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Effect of Telenursing on the Self-efficacy of COVID-19 Patients after Discharge from Hospital

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Abstract

Background: Considering the complications of coronavirus disease 2019 (COVID-19), it is necessary to implement telenursing in order to improve the quality of the healthcare services and ensure the continuity of these healthcare services out of the hospital.

Aim: This study aimed to evaluate the effect of telenursing on the self-efficacy of the COVID-19 patients after discharge from the hospital.

Method: This clinical trial was conducted on 66 COVID-19 patients in Vasei Hospital, Sabzevar, Iran, in 2021. The participants were divided into intervention and control groups using the random permuted block technique. The required data were collected through a demographic form and the COVID-19 Prevention, Recognition, and Home-Management Self-Efficacy Scale completed online by the participants before and 1 month after the intervention. A telenursing workshop was performed through an online platform to educate the patient in the intervention group for 1 month. Finally, the data were analyzed in SPSS software (version 24) using the independent t-test, paired t-test, Chi-square test, and Fisher's exact test.

Results: The mean scores of self-efficacy were estimated at 165.66±15 and 159.69±21 21.73 in the control group before and after routine training, respectively, while they were obtained at 144.24±20.58 and 172.15±13.28 in the experimental group before and after telenursing, which was significantly different (P<0.001).

Implications for Practice: It seems that telenursing was effective on the self-efficacy of patients. Accordingly, the nursing team is recommended to use telenursing to improve the self-efficacy of the COVID-19 patients.

Keywords: COVID-19, Self-efficacy, Telenursing

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Introduction

Most people with coronavirus disease 2019 (COVID-19) have mild symptoms, such as dry cough, sore throat, and fever, most of which are resolved spontaneously. However, in some cases, it has caused various fatal complications, including organ failure, septic shock, pulmonary edema, severe pneumonia, and acute respiratory distress syndrome (SARS) (1). Severe infections require treatment in the intensive care unit and can lead to post-recovery complications, such as respiratory, physical, cognitive, and psychological difficulties (2). These symptoms are known as intensive care syndrome, which can have long-term consequences for the quality of life (3). Carfi et al. found that 87.4% of patients experienced at least one symptom after recovery and most of them reported tiredness (53%) and shortness of breath (43%) (4). Lung lesions that are associated with COVID-19 can cause chronic and long-term lung disease (5). In addition, COVID-19 can affect various organs, such as the heart and kidneys, and cause vascular damage and thrombosis (6).

Since the results of previous studies have shown that acute infectious diseases, such as SARS, can lead to anxiety, depression, stress, and post-traumatic stress disorder in patients, it is necessary to consider the psychological effects of COVID-19 (7). In addition, physical symptoms, such as decreasing muscle function to sarcopenia with an increased risk of malnutrition, must be followed for all patients (8). The psychological symptoms related to COVID-19 have already been observed in patients, including anxiety and paranoia to attend social events. This disease has strong pathogenicity and transmissibility (9). Transmission may occur through personal objects in the vicinity of an infected person (10). This issue is a concern and great anxiety in the patients and their families (11) and reduces self-efficacy among patients.

One of the factors affecting the quality of life is self-efficacy. Self-efficacy is related to a person's belief in his/her ability to perform actions in response to events and adopt various behaviors to achieve specific goals (12). People with high self-efficacy choose more challenging goals and tend to focus on opportunities rather than obstacles (13). In general, people with self-efficacy involve themselves in health promotion programs and have less stress in their lives. They can control the events of their life by efficient ways; therefore, they have a higher quality of life. Moreover, the findings of studies have shown that an increase in self-efficacy boosts empowerment, and consequently, the quality of life (14). It should be noted that to prevent psychological complications of COVID-19 and improve the condition, these patients need psychological support in form of telenursing intervention. Since in this pandemic, we are facing a lack of facilities and hospital beds, while a large number of patients need to be hospitalized, this would lead to patients' early discharge from the hospital and the need for care and support at home. Furthermore, due to the side effects of COVID-19 in patients, to improve the quality of care, other methods should be adopted to ensure the continuity of care for such patients outside the hospital. It seems that telenursing is a good option because it can reduce the risk of disease. It seems that telenursing is a good option because it can reduce the risk of disease transmission. Also, it can help for the lack of resources and equipment during overload in hospitals by early dischrge of patients. According to the International Nurses Association, telenursing is the use of telecommunications technology in nursing to increase patient care, which includes the use of electromagnetic devices to transmit sound and information (15). Telephone follow-up after discharge is a highly useful and inexpensive method for assessing patients' needs and helping solve callers' problems (16, 17). Calls after discharge are helpful in identifying and correcting care gaps that may occur after discharge from the hospital (18). It also improves the relationship between patients and health care providers. The findings of studies on the use of telenursing as technology have confirmed its effectiveness in improving the self-efficacy of patients with rheumatoid arthritis in Denmark (19). It should be noted that Ćosić et al. emphasized the potential of digital tools to deal with COVID-19-related psychological distress and using their previous experiences in the development of relevant programs (20).

