

The Effect of Post-discharge Education Program on Self-Efficacy and Satisfaction of Family Caregivers of Patients with COVID-19

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Abstract

Background: The COVID-19 disease is currently one of the most important concerns of societies. Continuation of self-care behaviors after discharge by patients and their families is one of the factors affecting health promotion.

Aim: The present study was performed with aim to investigate the effect of the post-discharge training program on the satisfaction and self-efficacy of family caregivers of patients with COVID-19.

Method: This clinical trial study was conducted on 68 caregivers of patients with COVID-19 who were discharged from Valiasr Hospital in Birjand, Iran in 2020. The research units were randomly divided into two groups. Standard educational content was made available to the intervention group through the WhatsApp messenger. Then, two phone calls were made to the caregivers. The control group only received the hospital's routine cares. Data collection was done using demographic information form, general self-efficacy and information satisfaction questionnaire. $p < 0.05$ was considered statistically significant.

Results: The mean age scores of participants in the intervention and control groups were 39.88 ± 16.53 and 47.02 ± 14.82 years, respectively. Since there was significant difference between change in before-after scores in the two groups, the educational method in the intervention group was more effective in increasing information satisfaction than routine care ($p < 0.0001$). Also, the mean total self-efficacy score in the intervention group increased from 95.26 ± 20.37 to 97.79 ± 18.02 , which was significantly different from the control group ($p = 0.01$).

Implications for Practice: Providing post-discharge support and education to family caregivers of patients with COVID-19 improves the caregivers' experience through increased satisfaction and self-efficacy.

Keywords: Caregiver, COVID-19, Satisfaction, Self-care, Self-efficacy

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Introduction

Corona virus disease 2019 (COVID-19) is currently one of the most important concerns of human societies and the World Health Organization (WHO) (1,2). In Iran, during 3 January 2020 to 26 July 2023, 7,612,886 confirmed cases of COVID-19 with 146,307 deaths and 7,372,222 recovered/discharged from the hospital were reported to the WHO (3,4). According to this statistics, a large number of people hospitalized due to this disease are discharged from hospitals every day. The process of discharge from the hospital is a process in which continuous care of the patient is transferred from the hospital environment to the family, community or another treatment environment. Therefore, discharge from the hospital is not the end point of patient care and only the patient's care environment changes (5). Planning for patient discharge is one of the important nursing interventions, which actually aims to prepare and facilitate the patient's transfer from one treatment level to another (6). Proper planning for patient discharge by the medical team, including nurses, leads to the continuation of quality care after discharge from the hospital and in the community, also reduces the length of stay in the hospital and improves the coordination of services after discharge from the hospital (7).

COVID-19 patients and their families usually need a care plan after discharge, and the continuation of these cares and self-care behaviors is one of the determining and effective factors in maintaining health. Adhering to these behaviors is important to reduce the number of subsequent hospitalizations and feeling healthy, in addition to prevent the exacerbation of symptoms and signs. The patient and caregivers at home can be effective on the healing process of the disease by learning self-care programs and reduce the severity and complications of the disease (8). Accordingly, health care providers conduct training based on each patient and his/her specific care needs through face-to-face or distance learning (9). Distance education is a communication approach using educational technologies to create an environment for learning while the teacher and learner may not be at the same time or place (10,11). There are different types of distance learning systems, for example mobile phone and internet (10,12). This educational method increases people's access to resources and you can have a large audience, which is a cheap solution for teaching (11).

Corona patients and their families also have many challenges and educational needs after discharge. On the other hand, due to the limitations of access to these patients, distance learning is a suitable method for teaching these people. Since the presence of a caregiver is essential for these patients and prevention of disease transmission to caregivers is an important issue, the self-efficacy of caregivers is considered an important factor to achieve these goals. Self-efficacy means that a person believes that he/she can successfully perform an action and achieve a result. A strong sense of self-efficacy is necessary for a person to achieve a sense of well-being and also to be persistent in striving for success (13). Bandura (1977) stated that self-efficacy affects the choice of activities, effort and persistence. Learners with high self-efficacy to do a task, compared to those with low self-efficacy who doubt their learning abilities, act faster when faced with problems, are more hardworking and are determined to do the work (14,15).

