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RESEARCH PAPER

Fatigue, anxiety and depression levels, activities of daily living of patients with chronic obstructive pulmonary disease

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Fatigue, anxiety and depression levels, activities of daily living of patients with chronic obstructive pulmonary disease

The aim of this cross-sectional study was to determine the fatigue, anxiety and depression levels, activities of daily living of patients with chronic obstructive pulmonary disease ($n = 255$). It was found that there was significant difference between Visual Analogue Scale for Fatigue (VAS-F) point averages and gender, education levels, marital status and economical status of patient with chronic obstructive pulmonary disease. Among the participants in this study, 36.5% had an anxiety disorder whereas 69.0% exhibited depression. In the study, it was determined that 85.5% of those were independent in their Katz's Index of Activities of Daily Living (ADLs) and 49.4% of those were independent in their Lawton and Brody's Index of Instrumental Activities of Daily Living (IADLs). This study has shown that VAS-F, the Hospital Anxiety and Depression Scale, ADL and IADL instruments that measure the various aspects of health-related quality of living can contribute considerably to a more diversified understanding of the patients' situation with chronic obstructive pulmonary disease.

Key words: activities of daily living, anxiety, chronic obstructive pulmonary disease, depression, fatigue.

INTRODUCTION

Chronic obstructive pulmonary disease (COPD) is characterized by cough, phlegm, dyspnoea, chest pain, wheeze, decreased exercise tolerance and exacerbations.[1] COPD is a major cause of chronic morbidity and mortality throughout the world. Many people suffer from this disease for years and die prematurely from it. COPD is the fourth leading cause of death in the world and further increases in its prevalence and mortality can be predicted in the coming decades.[2] By 2020, the World Bank and the World Health Organization have projected that COPD will be the third leading cause of death and the fifth cause of disability in the world.[3] Approximately 2.5 million people die each year worldwide due to COPD which is a serious cause of death. It is estimated that this disease will

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rank fifth by 2020 in terms of global death. When death rates adapted to age between 1968 and 1995 in the United States were evaluated, a decrease was observed in deaths associated with coronary heart disease, stroke, other cerebrovascular diseases and other causes of death outside these diseases, whereas a serious increase (163%) was found in COPD-related death rates in the same period. Today, COPD ranks the sixth worldwide among all causes of death, and it is estimated to rank third by 2020. Although we do not have conclusive figures, the number of COPD patients in our country is estimated to be around 2.5–3 million.[4]

The patients with COPD often experience a variety of symptoms, with fatigue and dyspnoea as the two most common symptoms. Although fatigue is reported to occur with nearly the same frequency as dyspnoea. There are only a few studies focusing on fatigue in this group of patients.[5–7] Fatigue is one of the most distressing symptoms of this illness,[8,9] and significantly impairs both functional performance and quality of living.[10,11]

Anxiety and depressive symptoms are common in patients with COPD. Regardless of whether they are considered separately or as a combined construct, these symptoms adversely affect health-related quality of living and are likely to contribute to the physical disability and economic burden resulting from the disease. Factors such as cigarette smoke exposure, heightened experiences of dyspnoea, physical inactivity, social isolation, chronic hypoxia and long-term oxygen therapy might contribute to these psychological disorders in COPD.[12] A number of researchers have reported the severity of anxiety and depression in COPD.[13–15] Anxiety is a common co-morbidity in people with COPD but its identification and management are often insufficient.[16] People with COPD often experience more symptoms than those with other respiratory diseases. For example, it has been reported that patients with COPD and asthma had statistically significantly higher depression scores than individuals with tuberculosis.[15]

Complaint of exercise intolerance is common to patients with COPD, who also have to cope with exacerbations and remissions. Exercise, activities of daily living (ADLs), and health-related quality of living, which can be severely affected by such exacerbations, are interrelated and substantially impact the lives of these patients. Anxiety, depression and related emotional problems are often the squeals of this impact.[17] Individuals affected with COPD-related respiratory failure are frequently impaired in their social living, psychic function and ADLs[18]; therefore, it is of crucial importance to demonstrate the relationship between COPD and quality of living in this population.[19]

Nurses can play a vital role in screening and managing fatigue, anxiety, depression and levels of ADLs, and educating people strategies to prevent this symptoms in patients with COPD.[16] To improve health-related quality of living in patients with COPD, nursing interventions must focus on prevention of risk factors.[20,21]

Despite the prevalence of fatigue,[5,6,8,9] anxiety, depression,[13–15] levels of ADLs[18] in COPD patients, limited research has examined the relationship between the demographic variables and these symptoms.

