



Research

Dyspnea and Quality of Life in Patients with Lung Cancer

Akciğer Kanseri Hastalarda Dispne ve Yaşam Kalitesi

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ABSTRACT

Objective: This study was planned to evaluate dyspnea symptoms and quality of life of patients with lung cancer and to determine the affecting factors.

Methods: The study sample consisted of 146 patients with primary diagnosis of lung cancer who were treated in the medical oncology clinic between January and April 2018. Data were collected using the patient personal, disease and treatment characteristics information form, cancer dyspnea scale and the European Cancer Quality of Life Research and Treatment Self-Assessment Questionnaire (EORTC QLQ-C30).

Results: A statistically significant difference was found in the role functioning sub-dimension of males, insomnia symptom sub-dimension of females; global health status and physical functioning sub-dimensions of the employees; fatigue and appetite loss symptom sub-dimensions of unemployed patients; diarrhea symptom sub-dimension of those with high income and economic difficulties sub-dimension of low-income patients ($p<0.05$). A statistically significant negative correlation was found between the dyspnea scores and quality of life scores of lung cancer patients ($p<0.05$).

Conclusion: As a result, as the perception of dyspnea worsened, so did the quality of life. Healthcare professionals should evaluate dyspnea in patients with lung cancer and implement treatment care by considering the quality of life and the factors that affect it.

Keywords: Dyspnea, lung cancer, quality of life

ÖZ

Amaç: Bu çalışma, akciğer kanserli hastaların dispne semptomu ve yaşam kalitesini değerlendirmek ve etkileyen faktörleri belirlemek amacıyla planlandı.

Gereç ve Yöntem: Araştırmanın örneklemini Ocak-Nisan 2018 tarihleri arasında medikal onkoloji kliniğinde tedavi gören, primer tanısı akciğer kanseri olan 146 hasta oluşturmuştur. Veriler hasta kişisel, hastalık ve tedavi ilişkin özellikler bilgi formu, kanser dispne ölçeği ve Avrupa Kanser Yaşam Kalitesi Araştırma ve tedavi öz değerlendirme anketi (EORTC QLQ-C30) kullanılarak toplanmıştır.

Bulgular: Erkeklerin yaşam kalitesi rol fonksiyon alt boyutunda, kadınların uykusuzluk semptomu alt boyutunda; çalışabildiğini ifade edenlerin yaşam kalitesi genel sağlık durumu ve fiziksel fonksiyon alt boyutunda; çalışmadığını ifade edenlerin ise yorgunluk ve iştah kaybı semptomları alt boyutunda; gelir durumunun iyi olduğunu ifade edenlerin yaşam kalitesi diyare semptomu alt boyutunda, gelir durumunun kötü olduğunu ifade edenlerin ekonomik güçlükler alt boyutunda istatistiksel olarak anlamlı bir fark bulundu ($p<0,05$). Akciğer kanserli hastaların dispne puanları ile yaşam kalitesi puanları arasında istatistiksel olarak negatif yönde anlamlı bir ilişki bulundu ($p<0,05$).

Sonuç: Sonuç olarak, nefes darlığı algısı kötüleştikçe yaşam kalitesi de kötüleşti. Sağlık profesyonelleri; akciğer kanserli hastalarda nefes darlığını değerlendirmeli, yaşam kalitesini ve etkileyen faktörleri göz önünde bulundurarak tedavi bakım uygulamalıdır.

Anahtar Kelimeler: Dispne, akciğer kanseri, yaşam kalitesi

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INTRODUCTION

Although lung cancer is a common disease, it is associated with a high mortality rate (1). In 2018, 18.1 million individuals were newly diagnosed with cancer and 9.6 million died worldwide. Lung cancer accounts for 2.9 millions of these cancers and accounts for 1.76 million deaths (2). According to current statistics (2018), the total cancer incidence was 210.2 per 100,000 people in Türkiye; and a total of 163.417 people were newly diagnosed with cancer. In Türkiye, lung cancer ranks first in males at a rate of 21.0 per 100,000 individuals in all age groups; while it ranks fifth in females at a rate of 5.1 per 100,000 individuals in all age groups (3).

