

# The Effect of Breathing Exercise on Self-Care Management in Chronic Obstructive Pulmonary Patients

Mehtap Tan<sup>1</sup>, Derya Şimşekli<sup>2</sup>, Gönül Gökçay<sup>3</sup>

<sup>1</sup> Atatürk University, Faculty of Nursing, Department of Internal Medicine Nursing, Erzurum, Türkiye.

<sup>2</sup> Ardahan University, Vocational School of Health Services, Department of Health Care Services, Ardahan, Türkiye.

<sup>3</sup> Kafkas university, Faculty of Health Sciences, Department of Nursing, Kars, Türkiye.

**Correspondence Author:** Derya Şimşekli

**E-mail:** deryasimseki95@gmail.com

**Received:** 11.08.2023

**Accepted:** 07.08.2024

## ABSTRACT

**Objectives:** The aim of this study is to investigate the effect of breathing exercise on self-care management in chronic obstructive pulmonary patients.

**Methods:** The study was conducted in a cross-sectional descriptive type with 415 COPD patients between 04.01-04.02.2023. COPD patient identification form and self-care management scale in chronic diseases were used to collect research data. The research data were evaluated with the statistical package program.

**Results:** The rate of application of breathing exercises by the participants was found to be 47.7%. The mean self-care management of patients with COPD was found to be 93.53±35.32. It was determined that the mean of self-care management of the COPD patients who participated in the study who applied breathing exercise was 100.97±29.86, the mean of self-care management of the participants who did not apply respiratory exercise was 86.73±38.48, and the difference between the averages was statistically significant ( $p < .001$ ).

**Conclusion:** As a result of this study, it was determined that the level of application of breathing exercises in COPD patients was below fifty percent, and the level of self-care management was below the middle. It was determined that the practice of breathing exercise was effective on self-care management.

**Keywords:** Breathing exercise, COPD, self-care management

## 1. INTRODUCTION

Chronic obstructive pulmonary disease (COPD) is a chronic, irreversible disease that progresses with a lung infection and respiratory symptoms. COPD is one of the leading causes of mortality and morbidity in the whole world and in our country (1). COPD is responsible for 6% of all deaths, and it was reported that more than three million people died due to COPD in 2012 (2). While 35331 people died from respiratory system-related diseases in Turkey in 2013, this number increased to 52568 in 2018, showing an increase of 48.79% (3). COPD is a very important health problem due to the fact that it is a disease that negatively affects the patient physiologically, psychologically, socially, and economically, which occurs at this frequently. The inflammation that occurs in the lungs in the disease causes irreversible damage to the bronchi and bronchioles, causing

air to be trapped in the alveoli. This condition leads to the patient experiencing symptoms related to the respiratory system (4). In addition to medical treatment, pulmonary rehabilitation practices are included in the treatment of COPD disease. Breathing exercises, on the other hand, are an important part of pulmonary rehabilitation (5). It has been reported that breathing exercises have a positive effect on dyspnea, exercise capacity, and quality of life in individuals with COPD (6). Nurses have important duties in teaching breathing exercises and patient education. In this sense, nurses participate in increasing patient motivation, teaching, and applying these exercises to the patient and managing the disease (7). On the other hand, the practice of breathing exercises by individuals with COPD is thought to be effective in self-care management.

Self-care is the satisfaction of the individual's needs in social, emotional, and psychological terms, which he practices in order to prevent diseases and accidents and to live in a healthy way. Self-care management, on the other hand, is the individual making all kinds of decisions about his/her health and acting toward it. If it is desired to define self-care management in individuals with chronic illness, it is that the individual makes a decision about his/her illness, which negatively affects his/her health, and exhibits behavior towards it (10). There is a decrease in self-care management in individuals with chronic diseases. This situation is valid in COPD disease. In individuals with COPD, there is a decrease in self-care management due to the symptoms and problems caused by the disease. However, in COPD disease, it is particularly important that the individual has a high level of self-management of the disease (11).

A high level of self-management requires awareness of the disease and high compliance with treatment (10). In this sense, it is thought that regular practice of breathing exercises is also related to self-management, as it will benefit from keeping the disease under control. There have not been any studies in the national and international literature investigating the effect of the use of breathing exercises on self-care management in chronic obstructive pulmonary patients. Therefore, in this study, it was aimed to investigate the effect of breathing exercise practice on self-care management in chronic obstructive pulmonary patients. For this purpose, answers to the following research questions are being sought.

### Research Questions

1. What is the percentage of breathing exercise application in COPD patients?
2. What is the level of self-care management score of COPD patients?
3. Is there a statistical significance between the state of application breathing exercises in COPD patients and the self-care management scale and its sub-dimensions decisively?
4. Are the defining characteristics of COPD patients effective in breathing exercise application status?
5. Are the defining characteristics of COPD patients effective in self-care management and self-care management sub-dimensions?