Because COPD is a chronic disease, it is highly important to inform the patient about the disease and provide him/her with rehabilitation. The nurse should inform the patient with COPD about the disease, respiratory therapy, physiotherapy for respiration and exercise, occupational therapy, techniques of reducing energy consumption during daily living activities, nutrition, smoking cessation, COPD and sex living, methods of coping with chronic disease, and communication with health-care professionals.[22] The nurse should also monitor the patient regularly, assess his/her status of fatigue and anxiety, determine his/her activities according to his/her fatigue condition, and provide him/her with psychological support when necessary.

The aim of this study was to explore relations between demographic variables and the symptoms of fatigue, anxiety, depression, levels of activities of daily living of patients with COPD. The following research questions were addressed:

- What is the prevalence of fatigue, anxiety depression, and levels of activities of daily living in patients with COPD?
- What are the relations between the demographic variables and symptoms of fatigue, anxiety, depression and levels of activities of daily living?

METHODS

Population and determination of sampling

The study had a descriptive and cross-sectional design. The patients were recruited from a population of COPD patients from two general hospitals in the east and central regions of Turkey. Research data were collected between April and September 2010 in the Chest Inpatient Clinics at

Erzincan State Hospital and Kırşehir State Hospital in Turkey. No sampling was attempted in the study and the COPD patients who volunteered to participate (having been diagnosed with COPD for at least 6 months, residing in central Erzincan and Kırşehir, hospitalized in the clinic for at least 2 days and over, not having any serious complications, not having any psychiatric history of illness) and with whom communication could be established were included in the study ($n = 255$). Patients who were hospitalized in the thoracic clinic for 2 days and longer were included in the study, because the first 24 h of hospitalization is stressful and could affect patients' state of anxiety and depression.

Instruments

The data for the study were collected by the investigators during face-to-face interviews using the questionnaire prepared by the investigators for determining the patient identification form and the Visual Analogue Scale for Fatigue (VAS-F), developed by Zigmond and Snaith, the Hospital Anxiety and Depression Scale (HADS), Katz's Index of Activities of Daily Living (ADLs), and Lawton and Brody's Index of Instrumental Activities of Daily Living (IADLs). Filling out the forms lasted 25–30 min on the average.

Data collection tools

Patient identification form

This form includes questions on socio-demographic information such as gender, age, marital status; information regarding disease and length of hospital stay; and smoking. Patients were also asked about their educational level, which was categorized as primary school or below, secondary and high school, and university or above, according to Turkey's educational levels. The sheet for the baseline characteristics of the participants was developed by the authors based on the chart abstraction standardization.

VAS-F

VAS-F, which measures patients' perceived fatigue and energy, was developed by Lee *et al*. The scale has two subscales of fatigue and energy. The VAS-F has a 100 mm long horizontal line with 'not at all' written on one end and 'very severe' on the other end. The patient marks the severity of fatigue at that moment on the line between these two degrees. Scoring is done with the help of the marked area on the ruler. The VAS-F subscale goes from most positive items to most negative, and the energy subscale goes from most negative to most positive items. A high score from the VAS-F scale indicates a low score from the energy subscale and a severe level of fatigue. In addition, the scale is preferred because it is easy to use, short and easy to understand. The scale consists of 18 items with a score range of 0–10 for each question. Higher scores indicate higher intensity of fatigue. Thirteen questions ask about feeling of fatigue, whereas five asked about energy. Its internal consistency reliabilities are high.[23] The validity and the reliability of the Turkish version of VAS-F was established by Yurtsever and Bedük.[24] In this study, Cronbach's alpha of fatigue subscale was 0.83 and energy subscale was 0.88.

