Original Article

Effect of Telenursing on Care Burden and Resilience of Family Caregivers of Schizophrenic Patients

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Abstract

Background: Care burden is one of the consequences of caring for schizophrenic patients, caregivers need high resilience to have their best performance in caring for these patients and reduce their care burden. Psychiatric nurses should implement coherent programs to support these caregivers. Therefore, this study aimed to determine the effect of telenursing on the care burden and resilience of family caregivers of schizophrenic patients. **Materials and Methods:** This research was a before-after quasi-experimental study with a control group. Participants included 44 family caregivers of schizophrenic patients referring to the Razi Educational and Therapeutic Psychiatric Center in Tehran in 2023–2024. Participants were included via purposive sampling method and based on inclusion criteria. Data collection tools included demographic questionnaire, standard Zarit Burden Interview (ZBI), and Connor–Davidson Resilience Scale (CD-RISC). In addition to routine care, the intervention group also received telenursing care. **Results:** Findings of this study showed that between intervention and control group, except for dimensions of positive acceptance of change, secure relationships (p = 0.007) and trust in one's instincts, tolerance of negative affect, and strengthening effects of stress (p = 0.02) of resilience, there were no statistically significant differences in other discussed variables such as care burden and resilience. **Conclusions:** In this study, telenursing did not have a positive effect on all dimensions of resilience and care burden, but considering its potential and its positive effect on some dimensions of resilience, it is recommended that studies with longer intervention periods be conducted on other problems of family caregivers.

Keywords: *Caregiver burden, caregivers, resilience, schizophrenia, telemedicine, telenursing*

Introduction

Schizophrenia is a serious mental disorder that causes many challenges for the patient, family, and healthcare systems.[1] Prevalence of Schizophrenia is 0.32% worldwide,[2] while in Iran it is 0.25%.[3] Because of the social and cultural values in Iran, family members tend to take care of patients with schizophrenia after discharge.[4,5] Informal caregivers are family members, spouses, friends, or other close relatives who take care of patients.[6] Being cared for by family can have potential benefits for the patients. Patients, who are cared for by their families or friends, have fewer relapses and higher treatment adherence and quality of life.[7] Also, proper care by the family can reduce the healthcare system and the individual's costs.[8-10] However, having a family member with a chronic disease disrupts family's balance. Families face some challenges in caring for schizophrenic patients such as financial problems, stigma, insufficient information about the rehabilitation of patients, communication problems with patients and not having enough time.[11-13] These challenges cause caregivers to experience care burden. Burden is a multi-dimensional concept that changes the physical, psychological, and social responses of the caregiver. Care burden is caused by an imbalance between the caregiver's duties and needs.[14] Caregivers need high resilience to reduce the care burden and have their best performance in caring. Resilience is the ability to adapt to adverse situations and the capacity to create positive feelings despite difficult and stressful life experiences.[15-17] Because of the pressure placed on caregivers due to the nature of schizophrenia, in addition to patients, enough attention should also be paid to caregivers

According to our best knowledge, there is no support service available for family caregivers of schizophrenic patients in

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Iran, except for the healthcare system and private facilities. Therefore, support and follow-up programs should be designed for the families of schizophrenic patients, because empowering them, improves their ability to face different situations and ultimately, even improves patient's condition. Telenursing is a new method of providing care plans for caregivers. Telenursing is defined as using communication technologies to provide nursing services to patients and caregivers.[18] Considering that telenursing doesn't have the problems of face-to-face programs such as staff allocation, financial cost, spending more time, a place to provide care, and transportation costs for families,[19-21] it can help caregivers to pursue patient's treatment and care plans with more knowledge and awareness and receive necessary advice and guidance from care providers.[22] Telenursing uses different tools such as telephone calls, remote monitoring devices, and the Internet. In the meantime, due to rapid growth in the use of the Internet and smartphones, their capacities can be used as an accessible and affordable tool for telenursing.[23]

