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Lung Cancer Stigma, Anxiety, Depression and Symptom Severity

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Key Words

Lung cancer · Lung neoplasm · Lung tumor · Stigma · Anxiety · Depression · Symptom severity · Symptom burden · Physical symptoms · Blame

Abstract

Objectives: Compared to other cancers, lung cancer patients report the highest levels of psychological distress and stigma. Few studies have examined the relationship between lung cancer stigma (LCS) and symptom burden. This study was designed to investigate the relationship between LCS, anxiety, depression and physical symptom severity.

Methods: This study employed a cross-sectional, correlational design to recruit patients online from lung cancer websites. LCS, anxiety, depression and physical symptoms were measured by patient self-report using validated scales via the Internet. Hierarchical multiple regression was performed to investigate the individual contributions of LCS, anxiety and depression to symptom severity. **Results:** Patients had a mean age of 57 years; 93% were Caucasian, 79% were current or former smokers, and 74% were female. There were strong positive relationships between LCS and anxiety ($r = 0.413$, $p < 0.001$), depression ($r = 0.559$, $p < 0.001$) and total lung cancer symptom severity ($r = 0.483$, $p < 0.001$). Although its contribution was small, LCS provided a unique and significant explanation of the variance in symptom severity beyond that of age, anxiety and depression, by 1.3% ($p < 0.05$). **Conclusions:** Because LCS is associated with psychosocial and physical health outcomes, research is needed

to develop interventions to assist patients to manage LCS and to enhance their ability to communicate effectively with clinicians.

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Introduction

In 2012, over 226,000 new cases of lung and bronchus cancer were diagnosed in the USA [1]. Lung cancer is expected to account for 14% of new cases of cancer and will be the leading cause of cancer death in both men and women [1]. Overall survival in lung cancer remains low; however, changes in treatment, population growth and aging demographics and patient management have brought about an increase in long-term lung cancer survivors [2, 3].

Lung cancer survivors experience more physical and psychosocial problems for a longer period of time than survivors of other cancers [4, 5]. In a study of health and disability among cancer survivors, lung cancer survivors experienced significantly poorer general health status and more psychological problems than those with other types of cancer [5]. Whether they have ever smoked or not, lung cancer patients feel stigmatized because their disease is strongly associated with smoking [6, 7]. In addition, lung cancer stigma (LCS) has been shown to be a significant predictor of increased depression and decreased quality of life (QOL) [6]. With an increased number of lung cancer survivors and a dearth of information

on all aspects of their health and QOL, additional research is needed to understand not only the associations between LCS and psychosocial factors but also the associations between LCS and physical symptom burden [3].

Theoretical Framework

The theoretical framework for this study includes the LCS model [7; Brown-Johnson and Cataldo, unpubl. data] and the 'allostatic load' theoretical model of stress and adaptation [8, 9]. Based on a conceptual model of perceived stigma, Berger et al. [10] developed the items for the HIV stigma scale. This model was adapted to guide the development of the Cataldo Lung Cancer Stigma Scale (CLCSS) and is published elsewhere [6, 7].

Health-related stigma (HRS) is a personal experience related to a health condition [6], is characterized by the perception of exclusion, rejection and blame [11], and contributes to psychological, physical and social morbidity [12]. The judgment inherent in any HRS is medically unwarranted and may adversely affect health status [11]. Higher levels of HRS are associated with depression, limited social support and decreased treatment adherence [10, 13–19]. Stigma has been extensively studied in HIV/AIDS, mental illness, epilepsy and physical disability [13]. Evidence suggests that HRS is an important factor in the care of lung cancer patients [20].

LCS is a perceived stigma and refers to the anticipation or fear of discrimination and an awareness of negative attitudes and actions related to lung cancer [13]. It is a perceived HRS that is defined as a personal experience characterized by exclusion, rejection, blame or devaluation that results from anticipation of an adverse judgment related to lung cancer. A greater negative reaction occurs when factors that contribute to a disease, such as smoking, can be associated with stigma [21]. Stigma in lung cancer is based on the belief that the individual caused their own cancer via smoking. Regardless of their smoking status, lung cancer patients report stigmatization from clinicians, family and community because the disease is strongly associated with smoking [20]. Strong associations have been found among LCS, depression and QOL, in both smokers and nonsmokers [6].