Similar telenursing studies have focused on chronic diseases and the elderly (19, 21); nevertheless, its effects have been less studied in acute diseases, such as COVID 19. Additionally, in these patients, taking care of physical needs is different because of quarantine.

Due to the importance of the issue and the prevalence of this disease, the current public health emergencies impose a significant physical, psychological, and social burden on patients. Moreover, this is a new virus and we can currently only support the patient. Telenursing reduces the risk of transmitting disease, is affordable for patients, and decreases the risk of nosocomial infection when visiting the hospital (22). In addition, telenursing drastically reduces the workload of nurses (23).

Therefore, this study was conducted to determine the effect of telenursing on the self-efficacy of patients with COVID-19 after discharge from the hospital.

Methods

This clinical trial study was conducted on 66 COVID-19 patients (PCR+) hospitalization and discharged from Vasei Hospital, Sabzevar, Razavi Khorasan Province, Iran, within March-June 2021. The inclusion criteria were being 30-60 years old, lacking hearing or visual impairments, lacking obvious cognitive and mental disorders, lacking severe mood-emotional disorders, lacking stressful events in the last 6 months for the patient, speaking Persian or understanding Persian (or having a companion who understands Persian), being able to read or write, living with family, being quarantined at home, not participating in an empowerment program, having a diagnosis of COVID-19 (PCR+), having a home phone or mobile phone, having experienced the same conditions for COVID-19. On the other hand, the patients who were unwilling to participate in the study, failed to respond to follow-up for 3 consecutive days, did not participate in the training session, and were willing to leave the study were excluded from the research.

According to the results of a study carried out by Javanmardifard et al. (24), in which the mean scores of self-efficacy after the intervention were reported at 44.83±4.95 and 36.93±7.08 in the intervention and control groups, respectively, and considering the confidence level of 0.95%, the test power of 0.80%, and using G*Power software (vesion 3.1), the minimum sample size was determined at 33 participants in each group (Figure 1).

The required data were collected using a demographic form and the COVID-19 Prevention, Recognition, and Home-Management Self-Efficacy Scale. In this study, demographic and disease