Most patients experience physical and psychosocial symptoms that negatively affect their quality of life during the disease process (4-6). Dyspnea is among the most common symptoms experienced by patients with lung cancer. Dyspnea symptom causes difficulty performing daily activities, negatively affecting quality of life (4-8). Most patients describe dyspnea as "a very distressing condition". Dyspnea is defined as a disturbing condition of an individual's inability to breathe or uncomfortable awareness of breathing (9,10). Dyspnea, which can be observed in all stages of cancer, is particularly evident in lung cancer and mostly (50-70%) toward the end of life (11). Dyspnea symptoms vary among individuals. Personal, disease, and treatment-related characteristics affected this symptom (12).

Diagnosis and initiation of treatment in patients with lung cancer negatively affects the individual physically, emotionally, socially, and economically and decreases quality of life (13-15). The treatment applied to the patients aims to heal the symptoms, increase quality of life, and prolong life span. Quality of life is defined as "satisfaction and happiness of the individual regarding his/her own life" (16,17). Dyspnea negatively affects the patient's personal care, level of performing daily activities, functional capacity, and quality of life, making it difficult for patients to adhere to treatment (18,19). Therefore, determining the degree of dyspnea experienced by lung cancer patients and how it affects the patient's quality of life are very important in terms of compliance and effectiveness of treatment (7,16). In the literature; studies determining symptoms in patients with cancer and evaluating quality of life usually cover all types of cancer (19-21). All symptoms were evaluated globally in these studies, covering all cancer types. Therefore, these studies have provided an overview of the life quality of cancer patients (19,20). Studies examining dyspnea symptoms in patients with lung cancer and disease-specific quality of life are limited (15,22). More detailed and clear information can be obtained from studies focusing on a single type

of cancer and symptom. In this context, more successful symptom management will be achieved by evaluating the symptoms of dyspnea and quality of life experienced by patients with lung cancer (4,15,22). Therefore, this study was planned to examine dyspnea symptoms and quality of life and to determine the factors affecting the quality of life in patients with lung cancer.

METHODS

Setting and Participants

This study is descriptive and cross-sectional. The sample comprised 146 patients admitted to the medical oncology clinic between January and April 2018 to receive treatment, with a primary diagnosis of lung cancer, who did not have any cognitive and mental disorders or a psychiatric disease. According to the sample calculation with a known universe, 187 lung cancer patients treated in the medical oncology department of the University Hospital constituted the study population, considering repetitive hospitalizations according to January-April 2017 data. According to the sampling formula with a known universe, at least 126 patients were selected to be sampled at a 95% confidence level and 5% tolerance. Considering the risk of missing data, 146 patients were included in the study.

The purpose of this study was to answer three specific questions:

1. Is there a difference in the severity of dyspnea symptoms experienced by patients with lung cancer and their personal and disease-related characteristics?
2. Is there a difference between the quality of life of patients with lung cancer and personal and disease-related characteristics?
3. Is there a relationship between the severity of dyspnea symptoms experienced by patients with lung cancer?

Measures and Tools

Patients with lung cancer were invited to participate in the study. The inclusion criteria of patients who agreed to participate in the study were evaluated. Patients meeting the inclusion criteria were accepted to the study. The research data were collected by face-to-face interview using the patient's personal, disease, and treatment-related characteristics information form, the cancer dyspnea scale, and the European Cancer Quality of Life Research and treatment self-assessment questionnaire (EORTC QLQ-C30 version 3.0). The conversation took about 15 minutes.

Patient Characteristics Information

The form was created by the researchers in accordance with the literature and is divided into two sections (17).

The first section involves questions regarding the personal characteristics of the patient (gender, age, marital status, income status, employment status, etc.), and the second section involves questions regarding the disease- and treatment-related characteristics (status of metastasis, ECOG performance, chemotherapy, radiotherapy, surgical treatment status, etc.).

