

Evaluation of Family Physician's Knowledge, Attitudes and Behaviors towards Post-COVID-19 Pulmonary Rehabilitation

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ABSTRACT

Objective: This study was to evaluate the knowledge, attitude, and behaviors of family physicians working during the pandemic in terms of pulmonary rehabilitation for post-COVID patients, and to raise awareness of any deficiencies.

Material and Methods: This descriptive study was conducted on family physicians working in the city centre of Kahramanmaraş during the COVID-19 pandemic. A 21-item questionnaire was created by scanning the relevant literature information to be applied to the participants. SPSS 22.0 statistical program was used to evaluate the data. $P < 0.05$ was considered significant.

Results: Those who use correct resources showed statistically significant differences in the responses to certain issues ($p < 0.05$). These include pulmonary rehabilitation for post-COVID patients, the state of need ($p = 0.030$), an increase in muscle strength and endurance ($p = 0.05$), improvement in the quality of life ($p = 0.018$), regular exercise and breathing being just as important as muscle training ($p = 0.043$), rehabilitation of patients at the hospital ($p = 0.006$), explanation of the necessity of rehabilitation to patients ($p = 0.000$), recommendation of rehabilitation programs ($p = 0.023$), suggestion of appropriate visual materials for the situation ($p = 0.037$), and the benefit of follow-up for patients included in the program ($p = 0.000$).

Conclusion: There is a lack of knowledge, attitude and behaviour of family physicians about the pulmonary rehabilitation of post-COVID patients. Accordingly, it causes problems in treatment referral and follow-up regarding pulmonary rehabilitation.

Keywords: Pandemic, pulmonary rehabilitation, post-COVID, family medicine

INTRODUCTION

The COVID-19 infection, which started in 2019 and spread all over the world, causing severe destructive effects, is transmitted from person to person, mainly through droplets. The clinical status of the disease can progress in a wide range from asymptomatic, mild upper respiratory tract infection to severe viral pneumonia that can result in respiratory failure or death (1, 2). The main concern for COVID-19 disease is shortness of breath, respiratory failure and involvement of the lungs and respiratory system, requiring mechanical ventilation (3). Those with COVID-19 pneumonia may experience long-term reductions in functional capacity, exercise tolerance, and muscle strength, regardless of their health status (3, 4). The risk of developing pulmonary fibrosis after acute respiratory distress syndrome (ARDS) has been known for a long time (5). Rehabilitation approaches for this and some health risks, which can be permanent, play a very important role in providing functional recovery and improving quality of life (6). Healthcare professionals are undoubtedly the occupational group at the forefront in the fight against COVID-19, undertaking the greatest task and responsibility. One of the most important departments within this group is family physicians. Family physicians also serve as the place of presentation for patient follow-up, close contact follow-up, and complaints that continue in the post-disease period throughout the process. In the post-Covid period, pulmonary rehabilitation is of vital importance for every patient in terms of reversing declining lung functions or minimizing damage (7, 8).

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This study aimed to evaluate the knowledge, attitude, and behaviors of family physicians working during the pandemic in terms of pulmonary rehabilitation for post-COVID patients, and to raise awareness of any deficiencies.

MATERIAL and METHODS

This descriptive study was conducted on family physicians working in the city centre of Kahramanmaraş during the COVID-19 pandemic. The study universe comprised 205 family physicians. The sample size was calculated using the Epi Info program, which determined that a total of 140 subjects needed to be included in the study to achieve a 97% confidence level with a 5% margin of error. Ultimately, the study included $n=205$ subjects. A 21-item questionnaire was created by scanning the relevant literature information to be applied to the participants. After the approval of the Local Ethics Committee (18/10/2021), the 21-item questionnaire was applied in face-to-face interviews with volunteers from the family physicians in Kahramanmaraş city center within a 2-month period.

Statistical Analysis: Descriptive statistics were expressed as mean \pm standard deviation values, number (n) and percentage (%). The conformity of the variables to normal distribution was evaluated with the Kolmogorov-Smirnov test. The Chi-square test was used to compare categorical data. Spearman's rank correlation test was used for the correlation of categorical data. A value of $p<0.05$ was considered statistically significant.

RESULTS

The evaluation was made of 140 family physicians, comprising 70 (50%) females and 70 (50%) males. Of the total physicians, 44 (31.4%) were aged 25-30 years, 43 (30.7%) were aged 31-36 years, and 53 (37.8%) were aged >37 years. The participants had an average professional experience of 11.04 ± 8.70 years, ranging from 1 to 36 years. Of the 140 physicians, 26 (18.6%) had received training on pulmonary rehabilitation, while 114 (81.4%) had not. Additionally, 42 (30%) had received information on pulmonary rehabilitation, while 98 (70%) had not.

