RESEARCH ARTICLE

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HOW DOES FATIGUE IN INDIVIDUALS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE EFFECT DEPENDENCY STATUS

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ABSTRACT

Fatigue, one of the most important symptoms in COPD and if not controlled, the activities of daily living and quality of life of the individual are negatively affected. The study aims to determine the relationship between fatigue levels and daily living activities of individuals with Chronic Obstructive Pulmonary Disease. The average age of the patients participating in the study was 69.18±9.6, 66.7% were male. The mean fatigue score of the patients was 64.15±14.3. It was determined that 6.3% of the patients were semi-dependent in their activities of daily living and 30.6% were semi-dependent in their instrumental activities of daily living. A negative and statistically significant relationship between the fatigue score of the patients and the score of activities of daily living and instrumental activities of daily living was found (p=0.001, p=0.003). Also there was negative relationship between age and IADL. Fatigue levels of individuals with chronic obstructive pulmonary disease; bathing, dressing, home works, transportation means to meet the requirements of the need to meet higher in dependent group. The mean fatigue score of the patients was above the scale average. The determination of the areas where these patients are dependent on is important in terms of solution approaches.

Keywords: Chronic Obstructive Pulmonary Disease, Activities of Daily Living, Instrumental Activities of Daily Living, Fatigue

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1. INTRODUCTION

Chronic Obstructive Pulmonary Disease (COPD) is a disease characterized by not completely reversible, usually progressive airflow limitation, associated with abnormal inflammatory response in the lungs against detrimental particles and gases. In the National Disease Burden study, the prevalence was 10.2 in one thousand (8.4 in males and 11.9 in females), the incidence was 72.7 per hundred thousand (76.8 in males and 68.5 in females). COPD is one of the major causes of both morbidity and mortality worldwide and has been increasing in recent years and is estimated to rise to the third place among causes of death in 2020 (Öztürk & Günay, 2011).

Patients with COPD are always living together with the difficulties of their illness. These individuals face difficult and complex problems due to their limitations on activities of daily living, changes in emotional, cognitive and physical activities, economic and social limitations, caused by their illness (Ünsal & Yetkin, 2005).

Dyspnea, fatigue, and cough are the most common physical symptoms of these patients (Ek & Ternestedt, 2008). Fatigue, is the most common complication of coughing, that we have confronted (Kartaloğlu, Okutan & İlvan, 2001). Dyspnea was defined as fatigue by COPD and asthma patients, and a positive correlation was found between these two symptoms (Small & Lamb, 2000). Fatigue, one of the most important symptoms in COPD, is almost always felt by 43% to 58% of individuals with COPD, although it can be seen in 18.3% to 25% of the general population (Wong et al., 2010), and if not controlled, the activities of daily living and quality of life of the individual are negatively affected (Yurtsever, 2000). The term of activities of daily living is used to assess personal, self-care activities, and performance in daily routine needed for an independent life. It includes basic self-care activities in daily life such as eating, bathing, dressing, and mobility. If these activities cannot be performed, the patient becomes dependent on other people or assistive devices (İnce et al., 2005).

Until the severity of COPD is advanced, the level of patients' activity performance is not severely limited. However, with the progression of the disease, patients who avoid exercise due to dyspnea and fatigue think that a sedentary life is safe for them and limit their activities of daily living. As a result, their dependency levels are increasing (Korkmaz Ekren & Alev Gürgün, 2013). For individuals with chronic obstructive pulmonary disease, it is necessary to determine how fatigue affects daily activities in order to identify health services and meet the needs of patients. Therefore, health care services can be provided to ensure that patients are more independent and improve their quality of life. This study was conducted to determine the level of fatigue in individuals with Chronic Obstructive Pulmonary Disease and to determine the effect of dependence on fulfilling the activities of daily living.

2. MATERIALS and METHODS

Study Design

The research organised in an analytical and cross-sectional design. It was carried out in inpatient treatment at the Chest Diseases Hospital in the city centre center in the East Black Sea Region, Turkey. The sample of the research consists of 111 patients with participants voluntarily.