Cancer Dyspnea Scale

The scale was developed by Tanaka et al. (23) in Japan in 2000 to evaluate dyspnea frequently seen in patients with cancer. It consists of 12 items and 3 sub-dimensions that include feelings of anxiety, effort, and discomfort. Three subdimensions and total score values were used to evaluate the scale. The sense of effort has 5 items (4th, 6th, 8th, 10th, and 12th items), the sense of discomfort has 3 items (1st, 2nd, and 3rd items), and the sense of anxiety has 4 items (5th, 7th, 9th, and 11th items). The scale is a 5-point Likert scale. The total score obtained from the scale is 48 (the highest scores in the sub-dimensions are 20 for exertional dyspnea, 16 for anxiety-related dyspnea, and 12 for dyspnea due to feeling of discomfort). The higher the total score, the higher the dyspnea severity. The scale's validity and reliability study was conducted by Bitek and Tokem (11). Cronbach's alpha value of the scale was determined as ≥ 0.72 . In this study, Cronbach's alpha value was found to be ≥ 0.70 .

EORTC QLQ-C30 version 3.0

Quality of life was measured using the EORTC Quality of Life Questionnaire-Cancer 30 (EORTC QLQ-C30) Version 3.0 (24). The 30-item EORTC QLQ-C30 assesses global health status, five functional status (physical functioning, role functioning, emotional functioning, cognitive functioning, and social functioning), and nine symptoms/items (fatigue, nausea-vomiting, pain, dyspnea, insomnia, appetite loss, constipation, diarrhea and financial difficulty). Five functional status and symptoms were rated on a scale from 1 (not at all) to 4 (very much). Global health status is rated on a scale from 1 (very bad) to 7 (excellent). All scales and items were transformed into scores ranging from 0 to 100. Higher scores on the five functional subscales and global health status indicate better quality of life. Lower scores on the eight symptom items and financial difficulty represent better quality of life. In this study, we used the Turkish version of the EORTC QLQ-C30 (25).

Statistical Analysis

SPSS 22 statistical software was used to analyze the research data. Percentage and mean were used for the personal, disease-, and treatment-related characteristics of patients with cancer, dyspnea symptoms, quality of life, and affecting

factors; spearman correlation analysis was used for the relationships between continuous variables. The difference between the means of the two independent groups was tested using Mann-Whitney U test, and the difference between the means of the three groups was tested using Kruskal-Wallis analysis of variance. The statistical significance level was set as $p < 0.05$.

Ethical Considerations

Approval from the Scientific Research Ethics Committee of the Tarakya University Faculty of Medicine and research permission were obtained from the institution where the study was conducted (08.01.2018/TUTF-BAEK 2018/05). The purpose and scope of the study were communicated to the patients in the sample group before the study and their verbal consent was obtained.

RESULTS

The mean age of patients with lung cancer who participated in the study is 60.85 ± 9.81 years. The diagnosis time of the patients was 1.83 ± 2.53 years, and approximately half of the patients (49.3%) had an Eastern Cooperative Oncology Group (ECOG) performance score of "1". Most patients (82.9%) were male, most (94.5%) were married, and 71.1% were primary school graduates. More than half of the patients (69.2%) quit smoking. In addition, 38.4% of the patients had metastasis, approximately 25% (22.6%) did not undergo any surgical operation related to the diagnosis of lung cancer, and more than half (58.4%) did not receive radiotherapy. The majority of patients (85.6%) had middle incomes, (85.6%) were unemployed, and almost all (97.3%) had health insurance (Table 1).

The mean score of the EORTC QOL-C30 global health status subdimension of the patients was found to be moderate (50.11 ± 22.29). It was determined that the patients obtained the highest score from the cognitive functioning (82.87 ± 20.43) and the lowest score from the physical functioning (61.41 ± 24.89) in the functional subdimension. In the symptom sub-dimension; it was determined that the highest mean score was obtained from fatigue (48.47 ± 27.05) and the lowest mean score was obtained from diarrhea (16.89 ± 26.04). The three most common symptoms were fatigue, appetite loss, and pain (Table 2).

The mean score of the effort subdimension of the dyspnea scale was 4.67 ± 4.03 , the mean score for the anxiety sub-dimension was 2.28 ± 3.08 , the mean score for the discomfort sub-dimension was 4.62 ± 3.10 , and the total mean score was 26.33 ± 6.15 being at a moderate level (Table 2).

