

## Determination of anxiety, depression, and life satisfaction in lung cancer patients

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**Summary.** *Background and aim of the work:* This study aimed to determine the life satisfaction of patients with lung cancer by examining their levels of anxiety and depression. *Methods:* The study group consisted of 108 patients with lung cancer who were inpatients in a university hospital located in the Middle Black Sea region of Northern Turkey. The study was conducted between 28 March and 30 September 2013. Data were obtained using the Hospital Anxiety and Depression Scale (HADS) and Satisfaction with Life scale. *Results:* In this study, 3.7% of the patients were females, 96.3% were males, 96.3% were married, and 62.0% were primary school graduates. With regard to the disease stage, 40.7% were Stage 3. Among the group, 56.5% of the patients were receiving chemotherapy. In the patients, the treatment-related side effects were tiredness (78.7%), taste changes (68.5%), anorexia (65.7%), nausea (62.0%) vomiting (64.8%), and dyspnea (52.8%). According to the HADS scale, 97.2% of the patients had a risk of anxiety, and 100% had a risk of depression. The total score average of the patients on the Satisfaction with Life scale was  $24.4 \pm 7.3$ . *Conclusions:* Almost all the patients had a risk of anxiety and depression. They were partially satisfied with their lives. They obtained relief from complementary and alternative treatments, such as biologically based therapies (herbs and dietary supplements) and mind-body control (prayer). The use of complementary and alternative treatments by lung cancer patients should be considered, as these may interfere with their prescribed treatment protocols.

**Key words:** anxiety, depression, life, lung, oncology, satisfaction, Turkey

Lung cancer is on the first rank for the males and on the second rank for the females among causes of the death depending on the cancer in 2012, with 1.6 million anticipated death ratio. Along with that, it is the leading for the females among causes of the death depending on the cancer by setting back the breast cancer in the developed countries (1). The highest cancer incidence ratio is seen in North America, Europe, Eastern Asia, and Uruguay in males, it is seen in North America, Europe, Australia, New Zealand, North Korea, and China in females (1).

Cancer frequency in Turkey shows similarities to the world and developing countries. The cancers that are mostly seen at males are lung cancer and prostate cancers (2). Lung cancer incidence in Turkey was

75.87/100 000 at males and it is 9.58/100 000 at females. Also anticipated annual case number in Turkey is calculated as 30239. Along with that more than 90% of the cases were male; it is notified that smoking has role at the etiology of the lung cancer (3). When phases of lung cancer in our country was reviewed, it was seen that 59.4% of them made far metastases and more than half of the patients in the lung cancer were diagnosed at advanced phase (2).

Compared to other cancer types, lung cancer has a high symptom load and a poor prognosis during and after the treatment (4), resulting in psychological stress (5) and psychological problems (4, 6). The aggressive treatment of lung cancer produces a number of side effects, which negatively affect both the treatment of

the disease and the patient's daily functioning (7). In patients with lung cancer, a major aim is to alleviate treatment-related side effects and improve the comfort and functioning of the patient (8).

In addition to the physical symptoms of the disease, the prognosis and treatment of cancer may produce strong emotions, such as anxiety and depression (9-11). As reported in the literature, when a patient receives a cancer diagnosis, a common response is anxiety and depression (11). Research has shown that cancer patients also commonly experience sadness at the time of the diagnosis and during their treatment (12). However, if these emotions persist and become permanent, they can affect their daily functioning (13).

Treatment-related side effects, including dyspnea, cough, and hemoptysis, can decrease the functional performance of the patient, resulting in increased anxiety levels (4, 14). Social isolation, fatigue, anorexia, weight loss, sleep disorders, cognitive disorders, decreased libido, and psychomotor retardation are well-known side effects of major depression (9, 12, 15). Although depression is very common among lung cancer patients (16), research suggests that the symptoms of depression may be overlooked in cancer patients (9, 12, 15).

A recent review of psychosocial aspects of lung cancer found that one-fourth of patients experienced depression and other psychosocial problems during the disease and that the risk was much higher among patients with small-cell lung cancer compared to patients with other types of cancers (6). Other studies of lung cancer patients found that the risk of depression was associated with the level of education, with those who had a low level of education having a higher risk, and that a psychiatric consultation was recommended for 8% of patients who had major or minor depression symptoms (17). Zabora et al. (2001) stated that one of every five patients with cancer suffered distress and that the prevalence was 43.4% in those with lung cancer (5). Hamer et al. (2009) stated that psychological distress increased lung cancer-related mortality (18).