The status of training and having obtained information about pulmonary rehabilitation of the family physicians is presented together with the duration of professional experience and responses to the survey questions in **Table 1**.

Among the respondents, 35 reported obtaining information on pulmonary rehabilitation from correct sources such as Ministry of Health resources, scientific articles, books, and specialist physicians. However, 105 respondents were found to have used incorrect sources, such as the internet, non-physician health personnel, newspapers, and television. Those who use correct resources showed statistically significant differences in the responses to certain issues ($p<0.05$). These included pulmonary rehabilitation in post-COVID patients, with statistically significant improvements seen in the state of need ($p=0.030$), muscle strength and endurance ($p=0.05$), and quality of life ($p=0.018$). The study also found that regular exercises and breathing are just as important as muscle training ($p=0.043$), and that patients can be successfully rehabilitated at the hospital ($p=0.006$). Other important factors identified included explaining the necessity of rehabilitation to patients ($p=0.000$), recommending rehabilitation programs ($p=0.023$), suggesting visual materials appropriate to the situation ($p=0.037$), and following up with patients who participated in the program ($p=0.000$). When examined according to gender, a significant difference was determined between the responses of males and females to the items related to the state of need ($p=0.001$), reducing health expenditures ($p=0.009$), reducing hospitalizations ($p=0.003$), improving quality of life ($p=0.014$), and increased exercise tolerance ($p=0.000$) ($p<0.05$).

The correlation of age and professional experience of family physicians with the status of receiving education and obtaining information from the right sources is shown in **Table 2**.

Table 1. The status of training and having obtained information about pulmonary rehabilitation, the duration of professional experience and responses to the survey questions of the physicians.

Questions (Pulmonary rehabilitation in Post-COVID patients)		Professional Experience		P value*	Education Status		P value*	Obtaining Information		P value*
		0-7 years (%)	8 years and above (%)		Yes (%)	No (%)		Yes	No	
State of need	Yes	57(40.7)	58(41.4)	>0.05	23(16.4)	92(65.8)	>0.05	40(28.6)	75(53.5)	<0.05 (0.008)
	No	12(8.5)	13(9.3)		3(2.1)	22(15.7)		2(1.4)	23(16.5)	
Reduce health expenditures	Yes	52(37.2)	48(34.2)	>0.05	20(14.3)	80(57.2)	>0.05	33(23.6)	67(47.8)	>0.05
	No	17(12.2)	23(16.4)		6(4.3)	34(24.2)		9(6.4)	31(22.2)	
Reducing hospitalizations	Yes	51(36.4)	47(33.6)	>0.05	18(12.9)	80(57.1)	>0.05	33(23.6)	65(46.4)	>0.05
	No	18(12.9)	24(17.1)		8(5.8)	34(24.2)		9(6.4)	33(23.6)	
Dyspnea and increased fatigue in the lower extremities	Yes	8(5.8)	11(7.8)	>0.05	4(2.9)	15(10.7)	>0.05	6(4.3)	13(9.3)	>0.05
	No	61(43.5)	60(42.9)		22(15.7)	99(70.7)		36(25.7)	85(60.7)	
Muscle strength and endurance increase	Yes	49(35)	44(31.5)	>0.05	18(12.9)	75(53.5)	>0.05	34(24.3)	59(42.1)	<0.05 (0.017)
	No	20(14.2)	27(19.3)		8(5.8)	39(27.8)		8(5.7)	39(27.9)	
Improving quality of life	Yes	61(43.6)	64(45.7)	>0.05	25(17.8)	100(71.5)	>0.05	41(29.3)	84(60)	<0.05 (0.037)
	No	8(5.7)	7(5)		1(0.7)	14(10)		1(0.7)	14(10)	
Increased exercise tolerance	Yes	58(41.4)	55(39.3)	>0.05	20(14.3)	93(66.4)	>0.05	38(27.1)	75(53.5)	>0.05
	No	11(7.9)	16(11.4)		6(4.3)	21(15)		4(2.9)	23(16.5)	
Regular exercises and breathing are just as important as muscle training	Yes	46(32.9)	42(30)	>0.05	15(10.8)	73(52.1)	>0.05	32(22.9)	56(40)	<0.05 (0.033)
	No	23(16.4)	29(20.7)		11(7.9)	41(29.2)		10(7.1)	42(30)	

