study was to investigate the relationship of hope to emotional well-being, meaning and purpose in life, and positive and negative affect in a sample of patients with advanced stage lung cancer. The study also sought to identify how hope relates to patients’ goals and to explore whether goal characteristics and progress in achieving goals mediate the relationship between hope and emotional well-being.

Theoretical Overview of Hope

Although definitions of hope vary, they generally include an individual’s desire or expectation for a positive outcome or lack of a negative outcome and are future-oriented (Rousseau, 2000; Snyder, 2002). Given these definitional elements, the study of hope in the context of advanced cancer is particularly
relevant, since uncertainty about the extent of one’s future may make time seem more finite and alter an individuals’ perception of what they want or expect to accomplish in this potentially shortened future. However, the lack of a consensus definition of hope in cancer (Butt, 2011; Chi, 2007; Ebright & Lyon, 2004; Eliott & Olver, 2002), as well as variability in the application of theoretical frameworks and measures to study hope, makes synthesis of the extant research on hope in cancer difficult. Accordingly, while systematic reviews of the literature on hope in cancer have been conducted (Butts, 2011; Chi, 2007), the ability to draw definitive conclusions from the literature is limited. Therefore, hope remains a topic that is frequently mentioned in the context of cancer, but with much ambiguity about what hope is and how hope relates to patient-reported outcomes such as emotional well-being.

Snyder’s hope theory offers a concrete framework to study how individuals cognitively process and adapt to a changing reality and uncertainty about the future. Hope theory is grounded in the belief that humans are inherently goal oriented (Snyder et al., 1991; Snyder, 2002). It is a cognitively-based motivation model of goal attainment comprised of two major components, agency thinking and pathways thinking (Snyder et al., 1991). Agency thinking reflects the self-referential belief that an individual has the motivation, desire, and capacity to pursue and sustain pursuit toward a goal. Pathways thinking reflects the ability to conceive of strategies to reach goals. Agency and pathways thinking are considered equally important and are theorized to interact over time to influence individuals’ perceptions of their goal-related potential and progress (Snyder et al., 1991; Snyder, 2002).

Hope is viewed as a dispositional or trait-like construct (Snyder et al., 1991), such that individuals would be expected to demonstrate similar levels of hope across time and situations, including a cancer diagnosis. This view is supported by findings that patients with newly diagnosed cancer and recurrent cancer report similar levels of hope (Ballard, Green, McCaa & Logsdon, 1997), and that hope persists in patients with advanced cancer irrespective of proximity to death (Buckley & Herth, 2004; Esbensen & Thomsen, 2011; Sanatani, Schreier & Stitt, 2008). While life-threatening illness may impede goal pursuit and make it unlikely that certain goals might be attained, the cognitive processes of agency and pathways thinking are dynamic. Therefore, people with higher levels of hope dealing with advanced cancer are
more likely than people with lower levels to incorporate relevant contextual information into goal appraisal, adjust their goals or develop new attainable goals, and work toward these goals, thus sustaining higher levels of hope (Gum & Snyder, 2002).

Hope theory asserts that emotions provide important information during goal pursuit, but are secondary to cognitive processes and not the primary conduit of hope (Snyder, 2002). For example, in the face of an immutable goal, an individual would not make progress towards the goal and would experience negative emotions (Gum & Snyder, 2002). An individual higher in hope would be expected to interpret this as a signal to try a different pathway or to focus energy on a different valued goal, while an individual lower in hope would be expected to feel stuck and distressed. Individuals higher in hope therefore would experience generally positive emotions during goal pursuit compared to individuals lower in hope (Snyder et al., 1991).

Hope theory stresses the individuals’ self-appraised ability to pursue a goal (i.e., personal agency) (Snyder et al., 1991). However, people higher in hope may enlist other forces in goal pursuit if these forces can help them to achieve a positive outcome. For example, patients with advanced cancer that are higher in hope may enlist the help of their medical oncology team, family and friends, or religious or spiritual figures or beliefs to help progress toward valued goals (Gum & Snyder, 2002; Shorey, Snyder, Rand & Hockenmeyer, 2002).

Research based on hope theory has benefited from the development of a validated tool to measure the construct (Berendes et al., 2010). The Adult Hope Scale (AHS) (Snyder et al., 1991) is a psychometrically validated scale designed to measure agency thinking and pathways thinking. The agency and pathways subscales can then be summed to form a total score of hope (Babyak, Snyder & Yoshinobu, 1993; Snyder et al., 1991). The AHS has been used in cancer samples (Fischer, Cripe & Rand, 2018; Rand, Banno, Shea & Cripe, 2016; Stanton et al., 2000; Stanton, Luecken, MacKinnon & Thompson, 2002) and has demonstrated construct validity as evidenced by consistently good model fit to the hypothesized two-factor structure (Babyak et al., 1993; Bryant & Cvengros, 2004).
Studies have shown that, among cancer patients, scores on the AHS have not been consistently associated with demographic or clinical factors (Berendes et al., 2010). Higher (i.e., more hopeful) scores on the AHS have been found to be moderately positively correlated with other positive psychological constructs, such as optimism and self-efficacy, in general population samples (Bailey, Eng, Frisch & Snyder, 2007; Bryant & Cvengros, 2004; Magaletta & Oliver, 1999; Snyder, 2000; Snyder et al., 1991; Snyder, 2002; Tennen, Affleck & Tennen, 2002) and cancer samples (Hou, Law, Yin & Fu, 2010; Rajandram et al., 2011). This pattern of findings supports the view that these constructs are related but distinct. In addition, advanced statistical modeling techniques have demonstrated evidence of discriminant validity between the AHS and measures of optimism and self-efficacy (Bryant & Cvengros, 2004; Magaletta & Oliver, 1999). Given that the current study aimed to evaluate goals in patients with cancer and that hope theory is explicitly goal-oriented, hope was identified as the positive psychological construct of interest in the current study.

**Hope and Emotional Well-being in Cancer**

Broadly, literature supports hope as a predictor of positive outcomes in cancer, including well-being (Esbensen, Osterind, Roer & Hallberg, 2004; Nekolaichuk & Bruera, 2004; Peh, Kua & Mahendran, 2016; Schofield et al., 2016; Steffen, Vowles, Smith, Gan & Edelman, 2018). Well-being is defined as positive quality of life across multiple health domains, such as physical, functional, social, and emotional health (Cella et al., 1995). Emotional well-being is not simply the absence of distress, but instead reflects ‘being confident, positive, and able to cope with the ups and downs of life’ (Stewart-Brown, 1998). Emotional well-being is particularly salient in patients with advanced cancer, since high levels of emotional well-being may persist independent of physical and functional challenges imposed by the disease and its treatment.

Cross-sectional and longitudinal research has demonstrated associations of hope with emotional well-being in patients with cancer (Jo & Son, 2014; Li, Yang, Liu & Wang, 2016). For example, hope as measured by the AHS has been shown to be positively associated with emotional well-being in patients with cancer as measured using the Functional Assessment of Cancer Therapy – Emotional Well-Being
Hope has also been associated with measures of related constructs such as happiness (Blank & Bellizzi, 2006; Wnuk, Marcinkowski & Fobair, 2012), and better psychological adjustment to cancer (Felder, 2004; Shapiro, McCue, Heyman, Dev & Haller, 2010; Stanton et al., 2000).

One previous study examined the cross-sectional relationship between hope and quality of life outcomes in patients with lung cancer (Berendes et al., 2010). Hope assessed using the AHS was associated with less severe physical symptoms (e.g., pain, fatigue) and less severe symptoms of depression in lung cancer patients after controlling for age and disease stage (Berendes et al., 2010). However, this study did not examine the relationship between hope and emotional well-being. Therefore, the current study sought to address a gap in the literature and examine the relationship of hope with emotional well-being after controlling for relevant demographic and clinical covariates.

**Hope and Meaning and Purpose in Life in Cancer**

It is theorized that humans are driven to search for the meaning or purpose of their existence (Frankl, 1992). Patients with life-limiting illness, in particular, may cultivate meaning through their choice of attitude, connections with others and the world, participation in activities, and considerations of their legacy (Frankl, 1992; Montross Thomas, Meier & Irwin, 2014). Similarly, they may cultivate a sense of purpose by seeking to identify how their current actions can influence future outcomes (Baumeister, 1991). Hope theory postulates that individuals create meaning and purpose in their lives by pursuing valued, personally meaningful goals (Feldman, Balaraman & Anderson, 2018). Accordingly, individuals higher in hope are considered more likely to successfully engage in goal pursuit and attainment, which may generate a greater sense of meaning and purpose in life. This prediction is supported by the findings of an intervention trial in which individuals with some form of psychopathology (e.g., major depressive disorder, social anxiety disorder) who participated in hope theory-based group therapy demonstrated increases in hope and a greater sense of meaning in life compared to controls (Cheavens, Feldman, Gum, Michael & Snyder, 2006). Additionally, higher levels of hope have been correlated with a greater ability to find meaning, even in adverse situations (Gum & Snyder, 2002). This is consistent with findings in which higher levels of hope were related to greater
purpose in life in a sample of women with breast cancer (Wnuk et al., 2012). The current study examined the relationship of hope with meaning and purpose in life by assessing associations in patients with advanced lung cancer.

**Hope and Affect in Cancer**

Affect serves dual functions in hope theory. First, hope is believed to cast the ‘affective tone’ for goal pursuit, such that individuals higher in hope have greater positive and less negative affect when pursuing goals (Snyder, 2002). This prediction is supported by findings in a sample of prostate cancer survivors, in which higher hope agency thinking was significantly correlated with greater positive affect and less negative affect (Blank & Bellizzi, 2006). Interestingly, hope pathways thinking was not associated with affect in this study, a finding that warrants further investigation.

Beyond setting the overall tone, affect provides ongoing feedback about goal persistence and progress. For example, greater positive affect signals to the individual that they are making progress toward a goal and to keep going. Negative affect may signal to an individual that they are not making progress toward a goal. Literature suggests that when individuals with life-threatening illness who are higher in hope experience blocked progress toward a valued goal, they demonstrate flexibility in adjusting goals and goal effort to focus on valued, attainable goals, which sustains higher levels of hope and greater positive and less negative affect (Gum & Snyder, 2002; Snyder et al., 1991). However, relinquishing valued goals can be difficult, and hope theory acknowledges the importance of mourning the loss of unattainable goals (Gum & Snyder, 2002). Literature suggests that it is dependent on the individual whether it is more affectively adaptive to view the goal of survival as ‘blocked’, suggesting that the goal still remains to some degree, versus acceptance of the goal as ‘lost’, or unattainable (Gum & Snyder, 2002). This view is consistent with findings that hope as measured by the AHS was not significantly different in patients with advanced cancer who identified finding a cure and fighting cancer as paramount goals versus patients who identified other goals as most important (Rand et al., 2016). Instead, hope theory emphasizes the importance of individuals with advanced cancer identifying and pursuing other valued, attainable goals to maintain higher hope and greater positive and less negative affect (Mens &
Individuals who do not seek other valued goals may experience negative emotions; for example, identifying cure as a most important goal predicted depressive symptoms in the same sample of patients with advanced cancer (Rand et al., 2016). The current study sought to examine the relationship of hope with positive and negative affect in patients with advanced stage lung cancer.

**Goals in Cancer**

Given that hope theory is goal-oriented, it is important to explore the characteristics of goals to understand what people are hopeful for. When goals are discussed in the context of cancer, it is typically in reference to goals of cancer care (e.g., to live longer, control disease) (Demartini et al., 2019; Rand et al., 2016). While cancer care-specific goals may be important to promote optimal treatment outcomes and quantity of life, the continued pursuit of other valued goals (e.g., meaningful experiences, social connection) is also important to consider to ensure that individuals are living a life that is aligned with their values and is enjoyable and fulfilling (Rand et al., 2016; Schellinger, Anderson, Frazer & Cain, 2018). ‘Goals’ are here defined as things that people want to do or accomplish because they provide a sense of purpose, mastery, or enjoyment, or things that they want to stop or delay from happening (Snyder, 2002). Given the threat to a patient’s future that accompanies a life-threatening diagnosis, the types and characteristics of goals of patients with cancer may be different than those of healthy individuals or the goals that the patients had for themselves in the past. Indeed, literature has shown that patient goal characteristics (e.g., goal domains, temporality, attainability) are different than those of healthy controls (Pinquart, Nixdorf-Hanchen & Silbereisen, 2005). For example, patients with cancer report more social, transcendental and health-related goals and less achievement-related goals compared to healthy controls (Pinquart et al., 2005). Further, it is possible that characteristics of patient goals and progress toward those goals may help to explain the relationship of hope with emotional well-being in the context of life-threatening illness.

Research has begun to explore the characteristics of goals of patients living with cancer (Chow, Presseau, Perelman, Sikora & Ferguson, 2018; Hullmann, Robb & Rand, 2016). A systematic review of the literature identified 27 articles examining goals in adult cancer patients (Hullmann et al., 2016).
Twenty-four different theoretical models were cited, and there was significant variability in the way that goals were defined and measured (Hullmann et al., 2016). These methodologic and theoretical inconsistencies limit the ability to draw conclusions about goals in patients with cancer from the extant body of literature. However, review of individual research studies provides detailed information about specific methodologies that have been used to assess goals in cancer patients. This allows for consideration of their relative strengths and weaknesses to inform the design of a goal assessment study in advanced cancer.

Pinquart and colleagues (2005, 2008) utilized a face-to-face interview to elicit individuals’ goals, defined as “projects they are currently pursuing or want to achieve in the future”. The future here was defined as the “next few weeks or months or the distant future”. Research staff provided a consistent example of goals to participants, including “to meet friends or close relatives, to renovate one’s home, and to gain a better understanding of life” (Pinquart et al., 2005). Advantages of this methodology include the open-ended structure, which prompts patients to discuss their current and future goals freely, and the clear definitions of both goals and the future. Following goal elicitation, patients rated goal perceptions (e.g., perceived effort to attain) on a five-point Likert scale (Pinquart et al., 2005, Pinquart, Frolich & Silbereisen, 2008). The use of Likert scales with an odd number of answer choices and clear, verbal anchors (i.e., ‘great effort’ to ‘no effort’) that can be easily comprehended by patients is advantageous and permits quantitative analysis of the goal characteristic data. However, use of a standard example that may be relevant to participants has the potential to bias goal generation. Additionally, the cross-sectional assessment methodology does not permit examination of patient progress toward identified goals.

Other work has used a checklist to assess the degree to which patients strive to attain 13 different broad life goals (e.g., maintaining friendship ties) on a five-point Likert scale (‘not at all’ to ‘very much’) while receiving chemotherapy and nine months later (Pinquart, Silbereisen & Frolich, 2009). This approach is comprehensive since it provides a rating from each patient for each domain and permits the examination of whether goal priorities change over the course of cancer treatment. However, the data are
at the domain-level and do not provide information about patient-specific goals or the relative importance of life goals compared to one another.

Another study assessed life and treatment-related goals specifically in patients with advanced cancer (Rand et al., 2016). Using a semi-structured interview format, patients were prompted to discuss and record their current life goals followed by their cancer treatment goals. Patients then selected and ranked their five most important goals from either list and rated their likelihood of achieving each goal on a scale of 0-100% (Rand et al., 2016). The manner and order in which goals were elicited in this study introduces a potential source of bias. Querying specifically for treatment-related goals may unintentionally inflate their importance. Patients may also feel pressure to list treatment-related goals due to demand characteristics, and to rank these goals as important due to the common cultural expectation that one must be a “cancer warrior” and “fight the disease” (Penson, Shapira, Daniels, Chabner & Lynch, 2004).

As demonstrated by these studies, goals in patients with cancer have been provisionally explored. There are, however, methodologic features that may have biased goal elicitation, and research on goal characteristics and goal progress over time is limited. Informed by this literature and as described later in this proposal, the current study integrated methods from previous studies to elicit goals from patients with advanced lung cancer using a semi-structured interview format. Key terms, including ‘goals’ and the ‘future’, were clearly defined. Characteristics of patient-specific goals, including goal domain, importance, attainability, and temporality were assessed. The study design was longitudinal so that patient ratings of expected and perceived goal progress could be assessed over time.

**Hope and Goals in Cancer**

While both hope and goals have been evaluated in patients with cancer, hope theory has not been applied as a framework to examine differences in how patients evaluate and pursue goals. Hope theory is generally consistent with traditional conceptualizations of goal setting, which state that in order to pursue a goal, an individual must first specify the goal and evaluate whether it is attainable (Locke & Latham, 2002). Once engaged in goal pursuit, ongoing evaluation of the individuals’ progress towards a goal,
including the will to accomplish the goal (akin to agency thinking) and ways to get there (pathways thinking) influence perceptions of goal importance and effort dedicated to goal attainment (Snyder et al., 1991; Snyder, 2002; Locke & Latham, 2002; Latham, 2016). The current study aims to describe the goals of patients with advanced cancer, and to examine whether hope is related to goal characteristics in these patients.

Hope theory posits that individuals higher in hope set more goals, perceive themselves as having greater control over achieving their goals, and perceive that they are more likely to achieve their goals relative to less hopeful individuals (Snyder et al., 1991; Snyder, 2002). Individuals higher in hope are also thought to set goals that are more important to them and more difficult to attain (Snyder et al., 1991; Snyder, 2002). Several of these assumptions have been tested. For example, content analysis of the goals of college students indicated that higher scores on the AHS predicted setting more important, prosocial, long-term, and challenging goals (Cheavens, Heiy, Feldman, Benitez & Rand, 2018). Similarly, older adults higher versus lower in hope rated themselves as more likely to reach their goals, and perceived themselves as further along in reaching their goals (Wrobleski & Snyder, 2005). While this pattern of results may be different in patients with advanced cancer given their abridged time horizon, the relationship of hope with goal characteristics has not been explored in this population. Accordingly, the current study seeks to evaluate these relationships in a sample of patients with advanced cancer to examine how hope relates to goal characteristics as indicated by patient ratings of importance, temporality, and attainability. In this context patient ratings are preferable to external ratings, because agency thinking and pathways thinking are specific to the individual.

Beyond perceptions of attainability, hope theory further suggests that individuals higher in hope are more likely to pursue and achieve the goals that they set (Snyder et al., 1991, Snyder, 2002). This assumption is supported by findings of a longitudinal study in which higher hope at baseline predicted successful participant-reported goal attainment at follow-up (Feldman, Rand & Kahle-Wrobleski, 2009). Participant-reported goal progress has not been evaluated in patients with advanced cancer. Therefore, the current study examined patients’ expectations of how much progress they would make toward valued
goals over a three- to four-week period, as well as their self-reported progress toward goals at the end of this period of time. Given the uncertainty about life expectancy and whether patients will have time to completely realize valued goals, the current study evaluated patient-rated progress toward identified, valued goals over a three- to four-week period.

**Goals, Emotional Well-being, Meaning and Purpose in Life and Affect in Cancer**

Goals have been associated with patient-reported outcomes in cancer patients, including well-being. Findings of a systematic review of goals in cancer indicate that cancer diagnosis and treatment impact cancer patients’ life goals, and that disturbance of life goal attainment is associated with worse psychological well-being (Hullmann et al., 2016). Research also suggests that engagement in valued, attainable goals is associated with better subjective health and well-being (Holt, Mogensen, Jensen & Hansen, 2015; Klug & Maier, 2015; Mens & Scheier, 2016; Schroevers, Kraaij & Garnefski, 2008; Steca et al., 2016; Thompson, Stanton & Bower, 2013; von Blankenburg et al., 2014; Wrosch, Scheier, Miller, Schulz & Carver, 2003; Wrosch, Miller, Scheier & de Pontet, 2007). Therefore, this study examined characteristics of current goals in patients with advanced cancer, including importance, temporality, perceived attainability, number and content, and how these factors related to emotional well-being.