According to the literature review, effective interventions have been developed for the caregivers of schizophrenic patients;[24] however despite the effectiveness of telenursing and telecare on caregivers' care burden in patients with COVID-19, heart failure[25,26], and caregivers' resilience in patients with cancer,[27] a study that addresses the possible benefits of telenursing in caregivers of schizophrenic patients has not been conducted. Also, this study can be useful for developing better support systems for family caregivers of schizophrenic patients, especially with the involvement of policymakers and healthcare institutions which can in return improve patient and caregiver's quality of life. Therefore, due to a lack of sufficient evidence on the variables discussed in this study using the telenursing method in Iran, as well as the special condition of family caregivers of schizophrenic patients, this study aimed to determine the effect of telenursing on care burden and resilience of family caregivers of schizophrenic patients.

Materials and Methods

The present study was a quasi-experimental study that was conducted in 2023–2024. In this study, purposive sampling method was used. Caregivers in the intervention group participated in a telenursing program, whereas the caregivers in the control group received the standard routine care. Because of the nature of the study, randomization could not be performed while dividing the caregivers into intervention or control groups. First participants were randomly assigned to intervention or control group. The setting of this research was Razi Educational and Therapeutic Psychiatric Center affiliated to the University of Social Welfare and Rehabilitation Sciences in Tehran, which is one of the oldest psychiatric hospitals in Iran that was established in 1918. The study population consisted of family caregivers of schizophrenic patients with a recent diagnosis (diagnosis in the past six months), referring to the Razi Educational and Therapeutic Psychiatric Center. The inclusion criteria were being the main caregiver of the patient with a diagnosis in the past 6 months, caregivers in the age range of 18 to 60 years, being able to speak Farsi, being literate, having access to a mobile phone and the Internet and having no history of participating in educational or support programs about schizophrenia. Caregivers were excluded if they did not respond to three telenursing sessions or if they did not wish to continue. The minimum sample size according to the type I error of 5%, power of 80%, and based on data from Rotondi *et al*.[28] and a dropout rate of 20% was calculated to be 22 samples in each group and 44 samples in total.

Three questionnaires were used for data gathering: a) The demographic questionnaire included the age of the caregiver and patient, sex, marital status, education, and income. b) Zarit Burden Interview (ZBI): This questionnaire was developed by Zarit in 1986 to measure the burden of caregivers of patients with Alzheimer's disease. ZBI has 22 items about personal, social, emotional, and financial burdens.[29] It is scored based on a five-point Likert scale (from never = 0 to always = 4). The total score is computed by summing the 22 items, which ranges from 0 to 88, with lower scores indicating lower burden and higher scores indicating higher burden. A score between 0 and 20 indicates low burden, a score between 21 and 40 indicates intermediate burden, and a score between 41 and 88 indicates severe burden. The validity and reliability of ZBI were investigated by Talebi *et al*. in Iran.[30] The questionnaire was given to 11 faculty members of the school of nursing, and the results showed that all items had acceptable content validity. Internal consistency was also confirmed by α =0.86.[30]

c) Connor–Davidson Resilience Scale (CD-RISC): This questionnaire was developed by Connor and Davidson in 2003 for different populations such as the general population and the population of psychiatric and physical patients. CD-RISC is a 25-item questionnaire that consists of five factors: personal competence, high standards, and tenacity (8 items), trust in one's instincts, tolerance of negative affect, and strengthening effects of stress (7 items), positive acceptance of change, and secure relationships (5 items), control (3 items), and spiritual influences (2 items). It is scored based on a five-point Likert scale (from 0 to 4). The total score is computed by summing the 25 items, which ranges from 0 to 100, with lower scores indicating lower resilience and higher scores indicating higher resilience.[31] Karimirad *et al*. translated the questionnaire using the forward-backward method and after the approval of the developers, they obtained permission to use it. Then Cronbach's alpha was used to determine reliability, and factor analysis was used to determine validity. A reliability of α =0.93 was obtained. In the study of Karimirad *et al*.,[32] the questionnaire was completed by 20 caregivers of psychiatric patients and the reliability of the questionnaire was 0.89.