## 2. METHODS

### 2.1. Ethical Considerations

Before the study, the ethics committee of the university dated 04.01.2023 and E-67796128.000.2300000489 the numbered ethics committee permission was obtained. Consent was obtained from the participants participating in the study.

The research was conducted according to the principles in the Helsinki Declaration.

### 2.2. Study Design and Sample Selection

The research was conducted in descriptive cross-sectional type between the dates of January 4, 2023, and February 4, 2023. The population of the study consisted of patients diagnosed with COPD living in Turkey. The sample size of the research was determined through a program (12). Accordingly, it was determined that the minimum sample size to be included in the study was 237 with a 5% error, 95% power, and 19.1% COPD prevalence (13). A total of 451 patients were accessed, and 34 patients who did not meet the research criteria were excluded from the scope of the study. The sample of the study consisted of 415 patients. Criteria for inclusion in the study; being diagnosed with COPD by a doctor, having been receiving COPD treatment for at least one year, being over 40 years of age, using an Android phone, being able to use the social media account and voluntarily agreeing to participate in the research. Patients who were under the age of 40, who could not use an Android phone, who had vision problems, and who had been receiving COPD treatment for less than a year were excluded from the study.

Data Collection: Research data was collected online via WhatsApp, Facebook and Instagram. The participants were reached through snowball sampling. Snowball sampling is a known and applicable method for recruiting study participants who are not easily accessible or unknown to researchers (14-16). It is a widely used sampling method in which individuals are included in the research by contacting others who connect them to the research participants in cases where researchers cannot reach the participants directly (14,15,17). Researchers proved that COPD patients had to rely on social media to reflect the participants through snowball sampling and in general in Turkey, as providing transportation outside the hospital environment or an institution is especially important in terms of respiratory exercise and self-care management (14). The exacerbation status of the patients was not questioned.

### 2.3. Data Collection Forms

In the collection of research data, the COPD patient form and the self-care management scale for chronic diseases were used.

**COPD Patient Form:** It is a form consisting of 14 questions created by scanning the literature in order to determine the descriptive characteristics of the participants and their characteristics related to the disease (8,9,18). The questions in the form of patients age, gender, marital status, children status, place of residence, economic status, family type, non-smoking status, year of diagnosis, COPD, difficulty breathing can interfere with the condition, the condition to be able to do breathing exercises, breathing exercises finding useful and investigates the situation of the affected level. The level of exposure to the disease consists of a content that allows the patient to assess the level of exposure to COPD in the range

from 1 to 10. With this, it is aimed to evaluate the patient's own perception. '1' indicates the lowest level of exposure, while '10' indicates the highest level of exposure.

**Self-Care Management Scale in Chronic Diseases:** Hancerlioglu and Senuzun Aykar made the validity and reliability of the scale developed by Jones and Pruett to evaluate self-care management in chronic diseases in Turkish in 2018 (18). The scale, which consists of a total of 35 items and is scored in Likert type, has two sub-dimensions as self-protection and social protection. Some items of the scale such as 3., 15., 19., and 28. are scored in reverse. The lowest score that can be taken from the scale is 35, and the highest score is 175. As the score obtained from the scale increases, self-care management increases. In the validity and reliability study of the scale, Cronbach alpha was used in the scale of .75, in the self-protection sub-dimension .78, and in the social protection sub-dimension, it is .78 (18). The Cronbach alpha coefficient numbers in this study are, respectively, .96, and .95, and it was determined as .90.

## 2.4. Statistical Analysis

The research data were evaluated with Statistical Package for Social Sciences (SPSS) 26 program. Number, percentage, mean, and standard deviation were given for descriptive data. Skewness and Kurtosis for compliance of data with normal distribution – 2+2 the values were taken as a basis (19). It was seen that the data were in this range and were in accordance with the normal distribution. Independent samples T-test was applied for the difference between the self-care management and subscale averages according to the participants' breathing exercise status. In order to investigate the differentiation of breathing exercise according to descriptive features, independent samples t-test for binary variables and One Way ANOVA test for more than two variables were applied. Bonferroni test was used as post hoc analysis. Multiple regression analysis was performed for the level of influence of self-care management and its sub-dimensions on descriptive data. Statistical significance was accepted as  $p < .05$ .