Pursuit of valued goals has also been associated with a greater sense of meaning and purpose in life in patients with cancer (Pinquart et al., 2009; Thompson & Pitts, 1993; Wrosch et al., 2003). As described by Viktor Frankl’s existential model, the activities that humans frequently engage in to create meaning, such as creating connections with others and having meaningful experiences, are often cited as important goals in patients with life-threatening illness (Frankl, 1992; Rand et al., 2016). Given each individual’s unique assessment of what makes life meaningful, it is important that goals be selected by the individual, such that they are both personally relevant and valuable to the patient based on their appraisal (Gum & Snyder, 2002; Snyder et al., 1991). The current study sought to further examine the relationships between patient-generated goal characteristics and meaning and purpose in life.

Finally, elements of goals may influence patients’ positive and negative affect. Emotions are postulated to provide the individual with ongoing feedback about how goal pursuit is going, such that
individuals who perceive they are making progress toward valued goals would be expected to have greater positive and less negative affect (Snyder, 2002). Cross-sectional findings support this view, as pursuit of valued, attainable goals has been associated with greater positive affect in patients with cancer (Lam et al., 2015; Schroevers et al., 2008). This is also consistent with findings of a self-help goal setting intervention in patients with depression. In this study, intervention participants who learned how to set attainable goals and to develop pathways to reach these goals demonstrated greater positive affect and lesser negative affect post-intervention compared to control participants and their own pre-intervention scores (Coote & MacLeod, 2012). The current study sought to further evaluate the relationships between patient-generated goals and positive and negative affect in patients with advanced cancer.

**Goals as a Mediator of the Relationship between Hope and Well-being**

As noted previously, hope has been positively correlated with well-being in the cancer literature (Berendes et al., 2010; Blank & Bellizzi, 2006; Rajandram et al, 2011; Stanton, Danoff-Burg & Huggins, 2002) as have various goal attributes, including progress toward valued goals and goal attainment (Mens & Scheier, 2016; Thompson, Stanton & Bower, 2013; von Blankenburg et al., 2014; Wrosch, Scheier, Miller, Schulz & Carver, 2003). These findings, in combination with hope theory and its perspective on goal attainment (Snyder et al., 1991), suggest that goals may be the mechanism by which hope influences psychological outcomes. However, no studies to date have examined goal characteristics as a mediator of the relationship between hope and psychological outcomes in patients with cancer.

The current study first examined the univariate relationships among hope, goal characteristics, and emotional well-being at an initial assessment. Next, goal characteristics were evaluated as mediators of the relationship of hope with emotional well-being (see Figure 1). Additionally, goal progress at a three- to four-week follow-up assessment was evaluated as a mediator of the relationship between hope measured at the initial assessment and emotional well-being measured at the follow-up assessment (see Figure 2). The examination of goal characteristics and goal progress in the framework of a goal-oriented theory can help to further scientific understanding of how goals are related to psychological outcomes.
and, if supported, to inform the future development of a goal-related intervention to improve psychological outcomes in patients with advanced cancer.

**Aims of the Current Study**

**Aim 1. To examine the relationship of hope with emotional well-being, meaning and purpose in life, and affect in patients with advanced stage lung cancer**

Hypothesis 1a: Patients with lung cancer who report greater hope will report better emotional well-being (primary outcome), greater meaning and purpose in life, greater positive affect, and less negative affect (secondary outcomes)

**Aim 2. To examine the relationship of hope with goal characteristics in patients with advanced stage lung cancer**

Hypothesis 2a: Patients with lung cancer who report greater hope will rate their goals as more attainable

Hypothesis 2b: Patients with lung cancer who report greater hope will report greater perceived control over the ability to attain their goals

Hypothesis 2c: Patients with lung cancer who report greater hope will report greater likelihood that they will make progress toward their goals in the short term

Exploratory: To explore the relationship of hope with the number of goals that patients with lung cancer set

Exploratory: To explore the relationship of hope with the type of goal that patients with lung cancer identify as their most important goal

Exploratory: To explore in patients with lung cancer the relationship of hope with perceptions of the likelihood that they will accomplish their goals in full in the future

**Aim 3. To examine the relationship of goal characteristics with emotional well-being, meaning and purpose in life and affect in patients with advanced stage lung cancer**

Hypothesis 3a: Patients with lung cancer who rate their goals as more attainable will report better emotional well-being (primary outcome), greater meaning and purpose in life, more positive affect, and less negative affect
Hypothesis 3b: Patients with lung cancer who report greater perceived control over the ability to attain their goals will report better emotional well-being (primary outcome), greater meaning and purpose in life, more positive affect, and less negative affect.

Hypothesis 3c: Patients with lung cancer who report greater likelihood that they will make progress toward their goals in the short term will report better emotional well-being (primary outcome), greater meaning and purpose in life, more positive affect, and less negative affect.

Exploratory: To explore the relationship of number of goals that patients with lung cancer set with emotional well-being (primary outcome), meaning and purpose in life, and positive and negative affect.

Exploratory: To explore the relationship of type of goal that patients with lung cancer set as their most important goal with emotional well-being (primary outcome), meaning and purpose in life, and positive and negative affect.

Exploratory: To explore the relationship of patients with lung cancers’ perception of the likelihood that they will accomplish their goals in full in the future with emotional well-being (primary outcome), meaning and purpose in life, and positive and negative affect.

Aim 4. To explore cross-sectionally whether goal characteristics (i.e., perceived attainability, perceived personal control, perceived ability to make progress toward goals in the short-term) mediate the relationship of hope with emotional well-being in patients with advanced stage lung cancer (see Figure 1).

Aim 5. To explore longitudinally whether patient-reported goal progress mediates the relationship of hope at initial assessment with emotional well-being at follow-up assessment in patients with advanced stage lung cancer (see Figure 2).
METHODS

Participants

Eligible participants met the following criteria: 1) diagnosed with advanced stage lung cancer (American Joint Commission on Cancer stage IIIB/C or IV for patients with non-small cell lung cancer, or extensive stage disease for patients with small cell lung cancer), 2) ≥18 years of age, 3) no history of cancer with the exception of non-melanoma skin cancer, 4) undergoing first-line therapy for lung cancer at Moffitt Cancer Center, 5) had received at least one cycle of systemic treatment (chemotherapy, targeted therapy, and/or immunotherapy) for lung cancer, 5) able to understand, speak, and read English, and 6) able to provide informed consent.

Procedure

Study eligibility was determined by medical record review and consultation with Moffitt Cancer Center Thoracic Oncology Program team members. Potentially eligible patients were approached during an outpatient visit by trained research staff, who described the study protocol. Patients who were eligible and interested in participating were asked to provide written informed consent. Those who provided consent then completed a set of self-report measures, which took approximately 15 minutes to complete. Research staff then administered a semi-structured interview to elicit patient goals. Patients identified their goals then answered questions about the characteristics (e.g., perceived attainability, perceived control, perceived likelihood of making progress toward the goal in the short-term) of each of the three goals they identified as most important right now. If unable to complete self-report measures and/or the interview at the time of enrollment, participants returned the questionnaire via mail and/or completed the interview via telephone. Alternatively, completion of the measures and interview could be scheduled for the next upcoming visit. Study staff arranged follow-up for approximately one month after completion of the initial assessment.
Approximately one month later (+/- 2 weeks, depending on treatment schedule), study staff met the patient in the outpatient clinic to complete follow-up measures and answer follow-up questions about goal progress and characteristics. If the patient was unavailable to meet in person during the study time window, follow-up measures were express mailed to the patient for return via mail and the goal follow-up interview was conducted via telephone. The follow-up measures took approximately 10 minutes to complete. See Table 1 for information on measures comprising the initial (T1) assessment and the follow-up (T2) assessment.

Measures

Sociodemographic Characteristics. Participants completed a standardized self-report form to collect the following demographic information: age, sex, marital status, race, ethnicity, education, and employment status. Copies of this form and all other measures described below appear in Appendix D.

Clinical Characteristics. The following clinical information was collected via medical record review: date of cancer diagnosis, cancer type, disease stage, date of initial treatment and type(s) of treatment. Patient prognostic understanding (i.e., beliefs about likelihood of cure) and preferences for information about cancer diagnosis and treatment were assessed using previously validated single-item self-report measures (El-Jawahri et al., 2014; 2015).

Lifestyle Characteristics. Frequency and amount of alcohol consumption over the previous month was assessed. Participants were asked “Have you had any alcoholic drinks in the past month?” If yes, participants indicated the frequency with which they consumed alcoholic drinks, ranging from 1-3 times a month to 3 or more times a day. Smoking status and cigarette consumption were also assessed. Participants were asked “During your lifetime, have you smoked at least 100 cigarettes (5 packs or more)?” (Rudin, Avila-Tang & Samet, 2009). Participants who responded “yes” were asked about the average number of cigarettes they smoke or smoked daily, whether they had smoked in the previous month and, if so, the average number of cigarettes daily, and total number of years smoked (Ditre et al., 2011). Former smokers were asked how long they had been quit (in months or years). Participants completed the 5-item Duke University Religiosity Index (DUREL) to assess organizational religious
activity, non-organizational religious activity, and intrinsic religiosity (Koenig & Bussing, 2010). The DUREL has been used previously in adults diagnosed with cancer (Caplan, Sawyer, Holt & Brown, 2014).

**Hope.** The Adult Hope Scale (AHS) was used to measure hope (Snyder et al., 1991). The AHS is comprised of 12 items, with four items assessing agency thinking (e.g., “I meet the goals that I set for myself”), four items assessing pathways thinking (e.g., “I can think of many ways to get the things in life that are important to me”), and four distractor items. The scale title does not include the word “hope” when administered to make the purpose of the scale less obvious to those completing it. Respondents indicate the degree to which they believe each item to be true about themselves on an eight-point scale ranging from ‘definitely false’ to ‘definitely true’. Agency and pathways items are summed to form both subscale scores and a total score indicating degree of hopeful thinking. The AHS has demonstrated adequate psychometric properties in diverse samples, including cancer patients (Berendes et. al., 2010; Rand et al., 2016; Snyder et al., 1991; Steed, 2002). Internal consistency reliability has been found to be acceptable for both the total score ($\alpha = .74$ to $.88$) and subscales (agency $\alpha = .71$ to $.83$, pathways $\alpha = .68$ to $.86$) (Berendes et al., 2010; Rand et al., 2016; Snyder et al., 1991). The scale has also demonstrated evidence of acceptable test-retest reliability ($\alpha$’s > $.70$) up to 10 weeks later, supporting stability of the construct over time. Construct validity is evidenced by consistent support for a higher-order 2-factor model of state hope, with no relationship specified between the agency and pathways factors (Babyak et al., 1993). The AHS has demonstrated evidence of convergent validity with other positive psychological constructs and discriminant utility in predicting unique variance in outcomes when entered into models along with measures of theoretically similar constructs such as optimism (Bryant & Cvengros, 2004; Snyder et. al., 1991). In the current study, the AHS total score at the initial assessment was used to test hypotheses about the relationship of hope with emotional well-being, meaning and purpose in life, positive and negative affect, and goal characteristics and processes, as detailed in Aims 1-2 and 4-5. In the present study, the AHS scale demonstrated adequate internal consistency reliability ($\alpha = .86$) and good test-retest reliability ($r = .73, p < .001$).
**Emotional Well-being.** The Functional Assessment of Cancer Therapy- Lung (FACT-L) is 37-item lung cancer-specific measure of well-being (Cella et. al., 2005). The FACT-L is composed of four general subscales (labeled Emotional Well-Being, Physical Well-Being, Social/Family Well-Being, Functional Well-Being), as well as a Lung Cancer subscale. Respondents indicate the extent to which quality of life concerns had affected them over the past week, rating items on a five-point Likert scale ranging from ‘not at all’ to ‘very much’. Subscales are scored separately as well as summed to create a total well-being score (higher score = better well-being). The Emotional Well-being (EWB) subscale was the primary outcome variable in the current study. It should be noted that item ge3 on the EWB subscale includes the word “hope” (“I am losing hope in the fight against my illness”). The relationship between hope and emotional well-being remained consistent when the hope item was and was not included in the emotional well-being scale. Therefore, analyses were run with the hope item to retain the psychometric properties of the scale.

The emotional well-being score at the initial assessment was used to test the relationship of this variable with hope and goal characteristics in the cross-sectional analyses that address Aims 1, 3 and 4. The emotional well-being score at the follow-up assessment was used as the outcome variable in the mediation analysis for Aim 5. Additional subscale scores and the FACT-L total score were computed to characterize domain-specific and overall well-being in the study sample. The FACT-L domain and total scores are commonly used as outcome measures in psycho-oncology research in lung cancer patients with advanced disease (Temel et al., 2010) and have demonstrated adequate psychometric properties (Browning, Ferketich, Otterson, Reynolds & Wewers, 2009) and sensitivity to change over time (Cella et al., 1995). In the present study, the FACT-L emotional well-being subscale demonstrated adequate internal consistency reliability ($\alpha = .80$).

**Positive and Negative Affect.** The Positive and Negative Affect Scale (PANAS) was used to measure positive and negative affect (Watson, Clark & Tellegen, 1988). The PANAS is a 20-item measure that asks respondents to indicate how much words that describe different feelings and emotions (e.g., upset, attentive) are reflective of the way they feel in general, in the present moment, or over a defined period of
time, depending on the instructions given. Respondents rate each feeling or emotion on a 5-point Likert scale ranging from 1 (very slightly or not at all) to 5 (extremely). Ten items are summed to form the positive affect (PA) scale, and the other 10 items form the negative affect (NA) scale (each scale range: 10-50). The subscales are conceptualized as existing on different axes and are considered independent dimensions (Watson, Clark & Tellegen, 1988). Literature is consistent with regard to findings of a negligible correlation between trait positive and negative affect (i.e., “in general”) (Watson, Clark & Tellegen, 1988), but suggests that situation-specific positive and negative affect may be negatively associated (Schnukle, Egloff & Burns, 2002). In the current study, the correlation between the positive and negative affect “in general” at Time 1 was non-significant ($r = -.21, p = .08$), and positive and negative affect “right now” following the Time 1 interview were significantly, negatively correlated ($r = - .30, p < .01$). The PANAS has been used in patients with advanced cancer (Voogt et al., 2005) and has demonstrated a consistent, clear two-factor structure and good internal consistency reliability (PA and NA $a’s > .80$) in general samples (Watson et al., 1988). The PANAS scales have demonstrated evidence of convergent and divergent validity with other measures of mood states (Watson et al., 1988). The PANAS has been shown to be an effective tool to measure both state and trait mood, such that it is sensitive to changes in mood when keyed to the present moment, but stable when respondents are instructed to consider a wider time frame (e.g., past year, in general) (Watson et al., 1988). Participants completed the PANAS keyed to mood state ‘in general’ when completing the initial and follow-up assessments. The PANAS PA and NA subscales are secondary outcome measures in the cross-sectional analyses that address Aims 1 and 3. In the present study, PANAS subscales keyed to “in general” evidenced adequate internal consistency reliability (PANAS Positive affect $\alpha = .87$, PANAS Negative affect $\alpha = .86$). In addition, to explore the possible immediate impact of goal setting on affect, the PANAS keyed to ‘right now’ was completed after the initial goal interview. PANAS subscales keyed to “right now” also demonstrated acceptable internal consistency reliability (PANAS Positive affect $\alpha = .86$, PANAS Negative affect $\alpha = .81$).
**Meaning and Purpose in Life.** The Patient-Reported Outcomes Measurement Information System (PROMIS) Meaning and Purpose Scale - Short Form is an 8-item measure of individuals’ sense of life purpose and reasons for living (Salsman et. al., 2014). Respondents indicate the degree to which they agree with three statements (e.g., “I have a good sense of what makes my life meaningful”) on a five-point scale including ‘strongly disagree’, ‘disagree’, ‘neither agree nor disagree’, ‘agree’, and ‘strongly agree’. Next, respondents indicate the extent to which five statements are reflective of them (e.g., “I experience deep fulfillment in my life”) on a five-point Likert scale ranging from ‘not at all’ to ‘very much’. Items are summed to form a total score, which is converted to a T-score where 50 reflects the average score for the general US population with a standard deviation of 10. Higher scores reflect more of the construct (i.e., greater meaning and purpose) (PROMIS Meaning and Purpose Scoring Manual, 2018). The PROMIS Meaning and Purpose scale has demonstrated good internal consistency reliability (Cella et al., 2007; PROMIS Meaning and Purpose Scoring Manual, 2018). It served as a secondary outcome measure in the cross-sectional analyses that address Aims 1 and 3. In the present study, this scale demonstrated high internal consistency reliability ($\alpha = .91$).

**Goal Characteristics.** Based on previous research (MacLeod, Coates & Hetherton, 2008; Rand et al., 2016) a draft semi-structured interview was created to elicit patient goals. First, ‘goals’ were defined, and an example of a goal specific to the researcher but unlikely to be applicable to study participants was provided to illustrate what a goal might look like (i.e., “I am a graduate student working on my PhD, so one of my goals is to complete the requirements for my degree”). Patients were then asked to share their current goals, and the research staff wrote down the patients’ goals as they went. Patients were not limited on the number of goals that they provided, but were encouraged to generate a minimum of three. After goals were elicited, goals as they were written were reviewed with the patient to check for accuracy and completeness. Patients were then asked to select up to three goals that were the most important to them at the present time. Patients were asked to rank these goals in order of importance, starting with the goal that was most important. After the three most important goals were selected and ranked, the patient answered questions about the characteristics of each of these three goals, as described below. Study procedures
were pilot tested with two participants. Cognitive interviewing techniques were utilized to elicit pilot participant responses to and feedback on the goal setting script (Johnson & Weller, 2001). Pilot participant responses supported conducting the semi-structured interviews as designed. Pilot participants were debriefed about the study purpose after procedures were complete.

Quantitative and qualitative data analysis techniques described below were used to test the relationship of patient goal characteristics with hope and emotional well-being, meaning and purpose in life, and positive and negative affect (Aims 1 and 2). For their top three most important goals right now, participants provided ratings of perceived goal attainability, perceived control over reaching the goal, perception of their ability to make progress toward the goal in the short term, and likelihood of reaching the goal in full in the future on Likert scales as described below. Participants’ ratings were averaged across their top three most important goals to create a mean value for each goal characteristic variable, which were used to test hypotheses for Aims 2-4. The total number of goals that patients set was summed. Goal content was analyzed and grouped into domains as described below. Likert scale ratings of perceived goal process at follow-up were also averaged across the top three goals and used in analyses for Aim 5.

**Goal attainability.** Participants were asked to rate how attainable they perceived each of their most important goals to be (i.e., “To what extent do you believe that this goal is doable?”) on an 11-point Likert scale ranging from 0 (not at all doable) to 10 (extremely doable). This question was adapted from items used to assess perceived goal attainability in a goal setting and planning intervention (MacLeod et al., 2008).

**Perceived control over goal attainment.** Participants were asked to rate the extent to which they felt they had control over attainment of each of their most important goals on an 11-point Likert scale ranging from 0 (no control) to 10 (total control). This question was used previously to assess perceived control over goal attainment in a goal setting and planning intervention (MacLeod et al., 2008).