Anxiety and depression scale

Anxiety and depression were measured using HADS. The HADS was developed by Zigmond and Snaith. The HADS consists of 14 items, seven of which score for anxiety (HADS-A) and seven of which score for depression (HADS-D). The HADS is designed to measure levels of either anxiety or depression independently from each other. Each question has a 4-point scale. Scores range from 0 to 21, with higher scores indicating the presence of anxiety and depression. The scores range from 0 to 21 for each subscale, with a score of 0–7 denoting a non-case, 8–10 a possible case and 11 or higher a probable case.[25] Aydemir conducted work on its validity and reliability in Turkey. Cut-off points on each of the subscales of 7/8 for possible and 10/11 for probable diagnosis of anxiety and depression have been recommended.[26] The instrument demonstrates good internal consistency, with 0.85 as the average Cronbach's alpha scores of the anxiety subscale and 0.83 as the depression subscale.

Katz's index of ADLs and Lawton and Brody's index of IADLs

ADLs in COPD patients were assessed by using ADLs and IADLs. ADLs consist of six questions such as bathing, dressing, toileting, mobility, bladder control and feeding. Subjects are classified by a score ranging from 1 (dependent), 2 (semi-dependent), to 3 (independent). The ADLs have six items with a score ranging 0–18; a value of 0–6 indicates a dependent individual, 7–12 indicates a semi-dependent individual and 13–18 indicates an independent individual. IADLs involve higher functioning, such as home maintenance, shopping for clothing and food, preparing meals, travelling alone via car or public

transportation, and managing finances. Subjects are classified by a score ranging from 1 (dependent), 2 (semi-dependent), to 3 (independent). The IADLs have eight items with a score ranging 0–24; a value 0–8 indicates a dependent individual, 9–16 indicates a semi-dependent individual and 17–24 indicates an independent individual.[27] Reliability (Cronbach's alpha) scores for the scales were ADLs 0.84 and IADLs 0.85.

Statistical analysis

Data were analysed using SPSS software, version 11.0 for Windows (SPSS Inc., Chicago, IL, USA). For the analysis of data, descriptive statistical methods such as percentage, mean, median and standard deviations had been used. Independent sample *t*-test, one-way analysis of variance and least significant difference (LSD) *post hoc* test were used to determine which of the socio-demographic variables were related to the VAS-F, HADS, ADLs, and IADLs scores. Cronbach's alpha coefficients for the VAS-F, HADS, ADLs and IADLs subscales have provided an estimate of internal consistency reliability of the instruments. For the analysis of relationship between each other for the fatigue, energy, anxiety and depression, ADLs had been used for correlation. The level of statistical significance was set at $P \leq 0.05$.

Ethical considerations

The hospital director's two general hospitals in the east and central regions of Turkey approved the study. Permission was obtained from the institutions where the study could take place by sending an application with the tools to be used through the province's Health Directorate. Written permission was received from the institutions where the research would be carried out by applying through the Ministry of Health of the Erzincan and Kırşehir in Turkey province, with a petition enclosing the tools to be used in the research. Informed consent has been obtained from all participants and personal information had been kept strictly confidential. Participants completed the questionnaire and instruments. Completed questionnaire and instruments were coded and sealed in an envelope to keep confidentiality.

RESULTS

Finally, 255 patients (Mean = 68.87 ± 10.97 years) participated in the study, of which 101 were women and 154 were men. Of the total sample, 49.8% were literate (literate individuals (those who did not have primary school diploma and who learned how to read and write on their own or by attending literacy courses), 71.0% were married, 37.3% were housewives, 24.3% were farmers and predominantly 'income = expenditure' (58.8%). The characteristics and diagnosis of the patients are described in Table 1.