A life-threatening disease, such as cancer, affects both life quality and life satisfaction (19). Life satisfaction refers to general satisfaction with life (20). It was stated in the literature that it is concept enough and appropriate for detecting the life satisfaction as rele-

vant to the life quality regarding to the health (21, 22). The level of life satisfaction has a direct impact on the quality of life. Given the importance of life satisfaction, research has focused on determining the coping processes that people use in times of stress (23). As every individual assigns different meanings and value to health (24), the Satisfaction with Life scale developed by Diener et al. (1985) contains a subjective well-being component (24). According to the literature, this scale can be used to measure mental health and to predict future behavior. The Satisfaction with Life scale can be also be used to assess the subjective life quality of individuals with serious diseases whose anxiety is linked to their poor health (25).

Knowledge of the anxiety and depression levels of lung cancer patients and their level of life satisfaction can help to improve their quality of life. To achieve the goal of improving the life quality of lung cancer patients, there is a need for further studies that consider cross-country, cross-regional, and cross-cultural divergences in addition to relevant findings and data collected from such studies. In previous research the focus has mainly been on anxiety and depression levels (4, 16, 17, 26-37) among lung cancer patients, but no study has yet carried out a cultural interpretation of factors related to patients' anxiety and depression level, and life satisfaction. That missing link in the chain was the driving motive of the present study. Also to the best of our knowledge, this is the first study on treatment-related side effects in the Middle Black Sea region of Northern Turkey. The results of this study may be useful in terms of developing appropriate strategies for national cancer action plans devoted to preventing anxiety and depression among oncology patients and increasing their life satisfaction and quality of life. In addition, having awareness on the prevalent symptoms among lung cancer patients, and their self-care strategies will help healthcare professionals to provide optimum care and treatment options to their patients.

## Research questions

To determine the anxiety, depression, and life satisfaction levels of inpatient patients with lung cancer, the following questions were posed:

- What are the most frequent treatment-related symptoms?
- What are the levels of anxiety and depression?
- What is their level of life satisfaction?
- Do socio-demographic characteristics and the clinical status of the patients affect their levels of anxiety, depression, and life satisfaction?
- Does culture play a role in the methods that patients use to relieve treatment- and disease-related symptoms?

## Methods

### *Study design and sampling method*

This descriptive study was conducted between 28 March and 30 September 2013 in a university hospital located in the Northern Turkey. Patients with a lung cancer diagnosis who were 18 years old and older, literate, willing to participate in the study, and were physically and mentally capable were notified about the research and asked to sign a participation consent form. In this research, an initial attempt was made to access the entire population, but ultimately non-volunteering patients, those who had not properly completed the questionnaire form, and those with a cognitive disorder (n=17) were excluded from the research; thus, the final sample comprised 108 lung cancer patients. The rate of questionnaire completion was 84.2%.

### *Data collection*

In this research, data were collected via a 28-item questionnaire form developed by researchers in line with relevant literature (4, 17, 28-30, 34-36, 38) to determine patients' sociodemographic characteristics (age, gender, education level, occupation, marital status, socio-economic status, family type, number of children, employment status, health insurance status, inhabited settlements, perception of the prognosis of the disease, illness perception, dissatisfaction with the medical treatment received, presence of a chronic illness, treatment-related side effects and symptoms). Depression and anxiety were evaluated using the Hospital Anxiety and Depression Scale (HADS), and life

satisfaction was evaluated using the Satisfaction with Life scale. Clinical data on the patients (diagnosis, stage of the disease, applied treatments, time of the diagnosis, etc.) were obtained from the patient's files.

The questionnaire form was pre-tested as a pilot among a group of 5 patients; patients participating in the pilot study were not included in the sample. The data were collected by the researchers after explaining the objectives of the study to the participants. All the patients were advised that their participation was entirely voluntary and anonymous (i.e., no names would be written on the survey forms). They were also informed that the data collected in the study would only be used within the scope of the study. The data collection took 10-15 min.

