



# SMOKING DESIRE AND DYSPNEA STATUS OF PATIENTS WITH LUNG CANCER IN TURKEY

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**ABSTRACT – Objective:** Although it is known that there are health risks associated with smoking, patients with lung cancer continue to smoke, which leads to a decrease in survival. The present study aimed to investigate the relationship between the desire to smoke and dyspnea in patients with lung cancer.

**Participants and Methods:** This descriptive cross-sectional study was conducted in the medical oncology outpatient clinic and medical oncology outpatient unit of Konya City Hospital in Turkey. The sample consisted of 157 volunteer patients who met the inclusion criteria. The data were collected using the Personal Information Form, the Dyspnea-12 Scale, and the Questionnaire of Smoking Urges.

**Results:** It was found that the number of patients with lung cancer who continue to smoke is at a rate that cannot be ignored and their desire to smoke continues. The study revealed a moderate negative relationship between the duration of smoking cessation and the desire to smoke, and a weak positive relationship between the total years of smoking and the desire to smoke ( $p=0.000$ ). It was found that the dyspnea status of lung cancer patients significantly predicted the desire to smoke ( $p<0.05$ ).

**Conclusions:** When the desire to smoke and the dyspnea status of patients with lung cancer were evaluated, it was revealed that dyspnea had a positive effect on the desire to smoke. All active smokers should be encouraged to quit smoking, especially those undergoing screening or treatment for lung cancer.

**KEYWORDS:** Lung cancer, Desire to smoke, Dyspnea, Addiction.

## INTRODUCTION

Cancer is the leading cause of death in every country in the world and a major barrier to increasing life expectancy<sup>1</sup>. According to the GLOBOCAN 2020 data, there have been an estimated 19.3 million new cancer cases and approximately 10.0 million cancer deaths worldwide. Lung cancer is the leading cause of cancer deaths with an estimated 1.8 million deaths (18%)<sup>2</sup>. According to the Global Burden of Disease report, smoking is by far the most important avoidable risk factor for the emergence of lung cancer, accounting for approximately two-thirds of all lung cancer cases<sup>1,3</sup>.



Smoking is a common theme throughout the continuum of cancer risk, diagnosis, and treatment. Both the duration and amount of smoking are positively associated with increased morbidity and mortality risk<sup>4</sup>. Continuing to smoke after being diagnosed with cancer decreases the effectiveness of treatments and increases the risk of cancer-related death by 50% to 60%<sup>5</sup>. Although it is known that there are health risks associated with smoking, some patients with lung cancer continue to smoke, resulting in a reduced quality of life, an increased likelihood of cancer recurrence, and a reduced rate of survival<sup>6</sup>. Studies have reported some significant findings that smoking cessation can lead to an improvement in survival during and after the diagnosis of lung cancer<sup>7,8</sup>. Quitting smoking is not an easy process due to the desire to smoke, although the harm of smoking is known. The desire to smoke is one of the most important withdrawal symptoms and plays an important role in smoking cessation failure<sup>9</sup>. The desire to smoke is intense in the first days after quitting smoking; however, it gradually decreases and disappears<sup>10,11</sup>. The guide published by the American Society of Clinical Oncology (ASCO) to stop tobacco use after cancer diagnosis highlights that quitting smoking after cancer diagnosis has physical and mental benefits. Toxins in tobacco reduce the effectiveness of chemotherapy drugs, affect the immune system, and increase symptoms and side effects. The guide further asserts that quitting tobacco use after the diagnosis of cancer will also enable easier breathing<sup>6</sup>. Dyspnea is a common symptom in cancer patients. It has been reported that it is an indicator of worse prognosis, which can change clinical treatment and care planning<sup>12</sup>. Dyspnea, also known as shortness of breath or air hunger, is a subjective experience of breathing discomfort<sup>13</sup>. Moderate or severe dyspnea has been identified in 20-80% of patients with advanced cancer, and it has been accepted as a prognostic factor for shorter survival, alone or in relation to other parameters<sup>14,15</sup>. When combined with other symptoms such as fatigue, anxiety, and depression, the burden of dyspnea may result in functional limitation, poor quality of life, and increased caregiver burden<sup>16</sup>. Dyspnea is a negative indicator of quality of life in lung cancer<sup>17</sup>. Considering the limited number of studies focusing on dyspnea and smoking desire in patients with lung cancer, it is believed that this study may provide an opportunity for healthcare personnel to plan appropriate healthcare services and may contribute to the literature.

