The effect of education on self-care agency and rational drug use of patients with COPD

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ARTICLE INFO

ABSTRACT

Objective: This study examined the effects of education given to patients diagnosed with the COPD on self-care agency and rational drug use.

Methods: This study has a pretest-posttest quasi-experimental design. Participants were divided into two groups, those who received training with the COPD Guide booklet (n = 40) and routine clinical care (n = 43).

Results: As a result of the study found a statistically significant difference between the self-care agency and rational drug use scale post-test mean scores of the patients in the intervention and control group in favor of the intervention group (p < 0.01).

Conclusion: Education on COPD management increased patients' self-care agency and their information, attitudes, and behaviors regarding rational drug use.

Practice Implications: Clinicians can integrate a COPD Guide into routine care for patients with COPD.

1. Introductıon

Chronic Obstructive Pulmonary Disease (COPD), one of the most common respiratory system diseases, is a significant global health problem. COPD, a disease with significant mortality and morbidity, is characterized by progressive airflow obstruction; it is irreversible and accompanied by multiple symptoms and frequent exacerbations [1]. Among the leading causes of death, COPD is in fourth place in the world, while it is in third place in our country [2,3].

Self-care is essential in patients with COPD since it can improve health-related quality of life and decrease hospitalization and dyspnea [4]. The self-care agency is defined as ''is the dynamic process by which individuals participate in their healthcare" [5]. Respiratory function is severely impaired at the end of the physiopathological processes that occur in COPD. Individuals experience significant limitations during daily activities due to shortness of breath, cough, fatigue, and insomnia [6]. Therefore, it is critical for patients to have a sufficient level of self-care agency and to take responsibility for their self-care to control COPD symptoms [7].

Individuals with COPD must adhere to the drug regimen for COPD treatment, as well as lifestyle changes, in order to achieve disease management. Irrational drug use causes morbidity and mortality in COPD, as in other chronic diseases [8]. In patients with COPD, the problem of compliance with medication due to reasons such as insufficient or no training on medication, cognitive or physical insufficiency of patients, the educational and sociocultural level difference of patients, not choosing the device suitable for patients, misuse of the drug, or the inability to use the drug are very common among patients [3,9–11]. Considering these problems, there is a need for interventions targeting rational drug use for patients with COPD and to determine the level of knowledge of patients to evaluate the impact of interventions. Therefore, the rational drug use scale objectively assesses the knowledge level of patients with COPD [8]. Patients should be able to transform rational drug use into behavior and have the required knowledge and attitude levels [12]. In this context, the responsibility of nurses to educate and inform patients emerges.

Education is critical in improving the self-care skills of patients with COPD, increasing their functional abilities, using drugs properly, managing the disease processes, and improving their quality of life. The effects of the education given on different parameters have been evaluated in the literature. Therefore, the education given to patients about COPD management may contribute to increasing the patient's self-care agency

and rational use of drugs. Therefore, this study was conducted to determine the effects of COPD management education given to patients diagnosed with COPD on self-care agency and rational drug use.

2. Methods

2.1. Design and participants

This study is a pretest-posttest comparative randomized controlled quasi-experimental design registered on ClinicalTrials.gov, with the number NCT05577897.

The study population consisted of patients hospitalized at XXX clinic with COPD diagnosis between February 2021 and May 2021. Using G*power software, we determined that at least a sample size of 70 was required to detect a significant difference with a 0.05 significance level and 80% power. As a result, 43 individuals were included in the intervention group and 43 in the control group; thus, the study comprised 86 patients. In addition, the patients included in the sample were grouped in two in a randomized, controlled way. The first patient who met the research criteria was included in the control group. In contrast, the second patient was included in the intervention group, and randomization was provided as one control and one intervention.

The sample of the study consisted of a total of 86 patients who were literate, who had been receiving CODP treatment for longer than six months, who had low or moderate levels of self-care agency, who needed to use medication continuously to treat COPD, who had no sensory loss related to hearing and vision, who were open to cooperation and communication and who were no orientation problem in the clinic. However, the study was completed with 40 patients since one of the patients in the intervention group was not reached for the post-test application, and two patients stated that they did not want to continue (Fig. 1: Consort flowchart).

2.2. Data collection instruments

2.2.1. Descriptive information form

The first 8 questions in the descriptive information form used in data collection consisted of patients' descriptive characteristics. The remaining 16 questions consisted of information about patients' general health states. (Fig. 2).