### *Data collection tools*

#### *HADS*

The HADS was developed by Zigmond and Snaith (1983) with the aim of detecting the risk of anxiety and depression among patients and the severity of these symptoms (39). The validity of the scale in a Turkish population was confirmed by Aydemir et al. (1997) (40). This scale is not utilized to diagnose physically impaired patients or those applying to primary care health services, but it is employed to diagnose anxiety and depression rapidly to identify risk groups. Responses given on a 4-point Likert-type scale are scored with numbers 0-3. The HADS is easy to administer because it is short and easily understandable. The participants filled in the form on their own and marked the article that was most appropriate to their situation. Out of 14 questions in total, seven (odd numbers) measure anxiety and seven (even numbers) measure depression. For the anxiety subscale, the scores of items 1, 3, 5, 7, 9, 11, and 13 are added; for the depression subscale, scores of items 2, 4, 6, 8, 10, 12, and 14 are added. On both subscales, the lowest score that patients can receive is 0 and the highest is 21. At the end of validity test of this scale, the cutoff score of the HAD Scale's Turkish form was measured as 10 for the anxiety scale and 7 for the depression scale. Accordingly, those receiving more than 10 points from the anxiety subscale are considered to be at risk of anxiety, and those receiving more than 8 points on

the depression subscale are considered to be at risk of depression. In the reliability test of the Turkish form, Cronbach's alpha coefficient was computed as 0.85 for the anxiety subscale and measured as 0.77 for the depression subscale (40). In this study, the Cronbach's alpha reliability coefficient of the HADS was 0.71.

#### *Satisfaction with Life scale*

The Satisfaction with Life Scale (Diener et al., 1985) was developed with the aim of scaling the life satisfaction (24). This scale was adapted to a Turkish population by Köker (1991) (41). It is a Likert type scale consisting of 5 items, to which answers range from "completely opposing" to "absolutely accepting" with 1 to 7 points. The total score varies from 1-35. Scores of 31-35 denote a high level of satisfaction with life. Scores of 26-30 denote satisfied, and scores of 21-25 signify partially satisfied. A score of 20 denotes a medium level of satisfaction, whereas scores of 15-19, 10-14, and 5-9 denote some dissatisfaction, a medium level of dissatisfaction, and extreme dissatisfaction, respectively. The Cronbach's alpha reliability coefficient of the Satisfaction with Life scale was 0.92.

#### *Statistical Analysis*

Statistical analysis of the data was done using SPSS 15.0. Percentages, one-way ANOVA and the student's *t*-test were used to analyze the data.

## Results

One hundred-eight lung cancer patients took part in the study. As shown in Table 1, 3.7% of the patients were females, and 96.3% were males. Of these, 96.3% were married. In the study group, 62.0% had graduated from primary school, 12.0% had graduated from secondary school, 5.6% had graduated from high school, and 5.6% had graduated from university graduated. In this study, 95.4% had social security, 14.8% were working, 37.0% were retired, 30.6% were farmers, 3.7% were housewives, and 1.9% were civil servants. The incomes of 52.8% of the patients were less than their expenditures. In terms of their distribution, 28.7% lived in the

**Table 1.** Socio-Demographic characteristics of the patients (N=108)

Characteristics	M	(SD)
<b>Mean age</b>	61.9	(8.9)
	<b>n</b>	<b>(%)</b>
<b>Gender</b>		
Female	4	(3.7)
Male	104	(96.3)
<b>Marital status</b>		
Married	104	(96.3)
Single/widow	4	(3.7)
<b>Educational level</b>		
Literate	16	(14.8)
Elementary	67	(62.0)
Intermediate school	13	(12.0)
High school	6	(5.6)
University	6	(5.6)
<b>Social insurance</b>		
Present	103	(95.4)
Absent	5	(4.6)
<b>Employment status</b>		
Working	16	(14.8)
Nonworking	92	(85.2)
<b>Job</b>		
Civil servant	2	(1.9)
Employee	4	(3.7)
Retired	40	(37.0)
Self-employed	25	(23.1)
Farmer	33	(30.6)
Housewife	4	(3.7)
<b>Income status</b>		
Income less than expenditure	57	(52.8)
Income equal to expenditure	40	(37.0)
Income greater than expenditure	11	(10.2)
<b>Place of residence</b>		
City	31	(28.7)
Town	41	(38.0)
Village	36	(33.3)
<b>Family type</b>		
Large	34	(31.5)
Nuclear	74	(68.5)

province, 38.0% lived in the district, and 33.3% lived in villages. With regard to the family structure, 68.5% had a nuclear family structure. The average age of the patients was 61.9±8.9 (Table 1).

