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Prevalence, Predictors, and Correlates of Patient Concealment of a Lung Cancer Diagnosis

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Prevalence, Predictors, and Correlates of Patient Concealment of a Lung Cancer
Diagnosis

by

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A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
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Dedication

To my wife, Rebecca, whose unending love and support has made all of this possible.

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Abstract

Most cases of lung cancer have a commonly-understood behavioral etiology. Thus, individuals with lung cancer are often blamed for their illness by others and may therefore seek to avoid this blame by concealing their diagnosis from others. This study sought to determine the prevalence of diagnosis concealment, examine potential predictors of concealment, and test parts of a cognitive-affective-behavioral model of the effects of concealing a concealable stigma among individuals receiving treatment for lung cancer. With regard to predictors of concealment, it was hypothesized that concealment would be positively associated with male gender, introversion, and trait social anxiety and would be negatively associated with social support and the use of seeking guidance and support as a coping strategy. Hypothesized correlates of concealment included poorer self-esteem as well as greater anxiety, cancer-specific distress, and social avoidance. A sample of 117 participants receiving chemotherapy or radiation for stage I-IV non-small cell lung cancer and limited to extensive stage small cell lung cancer was recruited during routine outpatient visits. A medical chart review was conducted to assess clinical factors and participants completed a standard demographic questionnaire as well as measures of coping strategies, introversion, trait social anxiety, social avoidance, social support, anxiety, depression, cancer-specific distress, self-esteem, perceived stigma, public self-consciousness, and private self-consciousness. Results indicated that 31% of participants concealed their diagnosis from others since their diagnosis and 26% concealed their diagnosis in the month preceding

their participation in the study. Hypotheses regarding predictors and correlates of concealment were not supported. However, exploratory analyses identified use of alcohol, recency of a recurrence of lung cancer, use of positive reappraisal as a coping strategy, and social support as predictors of concealment as well as internalized shame as a correlate of concealment. These findings serve to extend existing literature on concealing a concealable stigma and support parts of an existing model on the effects of concealment. Future research should aim to test the impacts of concealment in the context of certain social situations to examine longitudinal relationships between predictors and consequences of concealment.

Introduction

Estimates suggest that in 2010 over 220,000 Americans were diagnosed with lung cancer and over 150,000 died of this disease (Jemal, Siegel, Xu, & Ward, 2010). Unlike many other forms of cancer, lung cancer is associated with a behavioral etiology (i.e., tobacco use). Accordingly, individuals with lung cancer may want to conceal their illness due to the potential for stigmatization (Chapple, Ziebland, & McPherson, 2004; Holland, Kelly, & Weinberger, 2010; Schonfeld & Timsit, 2008). Surprisingly, the extent to which patients conceal a disease such as lung cancer remains largely unstudied. The current study sought to evaluate the prevalence and predictors of diagnosis concealment and determine whether diagnosis concealment is associated with negative affective, behavioral, and self-evaluative implications in a sample of patients diagnosed with lung cancer.

As noted above, lung cancer has a well-established behavioral etiology. Along these lines, a recent study asked a sample of British women to rate the degree to which they believed patients with various cancers were to blame for their illnesses. Seventy percent considered lung cancer patients at least partly to blame for their illness, compared to 9% for leukemia patients and 15% for breast cancer patients (Marlow, Waller, & Wardle, 2010). Moreover, a study comparing attributions of blame found that lung cancer patients blamed themselves for their diagnosis more than their primary caregivers did (Lobchuk, Murdoch, McClement, & McPherson, 2008). Thus, individuals with lung cancer can be considered at higher risk of stigmatization than individuals with many

other forms of cancer due to perceptions of blame. Moreover, some studies have shown that illness-related perceived stigma is associated with poorer psychosocial well-being. For example, in a recent study of lung cancer patients, perceived stigma was associated with poorer social support and dyadic adjustment as well as increased depressive symptomatology (Gonzalez & Jacobsen, 2011).

Although the motivation to conceal one's lung cancer diagnosis is understandable, no published quantitative studies could be found which examined diagnosis concealment among individuals with cancer. Most studies of concealment in this population examine the ethical issues regarding a physician disclosing a diagnosis to the patient. Only one qualitative study could be found which discussed patients' concealing their cancer diagnoses from others. Donovan & Flynn (2007) interviewed men diagnosed with breast cancer and found that concealing one's diagnosis was one of four major themes discussed. The rate, predictors, and correlates of concealment among men with this stigmatizing diagnosis were not examined (Donovan & Flynn, 2007). To better understand this phenomenon, I developed and pilot-tested a brief questionnaire designed to assess whether or not individuals with a potentially stigmatizing diagnosis have chosen to conceal their illness. Twenty participants in a previous study of lung cancer patients were sampled. Seven (35%) reported that they had chosen to conceal their diagnosis from family, people at work, or friends around the time their treatment began. In addition, five (25%) reported that they were currently concealing their diagnosis from someone.

A review of the literature identified no quantitative studies of the predictors of diagnosis concealment in people with cancer. In the absence of such research it may be instructive to examine qualitative research on this topic in cancer populations and

quantitative research in other populations. For example, several qualitative studies have suggested that men with cancer are particularly resistant to discussing or disclosing their diagnosis (Boehmer & Clark, 2001; Hilton, Emslie, Hunt, Chapple, & Ziebland, 2009; Maliski, Rivera, Connor, Lopez, & Litwin, 2008). In a study about deciding whether or not to disclose one's cancer diagnosis, men were more likely than women to conceal their diagnosis, citing gender expectations of them as being stoical men (Hilton et al., 2009). Another study about men's experiences with prostate cancer found that men cited the need to protect others as a rationale for their reticence to discuss their diagnosis and their feelings about its symptoms (Maliski et al., 2008). Other evidence suggests that greater introversion and trait social anxiety is associated with greater tendencies to conceal personal characteristics likely to be perceived as negative (Cepeda-Benito & Short, 1998; Cramer & Lake, 1998; Wismeijer & van Assen, 2008). Along these lines, a study among college students indicated that social anxiety was associated with greater general self-concealment (i.e., the tendency to actively conceal from others) (Endler, Flett, Macrodimitris, Corace, & Kocovski, 2002). In contrast, greater social support may have the opposite effect. For example, among individuals with HIV, those who reported greater social support were less likely to indicate that they had concealed their diagnosis (Petрак, Doyle, Smith, Skinner, & Hedge, 2001). Use of certain coping strategies has also been associated with concealment. In a qualitative study, Seale & Charteris-Black (2008) interviewed individuals with various types of cancer. When deciding whether or not to conceal their diagnosis from others, women were more concerned with maintaining their social networks than men, suggesting that the coping strategy of seeking social support may be associated with concealment (Seale & Charteris-Black, 2008). Similarly, a study

of individuals with HIV found that among those who disclosed their diagnosis the desire for support was the most often endorsed reason for disclosure (Pettrak et al., 2001). Together, the results of these studies provide support for investigating associations between concealment and gender, introversion, social anxiety, social support, and seeking social support in lung cancer patients. Additionally, the literature on impression management has also examined the concepts of public and private self-consciousness, the tendencies to be concerned about aspects of the self that are easily observable or covert, respectively (Leary, 1996). Although these concepts have not been examined as predictors of concealment, they merit consideration because of their potential influence on individuals' decisions to conceal.

No published quantitative studies of the effects of concealing one's cancer diagnosis could be found, and only limited research has been conducted on this topic among individuals with other illnesses. However, a model examining the potential effects of concealing a concealable and potentially stigmatizing condition is of particular importance (Pachankis, 2007; see Figure 1). The following is a brief description of the most salient aspects of the model as it might relate to concealing a diagnosis of lung cancer.

Pachankis (2007) posits that concealment of a potentially stigmatizing condition can have negative affective, self-evaluative, and behavioral implications. Individuals who choose to conceal such a condition must often make this decision multiple times, even in one day, during encounters with family members, friends, and co-workers. Among those who decide to conceal their condition, these repeated reminders of one's condition may lead them to suppress thoughts of their condition (Lane & Wegner, 1995). This thought

suppression may place those who conceal their condition at elevated risk of depression, anxiety, and distress (Brewin, Watson, McCarthy, Hyman, & Dayson, 1998; Purdon, 1999). Moreover, these potential affective responses can result in diminished self-esteem among these individuals. In addition, individuals who conceal their potentially stigmatizing condition may also isolate themselves and avoid others in order to avoid these unpleasant consequences of associating with others.

Although a review of the literature identified no studies that have tested hypotheses based on Pachankis' (2007) model among cancer patients, several studies in other populations are instructive. For example, in one study college students who reported characteristics that might be considered concealable and stigmatizing (e.g., low socioeconomic status, bulimia nervosa, or homosexual sexual orientation) reported greater anxiety and depression as well as lower self-esteem than students with potentially stigmatizing characteristics that are not concealable (e.g., being overweight or having a stutter) (Frable, Platt, & Hoey, 1998). Another study sampled pregnant women just before they were to have an abortion and again two years later (Major & Gramzow, 1999). Results showed an association between secrecy regarding the abortion and psychological distress two years after the abortion; additional findings demonstrated that this association was mediated by intrusive thoughts as well as suppression of thoughts about their abortion (Major & Gramzow, 1999). These findings support extending research using Pachankis' model to the study of the affective, behavioral, and self-evaluative correlates of concealment among individuals with lung cancer.

Refining theories of the effects of concealment among individuals with lung cancer could help mental providers better attend to their patients' quality of life and well-

being. For example, thoracic oncologists may become better equipped to identify psychological distress associated with concealment and to address these issues. In addition, such research could inform new psychotherapeutic interventions targeting the potential affective, behavioral, and self-evaluative effects of concealment.

The Current Study: Overview, Aims, and Hypotheses

This study examined the prevalence, predictors, and correlates of concealment of one's lung cancer diagnosis. Participants were individuals receiving chemotherapy and/or radiotherapy for treatment for lung cancer, because they may be more likely to have been diagnosed more recently than others who are not receiving treatment. Also, because of frequent medical appointments, patients receiving treatment may be more likely to be making a deliberate decision regarding whether or not to conceal their diagnosis from others. Specific aims and hypotheses follow.