The mean length of stay in hospital of the patients was 7.01 days (SD = 4.73); the median length of time diagnosed with COPD was 8 years. Most patients were not given social support (51.0%) and their other chronic disease 'present' (67.1%) according to self-report of participants. The most frequently diagnosed diseases were hypertension (63.7%), heart disease (40.3%) and diabetes (type 2) (25.7%), respectively (Table 1).

Ninety-one per cent of the patients were currently non-smokers, whereas 52.9% of the sample had been ex-smokers. In current smokers, they smoke 14.26 ± 9.25 grooves/day; the duration of smoking was 29.91 ± 19.21 years. In ex-smokers, they smoke 29.09 ± 17.37 grooves/day; the duration of smoking was 34.18 ± 16.59 years (Table 2).

The mean VAS-F score of study participants was 72.47 ± 19.67. The mean HADS-A score of patients with COPD was 8.35 ± 4.48, whereas the mean HADS-D score of was 8.74 ± 4.44. In the study it was determined that there was 30.2% risk of severe anxiety of 33.7% risk of severe depression in patients with COPD. Also, it was determined that 85.5% of those were independent in their ADLs and 49.4% of those were independent in their IADLs (Table 3).

Significant difference was found between widowed (M = 77.57 ± 18.99), married (M = 70.57 ± 19.90) and unmarried (M = 70.60 ± 2.50) on VAS-F scores. And by using post *hoc* test, it was found that the widowed experienced more fatigue than the unmarried and married. A statistically significant difference was found between education level ($P < 0.01$), between VAS-F energy scores and marital status ($P < 0.05$), and education level ($P < 0.001$) of patients. Females experienced more fatigue and had less energy than males. Widowed individuals experienced more fatigue and had less energy than married and unmarried individuals. It was determined that the patients who were literate and had less income experienced more fatigue and had less energy than the others. As a result of the LSD *post hoc* test, a statistically significant difference in the levels fatigue and energy was found between the widowed and literate individuals (Table 4).

Table 1 Patient's socio-demographic and disease-related variables ($n = 255$)

Variables	*n*	%
Gender		
Female	101	39.6
Male	154	60.4
Marital status		
Married	181	71.0
Divorced/Widow	69	27.0
Single	5	2.0
Age group		
49 and below	18	7.1
50–59	23	9.0
60–69	74	29.0
70–79	104	40.8
80 and over	36	14.1
Education status		
Literate†	127	49.8
Primary school	104	40.8
Secondary school	15	5.9
High school + University	9	3.5
Occupational status		
Farmer + shopkeeper	87	34.1
Housewife	95	37.3
Civil servant	3	1.2
Retired	55	21.6
Worker-Unemployed	15	5.8
Financial status		
Income is lower than expenditure	92	36.1
Income is equal to expenditure	150	58.8
Income is higher than expenditure	13	5.1
Social support status		
Yes	73	28.6
No	182	71.4
Status of having any disease other than COPD		
Having	171	67.1
Not having	84	32.9
Additional diagnosis‡		
Hypertension	109	63.7
Heart disease	69	40.3
Diabetic (type 2)	44	25.7
Osteoarthritis	40	23.3
Hyperlipidaemia	18	10.5
Prostate	12	7.0
Another (osteoporosis, calculus, hernia, gastritis, renal failure, cataract, liver failure, psoriasis, goitre)	54	31.0

Variables	Mean ± SD
Age (years)	68.87 ± 10.97
The length of stay in hospital (Days)	7.01 ± 4.73
Length of time diagnosed (Years)	12.03 ± 12.77

† Literate individuals (those who did not have primary school diploma and who learned how to read and write on their own or by attending literacy courses. ‡ Patients gave more than one response. The percentages are calculated per $n = 171$. COPD, chronic obstructive pulmonary disease.