On the other hand, it is necessary to check the satisfaction level of clients as one of the basic criteria in determining the quality of care services for policy making and solving possible defects and problems (16). In most studies, caregivers were more satisfied with telehealth services compared to face-to-face services, but barriers such as technological issues, lack of face-to-face and personal interaction, access problems, etc. have created grounds for concern. Therefore, measuring satisfaction with telehealth services provides insight into health care developments (17). In this regard, Gholipour et al. investigated the effect of telephone training of nurses on the comfort of patients with COVID-19 during home quarantine and the results showed that this type of training method is not effective in increasing the patients comfort (18). The results of Raesi et al.'s study also showed that telephone training increases the quality of life of COVID-19 patients (19). Rajab Dizavandi et al. in their research also showed that telenursing was effective on self-efficacy of COVID-19 patients (20). To the best of our knowledge, no study has been conducted on the caregivers of patients with COVID-19. Therefore, considering the increasing prevalence of the disease caused by the COVID-19 virus, as well as the role of the nurses in providing educational programs after discharge, and on the other hand, the importance of improving the level of knowledge and health of family caregivers of COVID-19 patients and considering the limitations of communication with these patients due to the possibility of disease transmission, the present study was conducted with aim to determine the effect

of post-discharge education program on self-efficacy and satisfaction of family caregivers of COVID-19 patients.

Methods

This clinical trial study was performed on 68 family caregivers of patients with COVID-19 who were discharged from the corona center of Valiasr hospital in Birjand city, Iran in 2020. Considering that no similar study was found, the sample size of the study was calculated by conducting a pilot study on 20 people ($n=10$ in each group) and according to the results related to the satisfaction variable ($m_1=4.88$, $s_1=2.45$, $m_2=6.71$, $s_2=2.41$), based on the formula of comparing the mean of two independent communities and considering the confidence interval of 95% and the test power of 90%; therefore, 29 participants were estimated for each group that considering the possibility of 15% loss, 34 participants were determined for each group.

Inclusion criteria for caregivers were age above 18 years, willingness to participate in the study, reading and writing literacy, speech, hearing, vision and cognitive health to receive training, using a smart mobile phone, not participating in any other relevant educational program, the main caregiver who receive the training didn't change during the intervention (direct care of the patient for at least two weeks), no specific psychological problem and no use of medication to treat it, and no employment in the medical profession. Exclusion criteria were unwillingness to continue cooperation, participating in another educational program during the intervention, not fully answering the questions, not participating in the educational program for more than 3 days, death of the patient, and not answering phone calls or disconnection.

The research units were selected by available sampling method and randomly divided into intervention and control groups. So that, some cards were prepared according to the number of participants. The name of the group (intervention or control) was written on the cards and placed inside a box. Caregivers were asked to randomly pick a card from the box (the selected cards do not return to the box after selection). In this way, the type of group was determined for each individual. After obtaining permission from the hospital authorities, the first and second researchers visited the medical records unit of the hospital from November 24 to December 31, 2020, and received the contact information of the patients who had discharged three days ago. Therefore, they made the first phone call to the patient or his/her family. In this phone call, the first researcher, after introducing himself and assessing educational needs, explained the objectives of the study and how to provide information in the educational channel created in the WhatsApp messenger. Then he answered the caregivers' questions and the current possible problems in patient care. Finally, out of 249 people, 217 people agreed to participate in the study, and according to the inclusion criteria, 68 participants (main caregivers) were included in the study (Figure 1).

Data collection was done using demographic information questionnaire, general self-efficacy and information satisfaction questionnaire. Demographic information questionnaire included age, gender, education level and monthly income. The content validity of the form was confirmed by the opinion of 7 faculty members of Birjand Nursing and Midwifery School.