## PARTICIPANTS AND METHODS

### Participants and study design

A cross-sectional descriptive study was designed to investigate the relationship between the dyspnea status and the desire to smoke in patients with lung cancer.

The study was conducted in the medical oncology outpatient clinic and medical oncology outpatient unit of Konya City Hospital in Turkey between March 2019 and January 2022. According to the GLOBOCAN 2020 Turkey data, it was predicted that in the medical oncology unit of the hospital, which has an annual average of 500 new cancer patient admissions, 17.6% of the patients would be diagnosed with lung cancer. The size of the sample that should be included in the study was calculated using the [www.openepi.com](http://www.openepi.com) sample size calculator website database. Based on the size of the population ( $n=500$ ), the estimated frequency of new diagnoses in the population ( $p=17.6\pm 5\%$ ), the range of confidence limits ( $d=5\%$ ), the design effect ( $DEFF=1$ ), and the confidence level of 95%, it was planned to include 155 cases in the study. Patients who were newly diagnosed with lung cancer, who were older than 18 years, who could speak Turkish, and who had received at least one course of antineoplastic medication, were selected, while patients medically diagnosed with a psychiatric disease were excluded. Among the selected patients, those who had lung cancer, who smoked in the past and who continue to smoke, and who had an ECOG performance of 0-1 were included in the study. A patient who continued to smoke when the diagnosis of lung cancer was made or who quit smoking less than one month before the diagnosis of lung cancer was defined as a current smoker. A former smoker was defined as a patient who quit smoking at least one month before the diagnosis.

### Data collection

Data were collected by the researcher using the face-to-face survey method. Individuals who met the inclusion criteria were informed about the study. Data collection tools were the Personal Information

Form, the Dyspnea-12 (D-12) Scale, and the Questionnaire of Smoking Urges (QSU-Brief). The average time required to complete the data collection tools was 20 minutes.

#### Research questions

1. Do the dyspnea and smoking desire mean scores of patients with lung cancer differ across their socio-demographic and disease characteristics?
2. Is there a relationship between the dyspnea and smoking desire mean scores of patients with lung cancer?
3. What are the predictors of the desire to smoke in patients with lung cancer?

#### Personal Information Form

The form was developed by the researcher drawing on the literature<sup>18-20</sup>. The form was developed to reveal the sociodemographic characteristics (age, gender, marital status, educational status, working status, social support) and disease characteristics (smoking characteristics, state of surgery, presence of other cancer in the family, interventions).

#### D-12 Scale

The scale was developed by Yorke et al<sup>21</sup> and adapted to Turkish by Metin and Helvacı<sup>19</sup>. The first seven items of the scale, which consists of a total of 12 items assessing the severity of dyspnea, evaluate the physical difficulties caused by dyspnea in patients by posing questions as to whether the breath goes to the lung, whether the patient has shortness of breath, whether there is difficulty in breathing, and whether there is effort while breathing. The remaining five items of the scale focus on the effects of breathing on affective states such as stress, irritability, depression, distress and restlessness. Higher scores from the scale indicate an increase in the severity of dyspnea in the patient. The Cronbach's alpha of the adapted scale was 0.97<sup>19</sup>. In this study, the Cronbach's alpha of the scale was found to be 0.97.

#### QSU-Brief

The QSU-brief is a self-report questionnaire developed by Cox, Tiffany, Christen<sup>22</sup> to assess urges and cravings to smoke. The questionnaire was adapted into Turkish by Demirezen and Kurçer<sup>23</sup>. The highest score that could be obtained from the questionnaire is 70, indicating a very high desire to smoke. The Cronbach's alpha of the Turkish version of the questionnaire was found to be 0.92. In this study, the Cronbach's alpha of the scale was found as 0.98.