2.2.2. Self-care agency scale (SCAS)

SCAS was developed by Kearney and Fleischer [13]. It was adapted into Turkish by Nahcivan [14] on healthy young individuals and by Pınar [15] on chronic diseases. SCAS has 35 questions with answers on a 5-point, Likert-type scale (from 0 to 4). They are listed as 0 (does not describe me at all), 1 (does not describe me very well), 2 (no idea), 3 (describes me a little), and 4 (describes me a lot). A total score below 82 is evaluated as a low level of self-care agency. In contrast, a total score between 82 and 120 is evaluated as a moderate level of self-care agency,
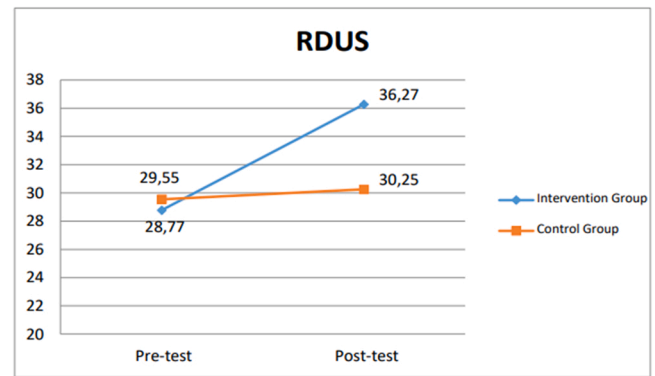

Fig. 1. Pre-Test and Post-Test SCAS Scores according to the Groups.

Fig. 2. Pre-Test and Post-Test RDUS Scores according to the Groups.

and a total score higher than 120 is evaluated as a high level of self-care agency [15]. Our study found Cronbach's alpha of the scale as 0.81 in the pre-test and 0.87 in the post-test.

2.2.3. Rational drug use scale (RDUS)

RDUS was developed by Demirtaş et al. [8] to determine adult patients' rational drug use knowledge levels. The 3 Likert-type scale consists of 21 expressions, 10 correct and 11 incorrect. The answers were given; the Correct answer was scored as 2, I do not know 1, and the wrong answer was 0 points. The maximum possible score on the scale is 42. A total score of 35 and higher is evaluated as having rational drug use knowledge [8]. Our study found Cronbach's alpha of the scale was 0.75 in the pre-test and 0.78 in the post-test.

2.3. Data collection

2.3.1. Pilot application

In order to evaluate the comprehensibility of the forms prepared for the study and the education booklet, a pilot application was conducted on 8 patients who met the sample criteria. Revisions were made about the parts patients did not understand and aligned with the feedback, and the education booklet was finalized. Patients in the pilot study were not included in the study.

2.3.2. Procedure

Following the pilot application, the study data were collected by the researchers from the patients who agreed to participate by using the face-to-face interview method. Pre-test data of the study were collected from the patients in the intervention and control group, while post-test data were collected 6 weeks after the pre-test application. The intervention group was trained with the COPD Guide in addition to routine nursing care. The control group received only routine nursing care in the clinic.

2.3.3. COPD guide (education booklet)

The education booklet "COPD Guide" on COPD management prepared in line with the literature [2,3] was given to the patients by the researcher. Information about COPD was integrated with the education booklet called "COPD Guide" by reviewing the literature and taking the views of relevant experts. Information about COPD was structured in the education booklet in three available titles: COPD overview, critical steps for living with COPD, and drug use in COPD. These titles discuss the following subjects:

- *COPD overview:* What are the functions of the lungs? What are COPD symptoms? What are the causes of COPD?
- *Critical steps for living with COPD:* Step 1: Quit smoking, Step 2: Avoid airway irritants. Step 3: Learn about COPD drugs. Step 4: Get flu and pneumonia vaccines. Step 5: Exercise. Step 6: Eat an adequate and
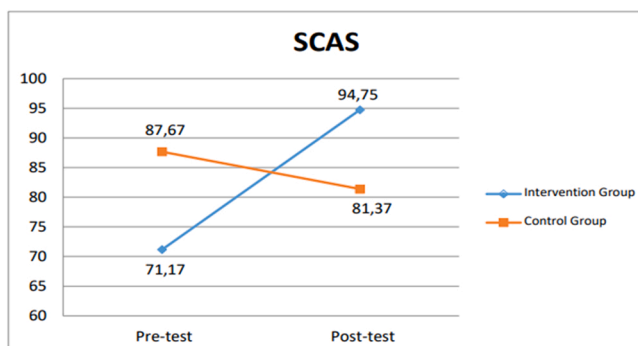
balanced diet. Step 7: Keep your energy. Step 8: Control your stress. Step 9: Control your respiration. Step 10: Oxygen therapy.

- *Drug use in COPD:* What are the drug groups used in COPD? How to use short-acting beta 2 antagonists, long-acting beta 2 antagonists, expectorants, anti-inflammatory drugs, and COPD drugs? How to use metered dose inhaler? How to use a dry inhaler? How to use an aerosolized/inhaler capsule? How to use a hand inhaler? How to use turbuhaler? How to use a nebulizer? How to use an air chamber (spacer)?