## 3. RESULTS

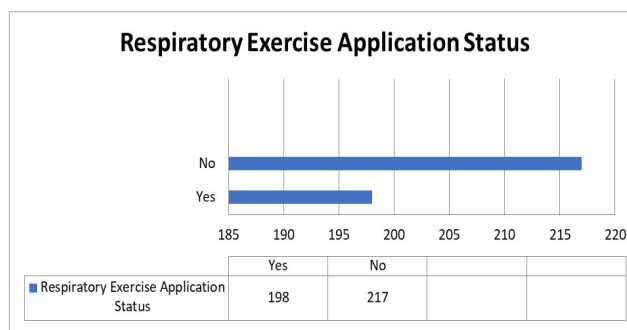
### 3.1. Findings of the Descriptive Characteristics of the Patients

Table 1 shows the descriptive characteristics of COPD patients. Accordingly, it was found that the average age of the patients participating in the study was  $64.46 \pm 9.41$ , the year of diagnosis of COPD was  $13.56 \pm 7.81$ , and the level of exposure to the disease was  $6.79 \pm 2.04$ . It was proved that 60% of the participants are male, 38.6% are in the 60-69 age group, 78.6% are married, 47.7% are literate, 78.6% have children, 68.7% live in the province, 73% have moderate economic status, 68% are in a large family type, 55.7% have quit smoking, and 50.6% are actively working (Table 1).

**Table 1.** Descriptive features of COPD patients

Variables		Mean $\pm$ SD	
Age		64.46 $\pm$ 9.41	
COPD diagnosis year		13.56 $\pm$ 7.81	
The level of being affected by the disease		6.79 $\pm$ 2.04	
Categories		n	%
Gender	Female	166	40.0
	Male	249	60.0
Age groups	40-49 age	51	12.3
	50-59 age	59	14.2
	60-69 age	160	38.6
	70 years and over	145	34.9
Marital status	The married	326	78.6
	Single	55	13.3
	Widowed/divorced	34	8.2
Educational status	Literate	198	47.7
	Secondary education	163	39.3
	High school and above	54	13.0
Do you have children?	Yes	326	78.6
	No	89	21.4
Where you live?	Province	285	68.7
	District	78	18.8
	Village	52	12.5
Economical status	Good	89	21.4
	Middle	303	73.0
	Bad	23	5.5
Family type	Nuclear family	118	28.4
	Extended family	282	68.0
	Broken family	15	3.6
Smoking status	I use	97	23.4
	I quit	231	55.7
	I dont use	87	21.0
Working status	I am working	210	50.6
	I am not working	205	49.4

47.7% (n=198) of the COPD patients participating in the study reported that they performed breathing exercises, while 52.3% (n=217) reported that they did not perform any breathing exercises (Figure 1).



**Figure 1.** Respiratory Exercise Application Status

When the status of finding this exercise useful in COPD patients who performed respiratory exercise was examined, it was found that 95.5% of the patients found the respiratory exercise useful (n=189) (Figure 2).

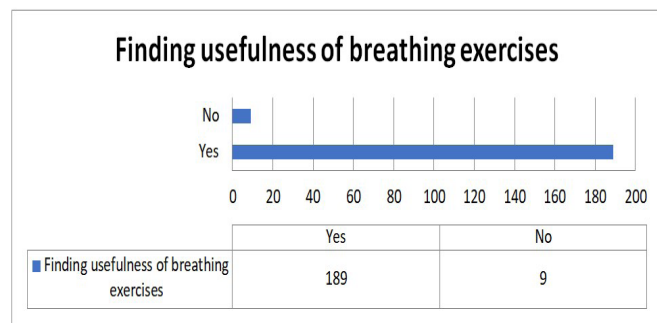


Figure 2. Finding Usefulness of bBreathing Exercises

According to the state of attendees making the breathing exercises, self-care management scores compared to self-protection ( $p < .01$ ), social protection ( $p < .01$ ), and self-care management, general ( $p < .01$ ) scores of making the breathing exercises were seen to differ according to the state at a statistically significant level (Table 2).

Table 2. Distribution of self-care management scores according to breathing exercise application status

	Breathing exercise application status		Statistical test/p
	Yes	No	
Self protection	58.24±16.15	50.08±21.23	t=3.036, p = .003
Social protection	42.73±14.04	36.64±17.58	t=4.039, p = .001*
Self-care management general	100.97±29.86	86.73±38.48	t=3.489, p = .001

\* $p < .001$

When the participants were asked 'How are you struggling with your breathing difficulties?' it was seen that 27.7% of the participants answered with medications, 23.6% by resting, and 17.6% by doing breathing exercises (Figure 3).