A statistically significant difference was found between the sex of the patients participating in this study and the EORTC QLQ-C30 role functioning sub-dimension ($p < 0.05$). Male

Table 1. Characteristics of patients (n=146)

Characteristics	Mean±SD	
Age	60.85±9.81	
Diagnosis time of the patient (year)	1.83±2.53	
	n	%
ECOG		
0	39	26.7
1	72	49.3
2	21	14.4
3	14	9.6
Gender		
Female	25	17.1
Male	121	82.9
Marital status		
Married	138	94.5
Single	8	5.5
Education status		
Primary school	111	76
High school and above	35	24
Smoking		
No	35	24.0
Yes	10	6.8
Quit smoking	101	69.2
State of the disease		
Primary	90	61.6
Metastasis	56	38.4
Surgical Treatment for lung cancer		
No	113	77.4
Yes	33	22.6
Receiving radiotherapy for lung cancer		
No	86	58.9
Yes	60	41.1
Income rate		
Poor	7	4.8
Middle	125	85.6
Good	14	9.6
Employment status		
Employed	21	14.4
Unemployed	125	85.6
Health Assurance	142	97.3
Yes	4	2.7
No		
Mean±SD: Mean±standart deviation		

patients played higher role functioning scores than female patients ($p=0.045$). A statistically significant difference was found between the gender and insomnia sub-dimension ($p < 0.05$). Female patients experienced more insomnia than male patients ($p=0.011$) (Table 3).

In this study, a statistically significant difference was found between the employment status of the patients and the EORTC QLQ-C30 global health status and physical functioning sub-dimension ($p < 0.05$). The global health and physical functioning scores of those who were employed were higher than those unemployed ($p=0.024$; $p < 0.001$). A statistically significant intergroup difference was found between the employment status and symptoms of fatigue and appetite loss in patients with lung cancer ($p < 0.05$). The symptoms of fatigue and appetite loss were worse in

Table 2. Distribution of patients' EORTC Qols-C30 quality of life and dyspnea perception mean scores (n=146)

EORTC QOL-C30/ DYPNEA	Mean± SD	Median	Minimum	Maximum
EORTC QOL 30				
Global health status	50.11±22.29	50.00	0.00	100.00
Functional status				
Physical functioning	61.41±24.89	66.66	0.00	100.00
Role functioning	72.48±27.65	66.66	0.00	100.00
Emotional functioning	74.25±25.44	75.00	0.00	100.00
Cognitive functioning	82.87±20.43	83.33	0.00	100.00
Social functioning	70.43±27.52	66.66	0.00	100.00
Symptoms/items				
Fatigue	48.47±27.05	44.44	0.00	100.00
Nausea-vomiting	21.68±24.94	16.66	0.00	100.00
Pain	34.01±29.74	33.33	0.00	100.00
Dyspnea	23.05±29.70	.00	0.00	100.00
Insomnia	32.64±34.89	33.33	0.00	100.00
Appetite loss	39.26±33.60	33.33	0.00	100.00
Constipation	23.28±26.04	.00	0.00	100.00
Diarrhea	16.89±26.04	.00	0.00	100.00
Economic difficulties	25.34±26.92	33.33	0.00	100.00
Dyspnea				
Effort	4.67±4.03	4.00	0.00	18.00
Anxiety	2.28±3.08	1.00	0.00	14.00
Discomfort	4.62±3.10	3.00	0.00	12.00
Total	26.33±6.15	25.00	12.00	46.00
Mean±SD: Mean±standart deviation				

unemployed than in employed patients ($p=0.017$; $p=0.024$) (Table 3).

A statistically significant difference was found between the income levels of the patients and the EORTC QLQ-C30 diarrhea symptom sub-dimension ($p<0.05$). Diarrhea symptoms were worse in patients with high income than in those with middle or low income ($p=0.026$). A statistically significant difference was found between the income levels of the patients and the economic difficulty sub-dimension ($p<0.05$). The economic difficulties score was higher in patients with low income than in those with high and middle income ($p=0.002$) (Table 3). No statistically significant difference was found between the sociodemographic

characteristics and dyspnea scores of patients with lung cancer (Table 3).