Specific Aim 1. To determine the prevalence of diagnosis concealment among lung cancer patients.

Specific Aim 2. To evaluate potential predictors of concealment. Hypothesis set 1: It was hypothesized that diagnosis concealment would be positively associated with male gender, introversion, and trait social anxiety. It was hypothesized that diagnosis concealment would be negatively associated with social support and use of seeking guidance and support as a coping strategy. Exploratory analyses: Exploratory analyses were conducted to determine whether age, smoking history, marital status, perceived stigma, public self-consciousness, and private self-consciousness would be associated with concealment. Depending on the outcomes of these exploratory analyses, hierarchical regression analyses were planned to determine if psychosocial variables (e.g., social

support) predicted concealment over and above relevant demographic and clinical variables.

Specific Aim 3. To evaluate potential affective, behavioral, and self-evaluative correlates of concealment of one's lung cancer diagnosis. Hypothesis set 2: It was hypothesized that concealment of one's lung cancer diagnosis would be positively associated with anxiety, depression, cancer-specific distress (affective correlates), social avoidance (behavioral correlate), and poorer self-esteem (self-evaluative correlate).

Exploratory analyses: Mediation analyses were planned to explore whether expected associations between concealment and affective outcomes were mediated by behavioral and self-evaluative factors.

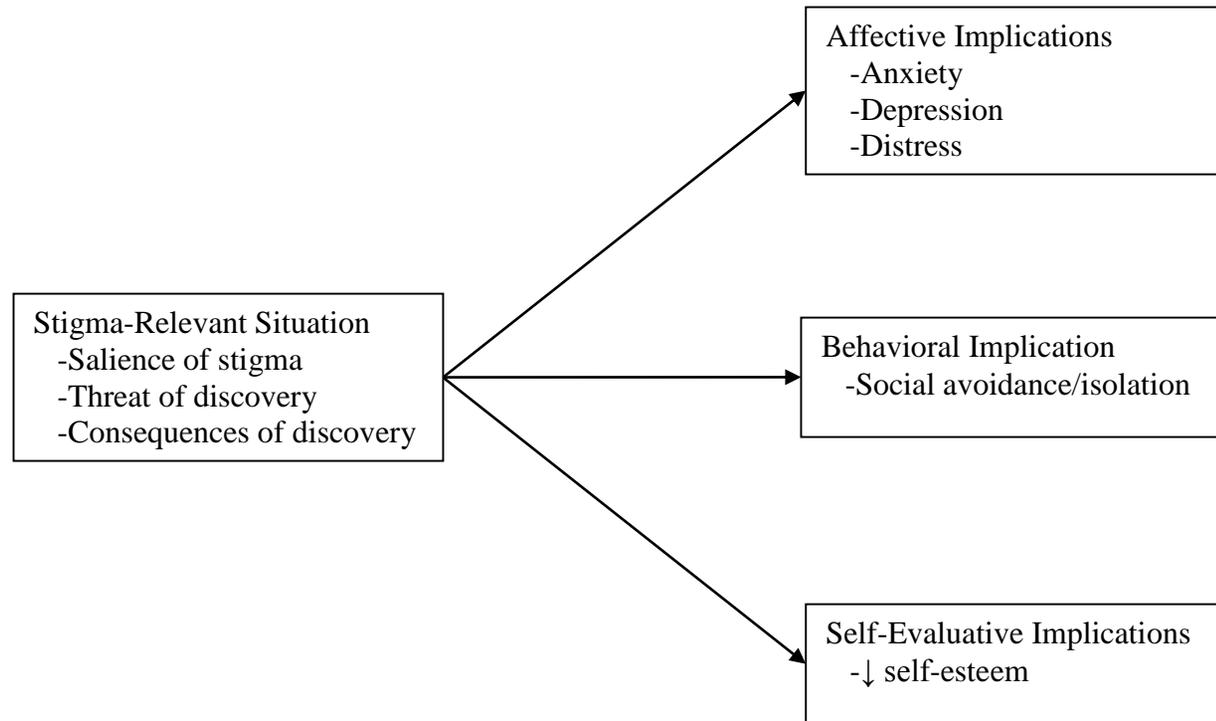


Figure 1. Adapted from Pachankis' (2007) cognitive-affective-behavioral model for psychological implications of concealing a stigma.

Method

Participants

Eligibility criteria for this study were: 1) receiving chemotherapy and/or radiotherapy for treatment of non-small cell lung cancer (NSCLC) or small cell lung cancer (SCLC), 2) no history of other cancers with the exception of non-melanoma skin cancers, 3) ≥ 18 years of age, 4) able to read English, and 5) able to provide informed consent.

Procedure

Two procedures were used to recruit participants for this study. For both procedures, study eligibility was determined in consultation with members of the H. Lee Moffitt Cancer Center Thoracic Oncology Program team. The first study procedure involved approaching potential participants during routine outpatient visits and explaining the study protocol. Those eligible and interested provided written informed consent. Participants were given the option of completing the study measures during their outpatient visit or taking them home and returning them in a self-addressed stamped envelope provided by study staff.

Those potential participants who were not scheduled to have a routine outpatient visit to the H. Lee Moffitt Cancer Center within the next 3 weeks after they were identified were recruited via mail. They were mailed a packet containing a cover letter that explained the nature of the study and indicated that they would be contacted via telephone to discuss participation. The packet also included a card which participants

could return in order to decline participation in the study without any further contact, two informed consent forms, the study questionnaire, and a pre-addressed postage-paid envelope in which they could return the declination card or a signed consent and a completed study questionnaire. After the packet was mailed, potential participants were contacted by phone and the study protocol was explained. Those eligible and interested were asked to sign the consent forms, complete the study questionnaire, and return one signed consent form with the completed questionnaire in the provided self-addressed stamped envelope. Participants were not compensated for their study participation.

Measures

Demographics and background information. Demographics and background information were collected using a standardized self-report form. The variables assessed included age, sex, race, ethnicity, education, income, marital status, living arrangements, employment status, and menopausal status (for women). In addition, participants completed a measure of their smoking history, which was used to classify participants as never smokers, former smokers, or current smokers. As part of this assessment, those who had smoked at least 100 cigarettes in their lifetime were asked whether or not they currently smoke. Both former smokers and current smokers were asked to indicate how many cigarettes per day they do or did smoke as well as how many years they smoked. Also, current smokers were asked to indicate how many times they have tried to quit smoking. Former smokers were asked to indicate how long ago they quit smoking.

Clinical information. The following clinical information was assessed via a review of patients' medical records: date of lung cancer diagnosis, disease stage, disease type (small cell vs. non-small cell), previous lung cancer treatment, current lung cancer

treatment, and ECOG performance status (a measure of overall well-being) (Oken et al., 1982).

Diagnosis concealment. Diagnosis concealment was assessed with a brief self-report measure that was designed and pilot-tested for this study. Respondents were asked to indicate whether or not they had chosen to conceal their lung cancer diagnosis (yes/no) from anyone within certain specified groups (i.e., family, friends, and coworkers) within two time frames: 1) since their cancer diagnosis and 2) within the past month. Those who indicated they had chosen to conceal their lung cancer diagnosis were asked to indicate their reason(s) for concealing by choosing from a specified list of reasons derived from pilot-testing of this questionnaire (e.g., “I didn’t want them to worry about me”). In addition, participants were asked to report how much discomfort, on a scale from 0 (*no discomfort*) to 4 (*extreme discomfort*), disclosing or not disclosing their lung cancer diagnosis to others caused in the past month. Lastly, participants were asked to report how many occasions in the past month they chose not to disclose their diagnosis.

Coping. Coping strategies was assessed using the Coping Responses Inventory (CRI; (Moos, 1993; Moos, 1993), a 48-item Likert-type instrument which assesses specific coping responses via eight subscales. Responses are coded from 0 (*not at all*) to 3 (*fairly often*). Four subscales assess approach coping styles: seeking guidance and support, problem solving, logical analysis, and positive reappraisal (Moos, 1993). Four subscales assess avoidant coping styles: seeking alternative rewards, emotional discharge, cognitive avoidance, and acceptance or resignation (Moos, 1993). The eight individual subscales of the CRI have been validated (Moos, 1993) and been shown to have adequate internal consistency reliability (α range: .61 - .74) in a sample of ovarian cancer patients

(Chan, Ng, Lee, Ngan, & Wong, 2003). In the present study, analyses focused on the seeking guidance and support subscale which asks questions such as, “Did you talk with a friend about the problem?” In the present study, this scale demonstrated poor internal consistency reliability ($\alpha = .54$).

Introversion. Introversion was assessed using the Extraversion-Introversion subscale of the NEO-Five Factor Inventory (NEO-FFI; (Costa Jr & McCrae, 1992). This subscale has 12 items rated on a 5-point Likert-type scale, ranging from 1 (strongly disagree) to 5 (*strongly agree*). Sample items include “I like to have a lot of people around me” and “I really enjoy talking to people.” The NEO-FFI has demonstrated acceptable reliability and validity in the general population as well as in individuals with cancer (Costa Jr & McCrae, 1992; Montgomery et al., 2009). In the present study, this scale demonstrated adequate internal consistency reliability ($\alpha = .79$).

Trait social anxiety and social avoidance. Trait social anxiety and social avoidance were assessed using the Liebowitz Social Anxiety Scale (LSAS; (Liebowitz, 1987), a 24-item measure which asks respondents to rate the fear/anxiety they experience during certain social situations (e.g., speaking up at a meeting) on a 4-point Likert-type scale ranging from 0 (*none*) to 3 (*severe*). Respondents are then asked to indicate the degree to which they would avoid these social interactions. These items are also coded on a 4-point Likert-type scale ranging from 0 (*never*) to 3 (*usually*) scale. The trait social anxiety and social avoidance subscales have demonstrated acceptable reliability and validity (Heimberg et al., 1999; Liebowitz, 1987). The social anxiety ($\alpha = .92$) and social avoidance ($\alpha = .89$) scales demonstrated adequate internal consistency reliabilities in the present study.