2.3.4. Intervention group

The patients were informed, and data collection tools were applied for the pre-test. The researcher gave the patients individual training for 45–50 min in the training room of the Chest Diseases Clinic. Firstly content of the education was explained to the patients, and the education was given by face-to-face verbal presentation and demonstration method. During the education, the trainer answered the patients' individual questions. The patients were given hands-on training on drugs used in COPD, relaxation exercises, and breathing exercises so that they could quickly adopt the information they learned was checked and corrected when needed. For the continuity of communication, each patient was given the phone number of the researcher and informed that they could call whenever needed. They were also given the education booklet and told they could access the information they forgot or wanted to repeat. Since the education, the patients were called once a week for 6 weeks, and the problems they encountered about disease management were listened to, and their questions were answered. The patient should be followed for a certain period, and education should be maintained to achieve a real lifestyle change. Studies in the literature state that patient education is given in the range of 4–8 weeks [16–18]. Therefore, at the end of 6 weeks, data collection tools were applied face-to-face or online. Post-test evaluations were applied to the patients who reapplied to the hospital in the hospital and those who were not hospitalized via WhatsApp.

2.4. Control group

Data collection tools were applied to the patients in the control group who received routine nursing care in the clinic for the pre-test. Then, 6 weeks after the first evaluation, the scale forms were applied. When the data collection process was over, the patients were explained about the "COPD Guide" booklet prepared on COPD management. This booklet was sent to the patients through a mobile application (WhatsApp of the patient or a relative), and the study was completed.

2.5. Ethical considerations

Before starting the study, written permissions were received from the Scientific Ethics Committee of XXX University Nursing Faculty (220–6/14) and XXX University Health Practice and Research Hospital to conduct the study. Necessary explanations were made, their questions were answered, and their consent was obtained for participation in the study.

2.6. Data analyses

The data collected in the study were analyzed using the Statistical Package for the Social Sciences for Windows 22.00 statistical package program. Numbers, percentages, minimum and maximum values, and mean and standard deviation were used in the data assessment [19]. In addition, skewness-Kurtosis values were examined to determine the normality distribution of the data.

Cronbach's α coefficient determined the reliability of the measurement tools. Ethical value and r-effect size were calculated with Cohen's d value. $p < 0.05$ was considered statistically significant in the study. Paired Samples t-test and One Way ANOVA was used for intragroup

pretest-posttest comparison of scales, and Independent samples t-test was used for intergroup comparison of scales. Chi-square value, Fisher Exact value, and Fisher-Freeman-Halton Exact value were used to determine the distribution of patients in the intervention and control groups according to their sociodemographic characteristics.

3. Results

Table 1. shows the results of comparing the demographic and disease characteristics of the patients in the intervention and control groups. It was found that 50.0% of the patients in the intervention group were female, 92.5% were married, 40.0% were middle school graduates, 42.5% were not working, 87.5% had a nuclear family, and 55.0% had an income equal to expense. In addition, it was found that 62.5% of these patients did not have an additional chronic disease, 80.0% did not have a history of COPD in the family, 50.0% had a diagnosis period between 6 months and 5 years, the frequency of hospitalization due to COPD was 2 times a year in 47.5%. It was also found that 67.5% of the patients used O2 at home, 62.5% quit smoking, 32.5% smoked between 21 and 30 years, 47.5% smoked 1–2 packs of cigarettes, and 90.0% had not received education on COPD.

Patients in the control group found that 69.8% were male, 86.0% were married, 33.7% were middle school graduates, 37.2% were not working, 88.4% had a nuclear family, and 55.8% had an income equal to expense. It was found that 67.4% of these patients did not have an additional chronic disease, 65.1% did not have a history of COPD in the family, 54.2% had a diagnosis period between 6 months and 5 years, the frequency of hospitalization due to COPD was 3 times a year in 37.2%. It was also found that 62.8% of the patients used O2 at home, 41.9% had quit smoking, 39.5% had never smoked, 39.5% smoked 1–2 packs of cigarettes, and 83.7% had not received education on COPD. As a result of the comparison of descriptive characteristics of the control and intervention groups, all demographic and disease variables were found to be homogeneous between groups ($p > 0.05$) (Table 1).

It was found that the difference between the SCAS pre-test mean scores of the patients in the intervention and control group was statistically highly significant ($p < 0.01$). It was found that the mean SCAS post-test score of the patients in the intervention group was significantly higher than the mean score of the SCAS post-test of the patients in the control group ($p < 0.01$). The SCAS pre-test means a score of the patients in the intervention group was 71.17 ± 7.97, while their post-test mean score was 94.75 ± 12.94. The difference between the means was statistically significant, and the SCAS pre-test means a score of the patients in the intervention group was found to increase significantly in the post-test ($p < 0.05$). The SCAS pre-test means a score of the patients in the control group was 87.67 ± 15.27, while their post-test mean score was 81.37 ± 15.12. The difference between the means was statistically significant, and the SCAS pre-test means a score of the patients in the control group was found to decrease significantly in the post-test ($p < 0.05$) (Table 2).