Ethics approval and consent to participate

The research conforms to the provisions of the Declaration of Helsinki. All participants gave informed consent for the research, and that their anonymity was preserved**.**

Data collection

Data were collected by the researcher using face-to-face interview technique using the "Information Form", "COPD and Asthma Fatigue Scale", "Katz's Index of Activities of Daily Living" and "Lawton and Brody's Index of Instrumental Activities of Daily Living". The filling out of forms have taken approximately 15-20 minutes.

Information Form: The form prepared by the researcher includes questions about socio-demographic characteristics such as age, gender, educational status, marital status, place of residence, occupation, income of the patients and questions about the characteristics of the illness such as duration of diagnosis, disease history other than COPD and smoking status.

COPD and Asthma Fatigue Scale: (CAFS)

COPD and Asthma Fatigue Scale (CAFS) was developed by Revicki et al. (2010), and Turkish validity and reliability were performed by Arslan and Öztunç (2013). The original scale consists of 12 items. The scoring typed of the scale is five-point Likert scale (1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Frequently, 5 = Very often) and a total of 12 to 60 scores is obtained. The score obtained is converted with the aid of a formula, which will range from 0 to 100 (**Formula: 100 * (total score-minimum value that may to be obtained / change interval).** In the scale, there is only one score obtained related to the fatigue condition and there is no evaluation related to the sub-dimensions. The increase in this score indicates that the level of fatigue of the person is high.

Katz's Index of Activities of Daily Living (ADL): The ADL index consists of 6 questions that include information about bathing, dressing, toilet, movement, emptying, movement and nutrition activities which are basic necessities to survive. The assessment is performed by giving 3 points if the individual is doing daily activities independently, 2 points if he / she is doing with help, 1 point if he / she is not able to do at all. In the ADL index, 0-6 points are being assessed as dependent, 7-12 points are semi-dependent, and 13-18 points are independent (Shelkey & Wallace, 1999).

Lawton and Brody's Index of Instrumental Activities of Daily Living (IADL): The IADL index consists of 8 questions about information on subjects that are oriented at independent living in the community which are phone use, food preparation, shopping, doing daily housework, doing laundry, getting on the means of transport, getting medication and money management. The assessment is performed by giving 3 points if the individual is doing daily activities independently, 2 points if he / she is doing with help, 1 point if he / she is not able to do at all. In the IADL index, 0-8 points are being assessed as dependent, 9-16 points are semi-dependent, and 17-24 points are independent. As scores increase, the level of dependence of patients decreases (Shelkey & Wallace, 1999).

3. STATISTICAL ANALYSES

SPSS-15 package program was used to evaluate the data. Data on the introductory and medical characteristics of patients participating in the study with ADL and IADL dependency status were evaluated using mean and percentage. T test and ANOVA test for data showing normal distribution; Mann-Whitney U and Kruskal Wallis-H tests from nonparametric tests for data not complying with normal distribution were used. The correlation between fatigue and ADL and IADL was evaluated by the correlation coefficient.

4. RESULTS

The mean age of the patients was 69.18±9.6 (min = 42, max = 88), 66.7% were male, 66.7% were primary school graduates, 73% were married, 57.7% were living in the village and 54.1% were having the balance of income and expenses (Table 1).

Table 1. Distribution of Some Socio-Demographic Characteristics of Patients (N=111)

Characteristics	Number	%
Age		
64 and under	35	31.5
65-74	45	40.6
75 and over	31	27.9
Sex		
Female	37	33.3
Male	74	66.7
Education Status		
Not literate	25	22.5
Primary education	74	66.7
Secondary education and upper	12	10.8
Marital Status		
Married	81	73.0
Single/Widowed	30	27.0
Occupation		
Farmer	30	27.0
Housewife	31	27.9
Worker	19	17.2
Officer / Retired	31	27.9
The Place He/She Lives		
Village	64	57.7
District	19	17.1
Province	28	25.2
Income Status		
Less than expense	48	43.2
Balanced	60	54.1
More than expense	3	2.7
Total	**111**	**100.0**

The mean score of CAFS scores of the patients was 64.15±14.3. It was determined that 6.3% of the patients were semi-dependent in ADL and 30.6% were semi-dependent in IADL. It was found that the patients were semi-dependent in activities of daily living such as excretion (45.9%), bathing (33.3%), nutrition (18.0%), dressing (17.1%) and moving (13.5%) and were fully dependent in the IADL such as doing laundry (41.4%), doing housework (35.1%), food preparation (30.6%), using telephone (21.6%) and money management (18.0%) (Table 2).