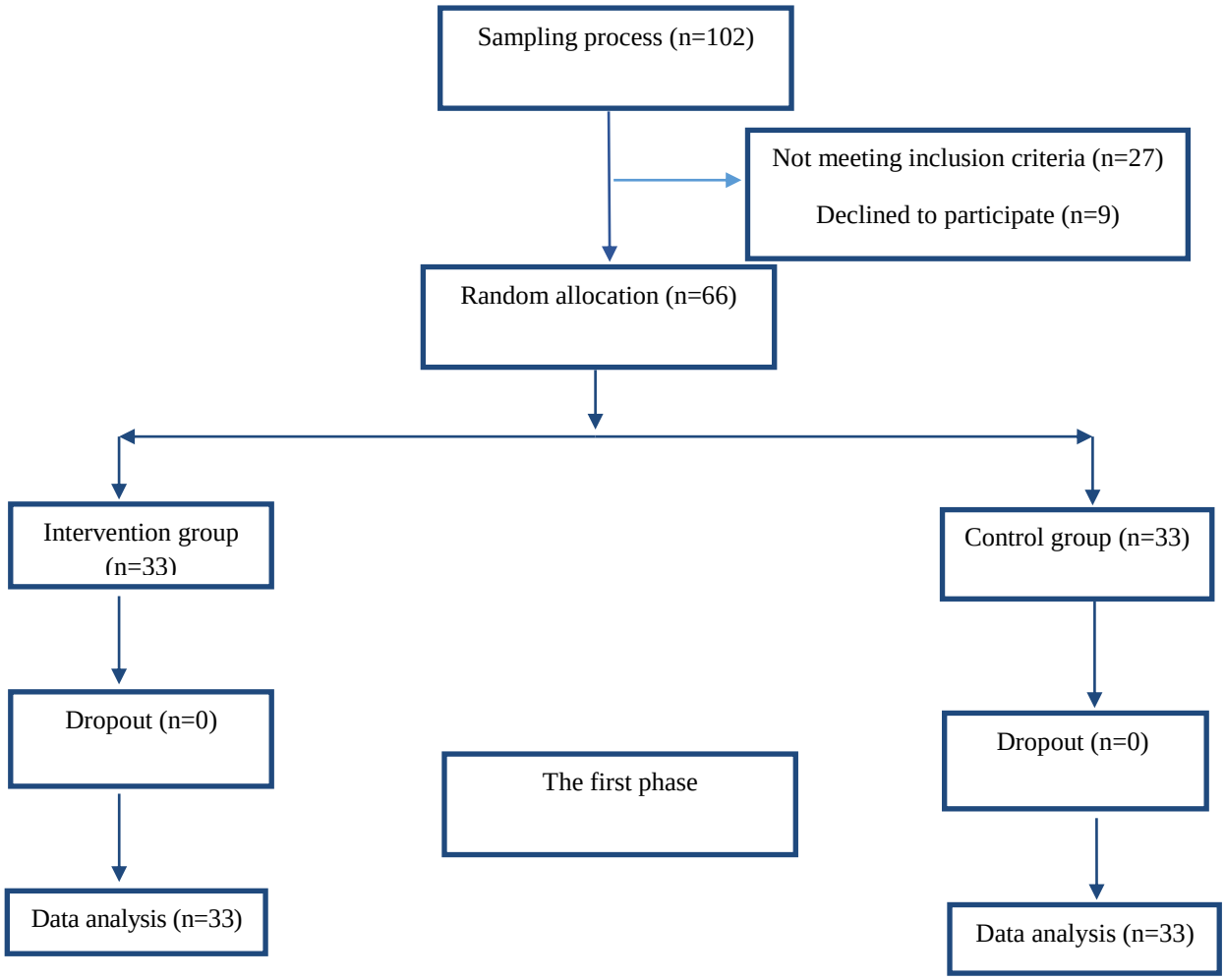

Figure 1. Flowchart of the design, group, and participants in the study

This study was conducted after obtaining introduction letter and necessary permission from relevant authorities. The COVID-19 Prevention, Recognition, and Home-Management Self-Efficacy Scale was designed and analyzed by Hernández-Padilla et al. (25). This 19-item questionnaire is scored by the participant with numbers between 0 and 100. Accordingly, the scores obtained at < 55, 55-68, 69-82, 83-96, and > 96 correspond to very low self-efficacy, low self-efficacy, medium self-efficacy, high self-efficacy, and very high self-efficacy, respectively. The reliability of this scale was assessed at 0.906 using Cronbach's alpha coefficient method, which is acceptable. It has also good content validity (scale content validity index=0.92). In this study, the instrument was initially translated by a dominant bilingual team (Persian-English) and experts in the field of COVID-19, and then used after that its validity and reliability were determined. To obtain the scientific validity of the questionnaire, the qualitative content validity method was employed; therefore, the translated items of the main questionnaire were given to 10 faculty members of Sabzevar University of Medical Sciences, Sabzevar, Iran, and infectious disease specialists. After performing the recommended corrections, the content of the questionnaire was utilized. The reliability of the instrument was determined by the internal consistency method using Cronbach's alpha coefficient (α=0.908). Regarding these, the instrument showed sufficient validity and reliability.