**Goal expectancy.** The perceived likelihood that the patient will accomplish each of their most important goals in the future was assessed by the question, “How likely is it that you will reach this goal in full in
the future?” Participants rated the likelihood on an 11-point Likert scale, ranging from 0 (not at all likely) to 10 (extremely likely). This item was adapted from an expectancy scale ranging from 0-100% that has been previously used in studies assessing goals in cancer patients (Rand et al., 2016; Wrobleski & Snyder, 2007). This item was administered at the initial and follow-up assessments to see if there was any change over time in goal expectancy.

**Goal progress.** For each of their most important goals, patients were asked at the initial assessment, “How much progress do you think you will make toward this goal in the next 3-4 weeks?” Participants selected one of five options, including “no progress at all”, “a little progress”, “some progress”, “a lot of progress”, or “done in full”. This item was also administered at follow-up, with the question stem changed to assess the patients’ perception of how much progress they made toward each goal. Patients were asked, “How much progress did you make toward this goal over the last 3-4 weeks?” with the same answer choices. The development of this item was informed by process questions from previous goal setting interventions (Coote & MacLeod, 2012; MacLeod et al., 2008) and a measure of participant-rated goal progress (Feldman et al., 2009).

**Expected versus perceived goal progress.** In order to assess patients’ perceptions of how much progress they made versus how much they thought they would make for each of their most important goals, at follow-up participants were asked “Did you make more, less, or about the same amount of progress toward this goal as you expected over the past 3-4 weeks?” Participants selected one of five options, including “I made significantly more progress than I expected”, “I made a little more progress than I expected”, “I made about as much progress as I expected”, “I made a little less progress than I expected”, and “I made significantly less progress than I expected”. The development of this item was informed by process materials from previous goal setting interventions (Coote & MacLeod, 2012; MacLeod et al., 2008).

**Open-ended questions.** Several open-ended questions at the follow-up assessment allowed for participants to provide explanations of what exactly they had done in relation to their goals over the three- to four-week time frame (“What have you done in relation to this goal over the past 3-4 weeks?”), and to share
anything that helped them to make progress (perceived facilitators) or hindered them from doing so (perceived barriers) (“What types of things, if any, impacted your making progress toward this goal?”).

*Goal domain.* Goals were written down by study staff during the semi-structured interviews as well as audio recorded. Study staff reviewed the written goals with patients for accuracy. Patient goals as they were recorded in the written document during goal elicitation were used at Time 2 to cue patients for goal follow-up questions. A portion of the audio recordings was reviewed and compared to the written documented goals to ensure consistency. Written goals were then coded into domains for content analyses using procedures established in previous goal setting research with advanced cancer patients (Rand et al., 2016). Two coders blinded to study hypotheses independently reviewed the written goals. An inductive content analysis approach was used, such that each coder first assessed the usefulness of established domains (Rand et al., 2016) to code a subset of goals. Raters then independently debriefed with the principal investigator to provide feedback on the clarity of goal domains and definitions and to determine whether study data were adequately captured by established domains. This feedback was integrated to produce the final goal domains and definitions. The coders then independently coded all goals into the established domains. Goals were coded orthogonally, such that each goal was assigned to one domain. A hierarchy was established, such that if a rater believed a goal may fit into multiple domains, it would be assigned to the domain that appeared first in the hierarchy. Interrater reliability was computed (percent agreement = 81%, Cohen’s kappa = .76) indicating adequate agreement (Cohen, 1960). After independent review by the principal investigator, raters discussed and resolved discrepancies until 100% agreement was achieved.

**Statistical Analyses**

Statistical analyses were performed using SAS version 9.4 (Cary, NC). Descriptive statistics (means, standard deviations, frequencies) were computed to characterize the sample. In cases where participants missed ≤ 20% of items on an individual scale, available data for that participant were used to calculate an item-level mean value for imputation. Scale scores were evaluated for normality of their
distributions. Skew and kurtosis were evaluated using a value of +/- 2; values fell within these bounds. Cronbach’s alpha was computed for each multi-item scale to estimate internal consistency reliability.

Correlational and chi square analyses were used to examine relationships of sociodemographic, clinical and lifestyle variables with hope. Hope was not significantly correlated with demographic characteristics, including age (r = -.03), gender (r = -.02), race (White vs ???) (r = -.08), ethnicity (Hispanic vs. non-Hispanic (r = -.01), married status (married vs. other) (r = .20) or education (having at least some college education vs not) (r = .13) (all p’s > .05). Hope was not significantly associated with relevant clinical characteristics, including disease stage (stage IV disease vs stage IIIB/C) (r = -.04), time since diagnosis (r = .02), time on treatment (r = .02), the presence or absence of brain metastases (r = .02), the presence or absence of disease progression during the study window (r = -.05), or performance status (r = .06) (all p’s >.05). With regard to lifestyle characteristics, hope was not significantly associated with being a current smoker (r = -.12) or having used alcohol in the previous month (r = .02) (p’s >.29). Hope was significantly correlated with religiosity as measured by the DUREL total scale score (r = .32, p <.01). The associations explored in Aims 2 and 3 were evaluated in a regression framework with and without religiosity to determine whether the pattern of results remained the same with the control variable. Religiosity was not significant in any of the models, and the pattern of results for Aims 2 and 3 with the addition of the control variable was consistent with univariate analyses. Therefore, the subsequent analyses were run without controlling for religiosity.

Accordingly, to address Aims 1-3, a series of Pearson’s r correlation coefficients was computed using data from the initial assessment. First, analyses tested whether hope was related to emotional well-being (primary outcome) and to meaning and purpose in life and positive and negative affect (secondary outcomes) (Aim 1). Next, the relationship of hope with goal characteristics (i.e., perceived goal attainability, the extent to patients feel they have control over goal attainment, perception of ability to make progress toward most important goals in the short term) was evaluated (Aim 2). Finally, the relationship of goal characteristics with emotional well-being (primary outcome), meaning and purpose in life and positive and negative affect (secondary outcomes) was examined (Aim 3).
To address Aim 4, mediation models were used to test whether goal characteristics at the initial assessment mediated the relationship between hope and emotional well-being at the initial assessment. Separate models evaluated whether each goal characteristic mediated the relationship between hope (the x variable) and emotional well-being (the y variable). To address Aim 5, mediation analysis was used to test whether goal progress at follow-up mediated the relationship between hope at the initial assessment and emotional well-being at follow-up.

More recent literature suggests that Baron and Kenny’s (1986) conditions for mediation, specifically the requirement of a significant effect of the independent variable on the outcome variable in order to test for mediation, should be relaxed (Fairchild & McDaniel, 2017; Hayes, 2009, 2017a, 2017b; Shrout & Bolger, 2002). It is argued that, independent of the presence of a relationship between the independent and outcome variables, mediation analysis can provide valuable information (Fairchild & McDaniel, 2017; Hayes, 2017a). Therefore, PROCESS v3 macro for SAS was used to run simple mediation analyses (Hayes, 2017b) for Aims 4 and 5, independent of the correlational relationships between variables observed in analyses for Aims 1-3. PROCESS uses bootstrap sampling to estimate the indirect effect and 95% confidence interval for the indirect effect. When the 95% confidence interval for the indirect effect did not include zero, the indirect effect was considered statistically significant. Reverse mediation models were also run evaluating emotional well-being as the mediator variable with goal characteristics and progress as the outcome variables.

A power analysis using G*Power 3.1 indicated that a sample of 84 patients was needed to detect a medium effect \( r = .30 \) with a Type I error rate of 0.05 (two-tailed) and power of 0.80 for the univariate correlational analyses addressing Aims 1-3. An additional power analysis was conducted to determine the number of participants needed for multiple regression analyses, should analyses require the inclusion of covariates. To obtain power of .80 using multiple linear regression with an alpha = .05 (two-tailed) to detect an effect size in which the variable of interest (hope or goal characteristics) accounts for an additional 7% of the variance in the outcome variable (goal characteristics or emotional well-being) after
accounting for three covariates (i.e., demographic, clinical and lifestyle characteristics), 107 participants would be needed. As noted above, analyses did not require the inclusion of covariates.

For the mediational analyses, established methods (Fritz & MacKinnon, 2007) indicated that a sample size of 115 patients was needed to detect a small-medium effect in the $\alpha$ pathway (x variable to mediator) ($\alpha = .26$) and a medium effect in the $\beta$ pathway (mediator to y variable) ($\beta = .39$) with a power of 0.80 when using bias-corrected bootstrapping to test for mediation. Therefore, the current study sought to obtain complete data from 115 participants. Assuming 10% attrition and missing data rate, a recruitment target of 127 patients was set.

As of March 16, 2020, 82 participants had been consented to the study. Due to the COVID-19 pandemic, all in-person research activities were halted on this date. Given that all study recruitment procedures had been conducted in person prior to this date and in consultation with the dissertation committee, recruitment was terminated at this point. The study protocol permitted follow-up procedures to be completed at a distance (i.e., via mail and telephone), and it was deemed appropriate to complete follow-up procedures with participants who had signed consent prior to the shutdown. Given the potential impact of COVID-19 and related distress on study variables of interest, additional exploratory analyses were conducted to evaluate any differences between participants who completed the follow-up assessment prior to March 16, 2020 and those who completed the assessment after this date.
RESULTS

Participant Characteristics

Participant flow is shown in Figure 3. A total of 997 patients were screened for eligibility between July 8, 2019 and March 13, 2020. Of that number, 902 patients were ineligible before consent due to: not having a diagnosis of advanced stage lung cancer ($n = 238$); not being on first-line therapy for advanced lung cancer ($n = 367$); having a history of another cancer other than non-melanoma skin cancer ($n = 228$); not being proficient in English ($n = 26$); not receiving treatment at Moffitt Cancer Center ($n = 26$); being too sick ($n = 9$); physician discretion ($n = 6$); and not being able to provide consent ($n = 2$). Ninety-five participants were approached for study participation, and 82 provided written informed consent (86% acceptance rate). Thirteen participants refused participation (11 active refusals, 2 passive refusals). Of the 82 participants consented, one was ineligible after consent (on second-line therapy). Seventy-nine participants completed and returned the Time 1 questionnaire, and 77 completed the Time 1 semi-structured interview. In total, 75 participants completed all Time 1 study procedures (questionnaire + interview) (91% Time 1 completion rate). Sixty-five patients were deemed to have complete Time 2 data (questionnaire + interview; 79% Time 2 completion rate). Fifty-three patients completed Time 2 procedures prior to March 16, 2020 when in-person research activities were suspended, while 12 completed Time 2 procedures after this date. Ten participants did not complete all Time 2 procedures. Six participants had no Time 2 data (no questionnaire or interview data), and four had partial data (3 interview but no questionnaire, 1 missing >20% of items on the Adult Hope Scale). Of the 10 participants who did not complete Time 2 procedures, eight were due for follow-up during COVID-19 related shutdowns. Analyses for Aims 1-4 were conducted on the 75 patients with evaluable Time 1 data. Analyses for Aim 5 were conducted using data from the 65 patients with evaluable Time 1 and Time 2 data.
Participants who consented to the study (n = 82) were compared to non-consenters (n = 13) on demographic characteristics. Consenters did not differ from refusers with regard to race, ethnicity, or gender (p’s > .27). Participants who completed the Time 1 questionnaire and interview (n = 75) were compared to those who did not (n = 6) on demographic and clinical characteristics. Completers and non-completers did not differ on gender, ethnicity, race, marital status, cancer stage, time since diagnosis, time on current treatment, presence of brain metastases, or progression during the study window (p’s > .08). On average, non-completers were younger than completers (M non-completers = 50.5 years (SD = 11.1), M completers = 65.2 years (SD = 9.6), t = -3.6, p < .001). Non-completers also differed from completers with regard to current treatment regimen ($\chi^2 = 20.9, p < .001$); 67% of non-completers were taking a tyrosine kinase inhibitor (TKI), whereas 8% of completers were taking a TKI.

Demographic, clinical, and lifestyle characteristics for the 75 patients included in the analyses for Aims 1-4 are shown in Tables 2-5. The majority were White (95%), not Hispanic (93%) and female (59%) (see Table 2). Most patients were married or living with a partner (69%), and had at least some college education (63%). Nearly half were retired (47%), 28% were working part or full time and 15% were disabled.

Participant clinical characteristics are shown in Table 3. Participants were diagnosed with either non-small cell (88%) or small cell (12%) lung cancer. The majority were diagnosed with Stage IV disease (85%), and patients were an average of nearly one year ($M = .94$ years) since diagnosis. Current treatment regimens included immunotherapy (41%), participation in a clinical trial (27%), chemoimmunotherapy (16%), targeted therapy (8%), chemotherapy (5%) or chemoradiation (3%). Participants had been on their current treatment regimen an average of .80 years. Over half (52%) of participants had a performance status of 1, indicating restriction in physically strenuous self-care activities.

With regard to cancer diagnosis and treatment information preferences, most patients (79%) indicated a preference to hear as many details as possible in all situations relating to their cancer and its treatment (Table 4). Patient prognostic perceptions regarding likelihood of cure ranged from “extremely likely” (>90% chance of cure) (24%) to “no chance” (0% chance of cure) (9%).
Participant lifestyle characteristics are shown in Table 5. Participants endorsed a mean score of 2.63 on the DUREL item assessing frequency of attendance at religious services, which corresponds to attendance “once a year” or “a few times a year”. Participants reported a mean score of 3.28 on an item assessing frequency of private religious activities (e.g., prayer, meditation, Bible study), which corresponds to practicing between “once a week” or “two or more times a week”. The final three items of the DUREL ask participants to indicate the degree to which statements of intrinsic religiosity (e.g., “In my life, I experience the presence of the divine (i.e., God)”), are representative of them, ranging from “1=definitely not true” to “5=definitely true of me”. Participants had a mean intrinsic religiosity score of 10.95, which corresponds to being between “unsure” and “tends to be true”.

Participants included current (8%), former (76%), and never (16%) cigarette smokers. Approximately one third of participants (32%) reported consuming an alcoholic beverage in the past month.

**Time 1 Variable Information**

Mean scores on the hope, meaning and purpose in life, affect and quality of life measures are presented in Table 6. Although no hypotheses were offered, correlations among the positive psychological outcome variables are presented in Table 7. Emotional well-being was significantly associated with meaning and purpose in life \((r = .24)\), positive affect \((r = .33)\) and negative affect \((r = -.67)\) \((p’s < .05)\). Meaning and purpose in life demonstrated a strong, positive association with positive affect \((r = .69, p < .001)\), but was not associated with negative affect \((r = -.12, p = .30)\). As reported above, positive and negative affect “in general” at Time 1 were not significantly correlated \((r = -.21, p = .08)\).

Descriptive data for the goals identified during Time 1 semi-structured interviews are presented in Table 8. Participants reported a total of 344 goals, with a mean of 4.6 goals per patient \((SD = 1.8, \text{ Range: 3-12})\). On average, participants rated their top three most important goals as highly doable \((M = 8.7, SD = 1.3)\) and perceived themselves as having a good amount of control over reaching their goals \((M = 7.8, SD = 1.8)\). Participants anticipated making between “some” and “a lot” of progress toward these
goals in the short-term ($M = 2.4$, Range = 0-4) and anticipated high likelihood of reaching their goals in full in the future ($M = 8.9$, $SD = 1.2$).

The following eight goal domains were identified through inductive content analysis based on Time 1 interview data: 1) social/role relationships, 2) everyday/practical, 3) leisure/pleasure, 4) psychological/existential/religions or spiritual, 5) major life changes or achievements, 6) cancer treatment response or disease outcome, 7) palliative outcomes, and 8) behavioral health improvement. Definitions for each goal domain and exemplary goals to characterize each domain are provided in Table 9.

Descriptive statistics for goal domains are presented in Table 10. Nearly three-quarters (73%) of patients identified at least one social/role goal, 71% of patients had at least one leisure goal, and 59% of patients had at least one everyday/practical goal. With regard to overall number of goals, leisure goals were the most common ($N = 93$), followed by social/role goals ($N = 84$) and everyday/leisure goals ($N = 54$). Participants most often identified a social/role goal as their most important goal (29%). Cancer outcome goals were the second most likely to be identified as most important (25%), followed by everyday/practical goals (15%) and palliative outcome goals (13%).

Given small cell sizes, planned exploratory analyses for Aims 2 and 3 evaluating hope and positive psychological outcome variables by most important goal domain could not be meaningfully conducted. Cancer-related goal domains (cancer treatment response/disease outcomes and palliative outcomes) were combined to compare patients who identified a cancer-related goal as the most important goal ($n = 29, 39\%$) to patients who identified a non-cancer related goal as the most important ($n = 46, 61\%$) (i.e., cancer-related vs not), with results of comparisons reported below.

Positive and negative affect keyed to “right now” were evaluated directly after the Time 1 interview procedures. Mean values are presented in Table 11. Participant ratings of positive affect right now after completing the interview were similar to their ratings of positive affect in general (right now $M = 37.0$, in general $M = 36.6$, $t = -1.02, p = .31$). In contrast, participant ratings of negative affect right now after completing the interview were lower than their ratings of negative affect in general (right now $M = 13.4$, in general $M = 18.2$, $t = 9.18, p < .001$) (see Table 12).
**Time 2 Variable Information**

Descriptive statistics for hope, emotional well-being, meaning and purpose in life, and positive and negative affect at Time 2 are shown in Table 13. Given the potential impact of COVID-19 on psychological variables, mean scores are presented for the total sample, then separately for participants who completed Time 2 procedures before March 16, 2020 and those who completed procedures on or after this date. Mean scores for participants who completed procedures after COVID-19 related shutdowns were lower on all indices; however, differences did not reach statistical significance (p’s >.20).

Mean scores for goal characteristics at Time 2 are presented in Table 14. On average, participants rated themselves as making “some progress” (M = 2.1) toward their goals in the short-term. Participants who completed the Time 2 interview after COVID-19 restrictions reported making less progress toward their goals than participants who completed the interview before COVID restrictions (M COVID restrictions = 1.6, M pre-COVID = 2.2, t = 2.1, p = .04). On average, participants reported making “about as much progress as expected” toward goals on the Likert scale assessing comparative progress (M = 3.1).

Participants were asked the same question about perceived ability to reach goals in full in the future at Time 1 and Time 2; scores remained consistent (Time 1 M = 8.9, Time 2 M = 8.8). Participants were asked an open-ended question about specific goal-related actions and facilitators of progress toward goals, as well as perceived barriers to making progress toward goals. Examples are provided in Table 14.

Although no hypotheses were offered, correlations among hope, goal characteristics, and psychological outcome variables at Time 2 are presented in Tables 15 and 16. Greater perceived progress toward goals in the short-term was moderately correlated with emotional well-being at Time 2 (r = .44, p <.001) Given the significant association between patient-rated goal progress and emotional well-being at Time 2, we conducted an unplanned hierarchical linear regression analysis to evaluate whether greater perceived progress toward goals predicted emotional well-being at Time 2 after accounting for emotional well-being at Time 1. Goal progress did not predict emotional well-being at Time 2 beyond the effects of emotional well-being at Time 1 (t = 1.95, p = .06) (Table 17).
Analyses Related to Aim 1

Correlations of hope with emotional well-being, meaning and purpose in life, and positive and negative affect are shown in Table 18. Contrary to hypotheses, hope was not associated with emotional well-being \((r = .08)\), or negative affect \((r = .01)\) \((p \text{ values} > .51)\). Consistent with hypotheses, hope was associated with greater meaning and purpose in life \((r = .34)\) and greater positive affect \((r = .47)\) \((p \text{ values} < .01)\). The hope agency subscale demonstrated the same pattern of significant results as the total score. In contrast, pathways thinking was not associated with meaning and purpose in life \((r = .22, p = .06)\).