In this study; a statistically significant negative correlation was found between the dyspnea effort sub-dimension and EORTC QOL-C30 functional sub-dimension scores, including physical functioning ($r=-0.443$; $p<0.001$), role functioning ($r=-0.395$; $p<0.001$), emotional functioning ($r=-0.284$; $p=0.001$), cognitive functioning ($r=-0.240$; $p=0.003$), and social functioning ($r=-0.372$; $p<0.001$). A statistically positive significant correlation was found between the dyspnea effort subdimension and EORTC QOL-C30 symptom subdimension scores, including fatigue ($r=0.289$; $p<0.001$), pain ($r=0.401$; $p<0.001$), respiratory distress

Table 3. Comparison of some characteristics of patients with EORTC QOL-C30 quality of life scale and cancer dyspnea scale (n=146)

EORTC QOL C30/ DYPNEA	Gender			Employment status			Income rate			
	Female mean±SD	Male mean±SD	p*	Employed mean±SD	Unemployed Mean±SD	p*	Good Mean±SD	Middle Mean±SD	Poor Mean±SD	p**
Global Health Status	46.33±21.09	50.27±22.61	.950	59.52±21.93	48.53±22.04	.024	51.19±23.07	50.46±22.55	41.66±15.95	.430
Functional Status										
Physical Functioning	52.53±27.71	63.25±23.99	.073	78.73±13.76	58.50±25.19	.000	62.85±17.67	62.02±25.09	47.61±32.53	.469
Role Functioning	62.00±29.86	74.65±26.79	.045	76.19±30.53	71.86±27.22	.368	69.04±22.51	73.60±27.69	59.52±35.81	.394
Emotional Functioning	72.66±27.69	74.58±25.06	.891	72.22±30.42	74.60±24.63	.919	74.25±25.44	73.86±25.47	73.80±22.78	.664
Cognitive Functioning	82.00±17.29	83.05±21.08	.442	86.50±16.34	82.26±21.03	.500	85.71±17.11	82.66±20.88	80.95±20.24	.892
Social Functioning	63.33±28.46	71.90±27.21	.145	72.22±27.55	70.13±27.62	.737	79.76±16.24	69.86±28.60	61.90±23.00	.349
Symptoms/items										
Fatigue	55.11±26.34	47.10±27.10	.187	36.50±27.92	50.48±26.49	.017	56.34±19.71	47.37±27.87	52.38±24.60	.441
Nausea-Vomiting	30.66±28.33	19.83±23.89	.054	23.01±27.11	21.46±24.66	.871	30.95±28.38	20.40±25.03	26.19±8.90	.169
Pain	44.00±30.38	31.95±29.31	.055	30.15±27.69	34.66±30.12	.566	30.95±25.19	34.26±30.40	35.71±29.54	.958
Dyspnea	28.00±31.44	22.03±29.36	.347	22.22±32.20	23.20±29.39	.795	30.95±33.24	22.93±29.45	9.52±25.19	.232
Insomnia	48.00±34.80	29.47±34.20	.011	20.63±30.68	34.66±30.12	.075	21.42±30.95	34.40±35.65	23.80±25.19	.374
Appetite Loss	48.00±30.55	37.46±34.03	.129	23.80±28.17	41.86±33.84	.024	42.85±27.51	37.86±34.22	57.14±31.70	.253
Constipation	17.33±29.05	24.51±30.66	.213	19.04±32.61	24.00±30.11	.280	21.42±30.95	23.46±30.23	23.80±37.08	.966
Diarrhea	28.00±22.93	14.60±26.13	.001	20.63±30.68	16.26±25.26	.623	35.71±33.24	15.20±24.86	9.52±16.26	.026
Economic Difficulties	30.66±28.73	24.24±26.52	.277	28.57±30.34	24.80±26.40	.645	11.90±16.57	25.06±26.65	57.14±25.19	.002
DYPNEA										
Effort	5.00±4.66	4.60±3.91	.867	4.23±3.60	4.74±4.11	.700	6.00±3.39	4.49±4.03	5.14±5.14	.260
Anxiety	2.68±3.53	2.20±2.99	.706	1.85±2.61	2.36±3.16	.695	2.42±2.68	2.30±3.11	1.71±3.72	.498
Discomfort	4.16±3.18	4.71±3.09	.313	4.09±3.11	4.71±3.10	.425	5.78±2.77	4.59±3.11	2.85±3.02	.070
Total	27.52±6.34	26.09±6.11	.277	26.00±4.38	26.39±6.41	.960	26.64±4.48	26.20±6.17	28.00±8.92	.732

* Mann-Whitney U, ** Kruskal-Wallis analysis of variance

($r=0.660$; $p<0.001$), insomnia ($r=0.331$; $p<0.001$), constipation ($r=0.190$; $p=0.022$), and economic difficulties ($r=0.306$; $p<0.001$) (Table 4). As the dyspnea effort subdimension of the patients worsened, their quality of life, global health status, functional status, and symptoms also worsened.

