

Evaluation of the Impact of Rehabilitation Training on the Knowledge and Attitude of Caregivers of COVID-19 Patients in Iran

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Abstract- Applying rehabilitative measures is shown to be influential in relieving the medical complications of the COVID-19 disease. Herein, we aimed to assess the effect of a rehabilitation training class on the knowledge and attitude of the caregivers of the COVID-19 patients. Twenty-three caregivers voluntarily filled the questionnaire before and after attending a training class that evaluated the participants' beliefs about the four types of rehabilitations in COVID-19, including musculoskeletal, respiratory, gastrointestinal, and deep vein thrombosis (DVT) prevention. Significant improvement in the caregiver's attitude about the importance of all four rehabilitation types was detected. Also, the knowledge was increased about the necessity of DVT prevention. The level of knowledge in the caregivers of COVID-19 patients in Iran is not satisfactory, which necessitates proper education to achieve the rehabilitation goals rapidly. In-person caregiver training along with presenting pamphlets is of the most useful methods.

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Introduction

Since the emergence of the COVID-19 and its rapid spread worldwide (1-7), a major global health concern has arisen. Depending on the severity of the disease, COVID-19 is divided into mild (most prevalent), common, severe, and very severe forms. The mild form manifests with few symptoms and no sign of pneumonia nor disease-related imaging evidence. The common form presents with fever, cough, and dyspnea. In the severe type, dyspnea occurs one week after the disease onset, rapidly leading to respiratory distress, septic shock, metabolic acidosis, and coagulopathy (4).

So far, no established treatment exists for the disease, which necessitates developing preventive and rehabilitative alternatives (8). Rehabilitative measures were shown influential from the initiation of the disease to hospitalization and even after discharge. However, a standard protocol for these measures has not yet been

established. The overall goal of rehabilitation in patients with mild to moderate symptoms is improving dyspnea, reducing anxiety and depression, maximizing residual function, reducing disability, and improving the quality of life. In the severe form, maintenance rehabilitation policies are necessary (9).

Generally, all hospitalized patients experience a decrease in muscle strength due to immobilization which is one of the major risk factors for DVT, especially in the lower limbs (10). Constipation and gastrointestinal problems are other common consequences of immobility. Pulmonary atelectasis and the inability to drain airway secretions are also common among hospitalized patients (11). Those COVID-19 patients experiencing disabling symptoms most probably will later encounter immobility and these complications.

Therefore, multi rehabilitation programs, including musculoskeletal rehabilitation to prevent rhabdomyolysis, respiratory rehabilitation for airway

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clearance and increasing respiratory capacity, appropriate exercises to prevent DVT, and abdominal and pelvic floor exercises to increase pelvic blood circulation, are essential (12).

Due to the high contingency of the disease and no approved treatment so far, and the scarcity of personal protection equipment, it is recommended to implement the rehabilitation protocols using patients and their caregivers. Based on the second version of the Chinese Pulmonary Rehabilitation Society Guideline about COVID-19, patient, and caregiver education through video tutorials, brochures, and Tele counseling is preferred (9,13).

Given the growing COVID-19 epidemic in Iran and the increasing prevalence of the patients needing quarantine and hospitalization and the importance of rehabilitation, this study was conducted to evaluate the caregiver's knowledge and attitude about the necessity and the manner of rehabilitation in these patients before and after a training class while providing them with an educational pamphlet.

Materials and Methods

Twenty-seven caregivers were voluntarily enrolled using simple sampling method from the caregivers of COVID-19 patients in Imam Khomeini hospital (Tehran, Iran). Those who volunteered for the companionship that filled out the questionnaire both before and after the training session were included. Informed written consents were acquired from all participants prior to the study. Also, the objectives of the study were clarified and the confidentiality of the answers was assured.

The study protocol conforms to the ethical guidelines of the 1975 Declaration of Helsinki and was approved by the ethics committee of the Tehran University of Medical Sciences with the ethics code IR.TUMS.VCR.REC.1399.012.

Due to the contagiousness of the disease and for health considerations, the class was held in a large hall with up to 300 people capacity and a minimum distance of two meters between the attendances, and personal protection equipment were freely distributed.

After acquiring the demographics, the questionnaire titled "assessment of the knowledge and attitude level in caregivers of the patients with COVID-19 about the rehabilitation and how to perform it" was obtained, which contains 13 questions. The first four questions are about the general knowledge of caregivers about the necessity of rehabilitation and how to perform it. Questions numbers 5 to 13 are about four specific types

of rehabilitation needed in these patients and the caregiver's attitude toward them. All questions except for Question 5 included five answers (using a Likert scale of 1 to 5). Question 5 included four answers about the types of rehabilitation needed in these patients, including musculoskeletal, respiratory, and gastrointestinal rehabilitation and DVT prevention, rating from 1 to 4 according to the number of options selected. The minimum score of the questionnaire was 12, and the maximum was 64.