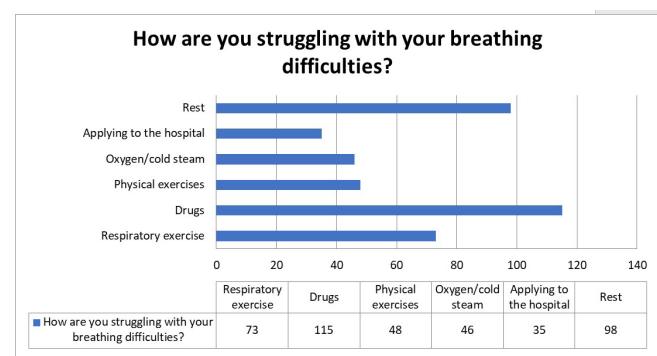


Figure 3. Ways to Cope with Breathing Difficulties

### 3.2. Findings of the Factors Affecting the Patients' Breathing Exercise Practice Status

Table 3 shows a comparison of the breathing exercise application status according to descriptive data. According to this, it was found that the individuals' breathing exercise status differed statistically significantly according to age groups ( $p < .001$ ), having children ( $p < .001$ ), economic status

( $p < .001$ ), smoking status ( $p < .01$ ), and working status ( $p < .001$ ).

Table 3. Comparison of breathing exercise application status with descriptive data

Categories		Breathing exercise application status	
		$\bar{X} \pm SD$	Significance between groups/p
Gender	Female	1.54±0.50	t=0.641 p = .522
	Male	1.51±0.50	
Age groups	40-49 age <sup>a</sup>	1.06±0.23	F=58.447 p = .001** a>c, a>d, b>c, b>d*
	50-59 age <sup>b</sup>	1.25±0.43	
	60-69 age <sup>c</sup>	1.48±0.50	
	70 years and over <sup>d</sup>	1.85±0.36	
Marital status	The married	1.51±0.50	F=0.976 p = .378
	Single	1.56±0.50	
	Widowed/ divorced	1.62±0.49	
Educational status	Literate	1.55±0.49	F=0.750 p = .473
	Secondary education	1.51±0.50	
	High school and above	1.46±0.50	
Do you have children?	Yes	1.47±0.50	t=-4.518 p < .001**
	No	1.73±0.44	
Where you live?	Province	1.49±0.50	F=2.934 p = .05
	District	1.64±0.48	
	Village	1.54±0.50	
Economical status	Good <sup>a</sup>	1.20±0.40	F=26.115 p < .001** a>b, a>c*
	Middle <sup>b</sup>	1.61±0.48	
	Bad <sup>c</sup>	1.61±0.49	
Family type	Nuclear family	1.55±0.50	F=0.502 p = .606
	Extended family	1.51±0.50	
	Broken family	1.60±0.51	
Smoking status	I use <sup>a</sup>	1.46±0.50	F=4.836 p = .008 b>c*
	I quit <sup>b</sup>	1.59±0.49	
	I dont use <sup>c</sup>	1.41±0.49	
Working status	I am working	1.30±0.46	t=-10.014 p < .001**
	I am not working	1.75±0.43	

\*Bonferroni test, \*\* $p < .001$

### 3.3. Findings of the Factors Affecting the Patients' Self-Care Management Levels

Table 4 shows the results of the regression analysis conducted for the situation of self-care management and its sub-dimensions being affected by descriptive data. Accordingly, it was found that the regression model established between the self-care management scale and decipherment data was significant ( $p < .001$ ). It was learned that the explanatory power of the created model was 19.5%. It was found that age ( $p < .01$ ), child-bearing status ( $p < .001$ ), family type ( $p < .01$ ), and year of COPD diagnosis ( $p < .001$ ) affected self-care management at a statistically significant level (Table 4).

It was found that the regression model established between the self-protection sub-dimension, and decipherment data from the sub-dimensions of the self-care management scale was significant ( $p < .001$ ). It was found that the explanatory power of the model was 21.5%. It was found that age ( $p < .01$ ), child-bearing status ( $p < .001$ ), family type ( $p < .01$ ), and year of COPD diagnosis ( $p < .001$ ) were significantly affected by the self-protection sub-dimension at a statistically significant level (Table 4).