Table 2 Patient's smoking-related variables ($n = 255$)

Variables	*n*	%
Currently smoking (non-smoking)	232	91.0
Ex-smokers	135	52.9

Variables	Mean ± SD
Smoking amount, grooves/day	14.26 ± 9.25
Duration of smoking, years	29.91 ± 19.21
Smoking amount, grooves	29.09 ± 17.37
Duration of smoking, years	34.18 ± 16.59

There was a significant difference between HADS-A scores and gender and economic status ($P < 0.05$), and between HADS-D scores and gender, education level and economic status ($P < 0.01$). Female, widowed, high school/university graduate and with less income patients were more anxious and depressive than the others. As a result of the LSD *post hoc* test, a statistically significant difference in the levels anxiety and depression was found between the literate, primary school graduate and with less income individuals (Table 4).

Statistically significant difference between ADLs with COPD patients and gender (ADLs and IADLs $P < 0.001$), marital status (ADLs $P < 0.001$, IADLs $P < 0.01$) and education level (ADLs and IADLs $P < 0.001$) was found. It was also found that female, widowed, literate and with less income patients were more dependent than the others. As a result of the LSD *post hoc* test, statistically significant differences in the levels ADLs and IADLs were found between the education levels of all individuals. At the end of the comparison between male and female patients, it was determined that women had higher levels of fatigue, lower levels of energy, and higher levels of anxiety and depression. Also, women were observed to be more dependent in their daily living activities and instrumental daily life activities compared with men (Table 4).

Table 5 shows a significantly negative ($P < 0.001$) bivariate relationship between VAS-F and VAS-E, ADLs, IADLs, VAS-E and HADS-A, HADS-D, HADS-A and ADLs, IADLs, HAD-D and ADLs, IADLs. Pearson's r ranged from −0.12 to −0.71. There was a significantly positive ($P < 0.001$) VAS-F and HADS-A, HADS-D, VAS-E and ADLs, IADLs, HADS-A and HADS-D. Pearson's r ranged from 0.32 to 0.71.

Table 3 Mean and standard deviation for the VAS-F and HADS subscales and levels of dependent in ADLs and IADLs ($n = 255$)

Subscales	Mean ± SD	
VAS-F Fatigue	72.47 ± 19.67	
VAS-F Energy	18.34 ± 10.87	
HADS-Anxiety	8.35 ± 4.48	
HADS-Depression	8.74 ± 4.44	
ADLs	15.36 ± 2.77	
IADLs	16.43 ± 4.40	
	n	%
ADLs		
Dependent (0–6 point)	3	1.2
Semi-dependent (7–12 point)	34	13.3
Independent (13–18 point)	218	85.5
IADLs		
Dependent (0–6 points)	9	3.5
Semi-dependent (7–12 points)	120	47.1
Independent (13–18 points)	126	49.4
The severity of HADS-Anxiety		
Mild	114	44.7
Moderate	64	25.1
Severe	77	30.2
The severity of HADS-Depression		
Mild	113	44.3
Moderate	56	22.0
Severe	86	33.7

ADLs, Katz's Index of Activities of Daily Living; HADS, Hospital Anxiety and Depression Scale; IADLs, Lawton and Brody's Index of Instrumental Activities of Daily Living; VAS-F, Visual Analogue Scale for Fatigue.

DISCUSSION

One of every 10 people in the world and in Turkey has COPD. However, only one tenth of individuals with COPD are aware of their disease.[28] Dyspnoea and exercise intolerance are the two most common complaints from patients with COPD, who also have to cope with exacerbations and remissions. Exercise, ADLs and health-related quality of life, which can be severely affected by such exacerbations, are interrelated and substantially impact the lives of COPD patients. Depression, anxiety and related emotional problems are often the sequelae of this impact.[17]

It was established that 40.8% of the patients with COPD participating into the study were aged between 70 and 79 years. The mean age of patients with COPD was found to be 68.87 ± 10.97. This study has similar results with those by Pirraglia *et al.*,[29] Mollaoğlu *et al.*,[30] Wong *et al.*[31] and Chen and Narsavage.[32] According to current data, morbidity caused by COPD increases with age and is greater in men than in women, though morbidity and mortality are increasing in women at a faster rate than in men.[17]

Some 63.7% of patients with a condition other than COPD were determined to be hypertensive patients. Another result of this study, which is comparable with the results reported in other studies,[29,33–36] is that hypertension was the primary and most common disease except COPD among these people.