#### Ethical Considerations

The study was approved by the Non-Invasive Clinical Research Ethics Committee of the Faculty of Healthy Science, Selcuk University (decision no: 2019/609) and was conducted in accordance with the Declaration of Helsinki. The participants were informed about the purpose of the study and their written consent was obtained prior to the study. The research was planned, implemented, and reported in accordance with the STROBE checklist.

#### Statistical Analysis

The data were transferred to Statistical Packages for the Social Sciences (IBM SPSS) Statistics 23 program (Armonk, NY, USA). Frequency, percentage, mean, and standard deviation were calculated to analyze the data. The Kolmogorov-Smirnov test was performed to determine whether the data showed normal distribution. The Mann-Whitney U test, the Kruskal-Wallis H test, and Bonferroni correction were performed in comparisons. Relationships were revealed using the Spearman correlation test. The level of significance was set at  $p < .05$  in all measurements.

## RESULTS

A total of 97.5% of the participants was male, 90.4% was married, 82.2% was primary school graduates, 91.7% was retired or not working, 74.5% quit smoking, 94.6% received social support, 63.7% did not have surgery, 63.1% did not have any cancer cases in their families, and 35.7% received only chemotherapy. The mean age of the participants was  $63 \pm 9$ ; the duration of smoking cessation was  $73.70 \pm 81.82$  months; the age to start smoking was  $16.20 \pm 4.17$ ; the number of cigarettes smoked a day was  $28.90 \pm 14.40$ ; the total years of smoking was  $41.96 \pm 10.64$ ; and the duration of illness was  $12.85 \pm 20.24$  months. The mean total score of the Dyspnea-12 Scale was found to be  $18.48 \pm 12.16$ , and the mean score for the “physical” subscale and the “affective” subscale of the Dyspnea-12 Scale were  $10.62 \pm 7.40$  and  $7.85 \pm 5.92$ , respectively. The QSU-brief mean score was found as  $27.96 \pm 20.51$  (Table 1).

The mean score of the single participants on the Dyspnea Scale was found to be higher compared to that of the married participants (33(20-36)). In addition, the participants who were primary school graduates were found to have a higher Dyspnea mean score than those with secondary school or higher degrees (20(10-31)). The mean QSU-brief score of the participants who were primary school graduates was found to be higher than those with secondary school or higher degrees (20(10-51)). The QSU-brief mean score of the participants who continued to smoke despite lung cancer diagnosis was found to be higher than that of the participants who stopped smoking (56(42.50-60.75)). A statistical difference was found between the Affective subscale mean score and the Dyspnea Scale total mean score across the interventions received by patients with lung cancer ( $KW=8.999$  and  $KW=9.366$ , respectively,  $p < .05$ ). According to the Kruskal Wallis-H test and Bonferroni correction, the difference between the groups was due to the difference between the patients who received only chemotherapy and those who had chemotherapy and surgery together ( $p=.025$ ) (Table 2).

The comparison of the mean scores of the participants on the Dyspnea Scale and the QSU-brief is shown in Table 3. A negative, moderate, and significant relationship was found between the duration of smoking cessation and the QSU-brief mean score ( $r=-0.503$ ,  $p=.000$ ). When the number of cigarettes smoked per day was compared with the Dyspnea Scale total, physical subscale and affective subscale mean scores, a positive but negligibly significant relationship was found (respectively,  $r=0.177$ ,  $p=.027$ ,  $r=0.176$ ,  $p=.027$ ,  $r=0.169$ ,  $p=.034$ ). When the years of smoking was compared with the QSU-brief mean score, a weak and positive correlation was observed ( $r=0.304$ ,  $p=.000$ ). In addition, a negative and negligible relationship was revealed between the duration of the disease and the QSU-brief mean score ( $r=-0.172$ ,  $p=.032$ ). No significant relationship was found in the comparisons including age and age of starting smoking ( $p > .05$ ).

A positive and negligibly significant relationship was found between the Dyspnea Scale total mean score and the QSU-Brief mean score ( $r=0.179$ ,  $p=.025$ ). The comparison of the affective subscale mean score and the QSU-Brief mean score revealed a weak, positive and significant relationship ( $r=0.260$ ,  $p=.001$ ) (Table 4).