**Table 4.** Results of regression analysis between self-care management of individuals with COPD and descriptive data

Dependent variable	Independent variable	B	SD	$\beta$	t	p
Self-care management general Overall	(Constant)	164.846	16.474		10.006	.001*
	Age	-0.510	0.185	-0.136	-2.759	.006
	Gender	-6.449	3.635	-0.090	-1.774	.077
	Marital status	4.223	2.930	0.073	1.441	.150
	Status of having children	-16.673	4.297	-0.194	-3.880	.001*
	Living place	-4.815	3.444	-0.067	-1.398	.163
	Economical status	9.783	3.339	0.141	2.930	.004
	Family type	-4.141	2.458	-0.078	-1.685	.093
	Smoking status	4.122	3.480	0.058	1.184	.237
	Working status	-1.895	0.226	-0.419	-8.381	.001*
	COPD diagnosis year					
R=0.464, R <sup>2</sup> =0.215, Adjusted R <sup>2</sup> =0.195, F=11.060, Durbin Watson=0.337						
Self protection Overall	(Constant)	94.950	8.933		10.629	.001*
	Age	-0.305	0.100	-0.148	-3.036	.003
	Gender	-3.634	1.971	-0.092	-1.844	.066
	Marital status	2.320	1.589	0.073	1.461	.145
	Status of having children	-8.238	2.330	-0.175	-3.536	.001**
	Living place	2.193	1.302	0.080	1.684	.093
	Economical status	-2.904	1.868	-0.074	-1.555	.121
	Family type	5.169	1.810	0.136	2.855	.005
	Smoking status	-1.816	1.333	-0.062	-1.362	.174
	Working status	2.248	1.887	0.058	1.192	.234
	COPD diagnosis year	-1.119	0.123	-0.451	-9.125	.001*
R=0.484, R <sup>2</sup> =0.234, Adjusted R <sup>2</sup> =0.215, F=12.363, Durbin Watson=0.355						
Social protection Overall	(Constant)	69.895	7.711		9.065	.001*
	Age	-0.206	0.087	-0.119	-2.377	.018
	Gender	-2.815	1.701	-0.085	-1.655	.099
	Marital status	1.903	1.371	0.071	1.388	.166
	Status of having children	-8.434	2.011	-0.213	-4.194	.001*
	Living place	2.051	1.124	0.089	1.825	.069
	Economical status	-1.911	1.612	-0.058	-1.185	.237
	Family type	4.614	1.563	0.145	2.952	.003
	Smoking status	-2.325	1.150	-0.095	-2.021	.044
	Working status	1.874	1.629	0.058	1.150	.251
	COPD diagnosis year	-0.776	0.106	-0.373	-7.334	.001*
R=0.434, R <sup>2</sup> =0.189, Adjusted R <sup>2</sup> =0.169, F=9.398, Durbin Watson=0.364						

\* $p < .001$

It was found that the model established between the social protection sub-dimension and decipherment data from the sub-dimensions of the self-care management scale was statistically significant ( $p < .001$ ). It was also found that the explanatory power of the model was 16.9%. It was found that age ( $p < .05$ ), child-bearing status ( $p < .001$ ), family type ( $p < .01$ ), smoking status ( $p < .05$ ), and year of COPD diagnosis ( $p < .001$ ) were significantly affected by the social protection sub-dimension (Table 4).

#### 4. DISCUSSION

Breathing exercises in COPD provide strengthening inspiratory muscles, increase exercise capacity (20,21), increase pulmonary functions, improving health-related quality of life (21,22), reduction of COPD exacerbations, increase lung capacity, and reducing symptoms (23). For this reason, the implementation of breathing exercises is especially important in COPD patients. In this study, it is observed that the rate of COPD patients' breathing exercise practice remains below fifty percent. When the patients were questioned about their status of considering breathing exercises useful, it was found that 95.5% of them found breathing exercises useful. Although patients find breathing exercises so useful, it is believed that the reason why more than half of them do not practice is due to their low level of education (47.7% of them are literate). In contrast to our study, in a study conducted with 182 individuals with COPD in Nepal, 36.3% of the participants reported that breathing exercises were necessary, and the low visual acuity required by breathing exercises was also associated with a low level of education (24).

In our research, it was seen that the patient's breathing exercise practice status differed statistically significantly according to age, child ownership, economic status, smoking status, and working status. Breathing exercises and the results of a systematic review of physical activity done by treating it as when we examined the barriers to physical activity of COPD health status of individuals with personal problems, lack of support, external factors, smoking status has been reported (25). When a study examining the obstacles in front of doing pulmonary exercise was examined, it was found that age, gender, and smoking were effective (26). It is seen that the results of this study coincide with our research.

COPD is a disease that makes it difficult for individuals to perform self-care due to problems caused by many symptoms and symptoms that occur. In this sense, when the literature is examined in general, it is seen that the self-care power of individuals with COPD is low (9,27). In our research, it was seen that the general, self-protection sub-dimension and social protection sub-dimensions of the self-care management scale of COPD patients were below the average level. In the Turkish validity and reliability study of the self-care management scale for chronic diseases, in contrast to our study, it was found that the general average of the self-care management scale was high, the self-protection sub-dimension was at a moderate level, and the social protection

was below the moderate level, similar to our study (18). In contrast to our study, in other studies, it has been reported that the overall score of the self-care management scale is high and its sub-dimensions are at a good level (28,29). It is believed that the differences between the studies are due to the fact that the studies were conducted with individuals of different sample sizes and characteristics.