Analyses Related to Aim 2

Correlations of hope with goal characteristics are shown in Table 19. As hypothesized, hope was positively associated with perceived goal attainability \((r = .24)\) and perceived control over reaching goals \((r = .34)\) \((p \text{ values} < .04)\). The agency subscale was also associated with greater perceived attainability \((r = .27)\) and perceived control over reaching goals \((r = .32)\) \((p \text{’s} < .02)\). In contrast, pathways thinking was associated with greater perceived control \((r = .29, p < .01)\), but not attainability \((r = .18, p = .12)\). Neither the total hope scale nor the agency and pathways subscales were correlated with anticipated progress toward goals in the short-term \((r \text{’s} .15 \text{ to } .18, p \text{’s} > .13)\) or the number of goals set \((r \text{’s} .01 \text{ to } .06, p \text{’s} > .63)\). Patients who identified a cancer-related goal as their most important goal did not differ in hope compared to patients who identified a non-cancer related goal as most important \((r \text{’s} -.01 \text{ to } -.19, p \text{’s} > .10)\). The total hope scale, as well as agency and pathways subscales, were correlated with perceived likelihood of reaching goals in the future \((r \text{’s} .25 \text{ to } .34, p \text{’s} < .03)\).

Analyses Related to Aim 3

Correlations between goal characteristics and emotional well-being, meaning and purpose in life, and positive and negative affect are shown in Table 20. Consistent with hypotheses, patients who rated goals as more attainable reported greater emotional well-being, greater meaning and purpose in life, greater positive affect and less negative affect \((r \text{’s} .29 \text{ to } .45, p \text{’s} < .02)\). Similarly, patients who reported greater perceived control over reaching goals also reported greater emotional well-being, greater meaning and purpose in life, more positive affect and less negative affect \((r \text{’s} .24 \text{ to } .44, p \text{’s} < .04)\). Anticipated
progress in the short term was positively associated with emotional well-being \( (r = .25) \) and negatively associated with negative affect \( (r = .24) \) \( (p’s < .04) \). Anticipated progress in the short term was not associated with meaning and purpose in life \( (r = .08) \) or positive affect \( (r = .22) \) \( (p’s > .05) \), and the number of goals reported was not associated with any of the positive psychological outcome variables evaluated \( (r’s .07 \text{ to } .13, p’s > .25) \). Identifying a cancer-related goal as the most important goal was associated with poorer emotional well-being \( (r = .24, p = .04) \) but was not associated with differences in meaning and purpose in life or positive or negative affect \( (r’s .12 \text{ to } .15, p’s > .20) \). Perceived likelihood of reaching goals in full in the future was positively associated with emotional well-being, meaning and purpose in life, and positive affect \( (r’s .26 \text{ to } .41, p’s < .03) \), but not negative, affect \( (r = -.14, p = .23) \).

**Analyses Related to Aim 4**

As outlined in the statistical analysis plan, three goal characteristics (i.e., perceived attainability, perceived personal control, perceived ability to make progress towards goals in the short term) were entered into three separate simple mediation analyses to examine whether goal characteristics mediated relationships of hope with emotional being at Time 1. Bootstrapped estimates and 95% confidence intervals for the mediation models are shown in Table 21. Results indicated that goal attainability and perceived control over reaching goals demonstrated evidence of mediation as indicated by 95% confidence intervals for the indirect effects that did not include zero. Anticipated progress in the short term did not mediate the relationship between hope and emotional well-being as indicated by a 95% confidence interval for the indirect effect that included zero. Unplanned analyses were conducted for two additional goal characteristic variables (number of goals, ability to reach goal in full in the future). Perceived ability to reach goals in full in the future demonstrated evidence of mediation \( (95\% \text{ CI of indirect effect: } .001 \text{ to } .11) \); number of goals did not demonstrate evidence of mediation \( (95\% \text{ CI of indirect effect: } -.02 \text{ to } .02) \).

Reverse mediation analyses were also conducted, in which the proposed mediators (goal characteristics) were entered as the dependent variable, and the dependent variable (emotional well-being) was entered as the mediator. In reverse mediation analyses, emotional well-being did not mediate the
relationship between hope and any goal characteristics as evidenced by 95% confidence intervals for the indirect effect that included zero (Table 22).

**Analyses Related to Aim 5**

Patient-rated progress toward goals in the short-term was entered into a mediation analysis to explore whether this variable mediated the relationship between hope at Time 1 and emotional well-being at Time 2. Bootstrapped estimates and 95% confidence intervals for the mediation model are shown in Table 23. Patient-rated progress toward goals in the short-term did not demonstrate evidence of mediation as indicated by 95% confidence intervals for the indirect effect that include zero.
DISCUSSION

The purpose of the current study was to investigate the relationship of hope to emotional well-being, meaning and purpose in life, and positive and negative affect in a sample of patients with advanced stage lung cancer in active treatment. The study also sought to identify how hope relates to patients’ goals and to explore whether goal characteristics and progress in achieving goals mediated the expected relationship between hope and emotional well-being. Description of the main study variables is presented, followed by discussion of findings by study aim in the context of relevant theory and research to date. Strengths and limitations of the current study, clinical relevance, and future directions are then discussed.

Descriptive Findings for Hope and Psychological Variables

The mean score on the Adult Hope Scale in the current sample ($M = 53.8$) was consistent with hope in a mixed cancer sample of patients with advanced disease ($M = 53.2$) (Rand et al., 2016) but slightly higher than in a sample of patients with primarily early-stage lung cancer ($M = 50.8$) and in various undergraduate and community samples ($M = 49$) (Berendes et. al., 2010; Snyder, 2002; Cheavens, Feldman, Gum, Michael & Snyder, 2006). Consistent with previous findings in general and cancer samples, hope was not correlated with demographic characteristics (i.e., gender, age) or clinical characteristics (i.e., time since diagnosis) (Snyder et al., 1991; Berendes et. al., 2010). Hope scores demonstrated adequate test-retest reliability from Time 1 to Time 2, which is consistent with the conceptualization of hope as a trait-like construct (Snyder et al., 1991).

The level of emotional well-being in the current study ($M = 18.7$) was consistent with normative data for adult cancer samples ($M = 18.1$) (Brucker et al., 2005) and slightly lower than US adult population-based norms ($M = 19.9$). Emotional well-being in the current sample was better than in previous samples of advanced lung cancer patients undergoing anticancer treatment (Range $M = 13-17$). (Auchter et al., 2001; Kurita, Garron, Stanton & Meyerowitz, 2015). This is possibly related to advances
in the treatment of metastatic NSCLC in the past several years, namely the introduction of immune checkpoint inhibitors and targeted therapies (Howlander et al., 2020). These treatments are generally better tolerated than those that they replaced (i.e., platinum-based chemotherapy) and have led to improvements in median survival in this patient population. Although promising that advanced lung cancer patients are endorsing emotional quality of life consistent with cancer patient norms, the changing treatment landscape presents new emotional challenges as patients and their families may have heightened expectations that they will respond positively to newer therapeutic agents.

Participants reported a mean T-score of 54.9 ($SD = 8.3$) on the PROMIS meaning and purpose scale, which falls within one standard deviation of the mean T-score for the reference population ($M = 50$, $SD = 10$). This finding indicates that patients had an average sense of life having purpose and that they believe there are reasons for living.

Mean scores on the PANAS positive ($M = 36.6$) and negative affect ($M = 18.2$) subscales keyed to “in general” ranged from 10 to 48, where higher scores indicate higher levels of positive or negative affect. Positive affect in the current sample was notably higher than in a mixed sample of patients with advanced cancer ($M = 27.7$) as well as non-clinical normative values ($M = 31.3$) (Voogt et al., 2005; Crawford & Henry, 2004), while negative affect was comparable (mixed advanced cancer $M = 17.6$, non-clinical $M = 16$). Positive and negative affect “in general” were not significantly correlated, consistent with the conceptualization of trait positive and negative affect as operating on different axes (Watson, Clark & Tellegen, 1988).

Participants who completed Time 2 procedures after COVID-19 related shutdowns endorsed lower scores on hope, emotional well-being, meaning and purpose in life, and positive and negative affect compared to participants who completed Time 2 procedures prior, although these differences did not reach statistical significance. Participants who completed Time 2 procedures pre-COVID had a mean overall FACT-L score of 103.7, while patients who completed the measure during COVID-related shutdowns had a mean score of 96.4. Although not statistically significant, four points is considered a
minimal clinically important difference (MCID) for the FACT measures, suggesting that participants experienced clinically relevant decrements in quality of life in the wake of the pandemic.

Findings Related to Aim 1

The current study addressed a gap in the literature by applying Snyder’s hope theory, a cognitively-based model of goal attainment, to understand the relationship of hope to psychological outcomes in patients with advanced stage lung cancer. With regard to a priori study hypotheses for Aim 1, findings were mixed. Contrary to hypotheses and previous findings in cancer samples (e.g., Liu et. al., 2017; Jo & Son, 2014; Li, Yang, Liu & Wang, 2016), greater hope was not associated with greater emotional well-being. This could be a function of hope being a cognitive, trait-like construct while emotional well-being is more state-dependent and may be impacted by other behavioral and environmental factors (physical symptom burden, pre-existing mental health disorders). The lack of relationship between hope and emotional well-being may also be a product of the framing of items within the measure. Items on the emotional well-being scale ask about facets of poor emotional well-being (e.g., I feel sad, I worry about dying), which are then reverse coded. Other psychological constructs that have been associated with hope, including happiness and psychological adjustment, are framed positively (Blank & Bellizzi, 2006; Wnuk, Marcinkowski & Fobair, 2012; Felder, 2004; Shapiro, McCue, Heyman, Dev & Haller, 2010; Stanton et al., 2000).

Consistent with hypotheses, higher hope was associated with greater meaning and purpose in life, extending findings of such a relationship in women with breast cancer to lung cancer patients (Wnuk, Marcinkowski & Fobair, 2012). Hope total score and agency thinking, but not pathways thinking were significantly associated with meaning and purpose in life. This finding is consistent with the PROMIS definition of meaning and purpose in life as an indicator of “hopefulness, optimism, goal-directedness, and feelings that one’s life is worthy”, which aligns with the self-referential element of agency thinking and hope more broadly (PROMIS scoring manual, 2018).

Consistent with hypotheses, higher hope was associated with greater positive affect. Contrary to hypotheses, higher hope was not associated with less negative affect. Although previous studies suggest
that individuals higher in hope have greater positive and less negative affect while pursuing goals (e.g., Blank & Bellizzi, 2006; Snyder et al., 1991), the correlation between hope and negative affect in the current study was nearly zero ($r = .01$). This finding may be interpreted as hope being an important factor contributing to positive affect, but that it is less important or effective in buffering against negative affect. This finding also may suggest co-occurrence of positive and negative affect in this population (Larsen et. al., 2017), which is sensible given the challenges of tolerating uncertainty about the future in the context of a life-limiting illness. Participants endorsed more positive than negative affect on the PANAS, which is consistent with previous studies (Coote & MacLeod, 2012; Lam et al., 2015; Schroers et al., 2008) and aligned with the comparatively high mean level of hope observed in the current sample.

Taken together, this pattern of relationships suggests that hope thinking among patients with advanced cancer in active treatment contributes to positive psychological outcomes (i.e., meaning and purpose in life, presence of positive affect), but does not buffer against negative psychological outcomes (e.g., poor emotional well-being, presence of negative affect).

**Goal-related Findings**

The current study extends previous research describing goals in patients with cancer. Methodology of the current study was intentionally updated to address limitations of prior work. For one, goals were elicited generally, versus asking specifically about life or cancer-related goals, to assess how many and what types of goals patients identified naturalistically. The most common goal domains in the current study, social/role/relationships and leisure/pleasure goals (e.g., spend time with loved ones, travel, engage in sport), are consistent with Frankl’s existential model. This model states that activities that humans frequently engage in to create meaning, such as creating connections with others and having meaningful experiences, are likely to be identified as important goals by patients with life-threatening illness (Frankl, 1992; Rand et al., 2016; Pinquart et al., 2009). Despite patients in the current study often completing semi-structured interviews while receiving cancer treatment or waiting for an oncology appointment, cancer outcome-related goals constituted a small percentage (7%) of goals overall. This finding is in contrast with a 2016 study (Rand et al.) in which life and treatment-related goals were
elicited separately, and patients identified treatment-related goals including cure and “fighting cancer” as the most important. Based on this methodology, participants may have felt compelled to rank cancer-related goals as most important given societal pressures and nomenclature focused on to “fighting” and “beating” the disease (Penson et al., 2004).

Measures used to evaluate goal characteristics were adapted from previous studies of goals in cancer and non-cancer samples (Rand et al., 2016, Pinquart et al., 2005, Pinquart, Frolich & Silbereisen, 2008). Mean scores for perceived attainability, perceived control over reaching goals, and anticipated likelihood of reaching goals in full in the future were relatively high on a 0-10 Likert scale. Anticipated progress in the short-term was lower, which may be a reflection of participants’ being realistic about what was attainable in a defined period of time.

To our knowledge the current study is the first to examine patients’ expectations of how much progress they would make toward valued goals over a three- to four-week period, as well as their self-reported progress toward goals at the end of this period of time. In general, participants anticipated making “some” to “a lot” of progress toward goals in the short-term, and their actual progress was generally aligned with expectations. As might be expected, patients who completed Time 2 procedures during the pandemic reported significantly less progress toward goals than participants who completed procedures before, and nearly all of these individuals identified COVID-19 as a barrier to making anticipated progress.

The current study provides novel insights into factors that facilitated participant progress toward goals in the short-term, and, alternatively, factors that impeded progress. Participants cited feeling physically well, social support, having a routine, healthy behaviors and mental fortitude as factors that helped them to make progress toward goals. Participants often discussed smaller steps they had made toward longer-term goals, such as doing research online for trips they were planning. Factors that impacted patient progress toward goals are consistent with factors that have previously been identified as impacting well-being in lung cancer patients, including physical symptom burden and functional limitations from cancer and its treatment (Lehto, 2017). Participants also discussed mental health as a
barrier to goal progress, for example, low motivation and depressive symptoms. These qualitative findings are aligned with the observed moderate correlation between greater progress toward goals in the short-term and better emotional well-being at Time 2. The association of goal progress with better emotional well-being and the information on barriers and facilitators of goal progress provide helpful information to consider in the development of psychological and behavioral interventions for patients with advanced lung cancer.

Findings Related to Aim 2

While both hope and goals have been evaluated in patients with cancer, hope theory has not been applied as a framework to examine differences in how patients evaluate and pursue their personal goals. With regard to a priori study hypotheses for Aim 2, findings were mixed. Consistent with hypotheses and Snyder’s hope theory, individuals higher in hope in the present study perceived their goals as being more attainable and perceived themselves as having greater control over achieving their goals relative to less hopeful individuals (Snyder et al., 1991; Snyder, 2002). Perceived attainability was associated with overall hope and agency thinking, but not pathways thinking. This is consistent with attainability being a reflection of one’s belief that they can do or reach something (e.g., agency thinking). Perceived control over reaching goals was associated with hope total score and subscale scores, which is consistent with this characteristic involving elements of both agency and pathways thinking (i.e., control over beliefs that one can attain goals, as well as control over deriving pathways to reach goals). Contrary to hypotheses, hope was not associated with perceived likelihood of making progress toward goals in the short-term (i.e., over the approximately one-month follow-up period). This reflects participants’ ability to incorporate temporality into hope thinking in order to generate expectations based on available information, instead of responding in the same way as they did to questions about goal attainability in general. Longer follow-up is warranted to better explore this hypothesis surrounding temporality and expectations for goal progress.

No hypotheses were offered for three additional goal characteristics: total number of goals, domain of the most important goal, and likelihood of reaching goals in full in the future. Consistent with Snyder’s hope theory, patients higher in hope perceived a greater likelihood of reaching their goals in full
in the future relative to less hopeful individuals (Snyder et al., 1991; Snyder, 2002). Hope was not associated with the number of goals or identifying a cancer-related goal (versus non-cancer related) as the most important goal. While hope theory suggests that higher hope individuals set more goals, our results did not support this finding. This may be a product of methodological differences between the current study and the original study (Snyder et al., 1991). In the current study, the total number of goals generated was summed, with no upper limit. In the original study by Snyder and colleagues (1991), individuals were queried (Y/N) if they had a goal in each of 6 domains (e.g., social, achievement) [Range: 0-6]. Ranking a cancer-related goal as the most important was not significantly associated with any facets of hope. Data from the current study suggests that hope is associated with how patients perceive their goals, as opposed to the absolute number of goals or types of goals set.

**Findings Related to Aim 3**

The current study examined characteristics of current goals in patients with advanced cancer, including relative importance, temporality, perceived attainability and control, number and content, and how these factors related to psychological outcomes. Consistent with *a priori* hypotheses for Aim 3, patients who rated their goals as more attainable reported greater emotional well-being, meaning and purpose in life and positive affect and less negative affect. This finding is consistent with research suggesting that engagement in valued, attainable goals is associated with better subjective health and well-being in general and cancer samples (Holt, Mogensen, Jensen & Hansen, 2015; Klug & Maier, 2015; Mens & Scheier, 2016; Schroovers, Kraaij & Garnefski, 2008; Steca et al., 2016; Thompson, Stanton & Bower, 2013; von Blankenburg et al., 2014; Wrosch, Scheier, Miller, Schulz & Carver, 2003; Wrosch, Miller, Scheier & de Pontet, 2007). Pursuit of valued goals that are perceived as attainable has also been associated with a greater sense of meaning and purpose in life (Pinquart et al., 2009; Thompson & Pitts, 1993; Wrosch et al., 2003) and greater positive affect in patients with cancer (Lam et al., 2015; Schroevers et al., 2008). Also consistent with hypotheses, greater perceived control over reaching goals was associated with greater emotional well-being, meaning and purpose in life, and positive affect and less negative affect. These findings are also consistent with literature which suggests that, in general, a
greater perceived internal locus of control to achieve goals is associated with better well-being (Snyder et al., 1991; Snyder, 2002), while a greater perceived external locus of control is associated with worse mental and physical well-being in patients with advanced cancer (Brown et al., 2017).

Consistent with hypotheses, patients who anticipated making more progress toward goals in the short-term reported better emotional well-being and less negative affect that those who anticipated making less progress. Contrary to hypotheses, anticipated short-term progress was not associated with meaning and purpose in life or positive affect. This may be a reflection of participants’ responding optimistically or from a place of emotion versus logic, such that individuals who anticipated more short-term progress may have avoided negative emotionality associated with acknowledging slowed or impeded progress toward goals. This also may be a function of the types of goals set, such that individuals who set goals that were more attainable in a short window and therefore anticipated making greater progress may experience the affective benefits associated with goal progress, but these goals may not be as meaningful or enjoyable as other, more involved goals.

Hypotheses were not offered for relationships of likelihood of reaching goals in full in the future, number of goals, and most important goal domain with psychological outcome variables. Greater perceived likelihood of reaching goals in the future was associated with all psychological factors except for negative affect. This is consistent with hope theory in that an individual believing they are likely to meet the goals they set for themselves would likely experience positive psychological well-being. Together, these findings suggest that, even if patients do not anticipate making progress toward goals in the short-term, they may still engender the affective benefit of having valued, reachable goals.