The regression analysis revealed that the duration of smoking cessation negatively affected the desire to smoke ( $\beta=-0.056$ ) and predicted 11.8% of the variance in desire to smoke ( $p=.000$ ). The analysis further revealed that total years of smoking positively affected the desire to smoke ( $\beta=0.486$ ) and predicted 6.4% of the variance in desire to smoke ( $p=.001$ ). The affective subscale of the Dyspnea Scale was found to positively affect the desire to smoke ( $\beta=0.848$ ) and predicted 6% of the variance in desire to smoke ( $p=.002$ ). The findings of the regression analysis showed that dyspnea positively affected the desire to smoke ( $\beta=0.290$ ) and predicted 3% of the variance in desire to smoke ( $p=.031$ ) (Table 5).

## DISCUSSION

Smoking is a risk factor for lung cancer and the duration and amount of smoking are both associated with increased morbidity and mortality<sup>4,24</sup>. In this study, the participants reported that they smoked with an average of more than one pack a day, their smoking duration was more than 40 years, and they started smoking at a very young age. One study revealed that patients diagnosed with smoking-related cancer had a history of heavy and continuous smoking<sup>4</sup>, while another study showed that the increase in the duration of smoking had a dose-dependent effect<sup>24</sup>. Heavy and consistent tobacco use in patients with lung cancer may reduce their motivation to quit. Health care providers should know that lung cancer patients may have serious tobacco use problems and they need services that include intensive and individualized therapeutic strategies to quit smoking.

**Table 1.** Distribution of Patients According to Socio-Demographic and Disease Characteristics (n=157).

Characteristics	n	%
<b>Gender</b>		
Male	153	97.5
Female	4	2.5
<b>Marital Status</b>		
Married	142	90.4
Single	15	9.6
<b>Level of education<sup>a</sup></b>		
Primary school	129	82.2
Middle school and above	28	17.8
<b>Working status</b>		
Working	13	8.3
Not working-Retired	144	91.7
<b>Smoking</b>		
Yes	40	25.5
Quitted	117	74.5
<b>Social support</b>		
Yes	149	94.9
No	8	5.1
<b>Lung surgery</b>		
Yes	57	36.3
No	100	63.7
<b>Any other cancer cases in the family</b>		
Yes	58	36.9
No	99	63.1
<b>Interventions</b>		
Chemotherapy	56	35.7
Chemotherapy-Surgery	41	26.1
Chemotherapy-Radiotherapy	46	29.3
Chemotherapy-Radiotherapy-Surgery	14	8.9
	<b>Mean±SD</b>	<b>Min-Max score</b>
<b>Age</b>	63±9	37-82
<b>Smoking cessation time (in months)</b>	73.70±81.82	1-360
<b>Age of starting smoking</b>	16.20±4.17	10-30
<b>Number of cigarettes smoked per day</b>	28.90±14.40	4-80
<b>Total years of smoking</b>	41.96±10.64	10-65
<b>Duration of the disease (in months)</b>	12.85±20.24	1-144
<b>Dyspnea Scale Total</b>	18.48±12.16	0-36
<b>Physical Subscale</b>	10.62±7.40	0-21
<b>Affective Subscale</b>	7.85±5.92	0-15
<b>QSU-brief</b>	27.96±20.51	10-70

**Abbreviations:** QSU, Questionnaire of Smoking Urges; Max, Maximum; Min, Minimum SD, Standard Deviation; ±, Arithmetic Mean.

<sup>a</sup>Education level: Primary School (Literate-11, Primary School-118), Middle School and above (Middle School-12, High School-12, University-4).

**Table 2.** Distribution of the Dyspnea-12 Scale and QSU-Briefmean Scores of the Participants Across Socio-Demographic and Disease Characteristics (n=157).