No statistically significant difference was found between the RDUS pre-test mean scores of the patients in the intervention and control group ($p > 0.05$). It was found that the RDUS post-test mean scores of the patients in the intervention group were found to be significantly higher than the RDUS post-test mean scores of the patients in the control group ($p < 0.05$). RDUS pre-test means a score of the patients in the intervention group was found to be 28.77 ± 3.75, while their post-test mean score was 36.27 ± 2.38. The difference between the means was statistically significant. RDUS pre-test means scores of the patients in the intervention group increased significantly in the post-test ($p < 0.05$). It was found that the RDUS pre-test means score of the patients in the control group was 29.55 ± 5.43, while their post-test mean score was 30.25 ± 4.20 and the difference between the mean scores was not found to be statistically significant ($p > 0.05$) (Table 3).

When the pretest-posttest mean scores of the SCAS scores of the patients in the intervention group were compared according to some

Table 1

Comparison of Demographic and Disease Characteristics of Individuals in the Intervention and Control Groups (N = 83).

	Characteristics	IG (n: 40)		CG (n: 43)		Materiality testing
		N	%	N	%	
Age(Years)	Female	20	50.0	13	30.2	χ2 = 3.381 *
	Male	20	50.0	30	69.8	p = 0.066
Marital Status	Married	37	92.5	37	86.0	χ2 = 939 ***
	Single	3	7.5	6	14.0	p = 0.485
Educational Level	Primary School	8	20.0	18	31.3	χ2 = 5.201 **
	Middle School	16	40.0	12	33.7	p = 0.173
	High School	14	35.0	10	28.9	
	University	2	5.0	3	6.0	
Occupation	Not working	12	42.5	16	37.2	χ2 = 0.444 **
	Officer	17	5.0	3	7.0	p = 0.986
	Employee	2	22.5	10	23.3	
	Retired	9	30.0	14	32.5	
Family Type	Nuclear	35	87.5	38	88.4	χ2 = 0.001 ***
	Extended	5	12.5	5	11.6	p = 1.000
Economic Level	Income less than expenses	8	20.0	11	25.6	χ2 = 0.675 *
	Income equal to expenses	22	55.0	24	55.8	p = 0.713
	Income more than expenses	10	25.0	8	18.6	
Additional chronic disease status	Yes	15	37.5	14	32.6	χ2 = 223 *
	No	25	62.5	29	67.4	p = 0.637
Family History of COPD	Yes	8	20.0	15	34.9	χ2 = 2.292 *
	No	32	80.0	28	65.1	p = 0.130
Diagnosis Time	6 months-5 years	20	50.0	25	54.2	χ2 = 4.336 *
	6–10 years	16	40.0	9	30.1	p = 0.114
	Over 10 years	4	10.0	9	15.7	
Frequency of Hospitalization in 1 Year Due to COPD	None	2	5.0	4	9.3	χ2 = 2.218 **
	1 time	6	15.0	9	20.9	p = 0.566
	2 times	19	47.5	14	32.6	
	3 and more	13	32.5	16	37.2	
O2 Usage at Home	I use	27	67.5	27	62.8	χ2 = 2.527 **
	I dont use	13	32.5	13	30.2	p = 0.357
	I've never used	0	0.0	3	7.0	
Using smoke	Use	2	5.0	8	18.6	χ2 = 5.171 *
	Not use	13	32.5	17	39.5	p = 0.075
	Forwent	25	62.5	18	41.9	
Duration of Use of Smoking	0 year	14	35.0	17	39.5	χ2 = 2.624 **
	1–10 years	1	2.5	2	4.7	p = 0.657
	11–20 years	4	10.0	4	9.3	
	21–30 years	13	32.5	8	18.6	
	More than 30 years	8	20.0	12	27.9	
Daily Cigarette Usage Amount	None	14	35.0	17	39.5	χ2 = 1.287 **
	Less than 1 pack/day	1	2.5	3	7.0	p = 0.808
	Between 1 and 2 packages/day	19	47.5	17	39.5	
	More than 2 packs/day	6	15.0	6	14.0	
Getting Education About COPD	Yes	4	10.0	7	16.3	χ2 = 0.711 *
	No	36	90.0	36	83.7	p = 0.399

* Ki kare test

** Fisher-Freeman-Halton Exact Test.

*** Fisher Exact Test

Table 2

Pre-Test-Post-Test SCAS Comparison of Individuals in Intervention and Control Groups and Between Groups (N = 83).

SCAS Score Averages	IG (n = 40)	CG (n = 43)	Test and p value
	X ± SS	X ± SS	
Pre-test	71.17 ± 7.97	87.67 ± 15.27	t = −6.099 ** p = 0.001
Post-test	94.75 ± 12.94	81.37 ± 15.12	t = 4.313 ** p = 0.001
Test and p value	t = −13.449 * p = 0.001	t = 2.685 * p = 0.001	
Cohen's d value	-2.194	0.414	
r-effect size	-0.739	0.202	

(IG= Intervention Group, CG= Control Group)

* Paired Samples t test

** Independent Samples t test

Table 3

Pre-Test-Post-Test RDUS Comparison of Individuals in Intervention and Control Groups and Between Groups (N = 83).