Similar to hope, psychological and emotional factors were not associated with the number of goals set. Ranking a cancer-related goal as the preeminent goal, as opposed to a non cancer-related goal, was associated with worse emotional well-being, but no other psychological factors. This may be a reflection of anxious preoccupation with cancer or dealing with challenging treatment side effects or cancer-related symptoms, which have been correlated with worse emotional well-being (Johansson et al., 2011; Lehto, 2017).
In the current study, the PANAS was administered directly following the Time 1 interview keyed to “right now” to explore affective tone directly after goal procedures. Although pretest data are lacking, the lesser relative magnitude of negative affect following the goal interview compared to reports of negative affect in general raises the possibility that the interview may have reduced negative affect in the moment.

Findings Related to Aim 4

Hope theory suggests that goals are the mechanism by which hope influences psychological outcomes. To our knowledge, no previous studies have examined goal characteristics as a mediator of the relationship between hope and psychological outcomes in patients with cancer. Findings of the current study are consistent with hope theory in that two of the three goal characteristics tested yielded evidence of mediation (Snyder et al., 1991; Snyder, 2002). Perceived attainability and perceived control over reaching goals mediated the relationship between hope and emotional well-being, such that participants who are higher in hope perceive their goals as more attainable and view themselves as having more control over reaching goals, which is associated with better emotional well-being.

The exception was findings showing that anticipated goal progress in the short-term did not mediate the relationship between hope and emotional well-being. Two additional unplanned analyses showed that perceived ability to reach goals in full in the future demonstrated evidence of mediation, while number of goals did not. Reverse mediation analyses did not provide support for mediation in any of the models when emotional well-being was treated as the mediator and goal characteristics were treated as the dependent variables, which supports the proposed directionality of the relationships.

Findings Related to Aim 5

Hope theory posits that individuals higher in hope would make more progress toward achieving their goals which, in turn, would be associated with better emotional well-being. While greater hope has been associated with greater progress toward and attainment of valued goals and, in turn, better psychological well-being in nonclinical samples (Feldman, Rand & Kahle-Wrobleski, 2009), these relationships have not been studied in patients with advanced cancer. To address this question, the current
study explored whether cancer patient perceptions of goal progress over time mediated the relationship between hope at the Time 1 assessment and emotional well-being at the Time 2 assessment. Findings suggest that patient-reported progress toward goals in the short-term did not mediate the relationship between hope and well-being in the current study. This may be a product of the short follow-up window, and warrants further exploration in longitudinal studies with longer follow-up. Findings may have also been impacted by lower rates of goal progress due to COVID-19.

**Strengths and Limitations of the Current Study**

Strengths of the current study include the novel application of Snyder’s hope theory to understand how goals link hope to psychological outcomes in patients with advanced lung cancer. Aspects of the study methodology, including grounding in a theoretical model, clearly defined study variables (e.g., goals), and use of a longitudinal, mixed methods design to explore perceptions of goal progress over time, are also notable strengths. Demographic, clinical, and lifestyle characteristics of the study sample are generally consistent with the population of lung cancer patients seen in major treatment centers. This pattern includes a roughly even division of men and women, a typical distribution of never versus ever smokers, and NSCLC accounting for nearly 9 of every 10 diagnoses (American Cancer Society, 2020; Molina et al., 2009). In addition, treatment regimens in the current sample are reflective of advances in first-line treatment for NSCLC over the past several years, with the majority of patients receiving immunotherapy. Therefore, this study provides valuable information about clinically relevant outcome variables (e.g., well-being) in the emerging group of patients experiencing improved median survival thanks to these new agents.

The study does, however, possess several limitations. Participants were patients receiving first-line therapy, and findings may not be generalizable to participants who have undergone multiple lines of cancer treatment. In addition, the sample was relatively homogenous in terms of racial and ethnic diversity, which may limit generalizability of findings to more diverse lung cancer populations. According to *a priori* power analyses, analyses for Aims 1-3 were slightly underpowered, which may have reduced the chance of detecting a true effect where there is one. Analyses for Aims 4 and 5 were
also underpowered and should be considered exploratory. Given study findings that were generally consistent with theory and aligned with study hypotheses, further exploration of this topic and replication of findings are warranted.

Analyses were primarily conducted using cross-sectional data. Mediation analyses provide important information about the nature of relationships among multiple variables, although conclusions about temporality cannot be drawn when conducted using data from a single time point. Reverse mediation analyses are encouraging regarding the hypothesized direction of relationships among variables, since emotional well-being did not mediate the relationship of hope with any goal characteristics variables. Future studies should consider the inclusion of an additional time point.

The COVID-19 pandemic significantly disrupted the ability to complete study recruitment as originally proposed and represents a confounding variable. From both a research and clinical perspective, it was important to allow participants who had consented to the study prior to COVID-19 related shutdowns the opportunity to complete Time 2 study procedures. The study protocol was written such that follow-up procedures could be conducted remotely, which made this study uniquely suited to capture the impact of COVID-19 on patient goals and psychological outcomes as the pandemic unfolded. From a clinical perspective, the follow-up semi-structured interview provided participants with an opportunity to process the impact of COVID-19 on goals and goal pursuit and to discuss how they were responding to this both behaviorally and psychologically. Results suggest that participants acknowledged the pandemic as a significant barrier to making progress toward valued goals. This interruption in goal pursuit is uniquely challenging for patients with advanced lung cancer, who are already dealing with life-limiting illness and may have already adjusted goals in the context of having advanced stage disease. The current study did not explicitly evaluate patient goal adjustment, either in response to cancer diagnosis or COVID-19. Literature suggests that cancer patients do adjust their goals following diagnosis, and that the ability to flexibly disengage and/or reengage with goals when progress is disturbed is associated with better well-being (Janse et al., 2015, 2016). It is also possible that other life events could impact goals and psychological outcomes, such as marital transitions, unemployment, or other comorbid medical
conditions. Future work might evaluate goal adjustment over time in patients with advanced cancer and assess participants’ perceptions of what contextual factors impact adjustment.

**Clinical Implications and Future Directions**

Now is an exciting time in cancer research, with novel therapies helping patients with advanced disease to live longer and with better quality of life than ever before. However, this injects a significant amount of uncertainty into what patients might be “hopeful” for, and what constitutes an “attainable” goal for a patient with advanced cancer. In the context of this changing landscape, a better understanding of how goal-oriented constructs like hope are related to well-being in patients is important for clinicians and patients alike.

This study is directly relevant to clinical practice, particularly for how clinicians use the word “hope”, and the importance of inquiring about patient goals beyond those that may be treatment-specific. The word “hope” is common in the cancer vernacular (Cantor, 2016), but what constitutes hope is variably defined, which has limited the interpretability of previous research on this topic (Butt, 2011; Chi, 2007; Ebright & Lyon, 2004; Elliott & Olver, 2002). In the current study, an item on the emotional well-being subscale “I am losing hope in the fight against my illness” demonstrated a lower correlation with the total score (standardized $r = .37$) compared to other items (standardized $r$’s = .43 - .66), which suggests the lack of clarity around the meaning of hope. Given this, clinicians should be thoughtful in their use of the word “hope” when communicating with patients, and may instead use goal language to assess hope as defined in Snyder’s model (Snyder, 1991).

Cancer care models emphasize the importance of engaging patients as active participants in their care to enable them to make informed treatment decisions that are aligned with their values and preferences (Committee on Improving the Quality of Cancer Care, 2013). While oncologists’ primary objective is to treat the cancer, having information about patient goals, both cancer-related and not, can help them to best meet patient needs. For example, having knowledge about an upcoming major event in a patients’ life (i.e., a child getting married, going on a trip), might allow clinicians to plan treatment dates, etc. around the event.
Snyder’s hope theory offers a useful framework to study how patients with advanced stage lung cancer cognitively process and adapt to a changing reality and uncertainty about the future. As hope theory suggests, individuals with higher levels of hope facing life-threatening illness are more likely to incorporate contextual information and adjust or create new goals that are doable and then work toward these goals, thus generating positive psychological well-being and sustaining their higher levels of hope. While the current study did not explicitly investigate goal adjustment, results suggest that patients with advanced lung cancer in the current sample continued to have and pursue important goals. While patients acknowledged advanced lung cancer and effects of its treatment as barriers to achieving goals, all patients were able to identify at least three valued goals, and most reported making some progress toward goals over a short follow-up period. Findings suggest that individuals higher in hope are more likely to pursue valued, attainable goals, which provides patients with a sense of purpose and positively impacts affect. Future research should further extrapolate the complex relationship among hope, goal adjustment and attainment, and psychological well-being in patients with advanced lung cancer.

Despite the limitations noted above, the current study provides important preliminary data about the relationships among hope as defined by Snyder’s hope theory, goals, and psychological well-being in patients with advanced stage lung cancer. Findings require replication and extension in larger samples of patients with advanced stage lung cancer. Along these lines, the current study procedures should be replicated with a longer longitudinal follow-up period to better assess trajectories of goal perceptions and progress over time. Assuming findings can be replicated and the pattern of results remains consistent, several intervention strategies aligned with the current findings may warrant evaluation.

The current study suggests there may be benefit to psychological interventions targeting hope and/or goals to bolster patient well-being. While hope is conceptualized as trait-like, interventions targeting agency thinking (e.g., motivational interviewing, bolstering self efficacy) or increasing pathways thinking through problem solving therapy may increase goal-directed action and, consequently, well-being (Liao et al., 2014). For example, Hope Therapy (Cheavens et. al., 2006), an intervention focused on patients’ identification of valued, specific, realistic, measurable goals and teaching strategies
to increase agency and pathways thinking to facilitate progress toward valued goals, has demonstrated efficacy in improving hope thinking and quality of life in women experiencing cancer recurrence (Thornton et al., 2014). A briefer, four-session hope intervention with content similarly focused on bolstering goal-related thoughts and agency and pathways thinking demonstrated evidence of feasibility in a sample of Chinese patients with cancer (Chan, Wong & Lee, 2019). Interventions focused explicitly on goals may also be beneficial in light of findings that goal setting was related to emotional well-being in the current study. Consistent with this, literature suggests that patients who set personalized treatment goals are more likely to be successful in focusing their goal-directed efforts, increasing their likelihood of achieving goals (Lindheim, Bennett, Orimoto & Kolko, 2016). Another possible intervention strategy is self-system therapy, which is grounded in self-regulation theory and focuses on increasing patients’ engagement in promotion-focused goals. This intervention has demonstrated efficacy in treating depressive symptoms in general population samples (Strauman et al., 2006), and is currently being tested in lung cancer samples. Additionally, cognitive behavioral approaches, specifically dialectical behavioral therapy, may help patients to entertain the dialectic of acceptance (i.e., accepting uncertainty about the future and that goals may require adjustment) and change (i.e., tools to manage distress and to change factors that are within their control). Mindfulness-based strategies may also be helpful for grounding patients in the present moment and for promoting a focus on valued, attainable goals right now (Thornton et al., 2014).

In sum, findings provide initial evidence of potential targets for interventions aimed at bolstering agency and pathways thinking or goal-directed thinking and action, in order to improve health-related outcomes in patients with cancer.
REFERENCES


Howlader, N., Forjaz, G., Mooradian, M. J., Meza, R., Kong, C. Y., Cronin, K. A., Mariotto, A. B., 
Lowy, D. R., & Feuer, E. J. (2020). The Effect of Advances in Lung-Cancer Treatment on 
https://doi.org/10.1056/NEJMoia1916623


https://doi.org/10.1002/pon.3924

and adjustment on well-being in cancer patients. *Quality of Life Research, 25*, 1017–1027. 
https://doi.org/10.1007/s11136-015-1139-8


Interview Research* (pp. 491–514). SAGE Publications, Inc. 
https://doi.org/10.4135/9781412973588


https://doi.org/10.3390/rel1010078
https://doi.org/10.1002/pon.3155


https://doi.org/10.3758/BRM.40.3.879


https://doi.org/10.1007/s00520-007-0336-6


https://doi.org/10.1300/J077V11N03_01

https://doi.org/10.1111/jopy.12025

https://doi.org/10.1200/JCO.2009.23.3403

https://doi.org/10.1002/pon.3538

https://doi.org/10.1002/pon.842


https://doi.org/10.1080/07347332.2012.684988

https://doi.org/10.1080/03610730590915452

APPENDIX A. TABLES

Table 1. Measures Collected

<table>
<thead>
<tr>
<th>Variable (measure)</th>
<th>Initial Assessment (T1)</th>
<th>Follow-up Assessment (T2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sociodemographic characteristics</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Clinical characteristics</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Lifestyle characteristics</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Hope (AHS)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Emotional Well-being (FACT-L)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Meaning and purpose (PROMIS Meaning and Purpose – Short Form 8a)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Positive and negative affect (PANAS)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Goal setting (# of goals, goal value, goal domains)</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Goal attainability</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Perceived control over reaching goals</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Patients’ expected goal progress</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Patient-rated goal progress</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Expected versus perceived goal progress</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Activity in relation to goals over 3-4 weeks (open-ended)</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Barriers and facilitators of goal progress (open-ended)</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Table 2. Sociodemographic Characteristics (N=75)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>M (SD) [Range] or N (%)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>65.14 (9.61) [24 - 85]</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td></td>
<td></td>
</tr>
<tr>
<td>31 (41%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td></td>
<td></td>
</tr>
<tr>
<td>44 (59%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ethnicity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spanish/Hispanic/Latino</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 (3%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not Spanish/Hispanic/Latino</td>
<td></td>
<td></td>
</tr>
<tr>
<td>73 (97%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Indian or Alaska Native</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 (1%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black or African American</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 (1%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Native Hawaiian/Pacific Islander</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 (3%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td></td>
<td></td>
</tr>
<tr>
<td>71 (95%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Marital Status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married or living with partner</td>
<td></td>
<td></td>
</tr>
<tr>
<td>52 (69%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 (8%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Divorced</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 (7%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Separated</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 (1%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Widowed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11 (15%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Completed Education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 12 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 (8%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High school graduate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15 (20%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trade school</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 (8%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some college</td>
<td></td>
<td></td>
</tr>
<tr>
<td>31 (41%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>College graduate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13 (17%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post-graduate degree</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 (5%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Current Employment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Working</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full time at job</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 (16%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Part time at job</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9 (12%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>On Leave</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>With pay</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 (7%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Without pay</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 (1%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Not Employed</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seeking work</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 (3%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disabled</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11 (15%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retired</td>
<td></td>
<td></td>
</tr>
<tr>
<td>35 (47%)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 3. Clinical Characteristics (N=75)

<table>
<thead>
<tr>
<th></th>
<th>M (SD) [Range] or N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lung Cancer Type</strong></td>
<td></td>
</tr>
<tr>
<td>NSCLC</td>
<td>66 (88%)</td>
</tr>
<tr>
<td>SCLC</td>
<td>9 (12%)</td>
</tr>
<tr>
<td><strong>AJCC Stage</strong></td>
<td></td>
</tr>
<tr>
<td>IIIB/C</td>
<td>11 (15%)</td>
</tr>
<tr>
<td>IV</td>
<td>64 (85%)</td>
</tr>
<tr>
<td><strong>Current Treatment</strong></td>
<td></td>
</tr>
<tr>
<td>Immunotherapy</td>
<td>31 (41%)</td>
</tr>
<tr>
<td>Chemotherapy</td>
<td>4 (5%)</td>
</tr>
<tr>
<td>Chemoimmunotherapy</td>
<td>12 (16%)</td>
</tr>
<tr>
<td>Chemoradiation</td>
<td>2 (3%)</td>
</tr>
<tr>
<td>Targeted Therapy</td>
<td>6 (8%)</td>
</tr>
<tr>
<td>Clinical Trial</td>
<td>20 (27%)</td>
</tr>
<tr>
<td><strong>Time Since Diagnosis</strong></td>
<td>.94 years (1.1 years) [37 days – 6.1 years]</td>
</tr>
<tr>
<td><strong>Time Since Start of Treatment</strong></td>
<td>.80 years (1.1 years) [14 days – 5.9 years]</td>
</tr>
<tr>
<td><strong>Performance Status</strong></td>
<td></td>
</tr>
<tr>
<td>(0) Fully Active</td>
<td>24 (32%)</td>
</tr>
<tr>
<td>(1) Restricted in physically strenuous self-care</td>
<td>39 (52%)</td>
</tr>
<tr>
<td>(2) Ambulatory and capable self-care, but unable to carry out work activities</td>
<td>10 (13%)</td>
</tr>
<tr>
<td>(3) Capable only limited self-care</td>
<td>2 (3%)</td>
</tr>
<tr>
<td>(4) Completely disabled</td>
<td>0 (0%)</td>
</tr>
<tr>
<td><strong>Brain Metastases</strong></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>24 (32%)</td>
</tr>
<tr>
<td>No</td>
<td>51 (68%)</td>
</tr>
<tr>
<td><strong>Disease Progression on Study</strong></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>5 (7%)</td>
</tr>
<tr>
<td>No</td>
<td>70 (93%)</td>
</tr>
</tbody>
</table>

NSCLC= Non-small cell lung cancer, SCLC= Small cell lung cancer, AJCC = American Joint Committee on Cancer
<table>
<thead>
<tr>
<th>Information preferences</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I prefer not to hear a lot of details</td>
<td>3 (4%)</td>
</tr>
<tr>
<td>I want to hear details only in certain situations, such as</td>
<td>13 (17%)</td>
</tr>
<tr>
<td>when tests are abnormal or when treatment decisions need to be made</td>
<td></td>
</tr>
<tr>
<td>I want to hear as many details as possible in all situations</td>
<td>59 (79%)</td>
</tr>
<tr>
<td>relating to my cancer and its treatment</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Patient prognostic perception</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extremely likely (&gt;90% chance of cure)</td>
<td>18 (24%)</td>
</tr>
<tr>
<td>Very likely (75-90% chance of cure)</td>
<td>14 (19%)</td>
</tr>
<tr>
<td>Moderately likely (50-74% chance of cure)</td>
<td>13 (18%)</td>
</tr>
<tr>
<td>Somewhat likely (25-49% chance of cure)</td>
<td>4 (5%)</td>
</tr>
<tr>
<td>Unlikely (10-24% chance of cure)</td>
<td>10 (14%)</td>
</tr>
<tr>
<td>Very unlikely (less than 10% chance of cure)</td>
<td>8 (11%)</td>
</tr>
<tr>
<td>No chance (0% chance of cure)</td>
<td>7 (9%)</td>
</tr>
</tbody>
</table>

N=74 for patient prognostic perception.
Table 5. Lifestyle Characteristics (N=75)