In this study, 84.3% of the patients had been diagnosed with cancer in the previous 0-6 months, and 40.7% had Stage 3 disease, 56.5% were receiving chemotherapy. The following symptoms were reported: tiredness (78.7%), taste changes (68.5%), anorexia (65.7%), vomiting (64.8%), nausea (62.0%), dyspnea (52.8%), alopecia (47.2%), pain (45.4%), and weight loss (39.8%). 52.8% perceived the prognosis of disease to be at a medium level. In the study, the following diseases were present: chronic disease (38.9%), atherosclerosis (38.9%), cardiac disease (13.9%), diabetes (7.4%), and hypertension (18.5%). A total of 90.7% of the study group was satisfied with their treatment, and 63.3% defined their level of satisfaction as medium. A total of 69.4% of the patients obtained a benefit from herbal treatments. Others achieved symptom relief from diet (44.4%) and prayer (79.6%). In the group, 88.9% of smokers quit smoking after the disease was diagnosed (Table 2).

Table 3 presents the HADS score averages. The average HADS-A score was  $18.5 \pm 2.7$ , and the average HADS-D score was  $16.5 \pm 2.3$ . According to the HADS-A dimension of the scale, 2.8% of the patients were under the cutoff score (0-10 points), and 97.2% were over the cutoff score (11-21 points). With regards to the HADS-D, 100% of the patients were over

the cutoff score (8-21 points) (Table 3). There was no association between the HADS-A scale score averages and the patients' socio-demographic and clinical statuses. However, on the HADS-D, there was a statistically significant association between the score averages and age ( $F=2.985$   $p=0.035$ ), income level ( $F=4.146$   $p=0.018$ ), social security status ( $t=2.279$   $p=0.025$ ), marital status ( $t=2.029$   $p=0.045$ ), and sex ( $t=3.449$   $p=0.001$ ). The HADS-D score was higher among those aged 64-76 and among those whose incomes were higher than their expenditures. It was also higher among those who had social security and who were married and male.

The total score average on the Satisfaction with Life scale was  $24.4 \pm 7.3$ , and most of the patients were partially satisfied with their lives (Table 4). There was a statistically significant difference between the groups in terms of age ( $F=5.485$   $p=0.002$ ), income level ( $F=5.976$   $p=0.003$ ), sex ( $t=3.449$   $p=0.001$ ), marital status ( $t=2.029$   $p=0.045$ ), and social security status ( $t=2.279$   $p=0.025$ ). The Satisfaction with Life scale score was higher among those aged 64-76 and among those whose incomes were higher than their expenditures. It was also higher among those who had social security and who were married and male.

**Table 2.** Clinical characteristics of the patients (N=108)

Characteristics	n	(%)
<b>Time since diagnosis (month)</b>		
0-6 days	91	(84.3)
7-13 days	17	(15.7)
<b>Phase of the disease</b>		
Nonsmall cell stage 1	4	(3.7)
Nonsmall stage 2	8	(7.4)
Nonsmall cell stage 3	44	(40.7)
Nonsmall cell stage 4	29	(26.9)
Smallcell limited stage	9	(8.3)
Smallcell wide stage	14	(13.0)
<b>*Applied treatments</b>		
Chemotherapy	61	(56.5)
Radiotherapy	7	(6.5)
Chemotherapy + radiotherapy	37	(34.3)
Surgical treatment	11	(10.2)

(continued)

**Table 2 (continued).** Clinical characteristics of the patients (N=108)

Characteristics	n	(%)
<b>* Symptom-related side effects of the treatment</b>		
Ache	49	(45.4)
Anorexia	71	(65.7)
Weight loss	43	(39.8)
Taste changes	74	(68.5)
Alopecia	51	(47.2)
Nausea	67	(62.0)
Vomiting	70	(64.8)
Fatigue	85	(78.7)
Dyspnea	57	(52.8)
Constipation	40	(37.0)
<b>Perceived disease prognosis</b>		
Good	42	(38.9)
Medium	57	(52.8)
Bad	9	(8.3)
<b>Presence of absence of a chronic disease</b>		
Yes	42	(38.9)
No	66	(61.1)
<b>*Chronic diseases (n=42)</b>		
Cardiac disease	15	(13.9)
Diabetes	8	(7.4)
High blood pressure	20	(18.5)
Atherosclerosis	42	(38.9)
<b>Satisfaction with the received medical treatment</b>		
Yes	98	(90.7)
No	10	(9.3)
<b>If yes, level of satisfaction(n=98)</b>		
Low	4	(4.1)
Medium	62	(63.3)
High	32	(32.6)
<b>*What thing/things do you do to alleviate the symptoms?</b>		
Herbal treatment	75	(69.4)
Regulating diet	48	(44.4)
Praying	86	(79.6)
Nothing	28	(25.9)
<b>Smoking history</b>		
Quit smokers	96	(88.9)
Never smokers	12	(11.1)