RDUS Score Averages	IG (n = 40) X ± SS	CG (n = 43) X ± SS	Test ve p value
Pre-test	28.77 ± 3.75	29.55 ± 5.43	t = −0.758 ** p = 0.451
Post-test	36.27 ± 2.38	30.25 ± 4.20	t = 7.934 ** p = 0.001
Test ve p value	t = −16.018 * p = 0.001	t = −1.094 * p = 0.280	
Cohen's d value	-2.388	-0.144	
r-effect size	-0.766	-0.071	

(IG= Intervention Group, CG= Control Group)

* Paired Samples t test

** Independent Samples t test

sociodemographic characteristics, it was determined that there was no statistically significant difference between the pre-test and post-test

SCAS mean scores of university graduates and smokers. When the other variable groups were examined, it was determined that there was a statistically significant difference between the pre-test and post-test

SCAS score averages, and the post-training score averages were higher than the pre-training scores (Table 4).

When the pretest-posttest mean scores of RDUS scores were compared according to some sociodemographic characteristics of the patients in the intervention group, it was determined that there was no statistically significant difference between the pre-test and post-test RDUS score averages of university graduates and smokers. When the other variable groups were examined, it was determined that there was a statistically significant difference between the pre-test and post-test RDUS score averages, and the post-training mean scores were higher than the pre-training scores (Table 5).

Table 4

Comparison of Pre-Test-Post-Test SCAS Mean Scores in and Between Groups According to Some Sociodemographic Characteristics of the Patients (N = 83).

		IG (n:40)			CG (n:43)		
Characteristics		Pre-test	Post-test	Intragroup test value and significance	Pre-test	Post-test	Intragroup test value and significance
		X ± SD	X ± SD		X ± SD	X ± SD	
Gender	Female	71.65 ± 8.43	95.05 ± 14.01	t = −8.256* p = 0.001	82.38 ± 9.59	78.69 ± 9.16	t = 1.692 * p = 0.116
	Male	70.70 ± 7.68	94.45 ± 12.15	t = −11.100* p = 0.001	89.93 ± 16.92	82.53 ± 17.09	t = 2.289* p = 0.030
Intergroup test value and significance		t = 0.372 * * p = 0.712	t = 0.145 * * p = 0.886		t = −1.858 * * p = 0.071	t = −0.761 * * p = 0.451	
Educational Level	Primary School	73.75 ± 8.96	99.88 ± 3.98	t = −13.337* p = 0.001	89.89 ± 13.08	82.39 ± 16.20	t = 1.475 * p = 0.159
	Middle School	72.69 ± 6.27	95.63 ± 8.10	t = −9.991* p = 0.001	85.41 ± 18.69	82.83 ± 14.35	t = 1.149 * p = 0.275
	High School	68.29 ± 9.71	89.07 ± 18.54	t = −5.533* p = 0.001	81.40 ± 9.77	74.20 ± 11.71	t = 2.056* p = 0.070
	University	69.00 ± 11.31	107.00 ± 1.41	t = −4.222 * p = 0.148	104.00 ± 20.88	93.33 ± 18.15	t = 6.047* p = 0.026