<table>
<thead>
<tr>
<th></th>
<th>M (SD) [Range] or N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DUREL Religiosity</strong></td>
<td></td>
</tr>
<tr>
<td>Total Score</td>
<td>16.57 (5.99) [5-25]</td>
</tr>
<tr>
<td>How often do you attend church or other religious meetings?</td>
<td>2.63 (1.67) [1-6]</td>
</tr>
<tr>
<td>How often do you spend time in private religious activities, such as prayer, meditation, or Bible study?</td>
<td>3.28 (1.98) [1-6]</td>
</tr>
<tr>
<td>Intrinsic religiosity (experience divine presence God, religious beliefs lie behind life approach, try to carry religion into other dealings life)</td>
<td>10.94 (3.64) [3-15]</td>
</tr>
<tr>
<td><strong>Smoking History</strong></td>
<td></td>
</tr>
<tr>
<td>Smoked &gt;100 cigarettes in lifetime</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>63 (84%)</td>
</tr>
<tr>
<td>No</td>
<td>12 (16%)</td>
</tr>
<tr>
<td>Smoking Status</td>
<td></td>
</tr>
<tr>
<td>Current Smokers</td>
<td>6 (8%)</td>
</tr>
<tr>
<td>Former Smokers</td>
<td>57 (76%)</td>
</tr>
<tr>
<td>Never Smokers</td>
<td>12 (16%)</td>
</tr>
<tr>
<td>Average # cigarettes/day</td>
<td>22.70 (11.95) [1-60]</td>
</tr>
<tr>
<td>Average number of years smoked</td>
<td>31.97 (12.42) [0-53]</td>
</tr>
<tr>
<td>Average time quit (former smokers) (years)</td>
<td>11.62 (13.42) [.25-51]</td>
</tr>
<tr>
<td><strong>Alcohol</strong></td>
<td></td>
</tr>
<tr>
<td>Consumed alcoholic beverage in past month?</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>24 (32%)</td>
</tr>
<tr>
<td>No</td>
<td>51 (68%)</td>
</tr>
<tr>
<td>If yes, average number of drinks in past month</td>
<td></td>
</tr>
<tr>
<td>1-3x/month</td>
<td>6 (25%)</td>
</tr>
<tr>
<td>1-3x/week</td>
<td>7 (29%)</td>
</tr>
<tr>
<td>4-6x/week</td>
<td>6 (25%)</td>
</tr>
<tr>
<td>1x/day</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>2x/day</td>
<td>4 (17%)</td>
</tr>
<tr>
<td>3 or more/day</td>
<td>1 (4%)</td>
</tr>
</tbody>
</table>
Table 6. Hope, Meaning and Purpose in Life, Affect and Quality of Life at Time 1 (N=75)

<table>
<thead>
<tr>
<th></th>
<th>M (SD)</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hope</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Adult Hope Scale (AHS)</td>
<td>53.8 (6.8)</td>
<td>[34 – 64]</td>
</tr>
<tr>
<td>Agency</td>
<td>27.0 (3.3)</td>
<td>[17 – 32]</td>
</tr>
<tr>
<td>Pathways</td>
<td>26.8 (4.2)</td>
<td>[12 - 32]</td>
</tr>
<tr>
<td><strong>Meaning and Purpose in Life</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PROMIS Meaning and Purpose Short Form (T-score)</td>
<td>54.9 (8.3)</td>
<td>[40 – 68]</td>
</tr>
<tr>
<td><strong>Affect</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PANAS Positive Affect – In General</td>
<td>36.6 (6.2)</td>
<td>[19 – 48]</td>
</tr>
<tr>
<td>PANAS Negative Affect – In General</td>
<td>18.2 (6.6)</td>
<td>[10 – 39]</td>
</tr>
<tr>
<td><strong>Quality of Life</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Functional Assessment of Cancer Therapy – Lung (FACT-L) Emotional Well-being</td>
<td>18.7 (4.0)</td>
<td>[7 – 24]</td>
</tr>
<tr>
<td>Physical Well-being</td>
<td>21.1 (5.6)</td>
<td>[3 – 28]</td>
</tr>
<tr>
<td>Functional Well-being</td>
<td>17.7 (6.0)</td>
<td>[4 – 28]</td>
</tr>
<tr>
<td>Social Well-being</td>
<td>23.4 (4.2)</td>
<td>[9 – 28]</td>
</tr>
<tr>
<td>Lung cancer subscale</td>
<td>20.5 (4.7)</td>
<td>[8 – 28]</td>
</tr>
<tr>
<td>Total</td>
<td>101.3 (18.4)</td>
<td>[61 – 132]</td>
</tr>
<tr>
<td>FACT-G</td>
<td>80.8 (15.0)</td>
<td>[48 – 106]</td>
</tr>
<tr>
<td>Trial Outcome Index</td>
<td>59.3 (13.9)</td>
<td>[23 – 84]</td>
</tr>
</tbody>
</table>
Table 7. Correlations among Psychological Variables at Time 1

<table>
<thead>
<tr>
<th>Positive Psychological Factors</th>
<th>Meaning and Purpose</th>
<th>Positive Affect (In General)</th>
<th>Negative Affect (In General)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotional Well-being</td>
<td>.24</td>
<td>.33</td>
<td>-.67***</td>
</tr>
<tr>
<td>Meaning and Purpose</td>
<td>.69***</td>
<td></td>
<td>-.12</td>
</tr>
<tr>
<td>Positive Affect (In General)</td>
<td></td>
<td></td>
<td>-.21</td>
</tr>
</tbody>
</table>

*p < .05 **p < .01 ***p < .001
Table 8. *Goal Descriptive Data at Time 1 (N=75)*

<table>
<thead>
<tr>
<th>Number of goals</th>
<th>M (SD) [Range] or N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>24 (32%)</td>
</tr>
<tr>
<td>4</td>
<td>23 (31%)</td>
</tr>
<tr>
<td>5</td>
<td>9 (12%)</td>
</tr>
<tr>
<td>6</td>
<td>10 (13%)</td>
</tr>
<tr>
<td>7</td>
<td>4 (5%)</td>
</tr>
<tr>
<td>8</td>
<td>2 (3%)</td>
</tr>
<tr>
<td>9</td>
<td>1 (1%)</td>
</tr>
<tr>
<td>10</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>11</td>
<td>1 (1%)</td>
</tr>
<tr>
<td>12</td>
<td>1 (1%)</td>
</tr>
</tbody>
</table>

Perceived doability 8.7 (1.3) [5 – 10]

Perceived control over reaching goal 7.7 (1.8) [2 – 10]

Anticipated progress in next month 2.4 (.8) [0 – 4]

Likelihood of reaching goal in full in the future 8.9 (1.2) [5 – 10]

Most Important Goal Domain

- Cancer (Cancer + Palliative Care Domains) 29 (39%)
- Not Cancer-related (Other Domains) 46 (61%)
<table>
<thead>
<tr>
<th>Domain</th>
<th>Definition</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Social/Role/Relationships</td>
<td>Mentions of social interaction or role functioning in relationships with others, including family, friends, and pets. Includes providing support to or helping others.</td>
<td>“to spend more time with friends and family”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“to be the best mom, grandma, sister, partner, and daughter I can be”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“to be able to take care of my 2 year old granddaughter”</td>
</tr>
<tr>
<td>2. Everyday/Practical</td>
<td>Mentions of engaging in ‘normal’ or everyday tasks of living, such as going to work or school, or maintaining independence. Mentions of completing specific, concrete tasks that are not inherently pleasurable</td>
<td>“to keep maintaining the house…lawn, outside work”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“to find another part-time job”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“to continue cooking”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“to get back to a semi-normal life”</td>
</tr>
<tr>
<td>3. Leisure/Pleasure</td>
<td>Mentions of engaging in activities for the purpose of fun or enjoyment and not necessity</td>
<td>“to have fun”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“to get back out on the golf course”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“to travel and explore”</td>
</tr>
<tr>
<td>4. Psychological/Existential/Religion or Spirituality</td>
<td>Mentions of psychological inner states or ways of seeing the world, existential thoughts about the human experience and the possibility of death, religion or spirituality (e.g., attending services, values, practices)</td>
<td>“to focus more on things I have the ability to control…my mindset”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“to be thankful and mindful every day”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“to not lose sight of my relationship with God”</td>
</tr>
<tr>
<td>5. Major life changes or achievements</td>
<td>Mentions making a significant change in lifestyle or location, reaching a life milestone or accomplishing a major life goal</td>
<td>“to get married”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“to sell my house”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“to fully retire”</td>
</tr>
<tr>
<td>6. Cancer treatment response/disease outcome</td>
<td>Mentions cancer treatment, responsiveness to cancer treatment or a positive disease outcome. Discussion of longevity, survival or any mention of cure fall into this category (e.g., remission, cure, live as long as possible, fight cancer)</td>
<td>“to get rid of cancer”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“to be cured”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“to extend life as long as possible”</td>
</tr>
<tr>
<td>7. Palliative outcomes</td>
<td>Cancer-related health goals that are not focused on survival or cure, including maintaining quality of life, symptom alleviation, gaining back strength, and feeling better</td>
<td>“to get energy back up to where it used to be”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“to put on more weight”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“to have no or minimal lasting side effects”</td>
</tr>
<tr>
<td>8. Behavioral health improvement strategies</td>
<td>Mentions of health-related maintenance or improvement, such as quitting smoking, exercising, or losing weight</td>
<td>“to change my lifestyle - nutrition, exercise”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“to get back to the gym, to be able to lift again”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“to completely quit smoking”</td>
</tr>
</tbody>
</table>
Table 10. *Goal Domain Descriptives*

<table>
<thead>
<tr>
<th>Domain</th>
<th>N (%)</th>
<th># Patients</th>
<th># Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Goals (N=344)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Social/Role</td>
<td>55 (73%)</td>
<td>84 (24%)</td>
<td></td>
</tr>
<tr>
<td>2. Leisure</td>
<td>53 (71%)</td>
<td>93 (27%)</td>
<td></td>
</tr>
<tr>
<td>3. Everyday/Practical</td>
<td>44 (59%)</td>
<td>54 (16%)</td>
<td></td>
</tr>
<tr>
<td>4. Palliative</td>
<td>26 (35%)</td>
<td>32 (9%)</td>
<td></td>
</tr>
<tr>
<td>5. Cancer</td>
<td>23 (31%)</td>
<td>24 (7%)</td>
<td></td>
</tr>
<tr>
<td>6. Major Life Accomplishments/Changes</td>
<td>19 (25%)</td>
<td>25 (7%)</td>
<td></td>
</tr>
<tr>
<td>7. Behavioral Health Improvement</td>
<td>18 (24%)</td>
<td>18 (5%)</td>
<td></td>
</tr>
<tr>
<td>8. Psychological/Existential/Spiritual</td>
<td>14 (19%)</td>
<td>14 (4%)</td>
<td></td>
</tr>
<tr>
<td><strong>#1 Most Important Goal (N=75)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Social/Role</td>
<td>22 (29%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Cancer</td>
<td>19 (25%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Everyday/Practical</td>
<td>11 (15%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Palliative</td>
<td>10 (13%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Leisure</td>
<td>6 (8%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Behavioral Health Improvement</td>
<td>3 (4%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Psychological/Existential/Spiritual</td>
<td>2 (3%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Major Life Accomplishments/Changes</td>
<td>2 (3%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>#2 Most Important Goal (N=75)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Social/Role</td>
<td>24 (32%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Leisure</td>
<td>15 (20%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Everyday/Practical</td>
<td>11 (15%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Palliative</td>
<td>10 (13%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Major Life Accomplishments/Changes</td>
<td>5 (7%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Behavioral Health Improvement</td>
<td>5 (7%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Psychological/Existential/Spiritual</td>
<td>4 (5%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Cancer</td>
<td>1 (1%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>#3 Most Important Goal (N=75)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Leisure</td>
<td>28 (37%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Everyday/Practical</td>
<td>14 (19%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Social/Role</td>
<td>13 (17%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Major Life Accomplishments/Changes</td>
<td>8 (11%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Psychological/Existential/Spiritual</td>
<td>6 (8%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Palliative</td>
<td>3 (4%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Behavioral Health Improvement</td>
<td>2 (3%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Cancer</td>
<td>1 (1%)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 11. PANAS “Right Now” Administered Post-Time 1 Interview

<table>
<thead>
<tr>
<th></th>
<th>M (SD)</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive Affect (Right Now)</td>
<td>37.0 (7.0)</td>
<td>[21 – 50]</td>
</tr>
<tr>
<td>Negative Affect (Right Now)</td>
<td>13.4 (4.6)</td>
<td>[10 – 31]</td>
</tr>
</tbody>
</table>

N=72 for PANAS “Right Now” scales

Table 12. Paired Samples T-tests for PANAS Positive and Negative Affect “In General” versus “Right Now”

<table>
<thead>
<tr>
<th></th>
<th>Mean Difference</th>
<th>Std Dev</th>
<th>t (p-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PANAS Positive Affect In</td>
<td>-.60</td>
<td>4.71</td>
<td>-1.02</td>
</tr>
<tr>
<td>General vs Right Now</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PANAS Negative Affect In</td>
<td>4.85</td>
<td>4.48</td>
<td>9.18***</td>
</tr>
<tr>
<td>General vs Right Now</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p <.05 **p <.01 ***p <.001
Table 13. *Hope, Meaning and Purpose in Life, Affect and Quality of Life at Time 2 (N=65)*

<table>
<thead>
<tr>
<th></th>
<th>M (SD) [Range]</th>
<th>Pre-COVID (N=53)</th>
<th>During COVID (N=12)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hope</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Adult Hope Scale (AHS)</td>
<td>54.1 (5.6) [37 – 64]</td>
<td>54.5 (5.5)</td>
<td>52.4 (5.7)</td>
</tr>
<tr>
<td>Agency</td>
<td>27.1 (2.8) [18 – 32]</td>
<td>27.3 (2.8)</td>
<td>26.4 (2.9)</td>
</tr>
<tr>
<td>Pathways</td>
<td>27.0 (3.3) [19 – 32]</td>
<td>27.2 (3.2)</td>
<td>26.0 (3.5)</td>
</tr>
<tr>
<td><strong>Meaning and Purpose in Life</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PROMIS (T-score)</td>
<td>54.4 (8.2) [40 – 68]</td>
<td>54.6 (8.1)</td>
<td>53.7 (9.3)</td>
</tr>
<tr>
<td><strong>Affect</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive Affect – In General</td>
<td>36.6 (7.1) [18 – 50]</td>
<td>36.9 (7.0)</td>
<td>35.7 (8.3)</td>
</tr>
<tr>
<td>Negative Affect – In General</td>
<td>17.6 (6.7) [10 – 36]</td>
<td>17.1 (6.4)</td>
<td>19.7 (7.8)</td>
</tr>
<tr>
<td><strong>Quality of Life</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Functional Assessment of Cancer Therapy – Lung (FACT-L)</td>
<td>18.6 (4.8) [2 – 24]</td>
<td>19.0 (4.9)</td>
<td>16.8 (4.7)</td>
</tr>
<tr>
<td>Emotional Well-being</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Well-being</td>
<td>21.5 (5.3) [6 – 28]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Functional Well-being</td>
<td>17.7 (5.9) [0 – 28]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Well-being</td>
<td>22.9 (4.6) [11 – 28]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lung cancer subscale</td>
<td>21.3 (4.1) [11 – 28]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>102.0 (17.6) [44 – 135]</td>
<td>103.7</td>
<td>96.4</td>
</tr>
<tr>
<td>FACT-G</td>
<td>81.0 (15.0) [32 – 108]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trial Outcome Index</td>
<td>60.5 (12.7) [18 – 84]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

N=64 for PANAS subscales
**Table 14. Goal Descriptive Data at Time 2 (N=65)**

<table>
<thead>
<tr>
<th></th>
<th>M (SD) [Range]</th>
<th>Pre-COVID</th>
<th>During COVID</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Goal Progress</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2.1 (.9) [0 – 4]</td>
<td>2.2 (.9)*</td>
<td>1.6 (.7)*</td>
</tr>
<tr>
<td><strong>Expected vs Actual Goal Progress</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3.1 (.8) [1 – 5]</td>
<td>3.2 (.8)</td>
<td>2.8 (1.0)</td>
</tr>
<tr>
<td><strong>Likelihood of reaching goal in full in the future</strong></td>
<td>8.8 (1.6) [4 – 10]</td>
<td>8.8 (1.5)</td>
<td>8.8 (1.8)</td>
</tr>
<tr>
<td><strong>Examples of goal-related actions (open text)</strong></td>
<td>Structure/routine (“make sure I get up, do my daily activities, keep busy”), mental fortitude (“I dig deep. Do something every day, set a goal for the day. Take time, keep going”; “kept believing”), feeling better, health behaviors/lifestyle (healthy diet, activity pacing “exert when need to, relax when can”, wash hands, exercise, quit smoking), social support (“amazing wife, great home care nurse”), planning and research related to longer-term goals</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Examples of goal-related barriers (open text)</strong></td>
<td>Cancer and treatment-related side effects (fatigue, low appetite, breathlessness, nausea, pain, “knocked down hard”), physical health (getting sick, weakness, compromised immune system), mental health (depression, low motivation “I struggle to figure out how to spend time and feel productive” “lack of motivation and energy”), practical barriers (making time, scheduling, location, finances, weather, “reality”), COVID-19, other people, other priorities</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p <.05*
### Table 15. Hope at Time 2 and Psychological Outcomes at Time 2

<table>
<thead>
<tr>
<th></th>
<th>Hope</th>
<th>Agency</th>
<th>Pathways</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal Progress</td>
<td>.22</td>
<td>.23</td>
<td>.19</td>
</tr>
<tr>
<td>Actual vs Expected Goal Progress</td>
<td>.33**</td>
<td>.31*</td>
<td>.30*</td>
</tr>
<tr>
<td>Likelihood of reaching goal in full in the future</td>
<td>.25*</td>
<td>.31*</td>
<td>.15</td>
</tr>
</tbody>
</table>

*p <.05  **p<.01  ***p<.001

### Table 16. Goal Descriptives at Time 2 and Psychological Outcomes at Time 2

<table>
<thead>
<tr>
<th></th>
<th>Emotional Well-being</th>
<th>Meaning and Purpose</th>
<th>Positive Affect (In General)</th>
<th>Negative Affect (In General)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal Progress</td>
<td>.44***</td>
<td>.20</td>
<td>.31*</td>
<td>-.43***</td>
</tr>
<tr>
<td>Actual vs Expected Goal Progress</td>
<td>.32**</td>
<td>.23</td>
<td>.34**</td>
<td>-.40**</td>
</tr>
<tr>
<td>Likelihood of reaching goal in full in the future</td>
<td>.19</td>
<td>.44***</td>
<td>.51***</td>
<td>-.33**</td>
</tr>
</tbody>
</table>

*p <.05  **p<.01  ***p<.001

### Table 17. Two-step Hierarchical Linear Regression Treating Emotional Well-Being at Time 2 as the Dependent Variable

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>SE</th>
<th>β</th>
<th>t (p-value)</th>
<th>Δ R² (p-value)</th>
<th>Model Adj R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emotional well-being at T1</td>
<td>.89</td>
<td>.11</td>
<td>.73</td>
<td>8.37***</td>
<td></td>
<td>.52</td>
</tr>
<tr>
<td>Step 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goal Progress</td>
<td>.97</td>
<td>.50</td>
<td>.18</td>
<td>1.95</td>
<td>.02</td>
<td>.54</td>
</tr>
</tbody>
</table>

Note: B = unstandardized regression coefficient; SE = standard error of the estimate for step 1 or step 2; β = standardized regression coefficient
*p <.05  **p<.01  ***p<.001
Table 18. Correlations of Hope with Positive Psychological Factors

<table>
<thead>
<tr>
<th>Positive Psychological Factors</th>
<th>Hope</th>
<th>Agency</th>
<th>Pathways</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotional Well-being</td>
<td>.08</td>
<td>.02</td>
<td>.11</td>
</tr>
<tr>
<td>Meaning and Purpose</td>
<td>.34**</td>
<td>.44***</td>
<td>.22</td>
</tr>
<tr>
<td>Positive Affect (In General)</td>
<td>.47***</td>
<td>.48***</td>
<td>.38***</td>
</tr>
<tr>
<td>Negative Affect (In General)</td>
<td>.01</td>
<td>-.03</td>
<td>.05</td>
</tr>
</tbody>
</table>