Table 2. Dependency Status of Patients in Their Activities of Daily Living (N=111)

Activities of Daily Living	**Independent**		**Semi-dependent**		**Fully dependent**	
	n	**%**	**n**	**%**	**n**	**%**
Status of Being Able to Bathing	63	56.3	37	33.3	11	9.9
Dressing Status	79	71.2	19	17.1	13	11.7
Toilet Status	94	84.7	13	11.7	4	3.6
Movement Status	91	82.0	15	13.5	5	4.5
Excretion Status	55	49.5	51	45.9	5	4.5
Nutrition Status	88	79.3	20	18.0	3	2.7
Instrumental Activities of Daily Living						
Status of Being Able to Telephoning	75	67.6	12	10.8	24	21.6
Status of Being Able to Shopping	76	68.5	19	17.1	16	14.4
Status of Being Able to Prepare Food	59	53.2	18	16.2	34	30.6
Status of Being Able to Doing Housework	13	11.7	59	53.2	39	35.1
Status of Being Able to Doing Laundry	35	31.5	30	27.0	46	41.4
Status of Being Able to Getting on the Means of Transport	76	68.5	18	16.2	17	15.3
Status of Being Able to Getting His/Her Own Medication	70	63.1	35	31.5	6	5.4
Status of Being Able to Managing His/Her Own Money	57	51.4	34	30.6	20	18.0

It was found that the CAFS mean score of the patients was different on the distribution of GYA and EGYA ($p<0.05$). The mean score of the patients who were fully dependent on bathing (73.48±14.10), dressing variables (74.35±14.06) and excretion (70.41±10.86) was high. In terms of IADL; In the variable of doing housework (68.80±15.37), the score of the fully-dependent group was high. IADL also had the fatigue score of the fully-dependent group in the variable transportability (72.54±13.54). Again in terms of IADL, the score of those who had independent status in managing the money in the distribution of fatigue status was high (Table 3).

Table 3. Distribution in term of ADL and IADL of dependency of patients according to CAFS score (N = 111)

Activities of Daily Living		**CAFS***	
	n	**X± SS**	**p**
Status of Being Able to Bathing			
Independent	63	61.67±12.44[a]	**F=3.796**
Semi-dependent	37	65.59±15.49	**p=0.026**
Fully dependent	11	73.48±14.10[a]	
Dressing Status			
Independent	79	61.47±13.91[a]	**F=6.262**
Semi-dependent	19	68.31±10.36	**p=0.003**
Fully dependent	13	74.35±14.06[a]	
Toilet Status			
Independent	94	63.98±14.41	
Semi-dependent	13	63.62±12.97	p>0.05
Fully dependent	4	69.79±7.70	
Movement Status			
Independent	91	63.30±14.61	
Semi-dependent	15	67.22±11.14	p>0.05
Fully dependent	5	70.41±8.51	
Excretion Status			
Independent	55	59.20±13.88[a]	**F=7.622**
Semi-dependent	51	68.87±12.72[a]	**p=0.001**
Fully dependent	5	70.41±10.86	
Nutrition Status			
Independent	88	63.87±14.61	
Semi-dependent	20	64.58±12.14	p>0.05

Fully dependent	3	69.44±9.39	
Instrumental Activities of Daily Living			
Status of Being Able to Telephoning			
Independent	75	63.58±13.65	
Semi-dependent	12	63.71±17.77	p>0.05
Fully dependent	24	66.14±13.60	
Being Able to Shopping			
Independent	76	63.07±13.16	
Semi-dependent	19	62.39±14.91	p>0.05
Fully dependent	16	71.5±15.65	
Being Able to Prepare Food			
Independent	59	63.10±12.77	
Semi-dependent	18	59.83±13.53	p>0.05
Fully dependent	34	68.25±15.67	
Being Able to Doing Housework			
Independent	13	60.25±7.72	**F=3.536**
Semi-dependent	59	61.93±13.53[a]	**P=0.033**
Fully dependent	39	68.80±15.37[a]	
Being Able to Doing Laundry			
Independent	35	60.35±11.65	
Semi-dependent	30	63.26±14.49	p>0.05
Fully dependent	46	67.61±14.80	
Being Able to Getting on the Means of Transport	76	61.29±13.12[a]	**F=5.881**
Independent	18	68.28±14.72	**p=0.004**
Semi-dependent	17	72.54±13.54[a]	
Fully dependent			
Being Able to Getting His/Her Own Medication	70	60.14±12.52	**F=8.861**
Independent	35	71.25±14.86	**p=0.001**
Semi-dependent	6	69.44±7.29	
Fully dependent			
Being Able to Managing His/Her Own Money			
Independent	57	66.59±14.04	