In a recent review by Chambers et al. [22], data suggest that HRS is a reality in the lung cancer experience and contributes to the excess psychological distress experienced by lung cancer patients. Smokers have become a marginalized group in society [23]. Current and former smokers have identified several factors that contribute to perceptions of LCS, including the following: perceptions of smoking as a choice not an addiction; discrimina-

tion perpetrated against smokers through no smoking policies, and perceptions that smokers are less educated [23]. Chambers et al. [22] recommend that while LCS is known to influence both patients and family caregivers, its full impact is unknown and further study is warranted.

LCS, Anxiety and Depression

Compared to other types of cancer, lung cancer patients experience the greatest amount of psychological distress [24] and are at higher risk for psychosocial problems during and after treatment [25]. In an investigation of the variation in distress among 14 cancer diagnoses, it was found that the prevalence of psychological distress varied across cancers, and lung cancer was the highest at 43.4% [24]. Studies have shown that 1 out of 4 persons with lung cancer experiences periods of depression or other psychosocial problems during their treatment [25]. In one study, at the time of diagnosis, 23% of 129 lung cancer patients were depressed and 16% were anxious. After 3 months, 30% had died or were terminally ill; of the remaining 82 patients, 44% were depressed [26]. A UK study found that the prevalence of depression was 43% among 352 patients with small cell lung cancer and 21% among 366 patients with non-small cell lung cancer. The prevalence of anxiety was 43 and 25%, respectively [27]. In a recent study, a positive association was found between perceived stigma and depression among lung cancer patients ($r = 0.46$, $p < 0.001$) which accounted for the unique variance in depressive symptomatology above and beyond demographic and clinical factors [28]. In our previous work, regardless of whether or not a person with lung cancer had ever smoked, LCS had a strong positive relationship with depression ($r = 0.68$, $p < 0.001$) and a strong inverse relationship with QOL ($r = -0.65$, $p < 0.001$) [6]. This work needs to be replicated.

LCS and Symptom Severity

Most newly diagnosed lung cancer patients present with advanced disease and more symptoms than other newly diagnosed cancer patients [29]. Lung cancer patients experience greater symptom severity throughout their illness trajectory [30–32]. The most common physical symptoms include dyspnea, fatigue, insomnia and pain [30–33]. Dyspnea is more common in patients with lung cancer than other cancers and follows a pattern of gradual increase with a plateau, and it then subsides at rest [34–36]. Perez-Soler et al. [37] found that up to 61% of lung cancer patients present with dyspnea at the time

of diagnosis. Pain is also highly prevalent among lung cancer patients, with reported rates of 28–51% [38, 39]. Symptoms that occur simultaneously may have a synergistic effect on each other and on important patient outcomes [39]. In a 2006 study, Fox and Lyon [40] found that fatigue and pain along with depression were reported by the majority of lung cancer survivors. Lung cancer patients have high levels of sleep disturbance [41]. Sleep in lung cancer patients is punctuated by long periods of awakesness, similar to patients with chronic obstructive pulmonary disease [42].

Very little research exists on factors that contribute to increased symptom severity [30]. The role of LCS as a contributing factor to physical lung cancer symptom severity is not known. HRS ascribed to controllable factors (e.g., smoking, drug abuse) elicits a greater negative reaction than stigma ascribed to uncontrollable factors [21, 43]. Lung cancer is associated with short survival times, and self-attribution can play an important role in the level of distress [44]. Patients with lung cancer can receive stronger messages of doom from family caregivers and clinicians [24]. They often feel responsible for their diagnosis because of smoking or other lifestyle behaviors and for the difficulties this causes their families [24].

No studies have examined the severity of LCS and its relationship with both psychosocial and physical lung cancer symptom burden. The purpose of this study was to (1) explore the severity of LCS and its relationship with the severity of psychosocial (anxiety, depression) symptoms and physical (i.e., appetite, fatigue, cough, dyspnea, hemoptysis, pain) symptom severity and (2) identify the contributions of demographic and clinical factors, anxiety, depression and LCS to physical symptom severity. It was hypothesized that positive relationships would exist between LCS and both psychosocial (anxiety and depression) and physical symptoms. In addition, after accounting for the effects of significant demographic and clinical factors, anxiety and depression, it was expected that LCS would make a significant independent contribution to the percentage of explained variance in total lung cancer symptom severity.