In our research, it was found that the practice of breathing exercises affects self-care management at a statistically significant level ( $p < .001$ ). It was seen that the state of doing breathing exercises was affected by the self-care management self-protection sub-dimension, age, gender, child-bearing status, economic status, working status, year of COPD diagnosis, the state of finding exercise useful, and the state of being affected by the disease ( $p < .05$ ). There has not been a study in the literature on the effects of doing breathing exercises.

In our research, it was seen that the self-care management scale of COPD patients was affected by age, child-bearing, family type, and year of COPD diagnosis ( $p < .05$ ). It was found that gender, marital status, place of residence, economic status, smoking status, and working status did not affect self-care management ( $p > .05$ ). In the studies conducted, it was seen the economic situation did not affect self-care, similar to our study (28,30). In contrast to our study, there is also a study that found that self-care management is affected by income level (29).

In a study conducted with individuals with COPD, in contrast to our study, married individuals' self-care power was found to be higher (31). According to the results of regression analysis in a study conducted with COPD patients in China, it was reported that self-management behaviors are influenced by age, marital status, and place of residence (32). While the situation of age affecting self-care management coincides with our study, marital status and place of residence were not affected by self-care management according to our study. It is thought that this situation may be due to the fact that the proportion of married people (79.2% of participants are married) and the rate of living in rural areas (64.4%) are higher compared to our study in a study conducted in China, without receiving more social support. The social support received from the family and the environment contributes to self-care management (33).

In our research, there was no relationship between education level and self-care management. On the contrary, it has been found that there is a linear relationship between educational level and self-care behaviors in the studies conducted (31, 34). In our study, child ownership and family type are affected by self-care management. This situation can be explained by the fact that high social support provides better self-care management (35).

In our research, it was found that the self-protection sub-dimension was affected by age, having a child, family type, and year of COPD diagnosis ( $p < .05$ ). It was figured out that social protection was affected by age, child-bearing status,

family type, smoking status, and year of COPD diagnosis. According to the results of regression analysis conducted in a study with COPD patients, it was reported self-protection is affected by age and family type, social protection is affected by smoking (15). This ultimately coincides with the results of our study.

Our research has some limitations. The research was conducted with COPD patients living in Turkey, aged 40 and over, and using smartphones. This situation limits the generalization of the results to all age groups. The data in the study were collected online by snowball sampling, which may cause the participants to focus on a specific social media network usage and environment, which may be inadequate in terms of representing the general population. Another limitation of our study is that treatment compliance, which is a factor affecting self-care, was not evaluated.

## 5. CONCLUSION

The results of the study, which examined the effect of breathing exercise application on self-care management in COPD patients, are as follows. It was found that the level of exposure of COPD patients to the disease is high, the rate of performing respiratory exercises is 47.7% and the level of self-care management is below average. It was detected that the difference between the breathing exercise practice status, the self-care management, and the sub-dimension averages was statistically significant decisively.

Based on the results of this study, it is seen that the practice of breathing exercises from COPD patients is an effective determinant in self-care management. In this sense, it is recommended to conduct randomized controlled trials with a high level of experimental-based evidence with larger samples, taking into account the stages of COPD. In addition, it is proposed to raise public awareness through congresses and conferences where large audiences are included in respiratory exercise, self-care management training, and interventional studies for this purpose.

**Acknowledgements:** We thank Marmara University and all participants for providing access to academic databases.

**Funding:** The author(s) received no financial support for the research.

**Conflicts of interest:** The authors declare that they have no conflict of interest.

**Ethics Committee Approval:** This study was approved by Ardahan University Scientific Publication and Ethics Board (Approval date: 04.01.2023; Number: E-67796128.000.230000489)