After filling the questionnaires, two psychiatrists presented at a one-hour long class, considering the four abovementioned rehabilitative types. Then, a post-test was acquired, and eventually, an educational pamphlet containing the main class tips with the instruction of some useful exercises and their figures were distributed.

Eventually, the questionnaire was completed by the participants for the second time.

The statistical correlation analysis was conducted blindly using SPSS version 25. Quantitative variables were analyzed based on the average and standard deviation values, and the analysis before and after the intervention was performed using the Paired-samples T-test. $P < 0.05$ was considered statistically significant.

Results

Twenty-seven volunteer caregivers attended the class. Four were excluded from the analysis due to not filling out both pre and post-tests completely.

The data were normally distributed. The average age of participants was 29.56 years (SD: 8.21). Table 1 illustrates the demographics of the participants.

The mean score of questionnaires was 29.73 (SD: 6.01) pre-intervention and 49.82 (SD: 7.13) after the intervention, which was significantly increased ($P < 0.001$).

Concerning question number 5 about the importance of different types of rehabilitation in these patients, most of the participants (10 persons: 43.5%) believed that respiratory rehabilitation alone was sufficient in these patients before the intervention. However, after taking part in the class and studying the pamphlets, 18 people (78.3%) believed that musculoskeletal, respiratory, and gastrointestinal rehabilitation and DVT prevention are necessary as well. Before the class, only seven caregivers (30.4%) believed that DVT prevention is crucial during immobilization, but the number increased to 20 caregivers (87%) after the intervention ($P < 0.001$) (the data is provided in the supplementary material).

Table 1. Demographic Characteristics of the participants

		Frequency
Gender	Male	17 (73.9%)
	Female	6 (26.1%)
Job	employed	6 (26.1%)
	unemployed	1 (4.3%)
	teacher	3 (13.0%)
	Clerical	6 (26.1%)
	Nurse, doctor	2 (8.7%)
	Student	5 (21.7%)
Education	Diploma	4 (17.4%)
	Associate Degree	4 (17.4%)
	Bachelor	8 (34.8%)
	Master	5 (21.7%)
	PhD	2 (8.7%)
Marriage	Single	15 (65.2%)
	Married	8 (34.8%)

Discussion

This study was conducted aiming to investigate the efficacy of organizing a training course on enhancing the knowledge and attitude of the caregivers of patients suffering from COVID-19 regarding four aspects of rehabilitation; musculoskeletal, respiratory, gastrointestinal rehabilitation, and DVT prevention.

Former works have suggested the rehabilitation be considered from the initial admission (10). Therefore, educating the patient's caregivers about the primary rehabilitation principles during the hospitalization and quarantine period can be a smart policy. Most admitted patients with COVID-19 are able to perform physical activities, including the range of motion, breathing, and DVT prevention exercises (4).

There are few prior studies regarding the rehabilitation in COVID-19 patients (8-14). In the second version of the Chinese Pulmonary Rehabilitation Society Guideline about COVID-19, the importance of rehabilitation has been emphasized. One of the issues highlighted in this guideline is rehabilitation education of patients and their caregivers using brochures, videos, and other similar ways. In this study, along with Chinese guidelines, we have investigated the impact of in-person training and pamphlet presentation on the knowledge and attitude of caregivers of patients with COVID-19 (9). According to our study, the caregiver's score was significantly increased after the training session and for each of the 13 questions, the score was significantly higher after the intervention as well. At the beginning of the study, merely 21.7% of the caregivers believed in the importance of all 4 types and 43.5% considered the respiratory rehabilitation sufficient. Additionally, only

seven participants were aware of DVT prevention significance. After taking part in the class and reading the brochures, 78.3% of the attendances found out the necessity of all four types of rehabilitation and 87% of them believed in the necessity of DVT prevention.

Several studies indicated the risk of clot formation in lower limbs DVT in hospitalized patients and those with limited physical activity, and prophylaxis is not usually sufficient in these patients (15). Therefore, educating the patients and their caregivers about the rehabilitative measures is crucial.

One of the most prevalent problems in patients, especially in the elderly who are hospitalized for any reason, is constipation (11,16). This disorder in patients with COVID-19 may reduce the respiratory capacity and affect the prognosis. In one former work, the impact of patient education on relieving early constipation and improving the quality of life was desirable (17). Herein, understanding the need for rehabilitation for constipation in patients with COVID-19 was questioned. The scores were significantly higher after the intervention.

Eventually, it is to be concluded that the level of knowledge in caregivers of patients suffering from COVID-19 in Iran is not satisfactory, and regarding the importance and the need for early rehabilitation in these patients, timely education would be necessary. In-person caregivers' training, along with presenting pamphlets, is one of the most useful and practical methods in this way.

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