The general self-efficacy questionnaire, which is based on Bandura's self-efficacy theory, was used to measure the participants' self-efficacy. This 29-item questionnaire is scored on a 5-point Likert scale ranging from very low confidence (1) to very high confidence (5) in three areas: stress reduction (10 questions), decision-making (3 questions) and positive attitude (16 questions). Therefore, the range of the scores in this questionnaire varies from 29 to 145, and higher scores indicate higher self-efficacy. This tool was used by Tsay et al. and they reported a reliability coefficient of 0.93 (21). The validity and reliability of the Persian version of this tool has also been confirmed in some studies (22-24).

The information satisfaction questionnaire (Thomas et al., 2004) examines satisfaction with information received about the disease, complications, available treatments, lifestyle, daily practical issues, and general information provided to the patient. The tool is scored on a five-point Likert scale from very satisfied (0) to very dissatisfied (4). Accordingly, a score in the range of 20-24 indicates excellent information satisfaction, 19-15 good, 14-10 moderate, 5-9 weak and 0-4 very weak (25). This questionnaire is used in various studies and its validity and reliability are confirmed (26,27). The validity and reliability ($\alpha=0.976$) of the Persian version of this questionnaire has been confirmed by Nikraftar et al. (28).

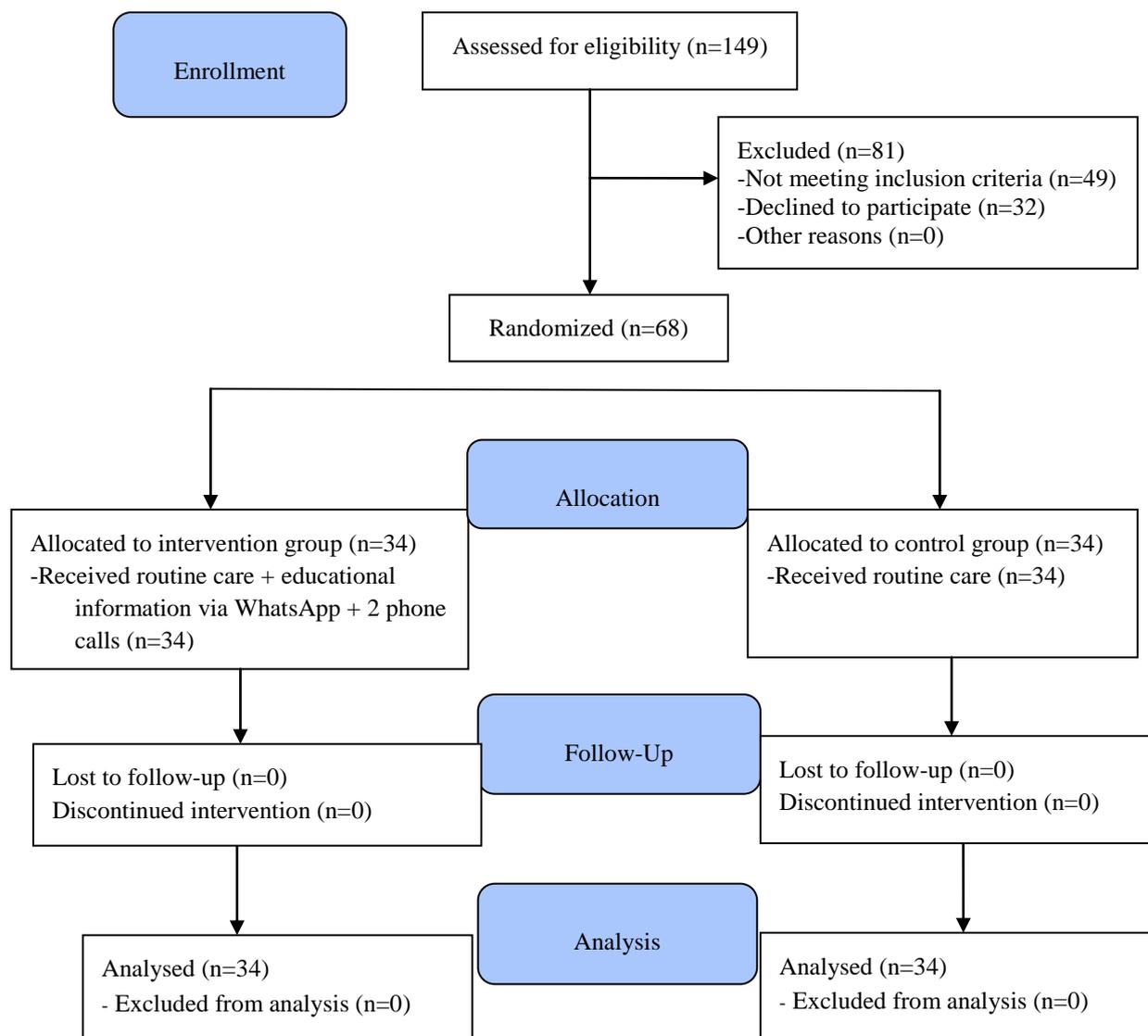


Figure 1. CONSORT flow diagram of the study

The questionnaires were prepared online and were sent to each participant via a social messenger (WhatsApp) as a link to be completed before the intervention. After the approval of the infectious disease expert, the intervention group received the educational content prepared from reliable sources such as the World Health Organization (WHO) and Disease Control and prevention (CDC) website in the form of videos, images, pamphlets and text messages in different areas (Table 1). Individual trainings were provided through the WhatsApp for the elderly, children, pregnant mothers and people with chronic diseases according to their conditions. In addition to answering the questions of the participants during the 10 days, days 11-14 were also considered to review and answer the questions of the participants. Also, the second researcher followed up the receiving and reading of the educational content by the caregivers in Messenger and answered their questions. In addition, according to the text message which was sent to the caregivers at the