**Peer-review:** Externally peer-reviewed.

**Author Contributions: (Initials only)**

Research idea: MT, DŞ

Design of the study: MT, DŞ

Acquisition of data for the study: DŞ, GG

Analysis of data for the study: DŞ

Interpretation of data for the study: MT, DŞ, GG

Drafting the manuscript: MT, DŞ, GG

Revising it critically for important intellectual content: MT, DŞ, GG

Final approval of the version to be published: MT, DŞ, GG

## REFERENCES

- [1] Global Initiative for Chronic Obstructive Lung Disease. GOLD 2023 Report. Accessed [04 January 2023]. <https://goldcopd.org/2023-gold-report-2/>
- [2] Singh D, Agusti A, Anzueto A, Barnes PJ, Bourbeau J, Celli BR, Criner GJ, Frith P, Halpin DMG, Han M, López Varela MV, Martínez F, De Oca MM, Papi, A, Pavord LD, Roche N, Sin DD, Stockley, R, Vestbo J, Wedzicha JA, Vogelmeier C. Global strategy for the diagnosis, management, and prevention of chronic obstructive lung disease: The GOLD science committee report 2019. *Eur Respir J.* 2019;53(5):1–12. DOI: 10.1183/13993.003.00164-2019
- [3] Türkiye İstatistik Kurumu: 2009-2018 ölüm nedeni istatistikleri. Accessed [04 January 2023] <https://data.tuik.gov.tr/Bulten/Index?p=Olum-ve-Olum-Nedeni-Istatistikleri-2019-33710>. (Turkish)
- [4] Hurst JR, Skolnik N, Hansen GJ, Anzueto A, Donaldson GC, Dransfield MT, Varghese P. Understanding the impact of chronic obstructive pulmonary disease exacerbations on patient health and quality of life. *Eur J Intern Med.* 2020;73:1–6. DOI: 10.1016/j.ejim.2019.12.014
- [5] Alharbi MG, Kalra HS, Suri M, Soni N, Okpaleke N, Yadav S, Shah S, Iqbal Z, Hamid P. Pulmonary rehabilitation in management of chronic obstructive pulmonary disease. *Cureus.* 2021;13(10):e18414. DOI: 10.7759/cureus.18414
- [6] Ubolnuar N, Tantisuwat A, Thaveeratitham P, Lertmaharit S, Kruapanich C, Mathiyakom W. Effects of breathing exercises in patients with chronic obstructive pulmonary disease: Systematic review and meta-analysis. *Ann Rehabil Med.* 2019;43(4):509–523.
- [7] Özdemir A, Yıldız Gülhan P, Arabacı Z, Hasgül E. The effect of respiratory exercise and inhaler usage training on some symptoms and psychosocial parameters in COPD individuals. *Sağlık Akademisi Kastamonu.* 2022;7(3):469–480. DOI:10.25279/sak.873358
- [8] Uslu A, Canbolat O. Nursing care of the chronic obstructive pulmonary disease patient according to Orem's theory of self-care deficiency: A case report. *J Educ Res Nurs.* 2022;19(2):269–274. DOI: 10.5152/jern.2022.73659
- [9] Demir Gökmen B, Fırat M. KOAH hastalarında hastalık algısı, ölüm kaygısı ve öz bakım gücü ilişkisinin incelenmesi. *Adıyaman Üniversitesi Sağlık Bilim Derg.* 2022;8(1):57–66. (Turkish)
- [10] Kennedy A, Rogers A, Bower P. Support for self care for patients with chronic disease. *Br Med J.* 2007;335(7627):968–970. DOI: 10.1136/bmj.39372.540903.94
- [11] Clari M, Matarese M, Ivziku D, De Marinis MG. Self-care of people with chronic obstructive pulmonary disease: A meta-synthesis. *Patient.* 2017;10(4):407–427. DOI: 10.1007/s40271.017.0218-z
- [12] <https://www.openepi.com/SampleSize/SSCohort.htm>. 2023. Accessed [04 January 2023].
- [13] Gunen H, Yılmaz M, Aktas O, Ergun P, Ortakoğlu MG, Demir A, Çetinkaya P, Gurgun A, Otlu M, Cilli A, Yılmaz U, Kokturk N, Candemir I, Yakar HI, Ar I, Konya A. Categorization of COPD patients in Turkey via GOLD 2013 strategy document: ALPHABET study. *Int J COPD.* 2015;10(1):2485–2494. DOI: 10.2147/COPD.S87464
- [14] Leighton K, Kardong-Edgren S, Schneidereith T, Foisy-Doll C. Using social media and snowball sampling as an alternative recruitment strategy for research. *Clin Simul Nurs.* 2021;55:37–42. DOI: 10.1016/j.ecns.2021.03.006
- [15] Marcus B, Weigelt O, Hergert J, Gurt J, Gelléri P. The use of snowball sampling for multi-source organizational research: Some cause for concern. *Pers Psychol.* 2017;70(3):635–673. DOI: 10.1111/peps.12169
- [16] Naderifar M, Goli H, Ghaljaie F. Snowball sampling: A purposeful method of sampling in qualitative research. *Strides Dev Med Educ.* 2017;14(3). DOI: 10.5812/sdme.67670
- [17] Parker C, Scott S, Geddes A. Snowball sampling. *SAGE Res Methods Found.* 2019;1–13. DOI: 10.41135/
- [18] Hancerlioğlu S, Şenuzun Aykar F. Kronik hastalıklarda öz bakım yönetimi ölçeği'nin Türkçe'ye uyarlanması, geçerlik ve güvenilirliği. *Gümüşhane Üniversitesi Sağlık Bilim Derg.* 2018;7(1):175–83. (Turkish)
- [19] George D, Mallery M. SPSS for Windows step by step: A simple guide and reference. Boston: Pearson; 2010.
- [20] Yun R, Bai Y, Lu Y, Wu X, Lee S Da. How breathing exercises influence on respiratory muscles and quality of life among patients with COPD? A systematic review and meta-analysis. *Can Respir J.* 2021;1-11. DOI: 10.1155/2021/1904231
- [21] Lu Y, Li P, Li N, Wang Z, Li J, Liu X, Wu Y. Effects of home-based breathing exercises in subjects with COPD. *Respir Care.* 2020;65(3):377–387. DOI: 10.4187/respcare.07121
- [22] Marotta N, Demeco A, Moggio L, Marinaro C, Pino I, Barletta M, Petraroli A, Pepe D, Lavano F, Ammendolia A. Comparative effectiveness of breathing exercises in patients with chronic obstructive pulmonary disease. *Complement Ther Clin Pract [Internet].* 2020;41(May):101260. DOI: 10.1016/j.ctcp.2020.101260
- [23] Wibrata DA, Putri RNA, Annisa F, Kholifah SN. International Conference of Kerta Cendekia Nursing Academy the effect of breathing exercises: Pursed-lips breathing and diaphragm breathing in COPD patients. 2019;8–11.
- [24] Subba HK, Subba R. Knowledge on self care among COPD patients attending at Chitwan Medical College Teaching Hospital, Bharatpur. *J Chitwan Med Coll.* 2014;4(8):34–37. DOI: 10.3126/jcm.v4i3.11938
- [25] Thorpe O, Johnston K, Kumar S. Barriers and enablers to physical activity participation in patients with COPD: A systematic review. *J Cardiopulm Rehabil Prev.* 2012;32(6):359–369. DOI: 10.1097/HCR.0b013e318262d7df
- [26] Hayton C, Clark A, Olive S, Browne P, Galey P, Knights E, Staunton L, Jones A, Coombes E, Wilson AM. Barriers to pulmonary rehabilitation: Characteristics that predict patient attendance and adherence. *Respir Med.* 2013;107(3):401–407. DOI: 10.1016/j.rmed.2012.11.016
- [27] Kılıç Z, Görüş S. Self-care agency and affecting factors in patients with chronic obstructive pulmonary disease. *East J Med.* 2020;25(4):484–490. DOI: 10.5505/ejm.2020.55822
- [28] Özdelikara A, Taştan Gürkan A, Şen Atasayar B. Kronik hastalıklarda öz bakım yönetimi ve uyumun değerlendirilmesi. *Samsun Sağlık Bil Der.* 2020;5(1):42–49. (Turkish)
- [29] Bayülgen MY, Gün M, Erdoğan S. Kronik obstrüktif akciğer hastalığı olan hastaların öz bakım yönetimleri ve bunları etkileyen faktörlerin değerlendirilmesi. *Eurasian J Heal Sci.* 2021;4(2):106–112. (Turkish)
- [30] Yu S, Guo AM, Zhang XJ. Effects of self-management education on quality of life of patients with chronic obstructive