This study was conducted after obtaining introduction letter and necessary permission from relevant authorities. At the next step, samples were was collected from all patients with COVID-19. The participants were selected immediately after discharge and contacted by the convenience sampling method. According to the sample size and based on inclusion and exclusion criteria, 66 patients were selected. The informed consent, demographic characteristics from, and COVID-19 Home Management Self-Efficacy Scale were completed online by the participants before and 1 month after the intervention in both groups. After initial communication with the participants, the link of informed consent and questionnaires were sent to them through social media and available media, such as WhatsApp, Telegram, and imo. The participants entered the related link and answered the questions .

Regarding the ethical considerations, informed consent was obtained from all participants, and the research objectives and procedures were explained to all individuals. The subjects were informed of the right to leave the study at any time. Moreover, all participants were assured of anonymity and confidentiality in this study .

The participants were randomly divided into intervention and control groups using permuted block technique. R software (4.0.3 version) was used to obtain the blocks. These blocks consist of 4 English letters, namely A, B, C, and D. A and B were considered for the intervention group and the other two letters were considered for the control group. The blocks were selected randomly and blindfolded. After selecting participants based on the inclusion and exclusion criteria, each block determined the order of entry into the intervention and control groups. Therefore, 17 blocks were selected to complete the sampling. There were 33 patients in each group. The study is one-sided blind and only the statistical consultant was not aware of whether the participant was in the intervention or control group.

In the intervention group, the patients received 3-hour training after discharge. This training was held by the author in two 90-minute sessions as a one-day training workshop through the Skyroom Platform. This workshop trained the patient for the disease and ways to prevent its transmission, attention to quarantine time, location (quarantine room particularities, quarantine room disinfection, patient travel areas, such as bathrooms and toilets), social communication, diet and medication, psychological issues (psychological strategies for stress management), having a healthy lifestyle, sleep and rest in quarantine, management of outpatient care (weakness, fever, body pain, loss of sense of smell, nausea, vomiting, diarrhea, ventilation, strong nutrition, enough fluids, and providing minimum facilities for psychosocial support). In this session, the participants expressed their problems and challenges by asking questions. Furthermore, the designed educational booklet and photos of educational writings were provided to the intervention group via social media. After that, in the intervention group, telephone follow-up was performed for a month daily in the first two weeks and every two days in the second two weeks. Agreements were made regarding follow-up times and calls, and the contact number of the researcher and WhatsApp, imo, Telegram, and SMS were provided to the participants; therefore, they could communicate and ask their questions whenever necessary. It should be noted that no intervention was performed for the control group and only

routine hospital care was provided. The ward nurse provided the necessary training on infection control, medication use, and revisits. In addition, for ethical considerations, at the end of the study, the designed educational booklet was given to the patients in the control group.

Results

In this study, 66 patients with COVID-19 were studied in two groups of control and intervention (n=33 each). As shown in Table 1, in the control group, the majority of patients were male, married, with higher education, housemaker, with reliable monthly income. In the intervention group, the majority of patients were female, married, high school graduated, and housewives, with unreliable monthly incomes. The mean age scores of the patients were obtained at 43.7±9.4 and 41.4±8.3 in the control and intervention groups, respectively. The groups showed no significant difference in terms of the mentioned variables, except for marital status (P=0.01) (Table 1). The highest number of

Table 1. Comparison of demographic variables of patients in the control and intervention groups