In this study, a statistically significant negative correlation was found between the dyspnea anxiety subdimension and the EORTC QOL-C30 global health status scores ($r=0.217$; $p=0.009$). A statistically negative significant correlation was found between the dyspnea anxiety sub-dimension and EORTC QOL-C30 functional sub-dimension scores, including physical functioning ($r=-0.469$; $p<0.001$), role functioning ($r=-0.398$; $p<0.001$), emotional functioning ($r=-0.237$; $p=0.004$), cognitive functioning ($r=-0.248$; $p=0.003$), and social functioning ($r=-0.336$; $p<0.001$). A statistically positive correlation was found between the

dyspnea anxiety subdimension score and EORTC QOL-C30 symptom subdimension score, including fatigue ($r=0.295$; $p<0.001$), pain ($r=0.407$; $p<0.001$), respiratory distress ($r=0.603$; $p<0.001$), insomnia ($r=0.274$; $p=0.001$), appetite loss ($r=0.178$; $p=0.032$), and economic difficulties ($r=0.262$; $p=0.001$) (Table 4). As the dyspnea anxiety dimension of the patients worsened, so did their quality of life, global health status, functional status, and symptoms.

In the study, a statistically significant negative correlation was found between dyspnea discomfort sub-dimension score and EORTC QOL-C30 functional sub-dimension scores, including physical functioning ($r=-0.327$; $p<0.001$), role functioning ($r=-0.272$; $p=0.001$), emotional functioning ($r=-0.235$; $p=0.004$), cognitive functioning ($r=-0.256$; $p=0.002$), and social functioning ($r=-0.209$; $p=0.012$). A statistically positive correlation was found between the

Table 4. Comparison of the relationship between the EORTC QOL-C30 quality of life scale and the cancer dyspnea scale (n=146)

EORTC QOL 30	DYSPNEA			
	Effort	Anxiety	Discomfort	Total
Global health status	$r= -.211$ $p= .010$	$r= -.217$ $p= .009$	$r= -.118$ $p= .154$	$r= -.209$ $p= .011$
Functional status				
Physical functioning	$r= -.443$ $p= .000$	$r= -.469$ $p= .000$	$r= -.327$ $p= .000$	$r= -.375$ $p= .000$
Role functioning	$r= -.395$ $p= .000$	$r= -.398$ $p= .000$	$r= -.272$ $p= .001$	$r= -.352$ $p= .000$
Emotional functioning	$r= -.284$ $p= .001$	$r= -.237$ $p= .004$	$r= -.235$ $p= .004$	$r= -.227$ $p= .006$
Cognitive functioning	$r= -.240$ $p= .003$	$r= -.248$ $p= .003$	$r= -.256$ $p= .002$	$r= -.183$ $p= .027$
Social functioning	$r= -.372$ $p= .000$	$r= -.336$ $p= .000$	$r= -.209$ $p= .012$	$r= -.331$ $p= .000$
Symptoms/items				
Fatigue	$r= .289$ $p= .000$	$r= .295$ $p= .000$	$r= .270$ $p= .001$	$r= .220$ $p= .008$
Nausea-vomiting	$r= .159$ $p= .055$	$r= .139$ $p= .094$	$r= .094$ $p= .259$	$r= .159$ $p= .055$
Pain	$r= .401$ $p= .000$	$r= .407$ $p= .000$	$r= .200$ $p= .016$	$r= .350$ $p= .000$
Dyspnea	$r= .660$ $p= .000$	$r= .603$ $p= .000$	$r= .479$ $p= .000$	$r= .499$ $p= .000$
Insomnia	$r= .331$ $p= .000$	$r= .274$ $p= .001$	$r= .170$ $p= .040$	$r= .276$ $p= .001$
Appetite Loss	$r= .130$ $p= .118$	$r= .178$ $p= .032$	$r= .120$ $p= .149$	$r= .126$ $p= .128$
Constipation	$r= .190$ $p= .022$	$r= .155$ $p= .061$	$r= .154$ $p= .063$	$r= .122$ $p= .142$
Diarrhea	$r= .096$ $p= .249$	$r= .136$ $p= .103$	$r= .105$ $p= .207$	$r= .066$ $p= .427$
Economic Difficulties	$r= .306$ $p= .000$	$r= .262$ $p= .001$	$r= .095$ $p= .252$	$r= .317$ $p= .000$