Social support. Social support was assessed using the ENRICH Social Support Instrument (ESSI; (Mitchell et al., 2003; Mitchell et al., 2003), a 5-item Likert-type instrument designed to assess emotional support. Responses range from 1 (*none of the time*) to 5 (*all of the time*). The ESSI has been shown to have acceptable reliability and validity (Mitchell et al., 2003; Mitchell et al., 2003). Sample questions include “Is there someone available to give you good advice about a problem?” and “Is there someone available to you who shows you love and affection?” (Mitchell et al., 2003; Mitchell et al., 2003). In the present study, this scale demonstrated adequate internal consistency reliability ($\alpha = .92$).

Anxiety and depression. Anxiety and depression were assessed using the respective Anxiety and Depression scales of the Hospital Anxiety and Depression Scale (HADS; (Zigmond & Snaith, 1983). The HADS asks respondents to indicate on a 4-point scale (from *most of the time* to *not at all*) how often they feel certain ways (e.g., I feel tense or “wound up”). The anxiety and depression scales have demonstrated acceptable validity and reliability and have been used extensively in studies of patients with cancer (Ibbotson, Maguire, Selby, Priestman, & Wallace, 1994; Jacobsen & Jim, 2008). Sample reverse coded items include “I can sit at ease and feel relaxed” and “I still enjoy the things I used to enjoy.” (Zigmond & Snaith, 1983). The anxiety ($\alpha = .66$) and depression ($\alpha = .57$) scales demonstrated poor internal consistency reliabilities in the present study.

Cancer-specific distress. Cancer-specific distress was assessed using the intrusion subscale of the Impact of Events Scale – Revised (IES-R; (Weiss & Marmar, 1997), a 22-item Likert-type scale in which respondents are asked to rate how distressing each item is on a scale from 0 (*not at all*) to 4 (*extremely*). Sample intrusion subscale

items include “Other things kept making me think about it” and “Pictures about it popped into my head.” Respondents were instructed to rate items with regard to the diagnosis and treatment of their lung cancer. This scale, which has demonstrated acceptable reliability and validity, has been extensively used in the cancer population as a measure of cancer-specific distress (Floyd et al., 2011; Weiss & Marmar, 1997). In the present study, this scale demonstrated adequate internal consistency reliability ($\alpha = .87$).

Self-esteem. Self-esteem was assessed using the Rosenberg Self-Esteem Scale (RSES; (Rosenberg, 1979), a 10-item Likert-type scale in which respondents indicate on a 4-point scale the degree to which they agree with statements such as “I feel I do not have much to be proud of” and “I certainly feel useless at times.” Responses are scored on a scale of 0 (*strongly disagree*) to 3 (*strongly agree*). This scale has demonstrated adequate reliability and validity and has been used with numerous populations, including with individuals with cancer (Greenfield et al., 2010; Rosenberg, 1979). In the present study, this scale demonstrated adequate internal consistency reliability ($\alpha = .88$).

Perceived stigma. Perceived stigma was assessed using the Social Impact Scale (SIS; (Fife & Wright, 2000; Fife & Wright, 2000)), a 24-item Likert-type scale which measures the extent to which individuals with an illness believe they are experiencing social rejection, financial insecurity, internalized shame, and social isolation as a result of their illness. In addition to a total score, the measure yields subscale scores for the four aspects of experienced stigma described above. These four subscales have been shown to have strong internal consistency reliability (α range: .85 - .90), and though they are related, their relatively low zero-order correlations with one another (r range: .28 – .66) suggest that they assess divergent aspects of one’s illness-related stigma (Fife & Wright,

2000). In the present study, the total perceived stigma scale ($\alpha = .92$) and the four subscales ($\alpha s = .69 - .87$) demonstrated adequate internal consistency reliabilities.

Public and private self-consciousness. Public and private self-consciousness were assessed using the respective subscales of the Self-Consciousness Scale – Revised (SCS-R; (Scheier & Carver, 1985). Public self-consciousness refers to the tendency to be concerned about easily observable aspects of oneself, and private self-consciousness refers to the tendency to be concerned about covert aspects of oneself that are not easily observable. The 8- and 7-item subscales provide statements and ask respondents to rate each on a 4-point Likert-type scale ranging from 0 (*not like me at all*) to 3 (*a lot like me*). These scales have demonstrated adequate reliability and validity in previous studies (Scheier & Carver, 1985). The public self-consciousness ($\alpha = .61$) and private self-consciousness ($\alpha = .64$) subscales demonstrated slightly less than adequate internal consistency reliabilities in the present study.

Statistical Analyses

Preliminary analyses. The rate of participation was computed, and those who declined to participate were compared to those who participated to determine whether demographic or clinical differences existed between these two groups. Descriptive statistics (e.g., means and standard deviations) were computed to characterize the sample in terms of its demographic, clinical, and psychological characteristics. In addition, the prevalence of concealment was computed. Along these lines, the number of participants who concealed their diagnosis from anyone was computed for both time frames (past month and since cancer diagnosis), as well as a summary indicating from whom participants chose to conceal their diagnosis and why.

Hypothesis testing. Diagnosis concealment was dichotomized to compare individuals who did not conceal their diagnosis from anyone in the past month to those who did conceal their diagnosis from anyone in the past month. This study also explored the possibility that differences existed as a function of from whom participants concealed their diagnosis (described below). Separate analyses were conducted for examining potential predictors of concealment and correlates of concealment for both time frames (i.e., within the past month and since the cancer diagnosis).

Logistic regression analyses were used to determine the association between diagnosis concealment (categorical variable) and hypothesized continuous (e.g., introversion) as well as categorical (e.g., gender) predictor variables (Aim 2). Point-biserial correlational analyses were conducted to determine the associations between diagnosis concealment and hypothesized correlates of concealment (e.g., depression) (Aim 3).

Exploratory analyses. Mediation analyses were conducted to explore whether the expected relationships of concealment with anxiety, depression, and cancer-specific distress are mediated by social avoidance and self-esteem. These analyses followed established protocol for determining mediation (Preacher & Hayes, 2008). Preacher & Hayes (2008) lay out the following steps (see Figure 2):

1. The dependent variable (psychological factor) is regressed on the predictor (diagnosis concealment). The regression coefficient for the independent variable (IV) in this equation is termed c .
2. The proposed mediator (avoidance/self-esteem) is regressed on the predictor. The regression coefficient for the IV in this equation is termed a .

3. The dependent variable is regressed on the predictor and mediator. The regression coefficient for the mediator is termed b , and the new regression coefficient for the predictor in this equation is termed c' .

To satisfy the requirements for mediation the product of ab , the indirect effect, must be significantly different from zero. Bootstrapping is used to derive an estimate of and 95% confidence interval for the indirect effect (Preacher & Hayes, 2008), and this confidence interval is examined to determine whether or not it includes zero.

An exploratory hierarchical logistic regression analysis was planned to determine whether psychosocial factors accounted for unique variance in diagnosis concealment above and beyond that contributed by relevant demographic, clinical, and smoking variables. However, given the lack of support for hypothesized associations between psychosocial factors and concealment (see below), these logistic regression analyses were not conducted.

Additional exploratory chi-square analyses were conducted to identify potential psychological predictors of discomfort associated with concealing or disclosing one's diagnosis in the past month. Lastly, an exploratory correlational analysis was conducted to attempt to replicate the association between perceived stigma and depression observed by Gonzalez & Jacobsen (2011).

Power analyses. Pilot-testing of the diagnosis concealment measure indicated that about 30% of lung cancer patients concealed their lung cancer diagnosis from anyone during treatment. Thus, power analysis for this study presumed that 30% of the sample would report concealing their diagnosis and 70% will not.

Hypothesis set 1. A power analysis for a logistic regression was run using Power and Precision 2.0 (Biostat, 2000). This power analysis indicated that with a Type I error rate of .05 (two-tailed) and power equal to .80, a sample of 86 participants was necessary in order to detect an OR = 2.06, which is equivalent to a small to medium effect size ($d = 0.4$) (Chinn, 2000).

Hypothesis set 2. A power analysis for a point-biserial correlation was run using Power and Precision 2.0 (Biostat, 2000). This power analysis indicated that with a Type I error rate of .05 (two-tailed) and power equal to .80, a sample size of 120 participants would be necessary in order to detect a small to medium effect size of $r = .25$.

Based on these analyses, the current study aimed to conduct analyses with data from 120 participants. With the consent of the dissertation committee, analyses were conducted with data from 117 participants.

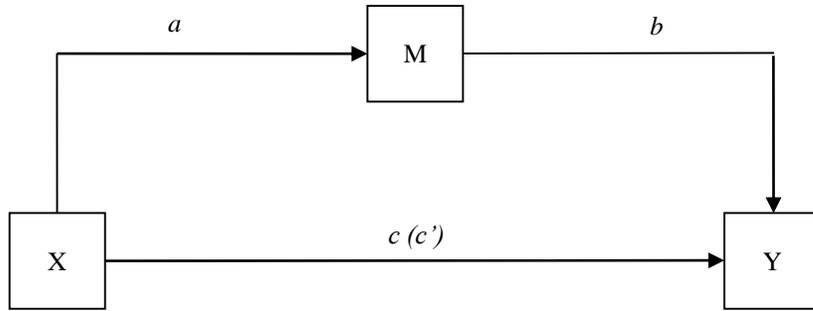


Figure 2. Path diagram for the indirect effect of a predictor on a dependent variable through a mediator.

Results

Participants

Participant flow is shown in Figure 3. One thousand four hundred forty-seven individuals were screened for this study; of these, 1,067 were ineligible based on medical record reviews (e.g., history of other cancer, not receiving chemotherapy). One hundred eight-four were potentially eligible for participation but were not approached for recruitment due to unavailability of research personnel. The remaining 196 participants were approached for participation; of these, an additional 4 were deemed ineligible before consent, 39 refused to participate, and 159 agreed to participate (83% of those eligible). Of those who agreed to participate, 4 withdrew from the study, 29 never completed the study measures and could not be reached, and 3 were found to be ineligible after they participated. Thus, analyses were conducted on the 117 participants who had evaluable data. The 159 patients who agreed to participate in the study did not differ in terms of age, gender, or race from the 39 patients who declined to participate, $ps \geq .24$.