beginning of the intervention, they were contacted at the end of the first and second week to ensure and remind them to learn the material as well as emotional and psychological support. During the first phone call, coping effectiveness skills were discussed with caregivers. The interventions related to this contact included confronting the prevailing stress, sharing fears and negative thoughts, encouraging adaptation and healthy lifestyle behaviors, and helping caregivers to manage the patient's needs (29). At the end of this conversation, the time of the next contact was arranged. The second phone call was also made to follow up the patient's condition, receive feedback about the training, and answer questions and

complete the questionnaires. The duration of each phone call was about 10-15 minutes and if needed, the conversation time was increased to 20 minutes. During the phone call, after introducing themselves, the researchers explained about the individual's voluntary participation and the right to withdraw from the study at each stage. All information was kept confidential.

The control group did not receive any of the above-mentioned interventions and only received training about Corona during discharge according to the hospital routine. Data collection was done using online questionnaires in both groups. Also, after completing the post-test questionnaires, to comply with ethical considerations, the educational content provided to the caregivers in the intervention group was also provided to the control group.

Table 1: Training areas in order of presentation from the first to the tenth day

Day	Training areas	Day	Training areas
1	Nature of the disease	6	Nutrition
2	Methods of preventing transmission and washing hands	7	Disinfecting surfaces and washing clothes
3	How to use the mask correctly	8	Go out and shopping
4	patient care (1)	9	Disinfect shopping
5	patient care (2)	10	Special training for each family

Data analysis was done using SPSS software (version 22). Appropriate descriptive statistical indices (mean and standard deviation for quantitative data and frequency for qualitative data) were used to describe the data. First, the normality of quantitative variables was determined by the Kolmogorov-Smirnov test, and the Chi-square test was used to determine the homogeneity of data in the two groups for qualitative variables, and Independent t-test was applied for quantitative variables. Independent t-test was used to compare dependent variables in the two groups, and paired t-test was employed for intragroup comparison in each of the two groups.