There was another similarity of our study comparable with previous studies[31,37]; there were 52.9% who were ex-smokers. Engström *et al.*[37] found that there were 54.0% ex-smokers and Wong *et al.*[31] reported that there were 78.6% ex-smokers. Cigarette smoking is a major risk factor for COPD and COPD severity.[36,38,39]

Fatigue is a common and generally overlooked symptom in chronic disease populations.[40] Earlier studies have reported that patients with fatigue have difficulty in describing their experience of fatigue to nurses.[41,42] The results of this study confirm that fatigue is one of the major symptoms for patients with COPD. Another similarity of our study was comparable with previous studies.[5,31,43] When the literature was examined, it was seen that VAS-F scale results pointed out high scores for the rheumatoid arthritis patient group in the original studies of Belza *et al.*[44] and Wolfe[45], and for COPD patients in the studies of Theander *et al.*[43] and Wong *et al.*[31] In this study, it was found that there was a highly significant difference between fatigue subscale and gender, and the average fatigue level of female participants was higher than male participants. These studies show that female patients were more fatigued than male patients. Belza *et al.*,[44] Huyser *et al.*,[46] and Ünsal[47] found that gender was related to fatigue patients with arthritis. Kapella *et al.*[6] found different scores for fatigue in men and

Table 4 Socio-demographic variables to the VAS-F, HADS, ADLs and IADLs in COPD patients ($n = 255$)

Socio-demographic variables	n (%)	VAS-F point averages		HADS point averages		ADLs point averages	
		Fatigue $\bar{X}+SD$	Energy $\bar{X}+SD$	Anxiety $\bar{X}+SD$	Depression $\bar{X}+SD$	ADLs $\bar{X}+SD$	IADLs $\bar{X}+SD$
Gender							
Female	101 (39.6)	75.36 ± 18.70	16.98 ± 10.98	9.5 ± 4.76	9.70 ± 4.88	14.96 ± 3.22	15.97 ± 5.32
Male	154 (60.4)	70.57 ± 20.11	19.24 ± 10.73	7.57 ± 4.13	8.12 ± 4.02	15.62 ± 2.40	16.73 ± 3.66
		1.913†	−1.634†	4.484†	7.847†	12.507†	32.084†
		$P > 0.05$	$P > 0.05$	**$P < 0.05$**	**$P < 0.01$**	**$P < 0.001$**	**$P < 0.001$**
Marital status							
Married	181 (71.0)	70.57 ± 19.90	19.62 ± 10.85	8.17 ± 4.33	8.34 ± 4.23	15.72 ± 2.40	15.92 ± 4.23
Unmarried	5 (2.0)	70.60 ± 2.50	18.20 ± 4.08	7.40 ± 3.36	8.60 ± 1.67	17.40 ± 0.89	20.20 ± 2.28
Widowed	69 (27.1)	77.57 ± 18.99	15.01 ± 10.64	8.89 ± 4.94	9.81 ± 4.65	14.26 ± 3.37	14.86 ± 4.52
		3.246‡	4.619‡	.760‡	2.747‡	8.856‡	7.683‡
		$P < 0.05$	**$P < 0.05$**	$P > 0.05$	$P > 0.05$	**$P < 0.001$**	**$P < 0.01$**
Education level							
Literate	127 (49.8)	78.65 ± 15.38	17.54 ± 11.15	8.76 ± 4.50	9.81 ± 4.66	14.27 ± 3.17	14.17 ± 4.22
Primary school	104 (40.8)	66.45 ± 19.23	21.25 ± 10.35	7.99 ± 4.19	7.84 ± 4.03	16.08 ± 2.23	17.82 ± 3.85
Secondary school	15 (5.9)	71.20 ± 31.51	18.80 ± 13.43	7.80 ± 4.21	7.13 ± 3.56	16.06 ± 1.79	17.86 ± 2.94
High school/University	9 (3.5)	73.66 ± 20.19	23.66 ± 13.68	10.88 ± 5.84	10.55 ± 5.74	17.55 ± 0.72	22.22 ± 2.04
		5.153‡	5.244‡	1.228‡	3.428‡	7.805‡	16.267‡
		$P < 0.01$	**$P < 0.001$**	$P > 0.05$	**$P < 0.01$**	**$P < 0.001$**	**$P < 0.001$**
Economic status							
Income > expenditure	92 (36.1)	74.96 ± 17.60	16.82 ± 9.79	9.34 ± 4.32	9.91 ± 4.34	14.83 ± 2.95	15.77 ± 4.68
Income = expenditure	150 (58.8)	71.08 ± 20.67	18.78 ± 11.05	7.81 ± 4.56	8.10 ± 4.38	15.62 ± 2.66	16.79 ± 4.12
Income < expenditure	13 (5.1)	70.76 ± 21.41	24.15 ± 14.15	7.61 ± 3.77	7.92 ± 4.55	16.00 ± 2.16	16.92 ± 5.21
		1.162‡	2.917‡	3.590‡	5.104‡	2.716‡	1.628‡
		$P > 0.05$	$P > 0.05$	**$P < 0.05$**	**$P < 0.01$**	$P > 0.05$	$P > 0.0$