Participant demographic and clinical characteristics are shown in Tables 1 and 2. Participants ranged in age from 36 to 85 years ($M = 64.22$; $SD = 9.66$). The majority of the participants were high school graduates (70%), married (62%), and White (82%). Twenty-six participants (22%) were never smokers, and 91 (78%) were previous smokers or current smokers at the time of the study visit. Mean body mass index for this sample was 26.33 ($SD = 5.19$), which indicates that the average participant was slightly overweight. On average, participants were 20.56 months ($SD = 27.92$) from their original

lung cancer diagnosis. Twenty-seven participants (23%) had a recurrence of their lung cancer, thirty-seven (32%) had a surgical resection of this cancer, and 50 (43%) had been treated with radiation therapy.

Prevalence of concealment and reasons for concealment

To address Aim 1, the number of participants who reported concealing their diagnosis from anyone was calculated using their responses to items asking whether they concealed from individuals in certain groups (e.g., “Did you choose not to tell a close family member?”). Concealment was calculated separately for those who concealed from anyone since their diagnosis and those who concealed from anyone in the past month (see Tables 3 and 4 for frequencies).

Thirty-six participants (31%) reported concealing since their diagnosis. The majority ($n = 25$, 69%) reported concealing from a casual friend since their diagnosis. Thirty participants (26%) reported concealing in the past month. The majority ($n = 20$, 67%) reported concealing from a casual friend since their diagnosis.

Reasons for diagnosis concealment are shown in Tables 5 and 6. A commonly-endorsed reason for diagnosis concealment was concern that one’s family or friends would worry about the patient. This was evident among participants who concealed since diagnosis and in the past month.

Comparing demographics between concealers and non-concealers

To address hypothesis set 1, comparisons were made between those who concealed and those who did not on demographic measures (see Tables 7 and 8). Contrary to expectations, gender was not associated with concealment since diagnosis ($p = .46$) or in the past month ($p = .67$). Exploratory analyses also indicated that age, history

of smoking, and marital status were not associated with concealment since diagnosis or in the past month ($ps \geq .07$). Additional exploratory analyses indicated that those who concealed in the past month were more likely to report drinking alcohol in the past month ($p = .04$); no differences based on alcohol use were observed for concealment since diagnosis ($p = .09$).

Comparing clinical factors between concealers and non-concealers

Exploratory analyses were conducted to identify potential clinical predictors of concealment (see Tables 9 and 10). Analyses indicated that among patients with a recurrence, those who recurred more recently were more likely to report concealing in the past month ($p < 0.01$); no differences based on recency of recurrence were observed for concealment since diagnosis ($p = .06$). Body mass index, time since diagnosis, time since resection, time since radiation, type of lung cancer (NSCLC vs. SCLC), disease stage, ECOG performance status, use of antidepressants, and use of sedative/hypnotics were not associated with diagnosis concealment since diagnosis or in the past month ($ps \geq .06$). Similarly, no associations were found between diagnosis concealment since diagnosis or in the past month and whether participants had a recurrence, a surgical resection of their lung cancer, radiotherapy, or chemotherapy ($ps \geq .13$).

Examining potential psychological predictors of diagnosis concealment

To address hypothesis set 1, analyses were conducted to identify potential psychological predictors of concealment (see Tables 11 and 12). Contrary to expectations, introversion, social anxiety, social support, and use of seeking guidance and support as a coping strategy were not associated with concealment since diagnosis ($ps \geq .25$) or in the past month ($ps \geq .15$). In addition to the planned analyses, exploratory

analyses were conducted to identify potential psychological predictors of diagnosis concealment (see Tables 13 and 14). Those who reported greater use of positive reappraisal as a coping strategy were more likely to report concealing their diagnosis in the past month ($p = .02$). Private self-consciousness and public self-consciousness were not associated with diagnosis concealment since diagnosis or in the past month ($ps \geq .13$). In addition, diagnosis concealment since diagnosis or in the past month were not associated with use of logical analysis, problem-solving, cognitive avoidance, acceptance or resignation, seeking alternative rewards, or emotional discharge as coping strategies ($ps \geq .13$).

Additional exploratory analyses were conducted to identify potential psychological predictors of discomfort associated with concealing or disclosing one's diagnosis in the past month (see Table 15). Social anxiety was positively associated with the discomfort participants reported around disclosing or concealing their diagnosis ($p < .01$). Discomfort with concealing or disclosing in the past month was not associated with introversion, social support, or use of seeking guidance and support as a coping strategy ($ps \geq .48$).

Examining potential correlates of concealment

To address hypothesis set 2, analyses were conducted to examine potential psychological correlates of diagnosis concealment (see Tables 16 and 17). Contrary to expectations, concealment since diagnosis and in the past month were not associated with anxiety, depression, cancer-specific distress, social avoidance, and self-esteem ($ps \geq .14$).

Additional exploratory analyses were conducted to identify potential stigma-related psychological correlates of diagnosis concealment (see Tables 18 & 19). Those

who reported concealing since diagnosis ($p = .01$) and those who reported concealing in the past month ($p < .01$) reported greater internalized shame related to the diagnosis of lung cancer. Perceived social rejection, financial insecurity, perceived social isolation, and total perceived stigma were not associated with diagnosis concealment since diagnosis or in the past month ($ps \geq .20$).

Additional exploratory analyses for concealment from close family/friends

Additional exploratory analyses were conducted to identify potential predictors and correlates of diagnosis concealment from close family or friends versus more distant others or not at all (see Tables 20, 21, 22, and 23). In order to conduct these analyses, the sample was dichotomized between those who reported concealing from close family or friends versus those who did not report concealing or else reported concealing from other family, work supervisors, co-workers, and/or casual friends. Analyses were conducted separately for concealment since diagnosis and in the past month. Analyses indicated that 20 (17%) participants reported concealing from close family or friends since their diagnosis and 15 (13%) reported concealing from close family or friends in the past month.

Regarding predictors, neither sex, age, smoking history, nor marital status were associated with concealment from close friends/family since diagnosis ($ps \geq .39$) or in the past month ($ps \geq .18$). Poorer social support was associated with concealment from close family/friends since diagnosis ($p = .03$) and in the past month ($p = .03$). Concealment from close family/friends since diagnosis and in the past month were not associated with introversion, social anxiety, and use of seeking guidance and support ($ps \geq .07$).

Regarding correlates, diagnosis concealment from close family/friends since diagnosis and in the past month were not associated with anxiety, depression, cancer-specific distress, social avoidance, and self-esteem ($ps \geq .08$).

Mediational analyses

Exploratory mediational analyses were conducted to determine whether the relationships between concealment (since diagnosis and in the past month) and affective correlates were mediated by social avoidance and self-esteem. Self-esteem did not mediate the relationships between diagnosis concealment (since diagnosis or in the past month) with anxiety, depression, or cancer-specific distress, $ps > .05$. Social avoidance did not mediate the relationships between diagnosis concealment (since diagnosis or in the past month) with anxiety, depression, and cancer-specific distress, $ps > .05$.

Additional exploratory analysis

An additional exploratory analysis was conducted to examine whether perceived stigma was associated with depression. Greater perceived stigma was associated with greater depressive symptomatology, $r(114) = .35, p < .01$.

Table 1

Demographic Characteristics of the Sample (N = 117)

Variable	<i>M</i>	<i>SD</i>
Age, years	64.22	(9.66)
Pack years of tobacco use ^a	42.52	(29.96)
Variable	<i>n</i>	%
Gender		
Males	58	(49.6%)
Females	59	(50.4%)
Education		
≤ High school graduate	35	(29.9%)
> High school graduate	82	(70.1%)
Race		
White	96	(82.1%)
Non-white	21	(17.9%)
Ethnicity		
Hispanic	5	(4.3%)
Non-hispanic	112	(95.7%)
Marital Status		
Currently married	73	(62.4%)
Not married	44	(37.6%)
Total household income		
< \$ 40,000	29	(24.8%)
≥ \$40,000	69	(59.0%)
Declined to answer	19	(16.2%)
Alcohol use in past month		
No	69	(59.0%)
Yes	48	(41.0%)
Cigarette use		
Never	26	(22.2%)
Previous & current	91	(77.7%)

Note. ^aAmong only past smokers and current smokers (*n* = 91).

Table 2

Clinical Characteristics of the Sample (N = 117)

Variable	<i>M</i>	<i>SD</i>
Body mass index	26.33	(5.19)
Months since original diagnosis	20.56	(27.92)
Months since recurrence ^a	9.74	(9.53)
Months since resection ^b	26.46	(32.75)
Months since radiation ^c	13.40	(21.70)
Variable	<i>n</i>	%
Type of lung cancer		
NSCLC	104	(88.9%)
SCLC	13	(11.1%)
NSCLC disease stage ^d		
I – II	14	(12.0%)
III	17	(14.5%)
IV	73	(62.4%)
SCLC disease stage ^e		
Limited stage SCLC	2	(15.4%)
Extensive stage SCLC	11	(84.6%)
ECOG performance status		
0	23	(19.7%)
1	84	(71.8%)
2 - 4	10	(8.5%)
Taking antidepressant medication at time of study visit		
No	92	(78.6%)
Yes	25	(21.4%)
Taking sedative/hypnotic medication at time of study visit		
No	67	(57.3%)
Yes	50	(42.7%)

Table 2 (Continued)

Had a recurrence		
No	90	(76.9%)
Yes	27	(23.1%)
Had resection of this cancer		
No	80	(68.4%)
Yes	37	(31.6%)
Had radiation therapy for this cancer		
Never	67	(57.3%)
Finished radiation before consent	42	(35.9%)
Receiving radiation	8	(6.8%)
Had chemotherapy for this cancer		
Never	1	(0.9%)
Receiving chemotherapy	116	(99.1%)

Note. ECOG = Eastern Cooperative Oncology Group. NSCLC = non-small cell lung cancer. SCLC = small cell lung cancer. ^aAmong only those with a recurrence ($n = 27$).