\*More than one answer was given

**Table 3.** Average scores on the HADS-A and HADS-D subscales

Scores	Score range	n	%	Mean ± SD	Total score average
<b>HADS-A scores</b>	0-10 points	3	2.8	9.66±0.57	18.5±2.7
	11-21 points	105	97.2	18.74±2.25	
<b>HADS-D scores</b>	0-7 points	-	-	-	16.5±2.3
	8-21 points	108	100.0	16.55±2.26	

**Table 4.** Distribution of the patients' scores on the Satisfaction with Life Scale (N=108)

Items	Strongly disagree <i>n</i> (%)	Disagree <i>n</i> (%)	Slightly disagree <i>n</i> (%)	Neither agree nor disagree <i>n</i> (%)	Slightly agree <i>n</i> (%)	Agree <i>n</i> (%)	Strongly agree <i>n</i> (%)	Mean ±SD
In most ways, my life is close to ideal	5 (4.6)	8(7.4)	6 (5.6)	16 (14.8)	21 (19.4)	35 (32.4)	17 (15.8)	5.0±1.7
The conditions of my life are excellent	5 (4.6)	9 (8.3)	8 (7.4)	24 (22.2)	22(20.4)	30 (27.8)	10 (9.3)	4.6±1.6
I am satisfied with my life	5 (4.6)	6 (5.6)	5 (4.6)	13 (12.0)	26 (24.1)	32 (29.6)	21 (19.5)	5.1±1.6
So far, I have achieved the things I wanted to in life	6 (5.6)	8 (7.4)	9 (8.3)	16 (14.8)	21(19.4)	29 (26.9)	19 (17.6)	4.9±1.7
If I could live my life over, I would change almost nothing	10 (9.3)	8 (7.4)	5 (4.6)	13 (12.0)	24(22.2)	34 (31.5)	14 (13.0)	4.8±1.8
Mean satisfaction with life score	24.4±7.3							

## Discussion

Anxiety and depression have a major influence on life quality, adaption to treatment, perceived severity of the disease, and life satisfaction (4, 6, 42). This is the first study to examine cultural factors that may influence the anxiety, depression, and life satisfaction of lung cancer inpatients treated in a university hospital located in the Middle Black Sea region of Northern Turkey. This research was executed because health care professionals play an important role in the detection of anxiety and depression among patients diagnosed with lung cancer and in the provision of psychosocial support. In this study, it was detected that almost all the patients had a risk of anxiety and depression. They were partially satisfied with their lives.

In this study, the patients had a high risk of anxiety (97.2%) and depression (100%), and they were partially satisfied with their lives. Previous studies reported that the prevalence of depression varied between 9% and 87% in lung cancer patients (26-29, 31, 33, 35-37), anxiety prevalence varied between 10% and 43.3% (4, 26, 27, 29, 31, 33, 35). Studies also reported that when compared with other types of cancer types, the incidences of anxiety and depression prevalence were higher in those with lung cancer (28, 43, 44, 45). Research also showed that the anxiety and depression levels of patients differed before and after a diagno-

sis of cancer, with a decrease in anxiety levels and an increase in depression levels (33). According to one study, the prevalence of depression and anxiety was the same among inpatients and outpatients (29). Another study found that and depression and anxiety were much more common among patients with a diagnosis of nonsmall cell lung and depression was correlated with the patients' quality of life and health (26).

As physical functions decrease and symptoms increase, anxiety levels of patients also increase (4). Studies reported that anxiety affected the prognosis of the disease (26) and that the survival of patients who had depression was shorter than those who did not (35). Social support factors were obviously correlated with depression (37). The difference in the prevalence of anxiety and depression among lung cancer patients may be explained by the clinical and socio-demographic specifications of the patients, social support, and disease coping strategies.