Semi-dependent	34	61.15±14.85	p>0.05
Fully dependent	20	62.29±11.72	

*Groups that differ according to Tukey Test

In the study; there was a negative and weak relationship between fatigue and ADL and IADL ($p<0.05$). Also there was negative and weak relationship between age and IADL. In the study a positive and weak correlation was found between ADL and IADL (Table 4).

Tablo 4. The Relationship Between Age, CAFS, ADL and IADL scores of the patients (N = 111)

		Age	CAFS	ADL	IADL
Age	Rho	1	0.101	-0.110	-0.305**
	p	-	0.290	0.251	**0.001**
CAFS	Rho	0.101	1	-0.340**	-0.283**
	p	0.290	-	**0.001**	**0.003**
ADL	Rho	-0.110	-0.340**	1	0.477**
	p	0.251	**0.001**	-	**0.001**
IADL	Rho	-0.305**	-0.283**	0.477**	1
	p	**0.001**	**0.001**	**0.001**	-

5. DISCUSSION

In our study, the majority of COPD patients were male (66.7%) and 68.4% were over 65 years of age and the mean age was 69.18±9.6. COPD morbidity is more common in men and especially in individuals above 45 years of age (Ovayolu, Ovayolu & Ateş, 2008). In other studies, the finding that COPD morbidity increases with age and is more frequent in males than females have also been supported (Arslan & Öztunç 2013; Kaşıkçı 2007).

Fatigue, a subjective and annoying condition that is felt throughout the body in a ratio from prostration to exhaustion, is the most commonly identified 'general' symptom in COPD individuals. At the same time, it is the most inadequate and least treated finding of this disease (Theander & Unosson, 2004; Antoniu et al., 2016).

Fatigue is reported as frequently as dyspnea in patients and there is a strong positive correlation between these two symptoms. Fatigue reduces quality of life in patients by reducing activity tolerance and limiting the fulfillment of activities of daily living (ADL) (Çiçek & Akbayrak, 2009). In this study, the fatigue score average (64.15±14.3) was above the average.

In the study conducted by Kütükçü et al. (2014) in patients with COPD, more than half of the patients experienced severe fatigue, Wong et al. (2010) found that nearly all of the patients (95.3%) experienced high levels of fatigue, in the study conducted by Mollaoğlu et al. (2011), all of the patients experienced fatigue and their fatigue levels were high. The fatigue score average (in test: 68.29 ± 21.4; retest: 67.04±21.5), which

was determined by Arslan and Öztunç (2013) in the study of validity in our country, is close to our findings.

It was determined that 6.3% of the patients were semi-dependent in their activities of daily living and 30.6% were semi-dependent in their instrumental activities of daily living. In a study conducted, it was reported that 13.3% of patients in activities of daily living, 49% in instrumental activities of daily living were semi-dependent and fatigue affects daily activities of patients negatively (Karakurt & Ünsal, 2013).

In literature, it is generally observed that the first affected activity in Chronic Obstructive Pulmonary disease patients is in IADL rather than ADL, and the patients leave IADL which is not compulsory that creates dyspnea and fatigue in them; they have reduced their speed much more than leaving activity in ADL, which is more necessary for life and reduced the severity of symptoms that may occur (Yıldırım, 2011).