Table 1. Continuation of Table 1

Questions (Pulmonary rehabilitation in Post-COVID patients)		Professional Experience			Education Status			Obtaining Information		
		0-7 years (%)	8 years and above (%)	P value*	Yes (%)	No	P value*	Yes	No	P value*
Rehabilitation should start immediately after discharge	Yes	37(26.4)	42(30)	>0.05	13(9.3)	66(47.1)	>0.05	29(20.7)	50(35.7)	<0.05
	No	32(22.9)	29(20.7)		13(9.3)	48(34.3)		13(9.3)	48(34.3)	
Patients can be rehabilitated at the hospital	Yes	33(23.6)	47(33.5)	<0.05	19(13.6)	61(43.5)	>0.05	31(22.1)	49(35)	<0.05
	No	36(25.7)	24(17.2)		7(5)	53(37.9)		11(7.9)	49(35)	
Patients can be rehabilitated at home	Yes	38(27.1)	43(30.7)	>0.05	19(13.6)	62(44.3)	>0.05	31(22.1)	50(35.7)	<0.05
	No	31(22.2)	28(20)		7(5)	52(37.1)		11(7.9)	48(34.3)	
Explaining to patients the necessity of rehabilitation	Yes	14(10)	30(21.4)	<0.05	14(10)	30(21.5)	<0.05	26(18.6)	18(12.9)	<0.05
	No	55(39.3)	41(29.3)		12(8.5)	84(60)		16(11.4)	80(57.1)	
Recommend rehabilitation programs	Yes	42(30)	39(27.9)	>0.05	16(11.4)	65(46.5)	>0.05	32(22.9)	49(35)	<0.05
	No	27(19.3)	32(22.8)		10(7.1)	49(35)		10(7.1)	49(35)	
Suggesting visual material appropriate to the situation	Yes	20(14.3)	19(13.6)	<0.05	10(7.1)	28(20)	>0.05	18(12.9)	21(15)	<0.05
	No	48(34.2)	53(37.9)		17(12.1)	85(60.8)		24(17.1)	77(55)	
Refer to a more advanced centre	Yes	11(7.8)	33(23.6)	>0.05	13(9.3)	31(22.1)	<0.05	19(13.6)	25(17.9)	<0.05
	No	57(40.8)	39(27.8)		13(9.3)	83(59.3)		23(16.4)	73(52.1)	
Benefit of follow-up of the patients included in the program	Yes	9(6.4)	15(10.7)	<0.05	14(10)	10(7.1)	<0.05	19(13.6)	5(3.5)	<0.05
	No	60(42.9)	56(40)		12(8.6)	104(74.3)		23(16.4)	93(66.5)	
Improved status if followed up	Yes	7(5)	14(10)	<0.05	13(9.3)	8(5.7)	>0.05	18(12.9)	3(2)	<0.05
	No	2(1.4)	1(0.7)		1(0.7)	2(1.4)		1(0.7)	2(1.4)	

* Chi-square test

Table 2. The correlation of age and professional experience of family physicians with the status of receiving education and obtaining information from the right sources

	Age		Professional experience	
	r*	p*	r*	p*
The status of receiving education	-0.300	0.000	-0.256	0.002
The status of right sources	-0.109	0.200	-0.066	0.441

*Spearman's rank correlation

DISCUSSION

Pulmonary rehabilitation, which is now seen as the cornerstone of managing chronic respiratory diseases and post-exacerbation care, has been shown to be one of the strongest evidence-based treatments for patients with respiratory diseases (9). In addition to chronic respiratory diseases, studies of COVID-19 have also argued that COVID-19 can cause restrictive lung diseases and that comprehensive and multidisciplinary pulmonary rehabilitation programs should be applied to COVID-19 patients, based on the content recommended for cases with lung fibrosis (10-12).

Although known for a long time, the modern concept of rehabilitation began to gain credibility after the mid-1990s (13). Studies conducted in the 2000s have shown that pulmonary rehabilitation significantly reduces high health expenditure in the following year and can be organized without any additional cost to society (13-15). However, there is a lack of plans and programs related to pulmonary rehabilitation, and there are deficiencies in the data about duration, basic components, place and patients of the programs implemented. The content and duration of the program may differ around the world and even within the same country, the quality may change, and patients may experience various problems regarding access to the program (16-18). Problems of transportation to pulmonary rehabilitation and the distance to the rehabilitation centre have been shown to be important negative factors in both starting the rehabilitation and completing the program after it has started.

In addition, studies are showing that the recommendation of the patients' family physicians rather than the advice of a doctor they do not know will have a more positive effect on participation in the program (19, 20). These findings show the importance of family physicians in the practice of pulmonary rehabilitation for COVID-19 patients, and this study examined the level of knowledge of family physicians about pulmonary rehabilitation after COVID-19.

The results of the current study showed a weak negative correlation between the age and professional experience of family physicians and their education on pulmonary rehabilitation. As mentioned above, the fact that pulmonary rehabilitation started to gain credibility after the mid-1990s (13) could explain the lack of training in pulmonary rehabilitation of older doctors with longer professional experience, and this lack of knowledge also reflects on the status of continuing training after graduation. This is important because family physicians who do not know about pulmonary rehabilitation were seen to state at a higher rate that post COVID-19 patients do not need pulmonary rehabilitation.