Variables		Group		Test result
		Intervention group number (percent)	Control group number (percent)	
Gender	Men	16 (48.5)	19(57.6)	*P=0.46
	Woman	17(51.5)	14(42.4)	
Marital status	Single	0(0)	2(6.1)	**P=0.01
	Married	27(81.8)	31(93.9)	
	Divorced	3(9.1)	0(0)	
	Widows	3(9.1)	0(0)	
Education	Illiterate	3(9.1)	1 (3.0)	*P=0.25
	Elementary	3(9.1)	9(27. 3)	
	Guidance	8(24.2)	5(15.2)	
	High school	11(33.3)	8(24.2)	
	University	8(24.2)	10(30.3)	
Occupational status	Employee	3(9.1)	3(9.1)	**P=0.68
	Retired	1 (3.0)	5(15.2)	
	Worker	5(15.2)	2(6.1)	
	Self-employed	8(24.2)	8(24.2)	
	Student	1 (3.0)	1 (3.0)	
	Housemaker	13(39.4)	12(36.4)	
	Unemployed	2(6.1)	2(6.1)	
Family income	More than adequate	0(0)	2(6.1)	**P=0.33
	Adequately	16(48.5)	18(54.5)	
	Less than adequate	17(51.5)	13(39.4)	
Family support	Weak	11(33.3)	9(27.3)	**P=0.97
	Medium	9(27.3)	10(30.3)	
	Good	9(27.3)	9(27.3)	
	Excellent	4(12.1)	5(15.2)	
Media literacy	Weak	4(12.1)	3(9.1)	**P=0.86
	Medium	18(54.5)	18(54.5)	
	Good	10(30.3)	9(27.3)	
	Excellent	1 (3.0)	3(9.1)	
Access to care and support	Weak	21(63.6)	14(42.4)	**P=0.30
	Medium	6(18.2)	11(33.3)	
	Good	5(15.2)	5(15.2)	
	Excellent	1 (3.0)	3(9.1)	

*Chi-square test ** Fisher's exact test

Table 2. Mean of patients' self-efficacy in the control and intervention groups

		Mean ± SD		Independent t-test result
		Intervention group	Control group	
Self-efficacy before intervention		20.58±144.24	15.50±165.66	t=-4.78 P<0.001
Self-efficacy 1 month after the intervention		13.28±172.15	21.73±159.69	t=2.81 P<0.001
Paired t-test result	Before and 1 month after the intervention	t=-10.33 P<0.001	t=2.17 P=0.04	

Table 3. Results of ANCOVA test with control confounding effect of the group before the intervention and marital status

Dependent Variable	Source	Mean Square	F	Sig.
Self-efficacy 1 month after the intervention	Intercept	4287.36	21.38	P<0.001
	Self-efficacy before intervention	8134.31	40.57	P<0.001
	Group	8040.35	40.11	P<0.001
	Marital status	5.53	0.027	P=0.87

participants did not smoke accounting for 30 (90.9%) and 27 (81.7%) cases in the control and intervention groups, respectively. It was also found that 30 (90.9%) participants in the control group and 31 (93.9%) participants in the intervention group were not addicted. Regarding the number of days of hospitalization, most participants in the control and intervention groups were in hospital 14 (42.4%) and 13 (39.4%) days, respectively. Most caregivers were the spouse of the participants, which accounted for 25 (75.8%) and 24 (27.7%) subjects in the control and intervention groups, respectively. In addition, 14 (42.4%) and 16 (48.5%) participants in the control and intervention groups had social security insurance, respectively. Fisher's exact test did not show a significant difference between the two groups in terms of the abovementioned variables (P>0.05).

After a routine training in the control group, the mean score of self-efficacy decreased from 165.66±15.55 to 159.69±73.21; however, after telenursing in the intervention group, it increased from 144.24±20 to 172.15±28.13 (Table 2). The results of analysis of covariance for self-efficacy after the intervention by adjusting the effect of the marital status and self-efficacy before the intervention showed that the mean of self-efficacy was statistically significant between the groups (P<0.001) (Table 3).

Discussion

This study aimed to investigate the effect of telenursing on the self-efficacy of patients with COVID-19 after discharge from the hospital. The results showed that the role of education and telenursing after discharge from the hospital led to an increase in the level of self-efficacy of patients with COVID-19. The mean score of self-efficacy between the two groups was statistically significant before the intervention. Furthermore, 1 month after the intervention, it increased significantly in the intervention group. These results could be due to continuous follow-up and training on the disease and ways to prevent its transmission, the necessary attention during quarantine, location, social communication, diet and medication in quarantine, psychological issues (psychological strategies for stress management), having a healthy lifestyle, sleeping and resting in quarantine, managing outpatient care and treatment, and establishing a two-way contact between the researcher and the patient during the intervention period. In this respect, training and support are two important things that are needed during the recovery period. Education is effective in promoting self-efficacy and health behaviors (26). In this study, the prominent role of education and counseling in the research results was quite evident. Therefore, it can be concluded that the changes made in the intervention group might be due to telenursing for this group.