^bAmong only those with a resection ($n = 37$). ^cAmong only those with radiation ($n = 50$).

^dAmong only those with NSCLC ($n = 104$). ^eAmong only those with SCLC ($n = 13$).

Table 3

Frequencies of Concealment Since Diagnosis From Various Groups (n = 36)

Concealment From	Yes	No	N/A	Sum
Close family	11 (30.6%)	25 (69.4%)	--	36
Other family	10 (27.8%)	26 (72.2%)	--	36
Work supervisor	2 (5.6%)	12 (33.3%)	22 (61.1%)	36
Co-worker	4 (11.1%)	8 (22.2%)	24 (66.7%)	36
Close friend	13 (36.1%)	23 (63.9%)	--	36
Casual friend	25 (69.4%)	11 (30.6%)	--	36

Table 4

Frequencies of Concealment in Past Month From Various Groups (n = 30)

Concealment From	Yes	No	N/A	Sum
Close family	5 (16.7%)	25 (83.3%)	--	30
Other family	8 (26.7%)	22 (73.3%)	--	30
Work supervisor	0 (0.0%)	13 (43.3%)	17 (56.7%)	30
Co-worker	4 (13.3%)	6 (20.0%)	20 (66.7%)	30
Close friend	12 (40.0%)	18 (60.0%)	--	30
Casual friend	20 (66.7%)	10 (33.3%)	--	30

Table 5

*Frequencies of Reasons for Concealment From Various Groups**Since Diagnosis (N = 117)*

Concealment From	n	%
Close family		
I didn't want them to worry about me	4	36.4%
Other	3	27.3%
I didn't want to overburden them	2	18.2%
Missing	2	18.2%
Other family		
I didn't want them to worry about me	6	60.0%
I didn't want them to take pity on me	3	30.0%
I didn't want to overburden them	1	10.0%
Work supervisor		
They might think I'd take too much time off	1	50.0%
Other	1	50.0%
Co-worker		
Other	2	60.0%
I didn't want to overburden them	1	20.0%
I was concerned that they might judge me	1	20.0%
Close friend		
I didn't want them to worry about me	7	53.8%
I didn't want them to take pity on me	4	30.8%
I didn't want to overburden them	1	7.7%
Other	1	7.7%
Casual friend		
Other	11	44.0%
I didn't want them to take pity on me	8	32.0%
I didn't want them to worry about me	4	16.0%
I didn't want to overburden them	1	4.0%
I thought they might avoid me	1	4.0%

Table 6

*Frequencies of Reasons for Concealment From Various Groups in the**Past Month (N = 117)*

Concealment From	<i>n</i>	%
Close family		
I didn't want to overburden them	2	40.0%
I didn't want them to worry about me	1	20.0%
Other	1	20.0%
Missing	1	20.0%
Other family		
I didn't want them to worry about me	5	62.5%
I didn't want them to take pity on me	2	25.0%
I didn't want to overburden them	1	12.5%
Co-worker		
Other	3	75.0%
I was concerned that they might judge me	1	25.0%
Close friend		
I didn't want them to worry about me	7	58.3%
I didn't want them to take pity on me	3	5.0%
I didn't want to overburden them	1	8.3%
Other	1	830.0%
Casual friend		
Other	10	52.6%
I didn't want them to take pity on me	6	31.6%
I didn't want them to worry about me	2	10.5%
I didn't want to overburden them	1	4.0%

Table 7

*Demographics of Participants Who Did Not Conceal Compared to Those Who Did**Conceal**Since Diagnosis (N = 117)*

	Did conceal (n = 36)	Did not conceal (n = 81)		
Variable	<i>M (SD)</i>	<i>M (SD)</i>	<i>t</i>	<i>P</i>
Age, years	62.7 (10.44)	64.9 (9.25)	1.15	.26
Pack years of tobacco use ^a	45.9 (30.22)	39.9 (28.65)	-.90	.37
Variable	<i>n (%)</i>	<i>n (%)</i>	χ^2	<i>p</i>
Gender			0.55	.46
Males	16 (13.7%)	42 (35.9%)		
Females	20 (17.1%)	39 (33.3%)		
Education			0.60	.44
≤ High school graduate	9 (7.7%)	26 (23.1%)		
> High school graduate	26 (22.2%)	55 (47.0%)		
Race			0.65	.42
White	28 (23.9%)	68 (58.1%)		
Non-white	8 (6.8%)	13 (11.1%)		
Ethnicity			0.21	.65
Hispanic	2 (1.7%)	3 (2.6%)		
Non-hispanic	34 (29.1%)	78 (66.7%)		
Marital status			1.04	.31
Currently married	20 (17.1%)	53 (45.3%)		
Not married	16 (13.7%)	28 (23.9%)		
Total household income			0.82	.66

Table 7 (Continued)

< \$ 40,000	7 (6.0%)	22 (18.8%)		
≥ \$40,000	23 (19.7%)	46 (39.3%)		
Declined to answer	6 (5.1%)	13 (11.1%)		
Alcohol use in past month			2.97	.09
No	17 (14.5%)	52 (44.4%)		
Yes	19 (16.2%)	29 (24.8%)		
Cigarette use			0.23	.63
Never	9 (7.7%)	17 (14.5%)		
Previous & current	27 (23.1%)	64 (54.7%)		

Note. ^aAmong only past smokers and current smokers ($n = 91$).

Table 8

Demographics of Participants Who Did Not Conceal Compared to Those Who Did Conceal in the Past Month (N = 117)

	Did conceal (n = 30)	Did not conceal (n = 87)		
Variable	<i>M (SD)</i>	<i>M (SD)</i>	<i>t</i>	<i>P</i>
Age, years	61.47 (9.93)	65.17 (9.40)	1.84	.07
Pack years of tobacco use ^a	46.48 (33.62)	40.22 (27.67)	-0.86	.39
Variable	<i>n (%)</i>	<i>n (%)</i>	χ^2	<i>P</i>
Gender			0.81	.67
Males	17 (14.5%)	41 (35.1%)		
Females	13 (11.1%)	46 (39.3%)		
Education			0.83	.36
≤ High school graduate	7 (6.0%)	28 (23.9%)		
> High school graduate	23 (19.7%)	59 (50.4%)		
Race			2.08	.15
White	22 (18.8%)	74 (63.2%)		
Non-white	8 (6.8%)	13 (11.1%)		
Ethnicity			0.57	.45
Hispanic	2 (1.7%)	3 (2.6%)		
Non-hispanic	28 (23.9%)	84 (71.8%)		
Marital status			0.02	.90
Currently married	19 (16.2%)	54 (46.2%)		
Not married	11 (9.4%)	33 (28.2%)		
Total household income			0.99	.61

Table 8 (Continued)

< \$ 40,000	6 (5.1%)	23 (19.7%)		
≥ \$40,000	20 (17.1%)	49 (41.9%)		
Declined to answer	4 (3.4%)	15 (12.8%)		
Alcohol use in past month			4.08	.04
No	13 (11.1%)	56 (47.9%)		
Yes	17 (14.5%)	31 (26.5%)		
Cigarette use			1.41	.24
Never	9 (7.7%)	17 (14.5%)		
Previous & current	21 (17.9%)	70 (59.8%)		

Note. ^aAmong only past smokers and current smokers ($n = 91$).

Table 9

Clinical Characteristics of Participants Who Did Not Conceal Compared to Those Who Did Conceal Since Diagnosis (N = 117)

	Did conceal (n = 36)	Did not conceal (n = 82)		
Variable	<i>M (SD)</i>	<i>M (SD)</i>	<i>t</i>	<i>P</i>
Body mass index	26.2 (4.97)	26.4 (5.31)	0.20	.85
Months since original diagnosis	23.0 (29.60)	19.5 (27.26)	-0.64	.53
Months since recurrence ^a	5.6 (5.99)	12.6 (10.61)	1.95	.06
Months since resection ^b	31.2 (34.51)	24.2 (32.35)	-0.60	.55
Months since radiation ^c	20.2 (34.86)	11.0 (14.60)	-1.33	.19
Variable	<i>n (%)</i>	<i>n (%)</i>	χ^2	<i>p</i>
Type of lung cancer			0.41	.52
NSCLC	31 (26.5%)	73 (62.4%)		
SCLC	5 (4.3%)	8 (6.8%)		
NSCLC disease stage ^d			0.05	> .99
I – II	4 (3.8%)	10 (9.6%)		
III	5 (4.8%)	12 (11.5%)		
IV	21 (21.2%)	51 (49.0%)		
SCLC disease stage ^e			0.13	.72
Limited stage SCLC	1 (7.7%)	1 (7.7%)		
Extensive stage SCLC	4 (30.8%)	7 (53.8%)		
ECOG performance status			2.67	.45
0	10 (8.5%)	13 (11.1%)		
1	23 (19.7%)	61 (52.1%)		
2 – 4	3 (2.6%)	7 (6.0%)		

Table 9 (Continued)

Taking antidepressant medication			0.11	.74
at time of study visit				
No	29 (24.8%)	63 (53.8%)		
Yes	7 (6.0%)	18 (15.4%)		
Taking sedative/hypnotic medication			0.02	.87
at time of study visit				
No	21 (17.9%)	46 (39.3%)		
Yes	15 (12.8%)	35 (29.9%)		
Had a recurrence			1.64	.20
No	25 (21.4%)	65 (55.6%)		
Yes	11 (9.4%)	16 (13.7%)		
Had resection of this cancer			0.07	.79
No	24 (20.5%)	56 (47.9%)		
Yes	12 (10.3%)	25 (21.4%)		
Had radiation therapy for this cancer			1.52	.47
Never	23 (19.7%)	44 (37.6%)		
Finished radiation before consent	10 (8.5%)	32 (27.4%)		
Receiving radiation	3 (2.6%)	5 (4.3%)		
Had chemotherapy for this cancer			2.27	.13
Never	1 (0.9%)	0 (0.0%)		
Receiving chemotherapy	35 (29.9%)	81 (69.2%)		

Note. ECOG = Eastern Cooperative Oncology Group. NSCLC = non-small cell lung cancer. SCLC = small cell lung cancer. ^aAmong only those with a recurrence ($n = 27$). ^bAmong only those with a resection ($n = 37$). ^cAmong only those with radiation ($n = 50$). ^dAmong only those with NSCLC ($n = 104$). ^eAmong only those with SCLC ($n = 13$).