Characteristics		Physical subscale Q(Q1-Q3) <sup>a</sup>	Affective subscale Q(Q1-Q3) <sup>a</sup>	Dyspnea Scale Total Q(Q1-Q3) <sup>a</sup>	QSU-brief Q(Q1-Q3) <sup>a</sup>
Gender	Male	11(3-18)	9(0.50-14)	19(6.50-29)	19(10-49)
	Female	1 (0-16.25)	13(2.75-15)	14(3.25-30.75)	36(12.50-52)
	Z	-1.346	-0.900	-0.402	-.599
	p	.178	.368	.688	.549
Marital Status	Married	10(3-16.25)	8.5(0-13)	18(6-28.25)	18(10-48.5)
	Single	18(14-21)	15(7-15)	33(20-36)	30(10-57)
	Z	-2.869	-3.022	-3.091	-0.991
	p	<b>.004<sup>b</sup></b>	<b>.003<sup>b</sup></b>	<b>.002<sup>b</sup></b>	.322
Level of education	Primary school	12(4-18)	10(2.5-15)	20(10-31)	20(10-51)
	Middle school and above	5.50(2-14)	2(0-10)	9(3-23)	10(10-29.50)
	Z	-1.954	-2.726	-2.585	-2.249
	p	.051	<b>.006<sup>b</sup></b>	<b>.010<sup>b</sup></b>	<b>.025<sup>b</sup></b>
Working status	Working	18(2.5-20.50)	14(7.5-15)	32(9.5-34.50)	30(12.50-51.30)
	Not working-Retired	11(3-17)	8.5(0-13.75)	18(6.25-28.75)	18(10-49.50)
	Z	-1.147	-1.751	-1.559	-0.974
	p	.252	.080	.119	.330
Smoking	Yes	10.50(3-18)	10(3.50-13.75)	2.50(7.25-32.25)	56(42.50-60.75)
	Quitted	11(3-8)	9(0-14.50)	18(6.50-29)	10(10-27)
	Z	-0.277	-0.831	-0.645	-7.641
	p	.782	.406	.591	<b>.000<sup>b</sup></b>
Social support	Yes	11(3-18)	10(0-14)	19(6.50-29)	19(10-48)
	No	12.5(4.75-20)	8(3.50-13.75)	22(8.25-33)	50(16.50-60.50)
	Z	-0.692	-0.045	-0.536	-1.886
	p	.489	.964	.592	.059
Lung surgery	Yes	8(2.50-14.50)	5(0-12.50)	14(3-24.50)	19(10-43.50)
	No	13(4.25-18.75)	10(3.50-15)	22(11-31.50)	19(10-51.75)
	Z	-2.207	-2.331	-2.451	-0.350
	p	<b>.027<sup>b</sup></b>	<b>.020<sup>b</sup></b>	<b>.014<sup>b</sup></b>	.726
Any other cancer cases in the family	Yes	12(3.75-8)	10(0.75-15)	18.50(9.75-33)	20(10-51)
	No	10(3-17)	9(0-14)	19(6-29)	17(10-50)
	Z	-0.731	-0.383	-0.615	-0.727
	p	.465	.702	.538	.467
Interventions	Chemotherapy	13(6-13)	10(5-15)	22(13-32.75)	27(10-51.75)
	Chemotherapy-Surgery	7(1.50-14)	5(0-10)	13(3-22)	15(10-42)
	Chemotherapy-Radiotherapy	13.50(3.75-18)	8.50(0.75-14.25)	22(6-30)	10(10-43)
	Chemotherapy-Radiotherapy-Surgery	10.50 (4-18)	8(0-14.25)	19(5.75-33)	30.50 (10.75-56.25)
	KW	7.474	8.999	9.366	5.642
	p	.058	<b>.029<sup>b</sup></b>	<b>.025<sup>b</sup></b>	.130

Since nonparametric Mann-Whitney U and Kruskal Wallis-H tests were used, the quartile ranges Q(Q1-Q3) were given. Bonferroni correction was made. <sup>b</sup>p<.05.

**Table 3.** The Correlation between The Socio-Demographic and Disease Characteristics of The Participants and Their Dyspnea and QSU-Brief Mean Scores (n=157).