dyspnea discomfort subdimension score and EORTC QOL-C30 symptom subdimension scores, including fatigue ($r=0.270$; $p=0.001$), pain ($r=0.200$; $p=0.016$), respiratory distress ($r=0.479$; $p<0.001$), insomnia ($r=0.170$; $p=0.040$) (Table 4). As the dyspnea discomfort subdimension of the patients worsened, the quality of life, global health status, functional status, and symptoms also deteriorated.

In the study, a statistically significant negative correlation was found between the dyspnea scale total score and EORTC QOL-C30 global health status ($r=-0.209$; $p=0.011$), functional subdimension scores including physical functioning ($r=-0.375$; $p<0.001$), role functioning ($r=-0.352$; $p<0.001$), emotional functioning ($r=-0.227$; $p=0.006$), cognitive functioning ($r=-0.183$; $p=0.027$), and social functioning ($r=-0.331$; $p<0.001$). A statistically positive correlation was found between the dyspnea scale total score and EORTC QOL-C30 symptom subdimension scores, including fatigue ($r=0.220$; $p=0.008$), pain ($r=0.350$; $p<0.001$), respiratory distress ($r=0.499$; $p<0.001$), insomnia ($r=0.276$; $p<0.001$) and economic difficulties ($r=0.317$; $p<0.001$) (Table 4). As the patients' dyspnea symptoms worsened, so did their quality of life.

DISCUSSION

In this study, the mean EORTC QOL-C30 global health status score of patients was moderate. It was determined that the patients obtained the highest score for cognitive functioning in the functional subdimension and the lowest score for physical functioning. In the symptom subdimension; the highest mean score was fatigue, and the lowest mean score was diarrhea. The three most common symptoms were fatigue, appetite loss, and pain. The total mean score of dyspnea was moderate. Çalışkan et al. (17) found that the EORTC QLQ-C30 global health status of patients was moderate, and the three most common symptoms were fatigue, anorexia, and insomnia. Damani et al. (26) reported that the main symptoms affecting quality of life were pain, anorexia, and respiratory distress. In a study conducted with patients with lung cancer, it was found that the EORTC QLQ-C30 global health status of the patients was moderate and they obtained the highest score in the functional sub-dimension on cognitive functioning. In the same study, the three most common symptoms were insomnia, financial difficulty, and fatigue (27). In a study of cancer patients receiving radiotherapy, it was shown that the cognitive and social domains of quality of life had the greatest impact, while tiredness and pain ratings were highest in the symptom subdimension (28). This situation can be explained by the fact that physical functioning along

with quality of life of patients are affected by the symptoms associated with the treatment they receive as well as the disease.

Male patients who participated in this study had better quality of life role functioning scores than female patients. Female patients had worse insomnia symptoms than male patients. Altıparmak et al. (29), determined in their study that the quality of life of males was better than that of females with physical, role, emotional, cognitive, and social functioning. In a study examining symptoms and functionality among males and females with lung cancer; it has been reported that males have a better quality of life role functioning than females and that the most common symptom in males is insomnia (30). Cheun et al. (31), reported more nausea and anxiety in females than males and reported a worse quality of life in females than males. The results of our study are consistent with the literature. This situation can be explained by the fact that women generally have more household chores (cooking, cleaning, maintenance, etc.) than men, and the symptoms experienced by cancer patients prevent women from performing their role functioning.

In this study, the employed patients had better quality of life, global health, and physical functioning scores compared to the unemployed patients. At the same time, the symptoms of fatigue and appetite loss were worse in the unemployed than in the employed ones. Zimmermann et al. (32) reported that employed or retired patients have a higher quality of life than unemployed and disabled patients. In another study, it was stated that quitting cancer patients from their jobs negatively affected their quality of life scores (33). This condition may be explained by the fact that patients with cancer who have fewer symptoms are able to execute their bodily functions, employment, and tasks and thus have a higher quality of life.