$P < 0.05$; there is significant difference, $P < 0.01$; there is most significant difference, $P < 0.001$; there is most significant difference. † Independent sample t-test. ‡ ANOVA. ADLs, Katz's Index of Activities of Daily Living; COPD, chronic obstructive pulmonary disease; HADS, Hospital Anxiety and Depression Scale; IADLs, Lawton and Brody's Index of Instrumental Activities of Daily Living; VAS-F, Visual Analogue Scale for Fatigue.

Table 5 Correlation matrices between symptoms ($n = 255$)

	VAS-F	VAS-E	HADS-A	HADS-D	ADLs	IADLs
VAS-F	1	−0.71	0.32	0.36	−0.45	−0.45
VAS-E	—	1	−0.18	−0.25	0.38	0.49
HADS-A	—	—	1	0.71	−0.23	−0.12
HADS-D	—	—	—	1	−0.41	−0.34

ADLs, Katz's Index of Activities of Daily Living; HADS, Hospital Anxiety and Depression Scale; IADLs, Lawton and Brody's Index of Instrumental Activities of Daily Living; VAS-E, Visual Analogue Scale for Energy; VAS-F, Visual Analogue Scale for Fatigue.

women. Mollaoğlu *et al*.[30] found that fatigue scores of females are higher and their energy scores are lower compared with those of males. This supposition is supported by the findings from earlier studies.[6,44,46] However, Theander *et al*.[43] and Wong *et al*.[31] (in COPD patients), and Repping-Wuts *et al*.[48](in rheumatoid arthritis) found that fatigue was not affected by the gender. Widowed, literate individuals and the patients with more income were more fatigued and less energetic than the others. This might be the result of the fact that the widowed individuals have less social and family support. The reason for this might be the fact that the literate individuals are less capable of coping with fatigue. This might be the result of the fact that the economic level improves the quality of living. This findings show that the predictors of decreased fatigue and increased energy were higher levels of education and economic status.