In this study, the HADS-D subscale score of patients aged 64-76 was higher. The score was also higher in those whose incomes were higher than their expenditures, as well as in those who had social security and who were married and males. The findings of some studies are in agreement with the results of the present study. According to one study, the prevalence of anxiety and depression was higher among males than females with various cancers (prostate, urology,

colon, gastrointestinal, lung, head/throat, and brain) (46). Other studies found that anxiety and depression levels were significantly increased in patients younger than 65 years compared to those older than 65 years (31) and that individual characteristics, such as the patient's education level (26), working status (36), lifestyle behaviors (e.g., alcohol use and smoking) (26, 36) comorbidity (26), histological status and the clinical phase of the disease (26,31), did not affect anxiety and depression levels.

However, the findings of some other studies do not agree with those of the present study. Some found that depression and anxiety were higher in females (26, 44, 47), civil servants had the lowest depression score (19), and the self-employed ones had the highest depression score (19). Age group (26, 27, 36), sex (36), and marital status (26, 36) were reported not to affect anxiety and depression. Vodermaier et al. (2011) reported that anxiety and depression levels were higher in lung cancer patients than in patients with other cancers(47). They also reported that elders with cancer were less anxious and depressive than younger patients (47). Furthermore, they found that the stage of the disease was important in terms of the detection of depression in males but not females and that male patients with early phase lung cancer were less anxious and depressive than female patients and patients with advanced stage cancer. In the present study, the high level of anxiety and depression in the male patients may be explained by the high numbers of males in the sample. Furthermore, in the present study, the low anxiety and depression levels of the young patients compared to the patients over 65 years may be explained by the young patients believing they would recover from the disease and by them having a stronger commitment to life.

The majority of the patients (90.7%) were satisfied with their treatment, and they (74.1%) obtained a benefit from complementary and alternative treatments (74.1%), which they used to alleviate their symptoms. Most of the patients used biologically based therapies (herbal treatments, 69.4%; dietary changes, 44.4%) and mind-body control (prayer, 79.6%). Their use of complementary and alternative medicines points to dissatisfaction with their medical treatment and the desire to identify other treatment methods that would help them to manage their symptoms. A similar study

found that lung cancer patients resorted to dietary/lifestyle changes (changing food options, changing former habits, and resting) to manage eating difficulties and oropharynx-related symptoms (48). The same study found that mind-body control (praying, listen to Buddha preaching) was the most popular complementary treatment used to manage fatigue, hair loss, numbness in fingers and toes, dyspnea, and taste changes. Another study of the symptoms, self-care, and life quality of Chinese-American cancer patients found that 20% of the patients used some type of Chinese herbal medicine (49). In a study by Gülgün and Kaya (2015) of a Turkish population, 56.5% of cancer patients reported obtaining a benefit from complementary and alternative treatments (mostly praying, 95%)(50). In that study, the patients stated that they used complementary and alternative treatments to relax and because they believed that they would enhance the effect of the chemotherapy treatment. In another study by Erbaycu et al. (2010), 27.4% of patients who used alternative medicines regularly while they were receiving chemotherapy reported obtaining a benefit. Of those patients, 8.0% consumed honey, 7.5% consumed nettle, 6.0% consumed carob/molasses, and 2.0% consumed plant juice tea, milk, or bee pollen(51). In a study by Düzen and Korkmaz (2015), 14.3%, of cancer patients used complementary and alternative treatment methods. The reasons they gave for their use of these methods included to combat the disease, inspire hope and positive thinking, reduce disease-related symptoms, and increase the body's resistance to cancer. The same study found that although most of the patients used complementary and alternative treatment methods, they did not share this information with their doctors and nurses (52).

Today, complementary treatments play an important role in the control of cancer-related symptoms and treatment-related side effects. The literature also notes that cancer patients should be routinely questioned about their use of complementary treatments, as these can affect their medical treatment. However, one study emphasized that dietary supplements, which can potentially react with chemotherapeutic agents and herbal products, should not be used simultaneously with chemotherapy and radiation or before surgery (53). Although acupuncture can help in pain control

and decreasing painkiller drug level, information on the advantages and disadvantages of the alternative treatments should be given to the patient (53). Since complementary and alternative methods could have a positive/negative effect on the treatment applied to oncology patients, it is suggested that healthcare professionals need to be aware of the patient's cultural background, the way s/he interprets health/disease, the measures they use to get rid of disease, and avenues pursued for treatment and support (54).