Study Aims and Hypotheses

The specific aims and hypotheses of this study are as follows: (1) to investigate the relationship between LCS and anxiety, depression and symptom severity (it is expected that there will be a positive relationship), and (2) to explore whether LCS has a unique contribution to the explanation of lung cancer symptom severity after controlling for age, anxiety and depression. It is expect-

ed that LCS will have a unique and significant contribution to lung cancer symptom severity after controlling for covariates.

Materials and Methods

Design

This descriptive study, with a cross-sectional, correlational design, evaluated the relationships among LCS, anxiety, depression and symptom severity. Institutional review board approval was received from the University of California San Francisco Committee on Human Research. Participants were recruited online and were able to complete the questionnaires online. An active link to the study's homepage was posted on websites frequented by potential study participants, including, but not limited to the following: <http://www.LUNGevity.org/>, <http://www.ALA.org>, <http://supportgroups.cancerca.org/>, <http://www.oncochat.org/>, <http://www.vitaloptions.org/> and <http://www.beverlyfund.org>. Participants were able to access the study questionnaires directly from these websites; however, there was not a mechanism to track the website of origination. Web-based, online data collection creates opportunities to conduct research among difficult to access populations. However, special consideration needs to be given as to how the study was advertised and how the data were collected to ensure high-quality data, privacy protection and validity of findings [45]. Support was elicited from the website administrators in advertising the study to increase the response rate, and all instruments, including the demographic questionnaire and the consent form, were formatted into an individual active HTML web page with encryption using RedCap. The first draft of the online survey was reviewed for edits by the site administrators before posting. The posting included an introduction to the study, a pledge of anonymity, the researcher's contact information and a direct link to the questionnaires. The Internet data were properly secured when stored on a computer with a password-accessed server. Data were collected as a spreadsheet and remained anonymous with no information linking questionnaires to participants. Informed consent was obtained from all participants prior to participation.

Measures

Lung Cancer Stigma

In our preliminary work, the CLCSS was found to be a reliable and valid measure in a diverse sample of people with lung cancer (Cronbach's $\alpha = 0.97$ and 0.96) [6, 7]. Construct validity was supported by expected relationships with related constructs, i.e., self-esteem, depression, social support and social conflict. The CLCSS consists of 31 items; each item is rated on a 4-point Likert-type scale (strongly disagree, disagree, agree and strongly agree), with higher values indicating greater agreement with the item. For this study, Cronbach's α for the total scale was 0.96 .

Anxiety

The Spielberger State Anxiety Questionnaire is a 20-item scale that evaluates the emotional responses of worry, nervousness, tension and feelings of apprehension related to how people feel 'right now' in a stressful situation and is expected to correlate positively with stigma. This scale asks participants to rate their emotional

response intensity on a 4-point scale (1 = not at all, 2 = somewhat, 3 = moderately so, and 4 = very much so). The scores for each of the items are summed, and the total score can range from 20 to 80. Construct validity was determined by testing participants under stressful and nonstressful conditions. Anxiety scores increased as the experimental stress conditions increased. In a study of oncology outpatients, Cronbach's α was 0.94 [46]. For this study, Cronbach's α for the total scale was 0.90.

Depression

The Center for Epidemiologic Studies-Depression Scale (CES-D) is a 20-item scale that is expected to correlate positively with stigma. The CES-D is a valid and reliable tool that has been widely used for self-ratings of depression in clinical populations, including people with cancer and people with HIV/AIDS [47]. Participants respond on a 4-point scale (0–3), yielding total scores of 0–60. Higher scores indicate greater depression. For this study, Cronbach's α for the total scale was 0.95.