In our study, symptoms of anxiety were reported by 36.5% of participants. According to Kunik *et al*.[49] 65% of COPD patients receive an anxiety and/or a depression disorder diagnosis. Similar results were reported by Wong *et al*.[31] and Blinderman *et al*.[50]; 69.0% of individuals in this sample reported symptoms of depression. In several other studies with COPD patients, Wong *et al*. (21.4%),[31] Di *et al*. (18.8%),[51] van Manen *et al*.[52] (25.0%) and Walke *et al*.[53] (56.0%) found that had depression was different levels. Another important result in this study was that female patients undergoing COPD had reported significantly more anxiety and depression than male patients. This can partly be due to the selection of patients being female. Other studies of COPD have identified gender differences in the experience of anxiety and depression symptoms. Di *et al*.[51] found that women experienced statistically significantly more anxiety and depression than men. However, Shuldham *et al*.[54] and Kapella *et al*.[6] found that anxiety levels were not affected by the gender. Zhang *et al*.[55] also found that there were no significant differences in the incidence of depression among people of different gender. In this study, it was found that the individuals between the high school/university graduate and low economic status were more anxious and depressive than the other groups. However, Borge *et al*.[36] found that less education was associated with higher scores for anxiety and depression. The reason for this might be the fact that the individuals with high educational level are less capable of coping with anxiety and depression. It could be associated with the fact that individuals with higher education level do not apply strategies to cope with anxiety and depression as they experience more problems in their daily life and work environment. A higher prevalence of anxiety and depression was found in patients who were female, unemployed and separated/divorced.[56] The prevalence of anxiety in COPD is generally considered to be high. Reviews of studies that have examined feelings of anxiety in COPD patients report prevalence ranging 2–96%.[12] In a systematic review of the literature, the prevalence of depression in patients with moderate to severe COPD ranged 7–42%.[12]

This result indicates the patient would avoid many activities or situations and this result supports previous studies.[57,58] ADLs and quality of living could be seen as a continuum in COPD. The patients affected with COPD-related respiratory failure are frequently impaired in their social living, psychic function and ADLs. The primary care nurses and physician should be able to ascertain an approximate level of severity by assessing the patient's ability to perform ADLs and IADLs as well as productive activities. In early COPD, with only mild dyspnoea on exertion, the patient should be able to participate in most productive activities. In 'stable' COPD, with moderate dyspnoea on exertion, patients should be able to accomplish at least most of the IADLs. Finally, in severe COPD,

patients might be able to complete only the most ADLs or they might need assistance with them.[19,59] Most patients tend, more or less unconsciously, to limit their physical activity gradually in accordance with the slowly increasing impairment of pulmonary function. However, when the pulmonary function is severely impaired, even ADLs are affected.[37]

In our study fatigue was statistically significantly negatively related to energy, ADLs and IADLs. More fatigue was associated with less energy, ADLs and IADLs. More fatigue was associated with more anxiety and depression. Energy was statistically significantly negatively related to anxiety and depression. More energy was associated with more ADLs and IADLs. More anxiety was associated with more depression. In our study, anxiety and depression were statistically significantly negatively related to ADLs and IADLs. Several studies suggest that anxiety and depression are associated with breathing difficulties.[36,60,61] The reasons for this are complex. Anxiety is often related to panic and fear and therefore can cause breathlessness, which in turn brings on more anxiety.[60] Feeling of hopelessness because of physical limitations and lack of energy[62] for activities such as shopping and cleaning can also lead to depression.

Nursing assessment of individuals with COPD should include an objective view of the possibility of patients being anxious or depressed, and the plan of care should incorporate strategies to alleviate these problems if they are present.

CONCLUSIONS

This study has shown that VAS-F, HADS, ADLs and IADLs instruments that measure the various aspects of health-related quality of living can contribute considerably to a more diversified understanding of the patients' situation with COPD. Clinical descriptions of patients with COPD are commonly restricted to their disease-specific symptoms and include details of the consequences for their everyday living. The information could serve as an important aid to rehabilitation in identifying patient-specific problems, individualizing rehabilitation programmes, evaluating treatment and nursing care. Additional research should focus on using different instruments such as sleep quality, quality of living and functional status in COPD patients. In addition, older age and limited functioning can be identified during a comprehensive nursing assessment and used to create individualized discharge plans.

LIMITATIONS OF THE STUDY

We should mention the limitations of the present study. Our findings might not generalize to other populations. Our study included only inpatients with COPD, as we experienced difficulty in recruiting a sufficient number of outpatients with COPD. Therefore, any generalization of our results to outpatients with COPD could be unwarranted. Despite this limitation, this study contributes to the literature on fatigue, anxiety and depression levels and ADLs and IADLs of patients with COPD. Results obtained from the study can be generalized to the mentioned units and patients who applied on specified dates.

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