The American Thoracic Society defines pulmonary rehabilitation as 'A comprehensive intervention based on a comprehensive patient assessment and a multidisciplinary care program that includes, but is not limited to, patient-specific treatment, exercise education, education and behavior modification to optimize physical and social performance and the individual's ability to live independently' (21, 22).

It is a comprehensive intervention based on a comprehensive patient assessment and includes exercise training and behavioral changes designed to improve the individual's physical and psychological well-being. Supervised exercise training is the cornerstone of pulmonary rehabilitation programs (22). Patients with COPD are less physically active than their peers, resulting in loss of muscle mass and function, and comprehensive physical exercise training is an integral component of pulmonary rehabilitation to increase tolerance (23, 24). Of the family physicians who participated in this study, the rate of those who did not have any knowledge about pulmonary rehabilitation and said that muscle strength and endurance would not increase after pulmonary rehabilitation was found to be significantly higher than those who knew. In addition, among the family physicians who stated that regular exercise does not improve quality of life, the rate of those with no knowledge was found to be higher. A higher proportion of uninformed physicians stated that regular exercise is not as important as breathing and muscle exercises. These results show the lack of knowledge among family physicians and that there is a need for family physicians to be correctly informed.

The main aim of the pulmonary rehabilitation program in COVID-19 patients is to improve the symptoms of shortness of breath, alleviate anxiety, reduce complications, minimize disability, preserve function and improve quality of life (25). Pulmonary rehabilitation may be more suitable for patients to undergo at home through minimal-contact telemedicine due to the high contagiousness of COVID-19, inadequate personal protective equipment, and the risk of transmission within hospitals (26). Studies have also found that home pulmonary rehabilitation and centre-based pulmonary rehabilitation programs provide equal results (27). In the current study, the fact that the rate of those who stated that COVID-19 patients cannot undertake pulmonary rehabilitation at home was higher among the uninformed family physicians shows the importance of having knowledge.

Patients who were offered pulmonary rehabilitation but did not participate were determined at the rate of 8.3% - 49.6%. The main reasons for not participating can be listed not wishing to disrupt daily routine, difficulty in reaching the rehabilitation centre, the effect of the doctor, the perceived lack of benefit, and an inconvenient program schedule (20). Previous studies have demonstrated that patients are more likely to participate in a pulmonary rehabilitation program if recommended by their own family physicians rather than an unfamiliar doctor (20). Additionally, having support during participation in the program has been shown to increase participation rates and reduce dropouts. This shows that physician ambivalence about the benefits of pulmonary rehabilitation have a negative effect on the patient's acceptance of the program (20). These data suggest that participation in the pulmonary rehabilitation program to be performed at home under primary care supervision may be higher. Home-based programs are more convenient for the patient and can enable easier adaptation of exercise and physical activity to daily life (28). A study conducted in England showed that patients participating in the pulmonary rehabilitation program applied in primary care developed exercise tolerance and improved health status, similar to leading hospital programs.

It has also been determined that the total cost per patient of the program is lower than hospital-based programs (29). Community-based programs have been shown to improve functional capacity and quality of life in individuals with COPD and can be an effective and cost-effective strategy to reduce the burden of disease (30). So much so that, in Sweden, rehabilitation programs have been organized within the primary healthcare service due to low participation in hospital-based programs (31).

A previous study found that only 3-16% of eligible patients were referred to a higher level centre (32). In the current study, the rate of referral by physicians to a more advanced centre for pulmonary rehabilitation was found to be 31.4%, and the rate of referral was found to be higher in trained physicians. In a study conducted in Australia, the rate of referral to pulmonary rehabilitation by general practitioners was 16.6%. The main reasons for the low referral rate were listed as a low level of knowledge of physicians about pulmonary rehabilitation, not knowing how to refer, and being unsure about the benefit of pulmonary rehabilitation for the patient (33).

The present study found that family physicians who had received training on pulmonary rehabilitation were more likely to inform their patients about the importance of this therapy. Conversely, physicians who lacked knowledge of pulmonary rehabilitation were more likely to omit explanations of its necessity and to refrain from recommending the rehabilitation program. This demonstrates the importance of educating family physicians on pulmonary rehabilitation. Likewise, referral to higher level centres was found to be higher in those who had received training, while non-referral was found at a higher rate in those who did not have knowledge. This can be interpreted as family physicians with a lack of knowledge, and education does not pay sufficient attention to pulmonary rehabilitation.

CONCLUSION

There is a lack of knowledge, attitude and behaviour of family physicians about the pulmonary rehabilitation of post-COVID patients. Accordingly, it causes problems in treatment referral and follow-up in terms of pulmonary rehabilitation. Necessary trainings should be planned for family physicians, and attention should be paid to field practices.

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Ethical approval: All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and/or with the Helsinki Declaration of 1964 and later versions. Informed consent or substitute for it was obtained from all patients for being included in the study.

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