Symptom Severity

The Lung Cancer Symptom Scale (LCSS) is a disease- and site-specific instrument that measures the physical and functional dimensions of lung cancer symptoms in persons with lung cancer. The LCSS emphasizes evaluation of the severity of symptoms associated with lung cancer and their effect on activity status and general QOL. The scale has 9 items, 6 measuring major symptoms of lung cancer (i.e., appetite loss, fatigue, cough, dyspnea, hemoptysis and pain) and 3 summary items related to total symptoms. Each item is given an individual score, with 0 being the lowest (best) rating and 5 the highest (worst) rating for severity of individual symptoms. An average of all 9 items is the total score that represents the sum severity of individual symptoms and the impact of those symptoms on function and QOL. Administration time is 3–5 min. The LCSS was tested in over 1,000 patients with lung cancer and proven to be valid and reliable [48]. In the initial psychometric analysis, content validity revealed a mean of 96% agreement for all major symptoms among 52 experts surveyed (confidence interval 86–99%; $p = 0.05$). A total of 69 patients with non-small cell lung cancer and 52 patients with small cell lung cancer confirmed that the symptoms matched their experiences. Past test-retest reliability indicated high patient reproducibility for 52 patients ($r > 0.75$, $p < 0.01$ for all items). Hollen et al. [48] concluded that the LCSS demonstrates (1) good feasibility, reliability and content validity and (2) high interrater reliability. Overall, the LCSS has consistently demonstrated good feasibility, reliability (internal consistency) and convergent validity [48–51]. For this study, Cronbach's α for the total scale was 0.94.

Data Analysis

Univariate analyses (i.e., frequencies and descriptive) were performed for all variables. Correlational analyses were performed to examine the bivariate relationships between demographic and study variables. According to the bivariate analysis, the only significant covariate that needed to be added to the model in addition to LCS, anxiety and depression was age. After controlling for demographic and disease-related covariates (i.e., age), a hierarchical multiple regression was performed to investigate the individual contributions of anxiety, depression and stigma to physical and psychosocial lung cancer symptom burden.

Table 1. Descriptive statistics of demographics and health status

Characteristic	Mean	SD	Range
Age, years (n = 144)	56.65	11.05	23–79
Years of education (n = 143)	15.01	5.08	2–51
	n		%
Race (n = 144)			
Caucasian	134		93.1
Non-Caucasian	10		6.9
Marital status (n = 141)			
Married/living with intimate partner	107		75.9
Widowed, separated, divorced, never married	34		24.1
Living arrangements (n = 144)			
Alone	19		13.2
With others	125		86.8
Currently employed (n = 144)	64		44.5
Depressed mood (n = 144)			
CES-D score ≥ 16	79		54.9
Smoking status (n = 143)			
Ever (>100 cigarettes in lifetime)	113		79.0
Never	30		21.0

Results

Sample

The 144 participants ranged in age from 23 to 79 years (mean age 56.7 years); 75.9% were partnered, and 13.2% of the sample lived alone. The majority of the participants were Caucasian (93.1%); 2.1% were Asian, 1.4% African-American, 2.1% Hispanic and 2.1% other race/ethnicity. Because of small cell sizes, for the analysis, racial/ethnic categories were collapsed into Caucasian and non-Caucasian (table 1). Seventy-nine percent of the sample were either current or former smokers (ever smokers); nearly 55% met the CES-D criteria for depression (total score ≥ 16 ; table 1). Nearly 26% were men and almost 92% had 12 years of education or greater (data not shown).

LCS, Anxiety, Depression and Symptom Severity

The means, standard deviations and ranges for the study variables are given in table 2. The participants (n = 144) reported a mean stigma level of 75.7 (SD 18.3; possible range 31–124), and the mean anxiety level reported was 43.3 (SD 14.9; possible range 20–80). The cutoff score for a diagnosis of depression is a total score ≥ 16 ; the mean CES-D depression score for the total sample (n = 144) was 19.6 (SD 13.2).

Table 2. Descriptive statistics for LCS, anxiety, depression and lung cancer symptom severity

	Mean	SD	Range	Possible range
LCS (n = 144)	75.69	18.32	34–121	31–124
Anxiety (n = 144)	43.30	14.88	20–78	20–80
Depression: CES-D (n = 144)	19.57	13.16	0–60	0–60
<i>Physical symptoms (n = 144)</i>				
Individual lung cancer symptoms				
Fatigue (n = 144)	2.45	0.91	1–4	1–5
Dyspnea (n = 143)	2.29	0.97	1–4	1–5
Pain (n = 143)	1.87	0.92	1–4	1–5
Cough (n = 144)	1.76	0.93	1–4	1–5
Appetite loss (n = 144)	1.75	0.94	1–4	1–5
Hemoptysis (n = 144)	1.37	0.80	1–4	1–5
Lung cancer symptom severity dimensions				
How bad are symptoms (n = 141)	1.91	0.95	1–4	1–5
Lung cancer interferes with normal activities (n = 144)	2.36	1.01	1–4	1–5
How is your QOL today? (n = 143)	2.03	0.88	1–4	1–5
Lung cancer total symptom severity score	17.76	6.54	9–36	9–45

A higher score indicates greater severity.