Characteristics	Physical subscale	Affective subscale	Dyspnea Scale Total	QSU-brief
<b>Age</b>				
<i>rho</i> <sup>a</sup>	0.079	0.017	0.060	-0.111
<i>p</i>	.327	.817	.452	.168
<b>Smoking cessation time (in months)</b>				
<i>rho</i> <sup>a</sup>	-0.046	-0.165	-0.100	-0.503
<i>p</i>	.624	.075	.283	<.001 <sup>c</sup>
<b>Age of starting smoking</b>				
<i>rho</i> <sup>a</sup>	0.045	0.111	0.082	-0.042
<i>p</i>	.579	.167	.308	.604
<b>Number of cigarettes smoked per day</b>				
<i>rho</i> <sup>a</sup>	0.176	0.169	0.177	-0.100
<i>p</i>	.027 <sup>b</sup>	.034 <sup>b</sup>	.027 <sup>b</sup>	.211
<b>Total years of smoking</b>				
<i>rho</i> <sup>a</sup>	0.056	0.053	0.063	0.304
<i>p</i>	.462	.512	.432	<.001 <sup>c</sup>
<b>Duration of the disease (in months)</b>				
<i>rho</i> <sup>a</sup>	-0.079	-0.084	-0.083	-0.172
<i>p</i>	.325	.293	.300	.032 <sup>b</sup>

Abbreviations: QSU, Questionnaire of Smoking Urges.

<sup>a</sup>Spearman Correlation. <sup>b</sup> $p < .05$ . <sup>c</sup> $p < .001$ .

**Table 4.** The Correlation Between the Mean Scores on The Dyspnea Scale and the QSU-Brief (n=157).

Characteristics	Physical subscale	Affective subscale	Dyspnea Scale Total
<b>QSU-Brief</b>			
<i>rho</i> <sup>a</sup>	0.080	0.260	0.179
<i>p</i>	.320	.001 <sup>c</sup>	.025 <sup>b</sup>

<sup>a</sup>Spearman Correlation. <sup>b</sup> $p < .05$ . <sup>c</sup> $p < .001$ .

The study revealed that although the participants were diagnosed with lung cancer and have been receiving treatment for the disease, they continue to smoke at a level that cannot be ignored. Like all active smokers, it is important to encourage people with ongoing screening and treatment for lung cancer to quit smoking<sup>25</sup>. The strong desire to smoke in patients who continue to smoke despite cancer diagnosis was compared to those who do not can be explained by their nicotine addiction and continuing their habits as a way of coping with the stress caused by the lung cancer diagnosis.

Although lung malignancy is the basis of dyspnea symptoms and exacerbates them, dyspnea is also affected by sociodemographic characteristics and disease characteristics. The low dyspnea scores of those who had lung cancer surgery and those who had chemotherapy and surgery together can be explained by the decrease in tumor burden and the reduction of symptoms secondary to treatment. In addition, increasing awareness in connection with education is also important in this process. The literature also suggests that dyspnea in patients with lung cancer is associated with psychological factors such as anxiety and depression<sup>26</sup>. It has been shown that the shortness of breath experienced by outpatients with

**Table 5.** Factors Independently Affecting the Desire to Smoke in Patients with Lung Cancer (n=157).

Characteristics	Unstandardized Coefficients	95% CI	<i>p</i>
Age	-0.189	-0.557-0.178	.310
Smoking cessation time (in months)	-0.056	-0.84-0.028	<b>**&lt;.001</b>
Age of starting smoking	-0.063	0.842-0.716	.873
Number of cigarettes smoked per day	-0.052	-0.278-0.174	.649
Total years of smoking	0.486	0.190-0.781	<b>**=.001</b>
Duration of the disease (in months)	-0.099	-0.259-0.061	.225
Physical subscale	0.241	-0.197-0.678	.279
Affective subscale	0.848	0.315-1.381	<b>*.002</b>
Dyspnea Scale Total	0.290	0.027-0.554	<b>*.031</b>

Regression analysis was performed. \* $p < .05$ . \*\* $p < .001$ .

advanced cancer is not only related to medical factors such as cough and pain, but also to many other factors such as psychological distress<sup>27</sup>. It should be noted that patients perceive dyspnea as an indicator of the progression of their disease, which may arouse anxiety. A better understanding of the nature of dyspnea in this population is important for effective and accurate management of health care.