*p <.05 **p<.01 ***p<.001

Table 19. Correlations of Hope with Goal Characteristics

<table>
<thead>
<tr>
<th>Goal Characteristic</th>
<th>Hope</th>
<th>Agency</th>
<th>Pathways</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived attainability</td>
<td>.24*</td>
<td>.27*</td>
<td>.18</td>
</tr>
<tr>
<td>Perceived control over reaching goal</td>
<td>.34**</td>
<td>.32**</td>
<td>.29*</td>
</tr>
<tr>
<td>Anticipated progress in next month</td>
<td>.18</td>
<td>.15</td>
<td>.17</td>
</tr>
<tr>
<td>Number of goals</td>
<td>.01</td>
<td>.06</td>
<td>-.02</td>
</tr>
<tr>
<td>Perceived likelihood reach goal in future</td>
<td>.32**</td>
<td>.34**</td>
<td>.25*</td>
</tr>
<tr>
<td>Cancer-related goal as most important</td>
<td>-.10</td>
<td>-.19</td>
<td>-.01</td>
</tr>
</tbody>
</table>

*p <.05 **p<.01 ***p<.001

Table 20. Correlations of Goal Characteristics with Positive Psychological Factors

<table>
<thead>
<tr>
<th>Goal Characteristic</th>
<th>Emotional Well-being</th>
<th>Meaning and Purpose</th>
<th>Positive Affect (In General)</th>
<th>Negative Affect (In General)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived attainability</td>
<td>.39***</td>
<td>.39***</td>
<td>.45***</td>
<td>-.29*</td>
</tr>
<tr>
<td>Perceived control over reaching goal</td>
<td>.33**</td>
<td>.42***</td>
<td>.45***</td>
<td>-.24***</td>
</tr>
<tr>
<td>Anticipated progress in next month</td>
<td>.25*</td>
<td>.08</td>
<td>.22</td>
<td>-.24*</td>
</tr>
<tr>
<td>Number of goals</td>
<td>-.13</td>
<td>-.10</td>
<td>.07</td>
<td>.11</td>
</tr>
<tr>
<td>Perceived likelihood reach goal in future</td>
<td>.26*</td>
<td>.36**</td>
<td>.41***</td>
<td>-.14</td>
</tr>
<tr>
<td>Cancer-related goal as most important</td>
<td>-.24*</td>
<td>-.15</td>
<td>-.14</td>
<td>.12</td>
</tr>
</tbody>
</table>

*p <.05 **p<.01 ***p<.001
Table 21. *Bootstrapped Estimates and Confidence Intervals for Tests of Indirect Effects of Goal Characteristics as Mediators of the relationship between Hope and Emotional Well-being*

<table>
<thead>
<tr>
<th>Mediator</th>
<th>Path c (IV to DV) Total effect B (SE)</th>
<th>Effect of IV on M (a) B (SE)</th>
<th>Effect of M on DV (b) B (SE)</th>
<th>Direct effects (c’) B (SE)</th>
<th>Indirect effect (a x b) 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived Attainability</td>
<td>.05 (.07)</td>
<td>.05 (.02)*</td>
<td>1.24 (.35)***</td>
<td>-.01 (.07)</td>
<td>.06 (.03) [.001 to .13]</td>
</tr>
<tr>
<td>Perceived Control</td>
<td>.05 (.07)</td>
<td>.09 (.03)**</td>
<td>.76 (.27)**</td>
<td>-.02 (.07)</td>
<td>.07 (.03) [.01 to .15]</td>
</tr>
<tr>
<td>Anticipated Progress in Short-Term</td>
<td>.05 (.07)</td>
<td>.02 (.01)</td>
<td>1.3 (.60)*</td>
<td>.02 (.07)</td>
<td>.03 (.02) [-.01 to .07]</td>
</tr>
<tr>
<td>Number of Goals</td>
<td>.05 (.07)</td>
<td>.004 (.03)</td>
<td>-.29 (.25)</td>
<td>.05 (.07)</td>
<td>-.001 (.01) [-.02 to .02]</td>
</tr>
<tr>
<td>Reach Goals in the Future</td>
<td>.05 (.07)</td>
<td>.06 (.02)**</td>
<td>.87 (.40)*</td>
<td>-.004 (.07)</td>
<td>.05 (.03) [.001 to .11]</td>
</tr>
</tbody>
</table>

*Unstandardized regression coefficients reported. IV = independent variable; DV = dependent variable; M = mediator variable; CI = confidence interval *p<.05 **p<.01 ***p<.001
Table 22. Bootstrapped Estimates and Confidence Intervals for Tests of Indirect Effects of Emotional Well-being as a Mediator of the relationship between Hope and Goal Characteristics (Reverse Mediation)

<table>
<thead>
<tr>
<th>Mediator</th>
<th>Path c (IV to DV)</th>
<th>Effect of IV on M (a) B (SE)</th>
<th>Effect of M on DV (b) B (SE)</th>
<th>Direct effects (c’) B (SE)</th>
<th>Indirect effect (a x b) 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total effect</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IV = Hope, DV = Perceived Attainability</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EWB</td>
<td>.04 (.02)*</td>
<td>.05 (.07)</td>
<td>.12 (.03)***</td>
<td>.04 (.02)*</td>
<td>.01 (.01) [-.01 to .03]</td>
</tr>
<tr>
<td>IV = Hope, DV = Perceived Control</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EWB</td>
<td>.09 (.03)**</td>
<td>.05 (.07)</td>
<td>.14 (.05)**</td>
<td>.08 (.03)**</td>
<td>.01 (.01) [-.01 to .03]</td>
</tr>
<tr>
<td>IV = Hope, DV = Anticipated Progress in the Short-Term</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EWB</td>
<td>.02 (.01)</td>
<td>.05 (.07)</td>
<td>.05 (.02)*</td>
<td>.02 (.01)</td>
<td>.002 (.003) [-.004 to .01]</td>
</tr>
<tr>
<td>IV = Hope, DV = Number of Goals</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EWB</td>
<td>.004 (.03)</td>
<td>.05 (.07)</td>
<td>-.06 (.05)</td>
<td>.01 (.03)</td>
<td>-.003 (.01) [-.02 to .01]</td>
</tr>
<tr>
<td>IV = Hope, DV = Reach Goals in the Future</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EWB</td>
<td>.06 (.02)**</td>
<td>.05 (.07)</td>
<td>.07 (.03)*</td>
<td>.05 (.02)**</td>
<td>.003 (.01) [-.01 to .02]</td>
</tr>
</tbody>
</table>

EWB = Emotional Well-being; IV = independent variable; DV = dependent variable; M = mediator variable; CI = confidence interval; Unstandardized regression coefficients reported.
*p <.05 **p <.01 ***p <.001
Table 23. Bootstrapped Estimates and Confidence Intervals for Tests of Indirect Effects of Patient-reported Progress Toward Goals in the Short-term as a Mediator of the relationship between Hope at Time 1 and Emotional Well-being at Time 2

<table>
<thead>
<tr>
<th>Mediator</th>
<th>Path c (IV to DV) (SE)</th>
<th>Effect of IV on M (a) (SE)</th>
<th>Effect of M on DV (b) (SE)</th>
<th>Direct effects (c') (SE)</th>
<th>Indirect effect (a x b) 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Progress toward goals in the short-term</td>
<td>.02 (.09)</td>
<td>.01 (.02)</td>
<td>2.38 (.62)***</td>
<td>-.02 (.08)</td>
<td>.03 (.05) [-.05 to .13]</td>
</tr>
</tbody>
</table>

*p <.05  **p <.01  ***p <.001
APPENDIX B. FIGURES

Figure 1. Model of Goal Characteristics Mediating the Relationship between Hope and Emotional Well-being at an Initial Assessment

Figure 2. Model of Goal Progress Mediating the Relationship between Hope at an Initial Assessment and Emotional Well-being at Follow-up Assessment
Figure 3. Participant Consort Diagram
APPENDIX C. INSTITUTIONAL REVIEW BOARD APPROVAL

June 11, 2019

Kelly Hyland
Psychology
Tampa, FL 33612

RE: Expedited Approval for Initial Review
IRB#: Pro00039818
Title: Hope, Goals and Psychological Outcomes in Patients with Advanced Lung Cancer

Study Approval Period: 6/10/2019

Dear Ms. Hyland:

On 6/10/2019, the Institutional Review Board (IRB) reviewed and APPROVED the above application and all documents contained within, including those outlined below. Please note this study is approved under the 2018 version of 45 CFR 46 and you will be asked to confirm ongoing research annually in place of a full Continuing Review. Amendments and Reportable Events must still be submitted per USF HRPP policy.

Approved Item(s):
Protocol Document(s):
Hope_Protocolv1_05152019.docx

Consent/Assent Document(s)*:
Adult Consent_HopeinLC_Version1_05152019.doc.pdf
*Please use only the official IRB stamped informed consent/assent document(s) found under the "Attachments" tab. Please note, these consent/assent documents are valid until the consent document is amended and approved.

It was the determination of the IRB that your study qualified for expedited review which includes activities that: (1) present no more than minimal risk to human subjects, and (2) involve only procedures listed in one or more of the categories outlined below. The IRB may review research through the expedited review procedure authorized by 45 CFR 46.110. The research proposed in this study is categorized under the following expedited review category:

(5) Research involving materials (data, documents, records, or specimens) that have been collected, or will be collected solely for nonresearch purposes (such as medical treatment or diagnosis).

(6) Collection of data from voice, video, digital, or image recordings made for research purposes.

(7) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

As the principal investigator of this study, it is your responsibility to conduct this study in accordance with IRB policies and procedures and as approved by the IRB. Any changes to the approved research must be submitted to the IRB via an Amendment for review and approval. Additionally, all unanticipated problems must be reported to the USF IRB within five (5) business days.

We appreciate your dedication to the ethical conduct of human subjects research at the University of South Florida and your continued commitment to human research protections. If you have any questions regarding this matter, please call 813-974-5638.

Sincerely,

Melissa Sloan, PhD, Vice Chairperson USF Institutional Review Board
APPENDIX D. PATIENT QUESTIONNAIRES

Hope, Goals and Psychological Outcomes in Patients
with Advanced Lung Cancer

Time 1 Questionnaire

Study ID#: [Blank]

Date of Completion: [Blank] / [Blank] / [Blank]

For questions or comments, please contact:

Kelly Hyland
Health Outcomes & Behavior Program
Moffitt Cancer Center & Research Institute
12902 Magnolia Dr., MRC-PSY
Tampa, FL 33612
(813) 745-5188
Kelly.Hyland@moffitt.org
1. Today's Date:     /    /    (MM/DD/YYYY)

2. Birth date:     /    /    (MM/DD/YYYY)

3. Gender (check one):

   □ Male
   □ Female

4. Ethnic group (check one):

   □ Hispanic/Spanish/Latino
   □ Not Hispanic/Spanish/Latino

5. Racial Background (check one):

   □ American Indian or Alaskan Native
   □ Native Hawaiian/Pacific Islander
   □ Asian
   □ White
   □ Black or African American
   □ More than one race (specify): ____________________________

6. Marital status (check one):

   □ Married or living with partner
   □ Separated
   □ Single
   □ Widowed
   □ Divorced

7. Completed education:

   □ Less than 12 years
   □ College graduate
   □ High school graduate
   □ Post-graduate degree
   □ Trade school
   □ Some college
8. Current employment situation (check the one box that applies the most):

A. WORKING
   - Full time at job
   - Part time at job

B. ON LEAVE
   - On leave with pay
   - On leave without pay

C. NOT EMPLOYED
   - Disabled
   - Seeking work
   - Retired
   - Homemaker
   - Student

9. Please check the box next to the option that describes your current level of activity:

   - Fully active, able to carry on all pre-disease performance without restriction
   - Restricted in physically strenuous activity but ambulatory and able to carry out work of a light or sedentary nature, e.g. light housework, office work.
   - Ambulatory and capable of self care, but unable to carry out any work activities. Up and about more than 50% of waking hours.
   - Capable of only limited self care, confined to bed or chair more than 50% of waking hours.
   - Completely disabled. Cannot carry on any self care. Totally confined to bed or chair.

10. During your lifetime, have you smoked at least 100 cigarettes (5 packs or more)?
    - No □
    - Yes □

    **IF YES:**
    a). How many cigarettes do/did you typically smoke each day? □□□□ (# cigarettes)
    b). Have you smoked in the past month? No □
    - Yes □
    - Yes, approximately □□□□ cigarettes per day
    - No, I quit about □□ years OR □□ months ago
    c). How many years in total have you smoked, or if you have quit, how many years did you smoke?
    □□□□ (Number of years)
11. Have you had any alcoholic drinks in the past month?  
   No ☐       Yes ☐

   If No, skip to #12

**IF YES:**
a). Which of the following best describes the number of alcoholic drinks you had in the past month? (check one)  
(Note: One drink equals: one 12 oz. can of beer, one 6 oz. glass of wine, or one 1 oz. shot of hard liquor)

   ☐ 1-3 times a month         ☐ 1 time a day
   ☐ 1-3 times a week          ☐ 2 times a day
   ☐ 4-6 times a week          ☐ 3 or more times a day

12. Patients differ in the amount of information that they want to know about their cancer diagnosis and treatment—some want to know everything, others want to know very little. What is your preference for details of information about your cancer diagnosis and treatment? (Please check one)

   ☐ I prefer not to hear a lot of details.
   ☐ I want to hear details only in certain situations, such as when tests are abnormal or when treatment decisions need to be made.
   ☐ I want to hear as many details as possible in all situations relating to my cancer and its treatment.

13. How likely do you think it is that you will be cured of cancer? (Please check one)

   ☐ Extremely likely (more than a 90% chance of cure)
   ☐ Very likely (75-90% chance of cure)
   ☐ Moderately likely (50-74% chance of cure)
   ☐ Somewhat likely (25-49% chance of cure)
   ☐ Unlikely (10-24% chance of cure)
   ☐ Very unlikely (less than 10% chance of cure)
   ☐ No chance (0% chance of cure)
Please mark one response.

1. How often do you attend church or other religious meetings?
   - Never
   - Once a year or less
   - A few times a year
   - A few times a month
   - Once a week
   - More than once a week

2. How often do you spend time in private religious activities, such as prayer, meditation, or Bible study?
   - Rarely or never
   - A few times a month
   - Once a week
   - Two or more times a week
   - Daily
   - More than once daily

3. In my life, I experience the presence of the Divine (i.e., God)
   - Definitely not true
   - Tends not to be true
   - Unsure
   - Tends to be true
   - Definitely true of me

4. My religious beliefs are what really lie behind my whole approach to life
   - Definitely not true
   - Tends not to be true
   - Unsure
   - Tends to be true
   - Definitely true of me

5. I try hard to carry my religion over into all other dealings in life
   - Definitely not true
   - Tends not to be true
   - Unsure
   - Tends to be true
   - Definitely true of me
Directions: Read each item carefully. Using the scale shown below, please select the number that best describes YOU.

<table>
<thead>
<tr>
<th></th>
<th>1 Definitely False</th>
<th>2 Mostly False</th>
<th>3 Slightly False</th>
<th>4 Slightly True</th>
<th>5 Somewhat True</th>
<th>6 Mostly True</th>
<th>7 Definitely True</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I can think of many ways to get out of a jam.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>2. I energetically pursue my goals.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>3. I feel tired most of the time.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>4. There are lots of ways around any problem.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>5. I am easily downed in an argument.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>6. I can think of many ways to get the things in life that are important to me.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>7. I worry about my health.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>8. Even when others get discouraged, I know I can find a way to solve the problem.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>9. My past experiences have prepared me well for my future.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>10. I’ve been pretty successful in life.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>11. I usually find myself worrying about something.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>12. I meet the goals that I set for myself.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td></td>
<td>Strongly Disagree</td>
<td>Disagree</td>
<td>Neither Agree nor Disagree</td>
<td>Agree</td>
<td>Strongly Agree</td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------------------</td>
<td>-------------------</td>
<td>----------</td>
<td>----------------------------</td>
<td>-------</td>
<td>----------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I have a good sense of what makes my life meaningful........................</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I generally feel that what I do in my life is valuable and worthwhile........</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I have very clear goals and aims for my life.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Not at All</th>
<th>A Little Bit</th>
<th>Somewhat</th>
<th>Quite a Bit</th>
<th>Very Much</th>
</tr>
</thead>
<tbody>
<tr>
<td>My life has meaning............</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>My life has significance........</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>I have a clear sense of direction in life..........</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>I experience deep fulfillment in my life.........</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>My life has purpose..................</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>
This scale consists of a number of words that describe different feelings and emotions. Read each item and then circle a number from the scale to indicate to what extent you feel this way IN GENERAL.

<table>
<thead>
<tr>
<th></th>
<th>Very Slightly or Not at All</th>
<th>A Little</th>
<th>Moderately</th>
<th>Quite a Bit</th>
<th>Extremely</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Interested..................</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2.</td>
<td>Distressed..................</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>3.</td>
<td>Excited......................</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4.</td>
<td>Upset........................</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5.</td>
<td>Strong........................</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>6.</td>
<td>Guilty........................</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>7.</td>
<td>Scared........................</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>8.</td>
<td>Hostile......................</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>9.</td>
<td>Enthusiastic...............</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>10.</td>
<td>Proud........................</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>11.</td>
<td>Irritable....................</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>12.</td>
<td>Alert..........................</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>13.</td>
<td>Ashamed......................</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>14.</td>
<td>Inspired.....................</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>15.</td>
<td>Nervous......................</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>16.</td>
<td>Determined..................</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>17.</td>
<td>Attentive...................</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>18.</td>
<td>Jittery......................</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>19.</td>
<td>Active.......................</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>20.</td>
<td>Afraid......................</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
**FACT-L**

**Instructions:** Below is a list of statements that other people with your illness have said are important. Please mark one box per line to indicate your response as it applies to the past 7 days.

<table>
<thead>
<tr>
<th>PHYSICAL WELL-BEING</th>
<th>Not at All</th>
<th>A Little Bit</th>
<th>Somewhat</th>
<th>Quite a Bit</th>
<th>Very Much</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I have a lack of energy.........................</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. I have nausea..................................................</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Because of my physical condition, I have trouble meeting the needs of my family...</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. I have pain..........................................................</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. I am bothered by side effects of treatment...........................................</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. I feel ill...............................................................</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. I am forced to spend time in bed...........</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SOCIAL/FAMILY WELL-BEING</th>
<th>Not at All</th>
<th>A Little Bit</th>
<th>Somewhat</th>
<th>Quite a Bit</th>
<th>Very Much</th>
</tr>
</thead>
<tbody>
<tr>
<td>8. I feel close to my friends.........................</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. I get emotional support from my family....</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. I get support from my friends.................</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. My family has accepted my illness...........</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. I am satisfied with family communication about my illness...........</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. I feel close to my partner (or the person who is my main support)...</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Regardless of your current level of sexual activity, please answer the following question. If you prefer not to answer it, please mark this box and go to the next section.

14. I am satisfied with my sex life............. 0 1 2 3 4
Please mark one box per line to indicate your response as it applies to the past 7 days.