Among individual lung cancer symptoms (possible range 1–5; higher score indicates greater severity), fatigue was reported as most severe, with a mean score (n = 144) of 2.45 (SD 0.91). The mean dyspnea score (n = 143) was 2.29 (SD 0.97); the mean pain score (n = 143) was 1.87 (SD 0.92); the mean cough score (n = 144) was 1.76 (SD 0.93); the mean appetite loss score (n = 144) was 1.75 (SD 0.94), and the mean hemoptysis score (n = 144) was 1.37 (SD 0.8).

For the lung cancer symptom severity dimension measures (possible range 1–5; higher score indicates greater severity), the mean score for ‘How bad are your symptoms?’ (n = 141) was 1.91 (SD 0.95), and the mean score for ‘Lung cancer interferes with normal activities’ (n = 144) was 2.36 (SD 1.01). Participants rated their QOL ‘today’ (n = 143) with a mean score of 2.03 (SD 0.88). The mean total lung cancer symptom severity score for the sample (n = 144) was 17.8 (SD 6.5; possible range 9–45).

Hypotheses

Both hypotheses 1 and 2 were supported. For hypothesis 1, there were strong positive relationships between LCS, anxiety, depression and symptom severity among lung cancer patients. The results in table 3 reveal strong Pearson product-moment correlations in the expected directions for LCS and anxiety ($r = 0.413$, $p < 0.001$), depression ($r = 0.559$, $p < 0.001$) and total lung cancer

Table 3. Pearson product-moment correlations for LCS, anxiety, depression and lung cancer symptom severity (n = 144)

	LCS	Anxiety	Depression
LCS	–	–	–
Anxiety	0.413**	–	–
Depression (CES-D)	0.559**	0.795**	–
Lung cancer symptom severity (total)	0.483**	0.488**	0.706**

** $p < 0.001$.

symptom severity ($r = 0.483$, $p < 0.001$). As shown in table 4, significant associations were found between LCS and all individual symptoms and symptom severity dimensions (i.e., ‘How bad are your symptoms?’, interference with normal activities and QOL).

The second hypothesis, that LCS would have a significant and unique role in explaining symptom severity after controlling for age, anxiety and depression, was also supported. After accounting for these covariates, LCS had a small but significant and unique contribution to the explanation of the variance in symptom severity (table 5). A simultaneous multiple regression with 4 independent variables revealed an overall model that explained nearly 53% of the total variance of lung cancer symptom sever-

Table 4. Pearson product-moment correlations for LCS, individual symptoms, symptom severity dimensions and total symptom severity

	LCS
Individual symptoms	
Appetite loss (n = 144)	0.269**
Cough (n = 144)	0.358**
Dyspnea (n = 143)	0.279**
Fatigue (n = 144)	0.328**
Hemoptysis (n = 144)	0.400**
Pain (n = 143)	0.460**
Symptom severity dimensions	
How bad are symptoms (n = 141)	0.381**
Lung cancer interferes with normal activities (n = 144)	0.259**
How is your QOL today? (n = 143)	0.278**
Total symptom severity (n = 144)	0.429**

** p < 0.001.

Table 5. Simultaneous multiple regression: the effect of LCS on lung cancer symptom severity controlling for age, anxiety and depression (n = 144)

Variable	R ²	β	R ² change	d.f.	F	p
Overall	0.529			4.139	38.98	<0.001
Age		0.092	0.095	1.142	14.972	<0.001
Anxiety		-0.209	0.174	1.141	26.040	<0.001
Depression		0.838	0.246	1.140	49.737	<0.001
LCS		0.140	0.013	1.143	38.983	0.050

d.f. = Degrees of freedom.

ity ($F_{4, 139} = 38.98$, $p < 0.001$). As anticipated, LCS provided a small but unique and significant explanation of the variance in symptom severity over and above that of age, anxiety and depression, by 1.3% ($p < 0.05$).

Discussion

This study expands the understanding of the association of LCS with both psychosocial factors [6] and physical factors (e.g., physical symptom severity). This work is consistent with the Cataldo Lung Cancer Stigma Model [7]. Precursors of LCS include awareness of society's attitudes toward one's diagnosis that leads to social isolation,

discrimination and a sense of stigma and shame related to smoking with responses that include both emotional and physical reactions.