Revealing the relationship between the negative effects of dyspnea and the desire to smoke in patients with lung cancer is important in the development of health care services<sup>1,2,6,28</sup>. As the number of cigarettes smoked per day increases, dyspnea increases. Therefore, reducing the number of cigarettes smoked or quitting smoking may reduce the symptoms of dyspnea. There are limited number of studies and thus not much discussion on this topic in the literature. It is thought that more studies are required to explain the complex nature of dyspnea in cancer patients.

Considering the factors that may affect the desire to smoke, it was found that the duration of smoking cessation, total years of smoking and dyspnea status are associated with the desire to smoke. Nicotine addiction in the body affects the desire to smoke. As the duration of smoking cessation increases, the desire to smoke decreases. On the other hand, smoking desire increases as the duration of lung cancer decreases and vice versa. The reason for this relationship may be attributed to the fact that patients quit smoking during the lung cancer process. As the duration of smoking cessation decreases, the desire to smoke increases. Cortellini et al<sup>30</sup> reported differences among patients based on the treatment and the smoking status.

The desire to smoke was found to be significant in patients with lung cancer who continued to smoke. A positive relationship was found between the total years of smoking and the desire to smoke. Kutlu et al<sup>29</sup> also revealed a positive relationship between the duration of smoking and the desire to smoke. In the same study, the mean QSU-Brief score of those who quit smoking was found to be statistically significantly lower than those who could not stop smoking.

One of the most important factors that distinguish lung cancer patients from patients with other types of cancer is that they try to cope with the side effects of their treatment and smoking withdrawal at the same time. Lung cancer patients who receive nicotine addiction treatment have difficulty maintaining long-term tobacco abstinence despite their motivation to quit<sup>4</sup>. It has been reported that quitting smoking at or near the time of diagnosis is effective on the survival, symptoms, and side effects of lung cancer patients<sup>8</sup>. The process of lung cancer diagnosis can be the correct time to teach how to quit smoking.

### Limitations

The study has some limitations. First, the number of cigarettes smoked per day was based on self-report. This is a significant problem since addicted individuals often deny their addiction problems or tend to misrepresent their tobacco addiction. Second, the participants were outpatients, and thus, the findings of the study may not be generalized to patients experiencing more severe dyspnea. Third, this was a cross-sectional study. A longitudinal follow-up study is required to identify future changes in diagnosis or severity of dyspnea.



## Implications for Practice

One of the most important reasons that distinguish lung cancer patients from patients with other types of cancer is that they try to cope with the side effects of their treatment and smoking withdrawal at the same time. For this reason, health workers should be aware of the desire of patients with lung cancer to smoke and should know that they need a more sensitive care that is different from other cancer types. Health workers are in an ideal position to offer smoking cessation interventions as they are trained in patient education, psychosocial interventions, and physiological interventions. The problem of dyspnea can be avoided by implementing educational programs that address sustainable change, attitudes and beliefs and conducting high-quality randomized controlled studies.

## CONCLUSIONS

The present study revealed that the participants had a long history of smoking, and a non-negligible number of the participants continue to smoke despite the diagnosis and the treatment process. It was found that the affective dimension of dyspnea experienced by the patients is important and is related to the desire to smoke. The study further revealed that as the duration of smoking cessation increased, the desire to smoke decreased, and the desire to smoke was associated with dyspnea.

### ETHICS APPROVAL:

The study was approved by the Non-Invasive Clinical Research Ethics Committee of a university in Turkey (decision no: 2019/609) and was conducted in accordance with the Declaration of Helsinki.

### INFORMED CONSENT:

The participants were informed about the purpose of the study and their written consent was obtained prior to the study.

### AVAILABILITY OF DATA AND MATERIAL:

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

### CONFLICT OF INTEREST:

The authors declare that they have no conflict of interest to disclose.

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### AUTHOR CONTRIBUTIONS:

Arslan Selda: Conceptualization; Data curation; Formal analysis; Investigation; Methodology; Roles/Writing – original draft. Özdemir Deniz: Conceptualization; Funding acquisition; Methodology; Resources; Supervision; Writing – review and editing. Öner İrem: Formal analysis; Writing – review and editing.

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