Before the intervention demographic questionnaire, the care burden questionnaire, and the resilience questionnaire were completed by the researcher through a telephone interview with caregivers and sending a questionnaire electronic link via SMS. The research team designed the telenursing program by reviewing literature and various studies. The telenursing program was carried out for the intervention group over 9 weeks via telephone calls (the average of each telephone call was 45 minutes) and social networks (Telegram, Eitaa, Bale, and Rubika). In total, four telephone calls were made and other educational contents were sent in the form of multimedia (audiovisual, audio, and text content). Each week the researcher had to make sure that all the patients received the educational content via social networks (double-check marks) or telephone calls in the next session. The intervention program is shown in Table 1.

During the intervention period, research team contact information and social networks were given to the families and they had access to the research team if they needed more information or if they had any questions. Immediately after the intervention, the questionnaires were completed again. It should be noted that during the study, the researcher did not provide any educational or therapeutic content for the control group, and to comply with the ethical consideration, at the end of the research, the aforementioned educational booklet was also given to the control group.

Data was analyzed by SPSS software (version 25.0; SPSS Inc., Chicago, IL, USA). Frequency and percentage were used for qualitative variables, and mean and standard deviation were used for quantitative variables. The Chi-square test or Fisher's exact test was used to compare qualitative variables between groups (intervention/control), and the *t*-test was used to compare quantitative variables between groups. The normality of variables was assessed using skewness and kurtosis values. The cut-off value (*p* value) of the significance was 0.05.

Ethical considerations

This research was approved by the (IR.USWR.REC.1402.111). The participants were informed of the information confidentiality and the voluntary nature of the participation in the study. After providing explanation about the research purpose, informed consent was obtained from participants.

Results

All 44 caregivers ended the trial and were incorporated into the final analysis [Figure 1]. According to demographic data, most caregivers were married, had a diploma or higher education, and had a medium economic level. The groups were homogeneous in terms of demographic characteristics [Table 2].

Based on the skewness and kurtosis values, quantitative variables had normal distribution; therefore, parametric tests were used to analyze the data. According to the paired *t*-test for within-group comparison, in the control group, there was no statistically significant difference between the mean scores of care burden, resilience, and its dimensions before and after the intervention. In the intervention group, except for the dimension of positive acceptance of change, and secure relationships ($p = 0.006$), there was no statistically significant difference in other dimensions of resilience, the total score of resilience and care burden [Table 3].

Based on the results of the independent *t*-test for comparing differences between means of two groups before and after intervention and independent *t*-test for comparing two groups before and after intervention, except for the dimensions of positive acceptance of change, and secure relationships ($p = 0.007$) and trust in one's instincts, tolerance of negative affect, and strengthening effects of stress ($p = 0.02$) of resilience, in other discussed variables, there was no statistically significant difference. Although the difference in the scores of the total care burden and

Table 1: Content of the telenursing program

Session	Title	Content	Presentation method
First	introduction	Introduction to telenursing program and how to send content on social networks	Telephone call
Second	Schizophrenia disorder	Schizophrenia disorder, etiology, symptoms, and prognosis	Audiovisual content
Third	Treatment and medication	Familiarity with treatments, medications, their side effects, and the importance of using medication	Audiovisual continent and telephone call
Fourth	Controlling delusion and hallucination (part 1)	. Familiarity with hallucination, delusion, aggression, and how to control them.	Audio content
Fifth	Controlling delusion and hallucination (part 2)	Familiarity with hallucination, delusion, aggression, and how to control them	Audio content
Sixth	Communicating with patient	How to communicate with patient correctly and encourage positive behavior	Text and audio content
Seventh	Problem-solving	Teaching problem-solving skills	Text and audio content and telephone call
Eighth	Relapse	Relapse symptoms, related factors, and how to prevent relapse	Text content
Ninth	End of program	Summarizing and answering families' questions	Telephone call