Table 10

Clinical Characteristics of Participants Who Did Not Conceal Compared to Those Who Did Conceal in the Past Month (N = 117)

	Did conceal (n = 30)	Did not conceal (n = 82)		
Variable	<i>M (SD)</i>	<i>M (SD)</i>	<i>t</i>	<i>p</i>
Body mass index	25.79 (4.97)	26.52 (5.27)	0.66	.51
Months since original diagnosis	22.03 (30.94)	20.05 (26.97)	-0.34	.74
Months since recurrence ^a	4.22 (2.73)	12.50 (10.55)	3.13	< .01
Months since resection ^b	31.17 (34.51)	24.20 (32.35)	-0.60	.55
Months since radiation ^c	19.83 (36.35)	11.37 (15.00)	-1.18	.24
Variable	<i>n (%)</i>	<i>n (%)</i>	χ^2	<i>p</i>
Type of lung cancer			3.23	.07
NSCLC	24 (20.5%)	80 (68.4%)		
SCLC	6 (5.1%)	7 (6.0%)		
NSCLC disease stage ^d			0.56	.91
I - II	4 (3.8%)	10 (9.6%)		
III	3 (2.9%)	14 (13.5%)		
IV	17 (16.3%)	56 (53.8%)		
SCLC disease stage ^e			0.01	.91
Limited stage SCLC	1 (7.7%)	1 (7.7%)		
Extensive stage SCLC	5 (38.5%)	6 (46.2%)		
ECOG performance status			3.00	.39
0	9 (7.7%)	14 (12.0%)		
1	19 (16.2%)	65 (55.6%)		
2 - 4	2 (1.7%)	8 (6.9%)		

Table 10 (Continued)

Taking antidepressant medication at time of study visit			0.09	.76
No	23 (19.7%)	69 (59.0%)		
Yes	7 (6.0%)	18 (15.4%)		
Taking sedative/hypnotic medication at time of study visit			1.46	.23
No	20 (17.1%)	47 (40.2%)		
Yes	10 (8.5%)	40 (34.2%)		
Had a recurrence			1.09	.30
No	21 (17.9%)	69 (59.0%)		
Yes	9 (7.7%)	18 (15.4%)		
Had resection of this cancer			1.31	.25
No	18 (15.4%)	62 (53.0%)		
Yes	12 (10.3%)	25 (21.4%)		
Had radiation therapy for this cancer			0.13	.94
Never	18 (15.4%)	49 (41.9%)		
Finished radiation before consent	10 (8.5%)	32 (27.4%)		
Receiving radiation	2 (1.7%)	6 (5.1%)		
Had chemotherapy for this cancer			0.35	.56
Never	0 (0.0%)	1 (0.9%)		
Receiving chemotherapy	30 (25.6%)	86 (73.5%)		

Note. ECOG = Eastern Cooperative Oncology Group. NSCLC = non-small cell lung cancer. SCLC = small cell lung cancer. ^aAmong only those with a recurrence ($n = 27$).

^bAmong only those with a resection ($n = 37$). ^cAmong only those with radiation ($n = 50$).

^dAmong only those with NSCLC ($n = 104$). ^eAmong only those with SCLC ($n = 13$).

Table 11

Psychological Predictors of Concealment in Participants Who Did Not Conceal

Compared to Those Who Did Conceal Since Diagnosis (N = 117).

Variable	Did conceal	Did not conceal	Wald χ^2	p
	(n = 36)	(n = 80)		
	M (SD)	M (SD)		
Introversion	27.1 (7.02)	28.6 (6.34)	1.32	.25
Social Anxiety	12.5 (10.33)	13.7 (12.68)	0.26	.61
Social Support	22.2 (4.06)	22.5 (3.72)	0.01	.92
Seeking Guidance & Support	52.4 (8.09)	53.9 (8.52)	0.74	.39

Table 12

Psychological Predictors of Concealment in Participants Who Did Not

Conceal Compared to Those Who Did Conceal in the Past Month (N = 117)

Variable	Did conceal	Did not conceal	Wald χ^2	p
	(n = 30)	(n = 87)		
	M (SD)	M (SD)		
Introversion	26.6 (6.39)	28.6 (6.58)	2.12	.15
Social Anxiety	12.2 (10.72)	13.7 (12.42)	0.39	.54
Social Support	22.1 (3.93)	22.5 (3.79)	0.03	.85
Seeking Guidance & Support	53.9 (8.16)	53.3 (8.50)	0.09	.77

Table 13

Psychological Predictors of Concealment in Participants Who Did Not Conceal Compared to Those Who Did Conceal Since Diagnosis (N = 117)

Variable	Did conceal	Did not conceal	Wald χ^2	p
	(n = 36)	(n = 80)		
	<i>M (SD)</i>	<i>M (SD)</i>		
Private Self-Consciousness	12.69 (4.33)	11.36 (4.23)	2.30	.13
Public Self-Consciousness	12.40 (5.83)	10.43 (6.60)	2.15	.14
CRI Logical Analysis	46.14 (7.46)	45.06 (15.75)	0.13	.72
CRI Positive Reappraisal	55.00 (6.39)	53.22 (8.34)	1.17	.28
CRI Problem-Solving	52.88 (6.46)	52.15 (8.75)	0.17	.68
CRI Cognitive Avoidance	49.66 (8.16)	50.96 (8.76)	0.51	.48
CRI Acceptance or Resignation	51.08 (10.20)	49.19 (8.35)	0.99	.32
CRI Seeking Alternative Rewards	51.76 (9.89)	53.52 (9.19)	0.78	.38
CRI Emotional Discharge	54.02 (9.08)	51.33 (8.13)	2.27	.13

Note. CRI = Coping Responses Inventory. SIS = Social Impact Scale.

Table 14

*Psychological Predictors of Concealment in Participants Who Did Not**Conceal Compared to Those Who Did Conceal in the Past Month (N = 117)*

Variable	Did conceal	Did not conceal	Wald χ^2	p
	(n = 30)	(n = 87)		
	M (SD)	M (SD)		
Private Self-Consciousness	12.76 (4.01)	11.43 (4.34)	2.07	.15
Public Self-Consciousness	12.52 (5.70)	10.52 (6.60)	1.96	.16
CRI Logical Analysis	46.26 (8.14)	45.09 (15.27)	0.14	.71
CRI Positive Reappraisal	56.94 (4.64)	52.70 (8.39)	5.63	.02
CRI Problem-Solving	52.66 (5.88)	52.27 (8.72)	0.04	.84
CRI Cognitive Avoidance	49.97 (8.63)	50.78 (8.61)	0.18	.67
CRI Acceptance or Resignation	50.03 (10.34)	49.64 (8.61)	0.04	.85
CRI Seeking Alternative Rewards	52.35 (9.92)	53.22 (9.26)	0.17	.68
CRI Emotional Discharge	53.18 (8.24)	51.78 (8.55)	0.54	.46

Note. CRI = Coping Responses Inventory. SIS = Social Impact Scale.

Table 15

Psychological Predictors of Discomfort With Concealing or Disclosing One's Diagnosis in the Past Month (N = 117)

Discomfort level		Introversion	Social Anxiety	Social Support	Seeking Guidance & Support
	n (%)	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
No discomfort	51 (43.6%)	28.02 (6.24)	9.82 (10.83)	22.78 (3.61)	53.28 (8.86)
A little discomfort	24 (20.5%)	28.29 (6.71)	15.21 (10.40)	22.17 (3.20)	53.96 (7.72)
Mild discomfort	19 (16.2%)	28.00 (7.36)	18.68 (15.2)	21.72 (3.80)	54.41 (8.01)
Moderate discomfort	16 (13.7%)	26.06 (5.70)	16.07 (12.50)	20.81 (6.63)	50.40 (8.68)
Extreme discomfort	7 (6.0%)	33.43 (7.09)	12.07 (8.06)	23.43 (3.31)	57.79 (6.54)
		<i>rho</i> = .009	<i>rho</i> = .265	<i>rho</i> = -.066	<i>rho</i> = .011
		<i>p</i> = .92	<i>p</i> < .01	<i>p</i> = .48	<i>p</i> = .91

Table 16

Psychological Correlates of Concealment in Participants Who Did Conceal Compared to Those Who Did Not Conceal Since Diagnosis (N = 117)

	Did conceal (n = 36)	Did not conceal (n = 80)		
Variable	<i>M (SD)</i>	<i>M (SD)</i>	<i>r</i>	<i>p</i>
Anxiety	13.06 (3.14)	12.44 (3.50)	.085	.37
Depression	14.03 (2.98)	14.11 (2.80)	-.014	.88
Cancer-Specific Distress	0.78 (0.73)	0.90 (0.73)	-.074	.43
Social Avoidance	16.49 (10.26)	18.25 (13.31)	-.066	.48
Self-Esteem	23.91 (4.95)	22.32 (5.37)	.160	.14

Table 17

Psychological Correlates of Concealment in Participants Who Did Not Conceal Compared to Those Who Did Conceal in the Past Month (N = 117)

	Did conceal (n = 30)	Did not conceal (n = 87)		
Variable	<i>M (SD)</i>	<i>M (SD)</i>	<i>r</i>	<i>p</i>
Anxiety	13.40 (2.93)	12.36 (3.52)	.135	.15
Depression	14.10 (3.10)	14.08 (2.77)	.003	.98
Cancer-Specific Distress	0.81 (0.76)	0.89 (0.72)	-.045	.64
Social Avoidance	17.17 (10.55)	17.89 (13.06)	-.026	.79
Self-Esteem	23.10 (5.07)	22.70 (5.37)	.033	.72

Table 18

Psychological Correlates of Concealment in Participants Who Did Not Conceal Compared to Those Who Did Conceal Since Diagnosis (N = 117)

Variable	Did conceal	Did not conceal	<i>r</i>	<i>p</i>
	(n = 36)	(n = 80)		
	<i>M (SD)</i>	<i>M (SD)</i>		
SIS Social Rejection	12.72 (3.15)	13.65 (4.31)	-.108	.25
SIS Financial Insecurity	4.25 (1.99)	4.84 (2.37)	-.120	.20
SIS Internalized Shame	9.61 (2.50)	8.36 (2.50)	.227	.01
SIS Social Isolation	13.42 (3.59)	13.66 (4.51)	-.027	.77
SIS Total Perceived Stigma	40.00 (8.48)	40.51 (11.25)	-.023	.81

Note. SIS = Social Impact Scale.