Intergroup test value and significance		F= 1.144 p = 0.345	F= 2.100 p = 0.117		F= 2.058 p = 0.122	F= 1.490 p = 0.232	
Economic Level	Income less than expenses	70.63 ± 8.23	90.25 ± 18.4	t = −3.728* p = 0.007	86.36 ± 8.95	81.73 ± 10.40	t = 1.741 * p = 0.112
	Income equal to expenses	72.18 ± 7.16	97.28 ± 7.76	t = −13.198* p = 0.001	89.50 ± 17.86	81.17 ± 16.83	t = 2.159* p = 0.042
	Income more than expenses	69.40 ± 9.86	92.80 ± 16.80	t = −5.941* p = 0.001	83.88 ± 14.49	81.50 ± 16.93	t = 0.669 * p = 0.525
Intergroup test value and significance		F= 0.429 p = 0.654	F= 1.015 p = 0.372		F= 0.446 p = 0.643	F= 0.005 p = 0.995	
O_2 Usage at Home	I use	72.33 ± 8.19	95.96 ± 11.12	t = −13.365* p = 0.001	88.33 ± 13.68	81.22 ± 14.59	t = 2.845* p = 0.009
	I dont use	68.77 ± 7.24	92.23 ± 16.34	t = −5.748* p = 0.001	89.23 ± 17.60	81.77 ± 17.82	t = 1.330 * p = 0.208
	I've never used	-	-		74.67 ± 18.58	81.00 ± 11.27	t = −1.272 * p = 0.331
Intergroup test value and significance		t = 1.337 p = 0.189	t = 0.851 p = 0.400		F= 1.188 p = 0.315	F= 0.006 p = 0.994	
Using smoke	Use	78.00 ± 9.90	94.50 ± 13.44	t = −6.600 * p = 0.096	87.63 ± 13.67	80.88 ± 17.99	t = 1.921 * p = 0.096
	Not use	69.46 ± 7.57	93.62 ± 15.23	t = −5.991* p = 0.001	93.76 ± 16.27	82.76 ± 18.33	t = 2.172* p = 0.045
	Forwent	71.52 ± 8.07	95.36 ± 12.16	t = −12.625* p = 0.001	81.89 ± 13.39	80.28 ± 10.60	t = 0.722 * p = 0.480
Intergroup test value and significance		F= 1.058 p = 0.357	F= 0.074 p = 0.929		F= 2.871 p = 0.068	F= 0.118 p = 0.889	
Duration of Use of Smoking	0 year	69.79 ± 7.37	94.21 ± 14.80	t = −6.527* p = 0.001	93.76 ± 16.27	82.76 ± 18.33	t = 2.172* p = 0.045
	1–10 years	70.00	106.00	-	103.50	97.50 ± 2.12	t = 1.000 * p = 0.500
	11–20 years	70.50 ± 9.15	92.25 ± 15.97	t = −2.459 * p = 0.091	10.61	90.50 ± 9.15	t = −0.258 * p = 0.813
	21–30 years	70.46 ± 9.90	93.77 ± 13.66	t = −9.946* p = 0.001	89.50 ± 16.44	69.50 ± 13.84	t = 0.0662 * p = 0.529
	More than 30 years	75.25 ± 5.03	97.13 ± 8.22	t = −11.314* p = 0.001	72.63 ± 10.41	81.58 ± 7.52	t = 1.732 * p = 0.111
Intergroup test value and significance		F= 0.642 p = 0.636	F= 0.295 p = 0.879		F= 4.179 p = 0.007	F= 2.521 p = 0.057	
Getting Education About COPD	Yes	70.75 ± 10.50	95.25 ± 6.99	t = −11.658* p = 0.001	89.57 ± 12.88	85.43 ± 9.47	t = 1.186 * p = 0.281
	No	71.22 ± 7.84	94.69 ± 13.51	t = −12.106* p = 0.001	87.28 ± 15.84	80.58 ± 15.97	t = 2.449* p = 0.019
Intergroup test value and significance		t = −0.111 * * p = 0.912	t = 0.080 * * p = 0.134		t = 0.359 * * p = 0.721	t = 0.772 * * p = 0.445	