Akıncı and Pınar (2011) also stated that in the study of patients with COPD, similar to our findings, patients are having more difficulty in IADL, and that this may be due to the fact that the activities in IADL are more complex and that the patients' oxygen requirement during these activities is higher**.**

It was found that the patients were semi-dependent in activities of daily living such as excretion (45.9%), bathing (33.3%), nutrition (18.0%), dressing (17.1%) and moving (13.5%) and were fully dependent in the instrumental activities of daily living such as doing laundry (41.4%), doing housework (35.1%), food preparation (30.6%). Daily activity can be reduced due to the direct effect of the disease, past experiences of the patient related to the disease, or changes in the perception of well-being (Ovayolu, Ovayolu & Ateş, 2008). The majority of individuals with COPD are 65 years of age and over. Activities of daily living that the elderly are most experiencing dependency are bathing, dressing, moving, doing housework, preparing food, doing laundry and managing money (Şahbaz & Tel, 2006). In one study, it was stated that elderly patients were mostly dependent in bathing and going to the toilet in the basic ADL, while the dependency ratios increase in assistant ADLs and they were mostly dependent in cleaning, preparing food and shopping (Özbek Yazıcı & Kalaycı, 2015). In a study conducted by Yıldırım (2011) in individuals with COPD, it is stated that patients are more dependent on bathing and excretion activities in ADL and it is also stated that in IADL, individuals are more dependent in doing laundry, doing housework, shopping and food preparation activities that require more effort.

The fatigue score averages were found to be higher in the fully dependent group in the bathing, dressing and excretion activities from the patients' activities of daily living, and in the doing housework and getting on the means of transport from the patients' instrumental activities of daily living. Fatigue generally affects activities of daily living and psychosocial life negatively. The fatigue that patients with COPD experience more frequent, prolonged and severe, is caused them to live physical and psychosocial limitations (Kütükçü, Savcı &Sağlam, 2014). In COPD, the need for oxygen in individual increases during physical activity, but not enough oxygen is provided to the body due to narrowing of the airways (Ünsal & Yetkin, 2005). Dyspnea, which cannot be tolerated in COPD patients, is a symptom that limits performance during both walking and upper extremity activity (Çalık Kütükçü et al., 2015). Defects in respiratory

mechanics, particularly simple ADL that requires the use of the upper extremities such as eating, brushing teeth, brushing hair, bathing and dressing cause an increase in oxygen need and the usage of a greater percentage of the ventilator reserve during activity, resulting in dyspnea and fatigue perception (İnce et al., 2005). Peripheral muscle weakness in patients with COPD also limits exercise and causes dyspnea and leg fatigue during exercise (Gosselink, Troosters & Decramer 1996; Hamilton et al.,1995). Thus, patients terminate ADL due to dyspnea, arm and leg fatigue (Çalık Kütükçü et al., 2015).

In the study, there was a negative correlation between fatigue score and activities of daily living and instrumental activities of daily living. Higher fatigue was associated with lower physical activity levels in older people (Soyuer&Şenol, 2011). In the studies of Karakurt et al., (2013), it has been determined that there is a decrease in patients' energy, activities of daily living and instrumental activities of daily living, while an increase in the fatigue. In another study conducted by Özel and Argon (2015), it was found that as the fatigue severity scores of patients increased, activities of daily living score decreased.

In the study; there was negative and weak relationship between age and IADL**.** In a study conducted, it was found that with increasing age, the level of dependency in ADL and IADL increased. (Özbek Yazıcı&Kalaycı, 2015). Decline in cognitive functions becomes evident by age progression. It has been reported that the instrumental daily activities have begun to deteriorate in the elderly with mild to moderate cognitive dysfunction. Disturbance in the basic daily life activities, are becoming apparent in patients with more advanced cognitive impairment (Çuhadar et al, 2006).

Study Limitations

The research is limited to patients with COPD who are referred to only one state hospital.

Implication for Nursing Practice

Fatigue limiting the fulfillment of activities of daily living and instrumental activities of daily living. To prevent fatigue from effecting an individual's activities of daily living negatively and to reduce the level of dependence of patients, it is necessary to assess fatigue and plan appropriate activities for the individual.

6. CONCLUSION

It has been determined that as the level of fatigue increases in individuals with COPD, the level of dependency in activities of daily living and in instrumental activities of daily living increases. The mean fatigue score of the patients was above the scale average. In the study, there was a negative correlation between fatigue score and activities of daily living and instrumental activities of daily living ın order to increase the independence of these patients in ADL and IADL, it is necessary to bring the fatigue under control and to attempt to reduce fatigue. The determination of the areas where these patients are dependent on is important in terms of solution approaches.

CONFLICTS OF INTEREST

The author declare no conflict of interest.

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