Table 19

Psychological Correlates of Concealment in Participants Who Did Not Conceal Compared to Those Who Did Conceal in the Past Month (N = 117)

Variable	Did conceal	Did not conceal	<i>r</i>	<i>p</i>
	(n = 30)	(n = 87)		
	<i>M (SD)</i>	<i>M (SD)</i>		
SIS Social Rejection	13.60 (3.32)	13.28 (4.22)	.035	.71
SIS Financial Insecurity	4.50 (2.13)	4.71 (2.32)	-.041	.67
SIS Internalized Shame	9.93 (2.59)	8.34 (2.42)	.275	< .01
SIS Social Isolation	13.93 (3.37)	13.47 (4.51)	.049	.60
SIS Total Perceived Stigma	41.97 (8.42)	39.79 (11.03)	.092	.33

Note. SIS = Social Impact Scale.

Table 20

Psychological Predictors of Concealment in Participants Who Did Not Conceal From Close Family/Friends Compared to Those Who Did Conceal Since Diagnosis (N = 117)

Variable	Did conceal from close family/friends (n = 20)	Did not conceal (n = 97)	Wald χ^2	p
	M (SD)	M (SD)		
Introversion	26.85 (8.24)	28.40 (6.18)	0.92	.34
Social Anxiety	9.58 (8.43)	14.11 (12.48)	2.32	.13
Social Support	20.58 (4.74)	22.59 (3.89)	4.59	.03
Seeking Guidance & Support	53.01 (8.23)	53.55 (8.46)	0.07	.80

Table 21

Psychological Correlates of Concealment in Participants Who Did Not Conceal From Close Family/Friends Compared to Those Who Did in the Past Month (N = 117)

Variable	Did conceal from close family/friends (n = 15)	Did not conceal (n = 102)	Wald χ^2	p
	M (SD)	M (SD)		
Introversion	25.20 (6.81)	28.56 (6.45)	3.34	.07
Social Anxiety	10.13 (9.29)	13.81 (12.29)	1.22	.97
Social Support	20.14 (4.37)	22.55 (3.98)	4.82	.03
Seeking Guidance & Support	52.48 (8.20)	53.60 (8.45)	0.22	.64

Table 22

Psychological Correlates of Concealment in Participants Who Did Not Conceal From Close Family/Friends Compared to Those Who Did Conceal Since Diagnosis (N = 117)

Variable	Did conceal from close family/friends (n = 20)	Did not conceal (n = 97)	<i>r</i>	<i>p</i>
	<i>M (SD)</i>	<i>M (SD)</i>		
Anxiety	13.45 (3.35)	12.46 (3.40)	.105	.26
Depression	13.90 (3.18)	14.13 (2.78)	-.023	.81
Cancer-Specific Distress	0.74 (0.75)	0.89 (0.73)	-.082	.38
Social Avoidance	15.23 (9.77)	18.22 (12.89)	-.085	.37
Self-Esteem	23.58 (5.71)	22.65 (5.20)	.143	.16

Table 23

Psychological Correlates of Concealment in Participants Who Did Not Conceal From Close Family/Friends Compared to Those Who Did Conceal In the Past Month (N = 117)

Variable	Did conceal from close family/friends (n = 15)	Did not conceal (n = 102)	<i>r</i>	<i>p</i>
	<i>M (SD)</i>	<i>M (SD)</i>		
Anxiety	14.07 (2.46)	12.42 (3.47)	.162	.08
Depression	13.80 (3.38)	14.13 (2.77)	-.017	.86
Cancer-Specific Distress	0.81 (0.82)	0.87 (0.72)	-.041	.66
Social Avoidance	17.33 (10.15)	17.76 (12.76)	-.021	.82
Self-Esteem	22.71 (5.90)	22.81 (5.21)	.056	.59

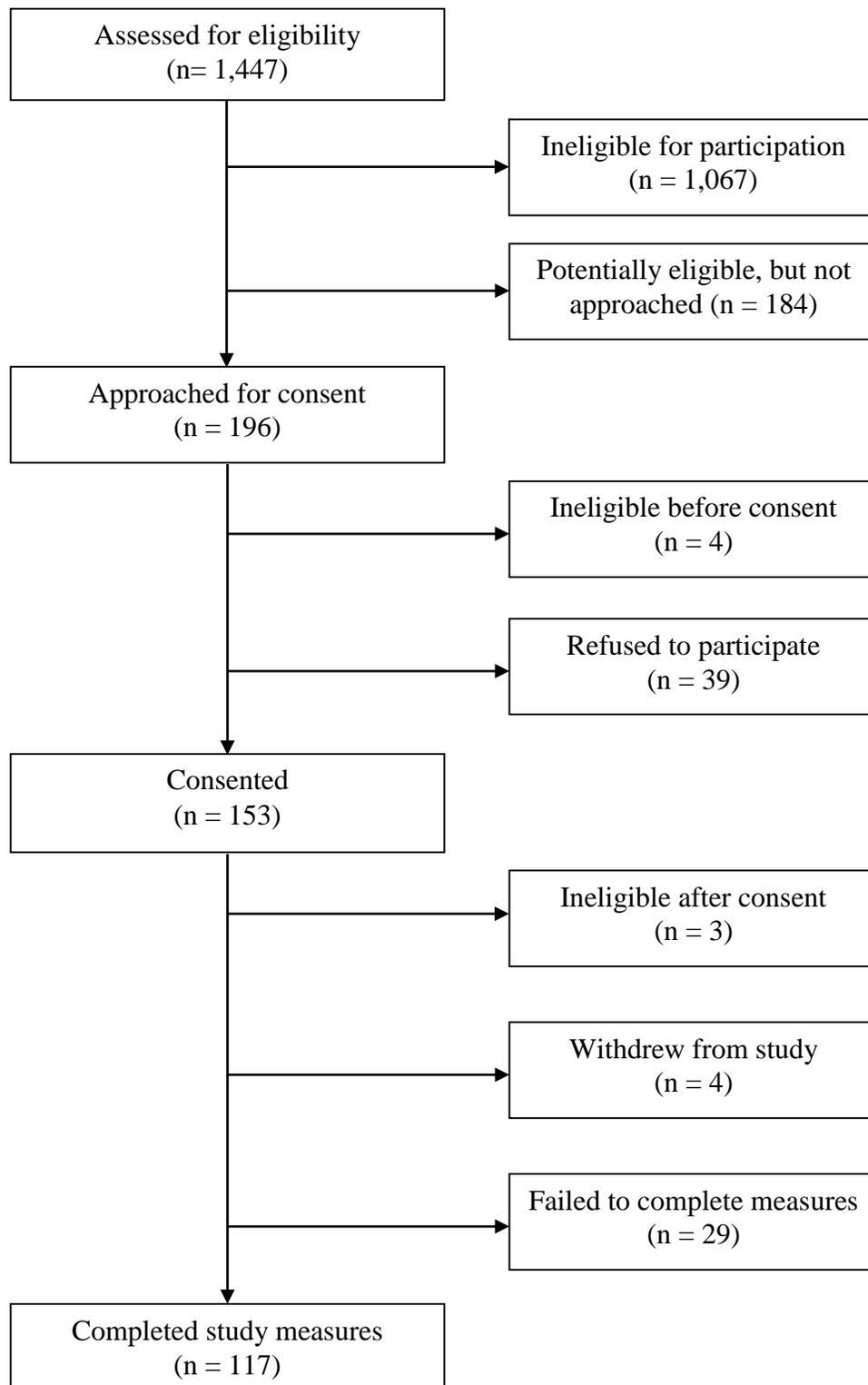


Figure 3. Participant Flow Chart

Discussion

Summary of Results

A primary aim of this study was to determine the prevalence of diagnosis concealment among individuals receiving treatment for lung cancer. This study also sought to evaluate potential predictors of concealment as well as potential correlates of concealment.

Results indicated that 31% of participants reported concealing their lung cancer diagnosis from others since their diagnosis; 26% reported concealing their diagnosis in the month preceding their participation in the study. Most participants who reported concealing since diagnosis as well as in the past month indicated they concealed from casual friends. Additional analyses indicated that one commonly-endorsed reason for concealment from family and friends was to avoid having family and friends worry about the patient. No published quantitative studies were found which examine rates of concealment of one's cancer diagnosis or any other potentially-stigmatizing condition. Thus, this is the first study to examine rates of diagnosis concealment among individuals with cancer, and as such it provides new information on rates of concealment and reasons for concealment among this population.

The hypotheses regarding predictors of concealment were not supported. Contrary to expectations, gender, introversion, trait social anxiety, and use of seeking guidance and support as a coping strategy were not associated with diagnosis concealment since diagnosis or in the past month. Exploratory analyses indicated that those who reported

drinking alcohol in the past month were more likely to conceal their diagnosis in the past month; there was also a trend for those who reported drinking alcohol in the past month to be more likely to conceal since diagnosis. Participants who had a recurrence of their lung cancer more recently were more likely to conceal their diagnosis in the past month; there was a trend for a similar relationship suggesting that those who recurred more recently were also more likely to conceal their diagnosis since the original diagnosis. In addition, those who reported greater use of positive reappraisal as a coping tool were more likely to conceal their diagnosis in the past month. Trait social anxiety was related to discomfort regarding concealment or disclosure of one's diagnosis in the past month. Lastly, those who concealed their diagnosis from close family or friends since diagnosis and in the past month reported poorer social support.