In this study, many of the patients obtained a benefit from mind-body control, including praying. Religious practices, including praying, are an important way that the people apply for coping with the stressful situations in Turkey. As reported elsewhere, 99% of the Turkish population is made up of Muslims, and patients widely get solace from their religious beliefs, which help them to cope with the disease-related symptoms (50). Against the problems, seeking refuge of God allow for both making sense of the event and individuals' realizing opinions and feelings of the individuals due to the event. The individual who sees the problem he/she experiences will exceed his/her own self-sources seeks help. The tendency to seek refuge in religion and the support of God, showing patience and strength make contribution to that the individual feels him/her strong and copes with the problems. According to the literature, these kinds of religious-based coping practices increase the coping tenacity of people who may be physically and mentally unwell, and they provide inner peace, giving the individual the strength accept the disease and coping with the disease (23).

In this research, patients were partially satisfied with their lives, and life satisfaction was higher in patients aged 64–76 years old and in those whose incomes were higher than their expenditures. It was also higher among those who had social security and who were married and males. According to Sherlaw-Johnson et al. (2008), compared to the other cancer groups, life satisfaction was lower among lung cancer patients (42), as found in the present study. This finding may be related to the predicted short survival time of lung cancer patients compared to those with breast, prostate, and colorectal cancer and to treatment differences between the diseases (e.g., surgery, chemotherapy, and radiotherapy). In another study done by Bjordal et al.

(1995) reported that 64% of cancer patients were satisfied with their lives, 9% were not satisfied, and the life satisfaction of the patients with cancer was lower compared to a control group (55). The same study found that stage of the disease and education level of the patient were correlated with the life satisfaction of cancer patients. These findings are in contrast to those found in the present study, which found that satisfaction of the patients who had a high education level was higher than that of the patients who had a medium and low education level.

In a study by Arslan et al. (2008), the life satisfaction of cancer patients was at a medium level, and it was higher than average in a literate group compared to secondary/high school graduated group (19). It was also higher in females than in males and higher among those who lived the provinces. Additional factors associated with higher than average life satisfaction were work status (i.e., a civil servant) and being from a nuclear family. In a study by Tate and Forchheimer (2002), life satisfaction was higher among elderly patients and married patients (56). Baker et al. (2007) reported that the life satisfaction of patients depended on relations with significant others (i.e., friends, partners, children). The same study found that medical treatments, and various factors, such as the time since diagnosis, number of diagnoses, spread of the disease, treatment status, and cancer type, all affected their life satisfaction (57). The findings on the life satisfaction of the patients in the present study differ from those in the literature. The difference may be explained by the socio-demographic and clinical characteristics of the study group. A multidisciplinary approach, with oncology-psychiatry and social services, is needed to enhance the quality of life of lung cancer patients.

A cancer diagnosis is a stressful event, which often leads to fear and uncertainty. The anxiety and depression that commonly following a diagnosis of cancer can have a negative impact on life satisfaction. Disease- and treatment-related symptoms can damage the quality of life and functioning of the patient. These symptoms may have negative effects and interrupt the treatment. Understanding the risk factors for anxiety and depression and the factors that affect the life satisfaction of patients with lung cancer may aid the development of useful programs. The optimum management of the

disease and treatment related symptoms in the clinical environment depends on communication between the health care professionals and patients, a prompt diagnosis, and correct treatment of the symptoms (10).

### Limitations

In this study, the data were collected using a survey form. A limitation of this study is that the findings were not based on simultaneously interviews with the patients. Future studies should include interviews with the patients. A long-term follow up to determine potential changes that may take place in the levels of anxiety, depression, and life satisfaction of the patients following their discharge from the hospital.

### Conclusion

In this study, tiredness, taste changes, anorexia, vomiting, nausea, dyspnea, alopecia, pain, and weight loss were the symptoms most widely reported by the patients, and these depended on the cancer treatment and the patient's prognosis. The majority of the patients (90.7%) were satisfied with the treatment they received, and many patients (74.1%) obtained a benefit from complementary and alternative treatments, which they used to alleviate their symptoms. Many patients used biologically based therapies (69.4% herbal treatments, 44.4% dietary changes) and mind-body control (prayer, 79.6%). The socio-demographics of the lung cancer patients affected their levels of anxiety, depression, and life satisfaction. Based on the findings of this study, health care professional caring for lung cancer patients need to consider the treatment- and disease-related symptoms and side effects. They also need to provide psychological support, in the form of tailored programs, to these patients.

### Declaration of authorship

All authors were responsible for the study conception/design, data collection/analysis, drafting of manuscript, critical revisions for important intellectual content, supervision, statistical expertise and administrative/technical/material support.

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