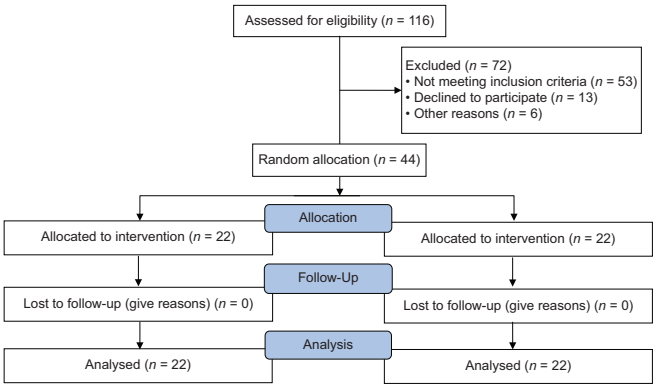

Figure 1: CONSORT diagram of the study

Table 2: Demographic characteristics in intervention and control groups

Variable	Categories	Intervention group *n* (%)	Control group *n* (%)	*p*
Gender	Male	11 (50)	9 (40.90)	0.545*
	Female	11 (50)	13 (59.10)	
Marital status	Married	16 (72.72)	17 (77.27)	0.728*
	Not married	6 (27.28)	5 (22.73)	
Education	Below diploma	8 (36.36)	7 (31.81)	0.750*
	Diploma and higher	14 (63.64)	15 (68.19)	
Income	Low	6 (27.28)	3 (13.63)	0.445**
	Medium	14 (63.64)	15 (68.19)	
	High	2 (9.08)	4 (18.18)	
Age (year)		Mean (SD)	Mean (SD)	0.810***
		47.22 (8.97)	46.52 (8.44)	

*p-value based on Chi-square test. **p-value based on Fisher's exact test. ***p-value based on independent samples t-test

resilience after the intervention was not statistically significant, the probability values in these two variables were close to the significance level [Table 3].

Discussion

In this research, telenursing did not have a significant effect on resilience and care burden. The results of Seyedfatemi *et al*.[33] study showed that the virtual social network-based psycho-education promotes the resilience of family caregivers of clients with severe mental disorders. Also, in Aghakhani *et al*.[27] study, social media-based patient care education improved resilience of family caregivers of people with cancer. The results of these studies were not in line with the present study. This contradiction could be attributed to the studied populations and settings. Aghakhani *et al*. study was conducted on family caregivers of cancer patients in Urmia teaching medical centers and Seyedfatemi *et al*. study included family caregivers of patients with other severe mental disorders in addition to schizophrenia who were recruited from Iran Psychiatric Center in Tehran.[27,33] However, it should be noted that in the present study positive effects were observed in two dimensions' resilience (e.g. positive acceptance of change and tolerance of negative affect). These findings can be because of the information that caregivers received during the intervention which has helped them to better cope with the patient. Lack of knowledge to understand the disease, the behavior patterns, and how to relate and help the sick relative can be a barrier toward coping with the patient's behaviors and attitudes. Receiving education from healthcare professionals can be useful for overcoming this limitation.[15]

Mueser *et al*.[34] investigated the effectiveness of a telehealth-based psychoeducation program (website) on the care burden of caregivers of schizophrenic patients. After intervention and 6-month follow-up, the program did not have a significant effect, which was in line with the results of this study. However, Ozkan *et al*.[35] study showed that psychoeducation and telepsychiatric follow-up given to the caregiver of the schizophrenic patient can decrease family burden which is inconsistent with the result of the present study. The similarities between the present and aforementioned studies were assessing the care burden of caregivers of schizophrenic patients and the use of telenursing programs. In Ozkan *et al*.[35] study caregivers received face-to-face psychoeducation during the hospitalization of their patients in addition to telephone follow-up after discharge but the present study and Spaniel *et al*.[36] study used only long-distance methods. This could be the reason for inconsistency between the results. Also, Zhang *et al*.[37] study demonstrated a higher endorsement rate for hospital-based family intervention than social media-based family intervention among caregivers of schizophrenic patients. Therefore, it might be useful to combine telenursing with face-to-face education and pay attention to caregivers' preferences.