In this study, individuals who stated that their income was good had more diarrhea symptoms than those who stated that their income was moderate or poor. At the same time, patients with a low income had worse economic difficulty scores than those with middle and high income. In a study conducted to determine the symptoms that occur due to chemotherapy treatment and the effect of these symptoms on quality of life, it was found that patients with high-income status have high quality of life scores (34). In the study of Altıparmak et al. (29) stated that those with sufficient income perception had better quality of life, global health status, and role functioning than those with low-income perception. Zimmermann et al. (32) found that low-income cancer patients had a lower quality of life. Gelin and Ulus. (33) observed that the higher the economic status of patients,

the higher the quality of life scores. Economic problems of individuals with poor health conditions due to health-related expenditures, care costs, etc. worsen the quality of life of people. At the same time, a high-income state makes individuals more comfortable with their purchasing power and nutrition, leading to the more frequent occurrence of certain symptoms (diarrhea, etc.) accordingly.

In this study, it was found that as dyspnea effort, anxiety, discomfort, and the total score increased, quality of life, global health status, physical functioning, role functioning, emotional functioning, cognitive functioning, and social functioning scores decreased. At the same time, this study found that as the effort, anxiety, discomfort, and total score increased, the symptoms of fatigue, pain, respiratory distress, and insomnia increased. In a study examining the symptom correlates of dyspnea in patients with advanced cancer, it was stated that tiredness, loss of appetite, depression, and anxiety were significant for the presence of moderate/severe dyspnea in patients (35). A study examining the characteristics and relationships of dyspnea in patients with advanced-stage cancer reported that dyspnea was positively correlated with fatigue, sleep, depression, anxiety, and feelings of well-being (36). In a study examining the emotional problems, quality of life, and symptom burden in patients with lung cancer, the severity of emotional problems increased, as did reported level of symptom burden, and those with more emotional problems reported having more frequent pain, greater pain severity, more dry coughing, more shortness of breath, and greater fatigue (13). It has been reported that the frequency of respiratory distress and insomnia symptoms is higher and quality of life is reduced in patients with advanced lung cancer (37). It has been reported that dyspnea is associated with many symptoms, such as fatigue, anxiety, and appetite loss causing poor quality of life in patients (26). It has been reported that patients with high dyspnea scores experience more severe physical symptoms, such as weakness, choking, tension, congestion, panic, and pain, and have higher anxiety levels (38). Because of the diagnosis of the disease and side effects of treatment, lung cancer patients experience respiratory distress, which is one of the basic functions of survival. This condition causes difficulties in performing other activities and negatively affects quality of life, along with other side effects.

Limitation

Since the study was conducted with patients who applied to the medical oncology clinic of the faculty of medicine hospital between the study dates, met the inclusion criteria,

and volunteered to participate, the research data can only be generalized to patients who are treated only in the institution where the study was conducted.

Conclusion

In this study; it was found that dyspnea symptoms and quality of life in patients with lung cancer were moderate. The quality of life was worse among females with lung cancer, unemployed individuals, and those with low-income status. Quality of life decreased as dyspnea symptoms worsened. In conclusion, health professionals should evaluate the symptoms of dyspnea that individuals with lung cancer may experience due to diagnosis and treatment and provide individualized care. Nurses should ensure that patients benefit from physical and psychosocial support to reduce dyspnea symptoms. In addition, nurses should provide treatment, care, and counseling that will improve patients' quality of life by reducing their physical and psychosocial symptoms.

ETHICS

Ethics Committee Approval: Approval from the Scientific Research Ethics Committee of the Tarakya University Faculty of Medicine and research permission were obtained from the institution where the study was conducted (08.01.2018/TUTF-BAEK 2018/05).

Informed Consent: The purpose and scope of the study were communicated to the patients in the sample group before the study and their verbal consent was obtained.

FOOTNOTES

Authorship Contributions

Concept: S.K., S.U., Design: S.K., Data Collection or Processing: S.K., İ.Y.Ç., Analysis or Interpretation: S.K., S.U., Literature Search: S.K., S.U., İ.Y.Ç., Writing: S.K., S.U., İ.Y.Ç.

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