Results

The mean age of the participants in the intervention group was 39.88 ± 16.53 years and in the control group was 47.02 ± 14.82 years. The results of the statistical test showed that there was no statistically significant difference between the two groups in terms of age, sex, education level and income, and therefore the two groups were homogeneous in terms of these variables (Table 2).

Table 2: Demographic information in the two studied groups^a

Variable	Group		Test Result
	Intervention	Control	
Gender			
Male	16 (47.1)	22 (64.7)	$X^2=2.14$
female	18 (52.9)	12 (35.3)	$P=0.14^*$
Patient's education level			
Illiterate and primary school	11 (32.4)	12 (35.3)	$X^2=3.87$
Diploma	9 (26.5)	15 (44.1)	$P=0.14^*$
University	14 (41.2)	7 (20.6)	
Economic status			
Poor	15 (44.1)	15 (44.1)	$X^2=1.02$
Good	18 (52.9)	19 (55.9)	$P=0.59^*$
Very good	1 (2.9)	0 (0.0)	
Age (year)	47.02 ± 14.82	39.88 ± 16.53	$t=1.87$ $P=0.006^{***}$

* Chi- square test; ** Fisher Exact test; *** Independent T-test

^a Values are expressed as mean \pm SD or No. (%)

In the pre-intervention phase, the Independent t-test results showed a significant difference between the two groups in terms of the information satisfaction scores ($p=0.01$). So that, the satisfaction score in the control group was lower than the intervention group. In the post-intervention phase, the mean information satisfaction score of the participants in the intervention

group was significantly higher than the control group ($p<0.001$). The results of the Independent t-test showed that the mean score of information satisfaction after the intervention had a statistically significant difference in the two groups compared to before the intervention ($p<0.001$). In the intra-group comparison, the results of the Paired t-test showed that the mean information satisfaction score after the intervention significantly increased in the intervention group ($p<0.001$) (Table 3).

Table 3: Mean information satisfaction score in the intervention and control groups before and after the intervention

Time	Mean±SD		Test Result*
	Intervention	Control	
Before intervention	11.79±2.67	13.47±3.00	t= -2.43 P=0.01
After intervention	15.64±2.53	13.41±2.18	t=3.89 P<0.001
Mean changes	3.85±2.87	-0.05±3.84	t=4.75 P<0.001
Test results**	t= -7.82 P<0.001	t=0.08 P=0.92	

*Independent T-test; **Paired-t test

Table 4: Self-efficacy and its dimensions scores in intervention and control groups before and after the intervention

Variable	Time	Mean ± SD		Test Result*
		Intervention	Control	
Stress	Before intervention	34.58±7.41	35.58±6.68	t= -0.58, p=0.56
	After intervention	39.17±5.20	36.76±5.92	t=1.78, p=0.07
	Mean changes	4.58±9.23	1.17±9.17	t=1.52, p=0.46
	Test Result**	t= -2.89, p=0.007	t= -0.74, p=0.46	
Decision	Before intervention	9.11±2.55	9.58±2.38	t= -0.78, p=0.43
	After intervention	10.55±2.47	10.02±2.30	t=0.91, p=0.36
	Mean changes	1.44±3.50	0.44±3.26	t=1.21, p=0.22
	Test Result**	t= -2.40, p=0.02	t= -0.93, p=0.43	
Positive attitude	Before intervention	51.55±12.28	52.61±11.24	t= -0.54, p=0.58
	After intervention	62.44±10.16	55.32±9.55	t=2.51, p=0.01
	Mean changes	10.88±15.90	2.70±16.88	t=1.94, p=0.56
	Test Result**	t= -3.98, p<0.001	t= -0.93, p=0.35	
Self-efficacy (Total)	Before intervention	95.26±20.37	112.17±16.02	t= -0.54, p=0.58
	After intervention	97.79±18.02	102.11±16.89	t=2.51, p=0.01
	Mean changes	16.91±26.17	4.32±27.17	t=1.94, p=0.56
	Test Result**	t= -3.76, p<0.001	t= -0.92, p=0.36	