The Pachankis (2007) model of the effects of concealing a concealable stigma is silent on theoretical predictors of the decision to conceal one's stigma. Although hypotheses for predictors of concealment based on findings in other populations were not supported, use of alcohol, recency of a recurrence of lung cancer, use of positive reappraisal as a coping strategy, and social support were identified as predictors of concealment among individuals with lung cancer. The observed relationship between poorer social support and concealment is in line with previous literature showing poorer social support among those who concealed a diagnosis of HIV (Petra et al., 2001). This finding suggests the Pachankis (2007) model may benefit from revision to include social support. Relationships between concealment with use of alcohol, recency of recurrence of lung cancer, and use of positive reappraisal as a coping strategy have not been found in the existing literature. Individuals with more recent recurrences have experienced a major

setback in their lung cancer treatment, which may reinforce the reported reasons to conceal their diagnosis (e.g., to avoid others' concern for them). Those who used of alcohol, which may be an indicator of a maladaptive coping strategy, may be more likely to resort to concealment when considering the potential negative psychosocial outcomes of disclosing their illness. Similarly, those who endorsed greater use of positive reappraisal as a coping strategy, an adaptive coping strategy, may have been more likely to focus on the positive aspects of concealment (e.g., greater privacy). These findings should be considered for inclusion as predictors in the model, pending replications.

Hypotheses regarding correlates of concealment were also not supported.

Anxiety, depression, cancer-specific distress, social avoidance, and self-esteem were not associated with diagnosis concealment since diagnosis or in the past month. Exploratory analyses indicated that those who concealed their diagnosis since diagnosis and in the past month reported greater internalized shame regarding their diagnosis. The identification of internalized shame as a correlate of diagnosis concealment is important in that it supports the Pachankis (2007) model's association between concealment and shame, an affective implication of concealment.

Theoretical implications

When contemplating the lack of support for hypotheses of correlates of concealment, it is important to consider that Pachankis' (2007) model focuses on individual situations that might elicit behavioral, affective, and cognitive consequences. It indicates that among individuals who conceal a stigma, situations in which one's stigma is salient, there is a high threat of discovery, and there would be negative consequences for discovery would result in negative affective, behavioral, and self-evaluative

outcomes. Rather than examining the social interactions of participants who concealed their stigma, this study examined broader implications of concealing one's stigma based on the model's theorized. Thus, it is possible that the negative consequences of concealing one's stigma and undergoing situations with high stigma salience, high threat of discovery, and dire consequences of discovery were not detectable by this study's measures or were not significant enough to impact participants' overall well-being. That is, concealing a concealable stigma such as lung cancer may result in negative consequences during and after the above-mentioned situations. However, these negative consequences may be short-lived and go unnoticed in a retrospective study such as the current study.

Another possible explanation for the lack of support for the study's hypotheses involves the reasons for concealment. Many participants reported concealing for what appeared to be altruistic reasons (e.g., "I didn't want them to worry about me"). Thus, it is possible that the situations within which the study's participants concealed their stigma did not meet the description provided by Pachankis of situations that would elicit negative consequences. Specifically, these situations may not have possessed sufficiently high threat of negative consequences for disclosure of one's stigma. That is, the potential negative consequence of disclosure (i.e., their loved one's excessive worry about them), may not have been sufficiently negative to elicit the negative affective, behavioral, and self-evaluative consequences proposed by Pachankis (2007).

Clinical implications

With regard to clinical implications, the findings suggest that oncologists and mental healthcare professionals treating individuals with cancer consider discussing

concealment or disclosure of their diagnosis with their patients. The data suggest that those who conceal their illness may be more likely to experience internalized shame regarding their illness. Although concealment was not associated with affective outcomes in this study, internalized shame has been associated with greater depressive symptomatology among individuals with lung cancer in previous research (Gonzalez & Jacobsen, 2011) and perceived stigma was associated with depressive symptoms in the current study. Addressing this potential impact of concealment of one's diagnosis could prove beneficial in avoiding depressive symptoms and their negative sequelae if, as hypothesized by Pachankis (2007), concealment results in greater shame. It is also conceivable that one's internalized shame may cause them to conceal their diagnosis, which may result in other negative behavioral, affective, and cognitive outcomes.

Limitations and future directions

The cross-sectional nature of this study's data collection limits the conclusions that can be drawn from its findings. Although the data can be interpreted as suggesting that use of positive reappraisal as a coping strategy, greater trait social anxiety, and poorer social support increase the likelihood that a person with lung cancer will conceal their diagnosis and that concealment contributes to greater internalized shame, the possibility of reverse relationships between these measures cannot be ruled out. One way to better establish causality would be to conduct *in vivo* studies that examine the impact of concealing vs. disclosing a lung cancer diagnosis to confederate strangers. These studies could more closely examine the impacts of concealing in various situations and could elucidate temporal relationships between predictors and consequences of concealment.

The sample's homogeneity with regard to race and ethnicity limits the ability to generalize to the broader population of individuals with lung cancer. Future studies should aim to recruit more diverse samples of individuals with lung cancer, especially with respect to racial, ethnic, and socioeconomic diversity. Similarly, participants in this study were receiving chemotherapy and/or radiotherapy for their lung cancer; thus, the study's findings may not generalize to individuals receiving other types of treatments or receiving no treatment at all.

Although the prescription of antidepressant and sedative/hypnotic medications were not related to concealment in this study, participants' use of psychotherapy and related services was not assessed. Thus, the potential buffering effect of these services could not be ascertained. Future studies should more closely examine the impacts that psychotherapy and related services may have on the negative outcomes hypothesized to result from concealment.

Another limitation of this study is the treatment of concealment as a dichotomous variable. This approach may have artificially increased the error in the measurement of concealment, thereby reducing the study's power to identify significant effects. Future studies should examine the frequency of concealment or study concealment as a continuous variable by measuring the varying degrees of concealment from others. In addition, the validity of the concealment measure used in this study should be better established. Future studies should examine whether patient reports of diagnosis concealment or disclosure could be corroborated with reports from significant others in a manner that would not violate patient privacy.

Beyond addressing these limitations, future research should examine the possibility that concealment or disclosure results in negative consequences for only certain subgroups of individuals. For example, it may be that only those with greater social anxiety experience poorer self-esteem as a result of concealment. It may also be that only those with poorer social support experience greater social avoidance and depression as a result of concealment.

Conclusions

This study, the first to examine predictors of diagnosis concealment and to test a model of the impacts of concealment on individuals with cancer, demonstrated that 31% of participants concealed their diagnosis from others since their diagnosis and 26% concealed their diagnosis in the month preceding their participation in the study. Exploratory analyses identified predictors of concealment, including use of alcohol, recency of a recurrence of lung cancer, use of positive reappraisal as a coping strategy, and social support. Internalized shame was also identified as a correlate of concealment in this study. These findings support parts of the Pachankis (2007) model on the effects of concealment and suggest that the model should be modified to include predictors of concealment. Future research should aim to replicate these findings and examine predictors and consequences of concealment in the context of certain social situations in order to test temporal relationships.

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Appendices

Appendix A: IRB Approval Letter



DIVISION OF RESEARCH INTEGRITY AND COMPLIANCE
Institutional Review Boards, FWA No. 00001669
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January 9, 2012

Paul Jacobsen, Ph.D.
H Lee Moffitt Cancer Center
12902 Magnolia Drive
MRC-PSY

RE: **Expedited Approval** for Initial Review
IRB#: Pro00005781
Title: Prevalence, Predictors and Correlates of Patient Concealment of a Lung Cancer Diagnosis

Dear Paul Jacobsen, Ph.D.:

On 11/30/2011 the Institutional Review Board (IRB) reviewed and **APPROVED** the above referenced protocol. Please note that your approval for this study will expire on 11-30-12.

Approved Items:
Protocol Document(s):

[Quality of Life in Lung Cancer Patients](#) 11/16/2011 12:06 PM 0.01

(Please note, per D. Martinez, on 1-9-12: "The title on the SRC & IRB submissions are different, thus, the Co-investigator, Brian Gonzalez will be submitting an amendment (version 4) to correct this situation")

Consent/Assent Documents:

Name	Modified	Version
Informed Consent Form.pdf	11/30/2011 4:07 PM	0.01

(Waiver of Informed Consent Process is for the chart review)

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 45CFR46.110 and 21 CFR 56.110. 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).

(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.

(Please note, the informed consent/assent documents are valid during the period indicated by the official, IRB-Approval stamp located on the form. Valid consent must be documented on a copy of the most recently IRB-approved consent form.

Your study qualifies for a waiver of the requirements for informed consent as outlined in the federal regulations at 45CFR46.116 (d) which states that an IRB may approve a consent procedure which does not include, or which alters, some or all of the elements of informed consent, or waive the requirements to obtain informed consent provided the IRB finds and documents that (1) the research involves no more than minimal risk to the subjects; (2) the waiver or alteration will not adversely affect the rights and welfare of the subjects; (3) the research could not practicably be carried out without the waiver or alteration; and (4) whenever appropriate, the subjects will be provided with additional pertinent information after participation.

Your study qualifies for a waiver of the requirement for signed authorization as outlined in the HIPAA Privacy Rule regulations at 45 CFR 164.512(i) which states that an IRB may approve a waiver or alteration of the authorization requirement provided that the following criteria are met (1) the PHI use or disclosure involves no more than a minimal risk to the privacy of individuals; (2) the research could not practicably be conducted without the requested waiver or alteration; and (3) the research could not practicably be conducted without access to and use of the PHI. A Waiver of HIPAA Authorization for screening purposes has been approved for you to conduct a review of medical charts generated between January 1, 2000 and December 31, 2012 at the Thoracic Oncology Program at H. Lee Moffitt Cancer Center involving patients who were diagnosed with lung cancer. Informed consents with HIPAA Authorizations will be obtained from the eligible individuals.

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 for review and approval by an amendment.

We appreciate your dedication to the ethical conduct of human subject 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,

John A. Schinka, Ph.D.

John Schinka, PhD, Chairperson
USF Institutional Review Board

Cc: Various Menzel, CCRP
USF IRB Professional Staff