The results of the intervention showed that telenursing had a positive effect on the overall self-efficacy score of patients with COVID-19. These findings are in line with those of studies performed on prostatectomy patients indicating that the effect of telephone follow-up has been identified as a tool for patient monitoring and this method has been effective in promoting self-efficacy in arthroplasty patients (27, 28).

In a study conducted by Kaveh Savadkooh et al., the intervention of the training workshop and the

subsequent two-month telephone follow-up significantly increased self-efficacy in patients with hypertension. However, in this study, nursing interventions were performed based on a self-management program (29).

In another research carried out by Behzad et al., regular follow-up after the workshop and telenursing intervention were able to significantly increase self-efficacy in self-care behaviors among the elderly with hypertension in the intervention group, compared to the control group (18). These results are consistent with those of our study. Based on the findings of a research performed by Petrelli et al., in times of public health crises, alternative strategies, such as telenursing or telemedicine, could be used to manage patients (30).

The results of various studies have shown the effect of nurse education and telephone follow-up (telenursing), which promotes self-efficacy among the management of diabetic patients (23, 31). The use of such methods as telenursing with the help of experienced people is possible, which in addition to increasing trust and communication between the patient and the nurse, can lead to the transfer of useful and relevant information. This information and training enable the patient to gradually acquire the ability to manage cases related to themselves and the disease, and ultimately, this process increases the quality of life. The results of the mentioned studies indicated the importance of education through new methods, such as distance education, and all of them were in agreement with those of the present research. Nonetheless, the results of our intervention are incontinent with those of a study conducted by Emme et al. (32). Based on the findings of the mentioned research, there was no statistically significant difference between the two groups in establishing counseling centers with health professionals on the self-efficacy of patients with chronic obstruction pulmonary. This discrepancy in the results may be attributed to social support from the family in our study, considering that the majority of the participants in our study were married, and the different conditions of the disease in both studies (32). The findings of a research performed by Sol et al. on cardiovascular patients in the Netherlands showed that the implementation of nursing interventions based on patient participation and self-care behaviors in the treatment process significantly increased self-efficacy in self-care of the patients in the intervention group (33). In this regard, according to the researcher, telenursing provided an opportunity to continue and improve the process of educating and changing health behaviors, which ultimately led to improved quality of medical care, and this might have led to similar results in similar research.

In their study, Goodarzi et al. showed that the mean score of self-efficacy in the intervention group was significantly different before and after the educational intervention, which indicated the favorable effect of the educational intervention using mobile capabilities. Therefore, the application of computer technologies in the field of healthcare services and its proper management can have a growing trend in the field of prevention, treatment, and medical education by changing people's behavior and self-care (34). One of the devices used in telenursing is the mobile phone, which are available to the majority of people in the community and its use is increasingly expanding. Telephone follow-up is considered a cheap and easily organized intervention and is a good way to exchange information, provide education and health counseling, manage symptoms, diagnose complications early, and reassure the quality of follow-up care (35).

One of the limitations of this study was individual differences and the mental state of the participants, which might have had an effect on how they responded. Self-efficacy is a mental concept that can be evaluated by the individual; consequently, the researcher's lack of confidence in the accuracy and precision of the answers given by research units was another limitation of the study. Furthermore, individual beliefs and differences affect a person's learning and application of training, which can affect outcomes that cannot be controlled.

Implications for Practice

The results showed that the role of education and telenursing after discharge from the hospital increased the level of self-efficacy among the patients with COVID-19. Due to the current situation, the staggering costs of the healthcare system, the lack of facilities, the large number of patients, the limited professional staff, and the needs of patients and their families, it is recommended to respond and solve patients' problems by providing services through follow-up telenursing and telephone in support of health-promoting behaviors programs.

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Conflicts of Interest
The authors declare that there is no conflict of interest.

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