- pulmonary disease. *Int J Nurs Sci.* 2014;1(1):53–57. DOI: 10.1016/j.ijnss.2014.02.014
- [31] Yıldırım A, Hacıhasanoğlu R, Bakar N, Demir N. Effect of anxiety and depression on self-care agency and quality of life in hospitalized patients with chronic obstructive pulmonary disease: A questionnaire survey. *Int J Nurs Pract.* 2013;19(1):14–22. DOI: 10.1111/ijn.12031
- [32] Yang H, Wang H, Du L, Wang Y, Wang X, Zhang R. Disease knowledge and self-management behavior of COPD patients in China. *Med (United States).* 2019;98(8):10–14. DOI: 10.1097/MD.000.000.0000014460
- [33] Lenferink A, van der Palen J, Effing T. The role of social support in improving chronic obstructive pulmonary disease self-management. *Expert Rev Respir Med.* 2018;12(8):623–626. DOI: 10.1080/17476.348.2018.1489723
- [34] Park SK. Factors affecting self-care behavior in Koreans with COPD. *Appl Nurs Res.* 2017;38(2):29–37. DOI: 10.1016/j.apnr.2017.09.003
- [35] Chen Z, Fan VS, Belza B, Pike K, Nguyen HQ. Association between social support and self-care behaviors in adults with chronic obstructive pulmonary disease. *Ann Am Thorac Soc.* 2017;14(9):1419–1427. DOI: 10.1513/AnnalsATS.201701-026OC

**How to cite this article:** Tan M, Şimşekli D, Gökçay G. The Effect of Breathing Exercise on Self-Care Management In Chronic Obstructive Pulmonary Patients. *Clin Exp Health Sci* 2024; 14: 719-726. DOI: 10.33808/clinexphealthsci.1247690