(IG= Intervention Group, CG= Control Group)

* Paired Samples t test

* *Independent Samples t test

Table 5

Comparison of Pre-Test-Post-Test RDUS Mean Scores in and Between Groups According to Some Sociodemographic Characteristics of the Patients (N = 83).

Characteristics		IG (n:40)			CG (n:43)		
		Pre-test	Post-test	Intragroup test value and significance	Pre-test	Post-test	Intragroup test value and significance
		X ± SD	X ± SD		X ± SD	X ± SD	
Gender	Female	30.05 ± 4.36	36.65 ± 2.83	t = −8.947 * p = 0.001	29.69 ± 4.68	30.31 ± 4.15	t = −1.120 * p = 0.285
	Male	27.50 ± 2.56	35.90 ± 1.83	t = −16.150 * p = 0.001	29.50 ± 5.81	30.23 ± 4.30	t = −0.825 * p = 0.416
Intergroup test value and significance		t = 2.255* * p = 0.031	t = 0.994 * * p = 0.328		t = 0.105 * * p = 0.917	t = 0.053 * * p = 0.958	
Educational Level	Primary School	29.63 ± 3.81	37.50 ± 1.85	t = −8.429 * p = 0.001	28.94 ± 5.12	30.11 ± 4.11	t = −1.311 * p = 0.207
	Middle School	29.13 ± 4.57	36.45 ± 2.58	t = −9.991 * p = 0.001	29.42 ± 6.63	31.08 ± 3.60	t = −1.086 * p = 0.301
	High School	27.64 ± 2.82	35.36 ± 2.58	t = −8.962 * p = 0.001	29.30 ± 4.81	28.80 ± 5.09	t = 0.429 * p = 0.678
	University	30.50 ± 0.71	35.50 ± 2.12	t = −5.000 * p = 0.126	34.67 ± 3.21	32.67 ± 4.04	t = 1.732 * p = 0.225
Intergroup test value and significance		F= 0.731 p = 0.540	F= 1.614 p = 0.203		F= 0.966 p = 0.418	F= 0.881 p = 0.459	
Economic Level	Income less than expenses	29.75 ± 4.74	36.50 ± 2.20	t = −5.014* p = 0.002	26.64 ± 5.35	29.09 ± 5.02	t = −2.186 * p = 0.054
	Income equal to expenses	29.14 ± 3.73	36.55 ± 2.59	t = −11.893* p = 0.001	30.88 ± 5.17	31.17 ± 3.57	t = 0.339 * p = 0.738
	Income more than expenses	27.20 ± 2.70	35.50 ± 2.07	t = −11.124* p = 0.001	29.63 ± 5.42	29.13 ± 4.67	t = 0.319 * p = 0.759
Intergroup test value and significance		F= 1.266 p = 0.294	F= 0.694 p = 0.506		F= 2.449 p = 0.099	F= 1.289 p = 0.287	
O_2 Usage at Home	I use	29.00 ± 3.85	36.78 ± 2.28	t = −14.405* p = 0.001	29.30 ± 5.65	29.67 ± 4.27	t = −0.387 * p = 0.702
	I dont use	28.31 ± 3.66	35.23 ± 2.35	t = −7.557* p = 0.001	30.31 ± 5.45	31.69 ± 3.88	t = −1.996 * p = 0.069
	I've never used	-	-		28.67 ± 4.72	29.33 ± 5.03	t = −0.555 * p = 0.635
Intergroup test value and significance		t = 0.541 p = 0.592	t = 1.993 p = 0.054		F= 0.187 p = 0.830	F= 1.099 p = 0.343	
Using smoke	Use	28.50 ± 6.36	37.00 ± 4.24	t = −5.667 * p = 0.111	29.75 ± 7.25	29.63 ± 6.16	t = 0.076 * p = 0.942
	Not use	29.69 ± 4.97	36.92 ± 2.84	t = −6.652 * p = 0.001	30.76 ± 4.68	30.82 ± 3.89	t = −0.085 * p = 0.933
	Forwent	28.32 ± 2.87	35.88 ± 2.01	t = −15.112 * p = 0.001	28.33 ± 5.27	30.00 ± 3.65	t = −1.416 * p = 0.175
Intergroup test value and significance		F= 0.563 p = 0.574	F= 0.910 p = 0.411		F= 0.874 p = 0.425	F= 0.268 p = 0.766	
Duration of Use of Smoking	0 year	29.50 ± 4.83	36.86 ± 2.74	t = −7.254 * p = 0.001	30.76 ± 4.68	30.82 ± 3.89	t = −0.085 * p = 0.933
	1–10 years	28.00	35.00	-	32.50 ± 3.54	32.00 ± 2.82	t = 1.000 * p = 0.500
	11–20 years	30.25 ± 4.19	34.50 ± 2.38	t = −4.123 * p = 0.026	26.25 ± 8.69	29.75 ± 6.29	t = −0.839 * p = 0.463
	21–30 years	28.15 ± 2.85	36.54 ± 2.33	t = −13.625 * p = 0.001	29.38 ± 5.50	27.88 ± 5.19	t = 1.197 * p = 0.270
	More than 30 years	27.88 ± 3.14	35.88 ± 1.73	t = −11.314 * p = 0.001	28.58 ± 5.58	30.92 ± 3.34	t = −1.912 * p = 0.082
Intergroup test value and significance		F= 0.471 p = 0.756	F= 0.922 p = 0.462		F= 0.809 p = 0.527	F= 0.881 p = 0.484	
Getting Education About COPD	Yes	28.75 ± 5.62	36.50 ± 2.65	t = −4.691* p = 0.018	30.29 ± 5.15	30.71 ± 4.96	t = −0.248 * p = 0.813
	No	28.78 ± 3.61	36.25 ± 2.39	t = −15.090* p = 0.001	29.42 ± 5.55	30.17 ± 4.12	t = −1.079 * p = 0.288
Intergroup test value and significance		t = −0.014 ** p = 0.989	t = 0.196 ** p = 0.845		t = 0.383 ** p = 0.704	t = 0.312 ** p = 0.750	

(IG= Intervention Group, CG= Control Group)

* Paired Samples t test

** Independent Samples t test

4. Discussion and conclusion

4.1. Discussion

A patient with COPD needs to be able to use drugs correctly and to perform self-care in the best way, to have sufficient information, skills, and a positive attitude about COPD and how to manage it. These can be provided with education in line with the needs of patients. With a supportive and educative system, nurses teach patients strategies to overcome self-care deficiencies and provide support for self-care agencies [5]. In a study, it was concluded that by providing education to patients with COPD, correct drug use of patients increased significantly after education [20]. The present study, which was conducted to examine the effects of education given to patients with COPD on self-care agency and rational drug use, found that education positively affected self-care agency and rational drug use. Since this is the first

study in our country examining these two scales in patients with COPD, we believe that the study will contribute to the field in terms of originality.