Some evidence suggests that LCS is a hindrance to help-seeking behavior and prevents early detection and treatment [52–55] and may keep patients from reporting distressing symptoms. A significant number of smokers report feeling unworthy of treatment [53]. Patients are frequently reluctant to report respiratory symptoms when they are smokers, a behavior clearly related to feelings of shame and guilt [54]. This reluctance is a consequence of the general supposition that lung cancer is a self-inflicted disease. Because lung cancer is widely viewed as a smoker's disease, those who have never smoked often experience the same stigmatization, namely a feeling that their disease was self-inflicted [56, 57]. Although the prognostic outlook for lung cancer patients is changing, clinicians know that lung cancer has one of the poorer prognoses of all human malignancies and that might unintentionally limit communication, treatment options and symptom management [55].

Stigma is a documented barrier to communication for cancer patients [58]. Stigma contributes to communication difficulties (i.e., stereotyping, status and power differentials between majority and minority groups and lack of cultural awareness of health professionals), which are implicated in poorer health service delivery and worse patient outcomes [49]. This barrier exists for many health conditions, including HIV, obesity and mental illness, and results in increased patient distress and poor patient outcomes [22, 50, 51, 58]. Across all stages of disease, patients with lung cancer report inadequate patient communication related to the felt experience of stigma on key topics such as prognosis, palliative care and symptom management [58]. Information exchange between patients and clinicians is a critical interface that can influence subsequent health-seeking behavior and management of complex treatment regimens and affect a patient's health status over time [59]. Open and nonbiased discussion between clinicians and lung cancer patients promotes favorable outcomes, including satisfaction with care, adherence to treatment, increased patient confidence and improved physical and psychological well-being [58, 60]. Quality of care for lung cancer patients depends on effective patient-clinician communication [59, 61]. Patients who establish open channels of communication with clinicians are more likely to engage in subsequent self-management.

According to Link and Phelan [62], the stress associated with stigma is especially difficult for those with disease-associated stigma. In addition to being at risk for

stress-related comorbidities, the clinical course and symptom experience of the stigmatized illness (e.g., lung cancer) itself may be worsened. In addition, other outcomes such as the ability to work or sustain a social support network may be impaired. The fear of being labeled with lung cancer may cause individuals to delay or avoid seeking treatment, while those already labeled may decide to distance themselves from the label, forgoing treatment or becoming noncompliant [62].

These findings are also consistent with the ‘allostatic load’ theoretical model of stress and adaptation [9]. The term allostatic load, coined by McEwen and Stellar [8] in 1993, is defined as the physiologic consequences of chronic exposure to stressors. According to this model, frequent activation of the neuroendocrine stress response (i.e., an interplay among the hypothalamus, pituitary gland, adrenal medulla and sympathetic nerve terminals) can damage the body over time. Further downstream signals can convert psychosocial stress into cellular dysfunction. Regardless of the source of stress, there are common biological pathways that attempt to mediate the effects of stress on the body. Adaptation to stress involves activation of neural, neuroendocrine and neuroendocrine-immune mechanisms. The main hormonal mediators of the stress response, cortisol and epinephrine (adrenaline), have both protective and damaging effects on the body;

they are protective in the short run and damaging over longer time intervals. If the activation of these systems occurs over long periods of time, and if coping responses are inadequate, there can be an acceleration of pathophysiology. This kind of stress can cause both psychological and physical symptoms and can eventually weaken the body’s immune system, affecting both morbidity and mortality. Over longer time intervals, ‘allostatic load’ exacts a cost that can accelerate disease processes.

This study has several limitations. The sample is moderate in size and does not reflect the overall population of lung cancer patients, as the participants were younger and mostly female and Caucasian. Although we are unable to make statements of causality, this study suggests that LCS is a unique predictor (i.e., above and beyond age, anxiety and depression) of patient outcomes. Further research is needed in larger samples and over time to validate these findings and further understand the associations among LCS, stress and psychological and physical outcomes. In addition, improved patient-clinician communication within the context of LCS may result in improvements in self-care management [63, 64]. Research is needed to plan and test symptom management interventions to assist patients to deal with LCS and to enhance their ability to communicate more effectively with clinicians [3].

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