Namjoo *et al*.,[26] investigated the efficacy of telenursing on caregiver burden among Iranian patients with heart failure by sending audio and video files for a month, which was effective. Another study by Uslu *et al*.,[38] which focused on the effect of telenursing on medication adherence in schizophrenic patients, demonstrated that telenursing has a significant effect on medication adherence. Other studies have shown the effectiveness of telenursing among caregivers of COVID-19 patients[39] and elderly with Alzheimer's disease.[40]

Schizophrenia due to its nature puts a lot of pressure on families which may have caused this intervention to be ineffective for caregivers of patients with schizophrenia,[11,12] despite its effectiveness on other caregivers in Iran. It is worth mentioning that significant improvement was observed in two dimensions of resilience, which can be indicative of a short-term effect of telenursing in this study, considering that the post-test was conducted shortly after the intervention. Therefore, it is possible to observe more improvements by having a follow-up period. The findings of the present study showed that telenursing did not improve care burden and resilience in caregivers of schizophrenic patients.[18]

Table 3: Comparison of resilience and its subscales and care burden in family caregivers in two intervention and control groups

Variable	Condition	Control group Mean (SD)	Intervention group Mean (SD)	*p**	*p****
Personal competence	Before intervention	19.68 (3.16)	18.50 (4.32)	0.30	0.86
	After intervention	19.86 (2.79)	18.81 (2.95)	0.23	
	*p***	0.55	0.48		
Tolerance of negative	Before intervention	14.77 (2.58)	16.22 (2.44)	0.062	0.02
	After intervention	14.54 (2.06)	16.68 (2.57)	0.004	
	*p***	0.23	0.057		
Positive acceptance of change	Before intervention	11.50 (2.26)	11.04 (3.06)	0.57	0.007
	After intervention	11.36 (1.78)	12.59 (1.53)	0.019	
	*p***	0.63	0.006		
Control	Before intervention	6.95 (1.32)	6.31 (1.96)	0.21	0.90
	After intervention	6.90 (1.82)	6.00 (2.63)	0.19	
	*p***	0.91	0.52		
Spiritual influences	Before intervention	5.45 (1.87)	4.68 (1.61)	0.15	0.78
	After intervention	5.72 (1.95)	4.81 (1.99)	0.13	
	*p***	0.45	0.69		
Resilience	Before intervention	58.45 (7.28)	56.77 (9.67)	0.51	0.08
	After intervention	58.40 (5.75)	58.81 (6.77)	0.83	
	*p***	0.94	0.054		
Care burden	Before intervention	53.95 (7.53)	54.22 (8.19)	0.90	0.21
	After intervention	54.13 (7.80)	53.63 (7.71)	0.83	
	*p***	0.72	0.07		

**p*-value based on independent sample *t*-test. ***p*-value based on paired *t*-test. ****p*-value based on independent sample *t*-test of the difference between the means of the IG and CG before and after the intervention

However, due to the increasing importance of technology in health care, telenursing can be seen as a suitable opportunity for providing nursing care. This study had some limitations including restrictions in sending large files and problems relating to Internet speed in uploading and downloading files. Relying on self-report questionnaires and information from participants was another limitation of this study.

Conclusion

Despite the lack of significant impact of telenursing on all dimensions of resilience and care burden, its potential should still be used. It is recommended that subsequent studies carry out interventions with longer duration and follow-up periods. It is also recommended that the level of satisfaction with telehealth programs and their cost-effectiveness compared to traditional methods be investigated.

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Conflicts of interest

Nothing to declare.

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