No statistically significant difference was found between the groups in terms of the descriptive characteristics of the patients in the intervention and control group in the study (p > 0.05) (Table 1). This result shows that the patients in both groups have a homogeneous distribution. For this reason, it is essential to start randomized controlled studies with a homogeneous patient group [21].

The pretest score of the control group indicates moderate (87.67 ± 15.27) self-care power. However, since a total score between 82 and 120 was considered moderate self-care power [14], the post-test score decreased to a low level (81.37 ± 15.12). This situation may have decreased the mean self-care scores since the patients in the intervention group were not in constant interaction, was not called once a week, and were not supported by a training booklet.

The difference between the SCAS pre-test and post-test mean scores of the patients in the intervention group were found to increase statistically at a high level in the post-test (p < 0.01) (Table 2). This result is interpreted as education increasing self-care agency from low to moderate levels. Similar to the results of our study, a significant increase was found in the self-care agency of patients with COPD after the education given by Ergin [22]. In a study conducted by Moriyama et al. [23], a significant increase was found in the self-care behaviors of patients 6 months after comprehensive self-management education. Bourbeau et al. [24] found that patients with COPD who participated in a 2-month comprehensive patient education program with monthly phone follow-up were referred to the hospital less than the patients in the control group in 12 months. Griva et al. [25] found a decrease in the self-care needs of patients and their rates of performing activities independently due to the face-to-face education they provided to patients to increase self-care agency. The intervention group SCAS post-test mean scores of the study are in parallel with the result of the studies mentioned. It was reported that the education given to patients with COPD might decrease fatigue, significantly affect dyspnea and improve respiratory function tests [26]. Therefore, it can be interpreted as decreasing fatigue and dyspnea and improving respiratory function tests increase patients' participation in care (self-care).

It was found that the difference between RDUS pretest-posttest mean scores of the patients in the intervention group increased statistically high in the post-test (p < 0.01) (Table 3). No scale-based studies were found on the rational drug use of patients with COPD in the literature. Therefore, studies examined the correct drug use levels in patients after education. Kim et al. [27] concluded that patient education programs are affected in promoting correct drug use. In a study by Abadoğlu et al. [28], significant differences were found between the correct use rates of drugs before inhaler education given to COPD patients and 1 month later. In the study of Göriş et al. [29], correct drug use increased significantly after the training given to patients with COPD. In a study by Güner [30] on rational drug use in patients with diabetes, it was found that in both the intervention and control groups, the RDUS score was moderate at the beginning. After the education, the RDUS score of the intervention group increased significantly. As a result of a study conducted by Finset [31] on patients with COPD, inhaler drug use of the group that received education was more correct when compared with the control group.

In the study, it was determined that the level of rational drug use and self-care power of university graduates and smokers increased. However, this increase was not as much as other sociodemographic characteristics. The reason for this is the low number of university graduates (n = 2) and smokers (n = 2) in the intervention group. Also, results proved that education was effective.

At the end of the training given for 6 weeks, the SCAS and RDUS scores increased. Studies have shown that as the frequency of education increases, the patients' self-care power and rational drug use scores increasen [22,30,32]. In the study of Ergin et al. [22], the SCAS score

level at the end of the 4-week training was lower than in this study. In the study of Deveci and Aydın [32], the SCAS score was higher than in this study, as training was given for 12 weeks. In the study of Güner [30], the RDUS score at the end of the 12-week training was higher than this. In line with these results, we can say that as the frequency of training increases, the effectiveness of training also increases.

4.2. Conclusion

In order to determine the effect of education given to COPD patients on self-care power and rational drug use, this study concluded that education is an effective way to improve self-care power and rational drug use. The education to be given to patients with COPD and caregivers about the correct use of drugs is an integral part of nursing care. At the same time, guiding and supporting patients to increase their independence and responsibility in self-care behaviors are among the objectives of nursing practices. Therefore, determining the prioritized needs in education and providing education in line with these needs will be effective.

4.3. Practical implications

In line with these results, it can be recommended;.

- For chest diseases, nurses to create education programs that use demonstration methods by using written and visual education materials to prevent health problems that may develop due to COPD,
- To control patients within suitable time intervals after education is given to patients with COPD and to continue education for individuals' needs,
- For nurses to hold education programs about self-care skills for patients with COPD within specific time intervals and thus create awareness,
- For nurses to hold education programs about rational drug use for patients with COPD who use drugs continually within specific time intervals and thus to create awareness,
- To increase studies that evaluate the effectiveness of education given to patients with COPD.

CRediT authorship contribution statement

Zeynep Yıldırım: Conceptualization, Data curation, Methodology, Resources, Software, Visualization, Writing – original draft. **Mağfiret Kaşıkçı:** Conceptualization, Data curation, Funding acquisition, Methodology, Software, Validation, Writing – review & editing.

Declaration of Competing Interest

The authors have no direct or indirect competing interest.

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