*Independent T-test; **Paired-t test

According to the Independent t-test, there was no statistically significant difference in the mean total self-efficacy score of the participants of the two groups in the pre-intervention phase ($p=0.58$) and in the three dimensions of stress ($p=0.56$), decision-making ($p=0.43$) and positive attitude ($p=0.71$). However, in the post-intervention stage, the mean score of total self-efficacy ($p=0.01$) and positive attitude ($p=0.004$) was significantly higher in the intervention group than the control group. It should be noted that there was no significant difference between the two groups in the two dimensions of stress ($p=0.07$) and decision-making ($p=0.36$). In the intra-group comparison, the results of the Paired t-test showed that the mean total score of self-efficacy and its dimensions significantly increased in the intervention group after the intervention ($p<0.05$) (Table 4).

Discussion

Family caregivers provide a significant amount of direct and indirect care to their sick family members. Therefore, they have to learn how to perform new tasks and responsibilities which are very time-consuming and also emotionally, psychologically and socially exhausting. In addition, vigilant patient care is a big challenge for caregivers of patients with COVID-19 at home. Therefore, it is very important to take care of family caregivers. Nurses must develop a therapeutic relationship with their family caregivers. Also, they should examine the physical, psychosocial, and economic effects of the disease on the patient and family caregiver and ensure that both caregivers and patients have access to appropriate resources and services in the community, including adequate rest, social affairs, education, and counseling (30). Therefore, the purpose of the present study was to determine the impact of the post-discharge training program on the satisfaction and self-efficacy of family caregivers of patients with COVID-19. The results of the current study showed that the changes in the information satisfaction of the participants were significantly higher in the intervention group than the control group, which is consistent with the results of some other studies (31-34). Despite the use of different tools to investigate the desired variable and the variety of interventions and the way of using mobile phone facilities and other educational materials in the field of electronic learning, it can be mentioned that the progress of information technology and the Internet and many advantages such as easy access, possibility of using at any time and place, ability to communicate and send information have made the learning process easier and improved the satisfaction from the received information, because one of the influencing factors on patient satisfaction is the teaching method (35,36).

The results of the present study showed that in the post-intervention stage, the mean total score of self-efficacy and positive attitude was significantly higher in the intervention group than the control group, but this difference in the two dimensions of stress and decision-making was not significantly different in the two groups. The result of the present study regarding increasing self-efficacy through distance learning is consistent with the previous studies (31,34,37,38). However, Mirhosseini et al. (39) didn't similar results with the present study regarding the dimension of stress and decision making. In their study, the intervention group received a psychoeducational support training program for stress management through six online group sessions on WhatsApp. Their results showed that after the intervention, the perceived stress of the patients was significantly lower in the intervention group than the control group (39). The reasons for the difference in the results may be that the research community was different and the educational content was focused on stress management. Caregivers may also experience negative physical and mental health outcomes. They are at risk of COVID-19 exposure. Therefore, their concern increases about taking care of their health, which can lead to stress. Many caregivers experience feelings of social isolation, which may be exacerbated by social distancing policy measures. Finally, caregivers may face loss of income and employment (40). In the study of Scott and colleagues (2022), family caregivers reported anxiety, depression, and fatigue, sleep disturbance, less social participation, less financial well-being, increased food insecurity, and increased financial worries (41). Therefore, it seems that more attention should be paid to the mental health of family caregivers during the COVID-19 outbreak, and it is necessary to provide psychological support along with education.

Implications for practice

As evidenced by the results of the present study, the post-discharge education program increases the satisfaction and self-efficacy of family caregivers of patients with covid-19. Providing virtually post-discharge support and education to family caregivers of COVID-19 patients creates opportunities to improve the caregiving experience through increased satisfaction and self-efficacy. Continued education, monitoring, and support for caregivers of patients is critical as the pandemic progresses, as its effects may be felt long after the pandemic.

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Conflicts of interest

The authors declared no conflict of interest.

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