<table>
<thead>
<tr>
<th>EMOTIONAL WELL-BEING</th>
<th>Not at All</th>
<th>A Little Bit</th>
<th>Somewhat</th>
<th>Quite a Bit</th>
<th>Very Much</th>
</tr>
</thead>
<tbody>
<tr>
<td>15. I feel sad</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. I am satisfied with how I am coping with my illness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. I am losing hope in the fight against my illness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18. I feel nervous</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19. I worry about dying</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20. I worry that my condition will get worse..</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FUNCTIONAL WELL-BEING</th>
<th>Not at All</th>
<th>A Little Bit</th>
<th>Somewhat</th>
<th>Quite a Bit</th>
<th>Very Much</th>
</tr>
</thead>
<tbody>
<tr>
<td>21. I am able to work (include work at home)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22. My work (include work at home) is fulfilling</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23. I am able to enjoy life</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24. I have accepted my illness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25. I am sleeping well</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26. I am enjoying the things I usually do for fun</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27. I am content with the quality of my life right now</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### ADDITIONAL CONCERNS

<table>
<thead>
<tr>
<th>Question</th>
<th>Not at All</th>
<th>A Little Bit</th>
<th>Somewhat</th>
<th>Quite a Bit</th>
<th>Very Much</th>
</tr>
</thead>
<tbody>
<tr>
<td>28. I have been short of breath...........................................</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29. I am losing weight..................................................................</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30. My thinking is clear..................................................................</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31. I have been coughing..................................................................</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>32. I am bothered by hair loss....................................................</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>33. I have a good appetite................................................................</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>34. I feel tightness in my chest...................................................</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35. Breathing is easy for me.......................................................</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

36. Have you ever smoked?
- ![No]
- ![Yes]

36a. IF YES: I regret my smoking............................................

### PHQ-4

Over the past 2 weeks, how often have you been bothered by the following problems? Please circle one response.

<table>
<thead>
<tr>
<th>Feeling nervous, anxious or on edge</th>
<th>Not at All</th>
<th>Several Days</th>
<th>More than Half the Days</th>
<th>Nearly Every Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2. Not being able to stop or control worrying</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3. Feeling down, depressed or hopeless</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4. Little interest or pleasure in doing things</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
LOT-R

Please be as honest and accurate as you can throughout. Try not to let your response to one statement influence your responses to other statements. There are no "correct" or "incorrect" answers. Answer according to your own feelings, rather than how you think "most people" would answer. Please circle one response.

<table>
<thead>
<tr>
<th>Statement</th>
<th>I Agree a Lot</th>
<th>I Agree a Little</th>
<th>I Neither Agree nor Disagree</th>
<th>I Disagree a Little</th>
<th>I Disagree a Lot</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. In uncertain times, I usually expect the best.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2. It's easy for me to relax.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3. If something can go wrong for me, it will.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4. I'm always optimistic about my future.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5. I enjoy my friends a lot.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6. It's important for me to keep busy.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>7. I hardly ever expect things to go my way.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8. I don't get upset too easily.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9. I rarely count on good things happening to me.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>10. Overall, I expect more good things to happen to me than bad.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
### BFI-10
How well do the following statements describe your personality? Please circle one response.

<table>
<thead>
<tr>
<th>I see myself as someone who...</th>
<th>Disagree Strongly</th>
<th>Disagree a Little</th>
<th>Neither Agree nor Disagree</th>
<th>Agree a Little</th>
<th>Agree Strongly</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. ...is reserved</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2. ...is generally trusting</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3. ...tends to be lazy</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4. ...is relaxed, handles stress well</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5. ...has few artistic interests</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6. ...is outgoing, sociable</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>7. ...tends to find fault with others</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8. ...does a thorough job</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9. ...gets nervous easily</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>10. ...has an active imagination</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
This scale consists of a number of words that describe different feelings and emotions. Read each item and then circle a number from the scale to indicate to what extent you feel this way RIGHT NOW.

<table>
<thead>
<tr>
<th></th>
<th>Very Slightly or Not at All</th>
<th>A Little</th>
<th>Moderately</th>
<th>Quite a Bit</th>
<th>Extremely</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Interested.........</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2. Distressed.........</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3. Excited............</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4. Upset...............</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5. Strong.............</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6. Guilty.............</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>7. Scared...............</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8. Hostile............</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9. Enthusiastic........</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>10. Proud..............</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>11. Irritable.........</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>12. Alert.............</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>13. Ashamed...........</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>14. Inspired..........</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>15. Nervous...........</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>16. Determined........</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>17. Attentive..........</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>18. Jittery...........</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>19. Active............</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>20. Afraid............</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
Hope, Goals and Psychological Outcomes in Patients with Advanced Lung Cancer

Time 2 Questionnaire

For questions or comments, please contact:
Kelly Hyland
Health Outcomes & Behavior Program
Moffitt Cancer Center & Research Institute
12902 Magnolia Dr., MRC-PSY
Tampa, FL 33612
(813) 745-5188
Kelly.Hyland@moffitt.org
Directions: Read each item carefully. Using the scale shown below, please select the number that best describes YOU.

<table>
<thead>
<tr>
<th></th>
<th>1 Definitely False</th>
<th>2 Mostly False</th>
<th>3 Somewhat False</th>
<th>4 Slightly False</th>
<th>5 Slightly True</th>
<th>6 Somewhat True</th>
<th>7 Mostly True</th>
<th>8 Definitely True</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I can think of many ways to get out of a jam.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>2. I energetically pursue my goals.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>3. I feel tired most of the time.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>4. There are lots of ways around any problem.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>5. I am easily downed in an argument.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>6. I can think of many ways to get the things in life that are important to me.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>7. I worry about my health.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>8. Even when others get discouraged, I know I can find a way to solve the problem.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>9. My past experiences have prepared me well for my future.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>10. I’ve been pretty successful in life.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>11. I usually find myself worrying about something.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>12. I meet the goals that I set for myself.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>
Meaning and Purpose

Please respond to each item by marking one box per row.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree nor Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have a good sense of what makes my life meaningful...............</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I generally feel that what I do in my life is valuable and worthwhile</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I have very clear goals and aims for my life.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Not at All</th>
<th>A Little Bit</th>
<th>Somewhat</th>
<th>Quite a Bit</th>
<th>Very Much</th>
</tr>
</thead>
<tbody>
<tr>
<td>My life has meaning...............................................</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My life has significance........................................</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I have a clear sense of direction in life.......................</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I experience deep fulfillment in my life.......................</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My life has purpose...............................................</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**PANAS**

This scale consists of a number of words that describe different feelings and emotions. Read each item and then circle a number from the scale to indicate to what extent you feel this way IN GENERAL.

<table>
<thead>
<tr>
<th></th>
<th>Very Slightly or Not at All</th>
<th>A Little</th>
<th>Moderately</th>
<th>Quite a Bit</th>
<th>Extremely</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Interested</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2. Distressed</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3. Excited</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4. Upset</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5. Strong</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6. Guilty</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>7. Scared</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8. Hostile</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9. Enthusiastic</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>10. Proud</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>11. Irritable</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>12. Alert</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>13. Ashamed</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>14. Inspired</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>15. Nervous</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>16. Determined</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>17. Attentive</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>18. Jittery</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>19. Active</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>20. Afraid</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
**FACT-L**

**Instructions:** Below is a list of statements that other people with your illness have said are important. Please mark one box per line to indicate your response as it applies to the past 7 days.

<table>
<thead>
<tr>
<th>PHYSICAL WELL-BEING</th>
<th>Not at All</th>
<th>A Little Bit</th>
<th>Somewhat</th>
<th>Quite a Bit</th>
<th>Very Much</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I have a lack of energy............................</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>2. I have nausea.........................................</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>3. Because of my physical condition, I have trouble meeting the needs of my family...</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>4. I have pain............................................</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>5. I am bothered by side effects of treatment................................................</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>6. I feel ill...............................................</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>7. I am forced to spend time in bed............</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SOCIAL/FAMILY WELL-BEING</th>
<th>Not at All</th>
<th>A Little Bit</th>
<th>Somewhat</th>
<th>Quite a Bit</th>
<th>Very Much</th>
</tr>
</thead>
<tbody>
<tr>
<td>8. I feel close to my friends...............................</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>9. I get emotional support from my family...</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>10. I get support from my friends.......................</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>11. My family has accepted my illness.................</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>12. I am satisfied with family communication about my illness.........</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>13. I feel close to my partner (or the person who is my main support)........................</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>

Regardless of your current level of sexual activity, please answer the following question. If you prefer not to answer it, please mark this box and go to the next section □

14. I am satisfied with my sex life............. 0 1 2 3 4
Please mark one box per line to indicate your response as it applies to the past 7 days.

<table>
<thead>
<tr>
<th>EMOTIONAL WELL-BEING</th>
<th>Not at All</th>
<th>A Little Bit</th>
<th>Somewhat</th>
<th>Quite a Bit</th>
<th>Very Much</th>
</tr>
</thead>
<tbody>
<tr>
<td>15. I feel sad..........................................................</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. I am satisfied with how I am coping with my illness..................................................</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. I am losing hope in the fight against my illness....................................................................</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18. I feel nervous..........................................................</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19. I worry about dying...............................................</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20. I worry that my condition will get worse..</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FUNCTIONAL WELL-BEING</th>
<th>Not at All</th>
<th>A Little Bit</th>
<th>Somewhat</th>
<th>Quite a Bit</th>
<th>Very Much</th>
</tr>
</thead>
<tbody>
<tr>
<td>21. I am able to work (include work at home)..................</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22. My work (include work at home) is fulfilling..............</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23. I am able to enjoy life.........................................</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24. I have accepted my illness....................................</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25. I am sleeping well..............................................</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26. I am enjoying the things I usually do for fun...............</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27. I am content with the quality of my life right now........</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Please mark one box per line to indicate your response as it applies to the past 7 days.

<table>
<thead>
<tr>
<th>ADDITIONAL CONCERNS</th>
<th>Not at All</th>
<th>A Little Bit</th>
<th>Somewhat</th>
<th>Quite a Bit</th>
<th>Very Much</th>
</tr>
</thead>
<tbody>
<tr>
<td>28. I have been short of breath..........................</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29. I am losing weight.................................</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30. My thinking is clear..................................</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31. I have been coughing.................................</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>32. I am bothered by hair loss...........................</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>33. I have a good appetite...............................</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>34. I feel tightness in my chest.........................</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35. Breathing is easy for me.............................</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>36. Have you ever smoked?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>36a. IF YES: I regret my smoking.........................</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

   No   Yes
APPENDIX E. SEMI-STRUCTURED GOAL INTERVIEW GUIDES

Goal Setting Semi-Structured Interview Guide

Thanks for completing the questionnaire. Next...

I would like to talk to you about goals. I am going to ask you a few questions about your goals, and I encourage you to answer as honestly as possible. I want to remind you that this is part of a research study to learn more about the goals of patients like you. What you talk about will not be shared with your medical team. I also want to remind you that I will turn on this audio recorder while we are talking, just in case I miss anything that you say. Does that sound okay?

...Great, so...

Define ‘goals’
Goals are things you want to do or want to accomplish. Goals might be things that you do because they give you a sense of purpose, or because you are interested in them or enjoy doing them. Goals may be things you want to do soon, like in the next few days or weeks and things you want to do longer into the future.

Example of a goal
Goals might cover different parts of your life. For example, I am a graduate student working on my PhD, so one of my goals is to complete the requirements of my degree.

Elicit patient goals (goals, broad)
I want to hear about your current goals, or things that you want to do or want to accomplish. I am going to write these goals down as we go.
If patient asks about number of goals: you can list as many as you want
If patient says they don’t have any goals: reframe question; things patient likes to do, interested in, give a sense of purpose

Okay, great. Are there any others goals that you’d like to add?

Patient goals, top 3 ranked
Okay, so your goals are to (recap). From these goals, I would like you to pick those that are the most important to you right now. You can pick up to 3 goals, or things that you want to do or work towards that are priorities for you right now. I will put a star to note which goal(s) are most important to you right now.
Rank top goals: 3
Now, I’d like for you rank these goals in order of importance to you, starting with the one that is the most important to you right now. Which is the second most important after that? How about next? (up to 3). I will put a number to note the order of importance of your goal(s)

Measure process variables related to goals (Likert scales of 1-5, look for citations)
Great, thank you. Now that you have picked the goals that are most important to you right now, I want to ask you a few questions about each of these goals. I am going to write each of your top goals on the numbered line, then you will answer the questions that follow for each specific goal.

Arrange follow-up/plan to check in on goals and progress
Great, thanks for telling me about your goals. I will be following up with you at one of your appointments scheduled in the next 3-4 weeks. This usually matches up will with when your next treatment may be scheduled for.

I have a list of when your appointments are scheduled for here (if no appointments scheduled in chart, ask: when is your next (tx, infusion) scheduled for?)

I will plan to meet you (at your next treatment, before this appointment – pick time and place as specifically as possible) on (date). I will give you a call a few days before to remind you of this meeting. Can you confirm the best telephone number to reach you?

TELEPHONE: ________________________

If you have questions before the next appointment, please give us a call (give card).

If no visit in the next ~4-6 weeks: since you don’t have an appointment in the next month or so, I will plan to follow up with you by telephone and mail you the follow-up questionnaire. This will come via FedEx so that it gets to you quickly. Can you confirm the best telephone number and address to reach you?

TELEPHONE: ________________________

ADDRESS: __________________________
1) To what extent do you believe that this goal is doable?

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all</td>
<td>Moderately</td>
<td>Extremely</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>doable</td>
<td>doable</td>
<td>doable</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2) To what extent do you feel you have control over reaching this goal?

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have no control</td>
<td>I have some control</td>
<td>I have total control</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3) How much progress do you think you will make toward this goal in the next 3-4 weeks? *(Please check one box)*

- [ ] No progress at all
- [ ] A little progress
- [ ] Some progress
- [ ] A lot of progress
- [ ] Done in full

4) How likely is it that you will reach this goal in full in the future?

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all</td>
<td>Moderately</td>
<td>Extremely</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>likely</td>
<td>likely</td>
<td>likely</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
GOAL #2: ________________________________________________________________
____________________________________________________________________
____________________________________________________________________
1) To what extent do you believe that this goal is doable?
   0 1 2 3 4 5 6 7 8 9 10
   Not at all Moderately Extremely
doable doable doable

2) To what extent do you feel you have control over reaching this goal?
   0 1 2 3 4 5 6 7 8 9 10
   I have no control I have some control I have total control

3) How much progress do you think you will make toward this goal in the next 3-4 weeks? (Please check one box)
   □ No progress at all
   □ A little progress
   □ Some progress
   □ A lot of progress
   □ Done in full

4) How likely is it that you will reach this goal in full in the future?
   0 1 2 3 4 5 6 7 8 9 10
   Not at all Moderately Extremely
   likely likely likely
GOAL #3: _______________________________
____________________________________________________________________
____________________________________________________________________

1) To what extent do you believe that this goal is doable?

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all</td>
<td>Moderately doable</td>
<td>Extremely doable</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2) To what extent do you feel you have control over reaching this goal?

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have no control</td>
<td>I have some control</td>
<td>I have total control</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3) How much progress do you think you will make toward this goal in the next 3-4 weeks? (Please check one box)

- [ ] No progress at all
- [ ] A little progress
- [ ] Some progress
- [ ] A lot of progress
- [ ] Done in full

4) How likely is it that you will reach this goal in full in the future?

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all likely</td>
<td>Moderately likely</td>
<td>Extremely likely</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
For reference:
Date Baseline Interview: ____________
Saw clinician before interview today? Y / N  Name clinician: ________________
Scans today? Y / N
Scans since baseline interview?  Y / N

Thanks for completing the questionnaire.

Check in on goals
A few weeks ago, we met and discussed goals, things you want to do or accomplish because they give you a sense of purpose, or because you are interested in them or you enjoy doing them.

I want to ask a few questions about the goals that you identified as most important to you right now.

I also want to remind you that what you talk about will not be shared with your medical team. I will turn on this audio recorder while we are talking, just in case I miss anything that you say. Does that sound okay?

[Choose which is applicable]
Before we get started, I saw that you had labs/ a scan earlier today. Did your doctor/clinician share anything with you about that today?
OR
Before we get started, I wanted to ask if you’ve had any scans or received any new information about your lung cancer since we met a few weeks ago?

____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

Here, I’ve got the list of goals that you identified as most important when we first met a few weeks ago. I want to focus on the three goals that you identified as most important to you right now.

Provide patient with follow up questions with their priority goals already written in for each set of questions.

So, those goals were...(read aloud)…
You’ll see that each of these goals is written on the top line of one of these pages. First, I want you to answer these 3 questions about your goal, then tell me a little bit more about what, if anything, you did in relation to this goal over the past few weeks. We’ll do this for each of your top 3 goals, okay?

Arrange follow-up/plan to check in on goals and progress

Great, thanks for answering these follow-up questions about your goals. You are all done with the study! I really appreciate you taking the time to talk to me. Do you have any other questions for me? If you have any questions in the future, please feel free to contact me.
GOAL #1: ____________________________________________________________
____________________________________________________________________

1) How much progress did you make toward this goal over the past 3-4 weeks?
(Please check one box)
☐ No progress at all
☐ A little progress
☐ Some progress
☐ A lot of progress
☐ Done in full

2) Did you make more, less or about the same amount of progress toward this goal as you expected over the past 3-4 weeks? (Please check one box)
☐ I made significantly more progress than I expected
☐ I made a little more progress than I expected
☐ I made about as much progress as I expected
☐ I made a little less progress than I expected
☐ I made significantly less progress than I expected

3) How likely is it that you will reach this goal in full in the future?

Not at all       Moderately       Extremely
likely          likely          likely
4) What have you done in relation to this goal over the past 3-4 weeks?
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

5) What types of things, if any, impacted your making progress toward this goal?
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
GOAL #2: ___________________________________________________________
_________________________________________________________________
_________________________________________________________________

1) How much progress did you make toward this goal over the past 3-4 weeks?
(Please check one box)
☐ No progress at all
☐ A little progress
☐ Some progress
☐ A lot of progress
☐ Done in full

2) Did you make more, less or about the same amount of progress toward this goal as you expected over the past 3-4 weeks? (Please check one box)
☐ I made significantly more progress than I expected
☐ I made a little more progress than I expected
☐ I made about as much progress as I expected
☐ I made a little less progress than I expected
☐ I made significantly less progress than I expected

3) How likely is it that you will reach this goal in full in the future?

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all likely</td>
<td>Moderately likely</td>
<td>Extremely likely</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

115
4) What have you done in relation to this goal over the past 3-4 weeks?
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

5) What types of things, if any, impacted your making progress toward this goal?
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
GOAL #3: ___________________________________________________________
____________________________________________________________________
____________________________________________________________________

1) How much progress did you make toward this goal over the past 3-4 weeks? (Please check one box)
   - No progress at all
   - A little progress
   - Some progress
   - A lot of progress
   - Done in full

2) Did you make more, less or about the same amount of progress toward this goal as you expected over the past 3-4 weeks? (Please check one box)
   - I made significantly more progress than I expected
   - I made a little more progress than I expected
   - I made about as much progress as I expected
   - I made a little less progress than I expected
   - I made significantly less progress than I expected

3) How likely is it that you will reach this goal in full in the future?
   
<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all</td>
<td>Moderately</td>
<td>Extremely</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>likely</td>
<td>likely</td>
<td>likely</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4) What have you done in relation to this goal over the past 3-4 weeks?
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

5) What types of things, if any, impacted your making progress toward this goal?
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________