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The Effect of Nursing Telephone Follow-up (Tele-nursing) on Compassion Fatigue and Self-Care Self-Efficacy in Family Caregivers of Hemodialysis Patients

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Abstract

Background and aim: Family caregivers of hemodialysis patients are at risk of compassion fatigue and decreased self-efficacy due to exposure to emotional and continuous caregiving pressures. Telenursing can be effective as a structured, non-clinical intervention in improving caregivers' psychological state and functioning. The present study aimed to investigate the

effect of nursing telephone follow-up on compassion fatigue and caregiving self-efficacy in family caregivers of hemodialysis patients.

Method: present study was a quasi-experimental study with a pre-test and post-test design with a control group. The sample included 60 family caregivers of hemodialysis patients who were selected conveniently and randomly divided into two intervention and control groups. The intervention group participated in 12 telephone follow-up sessions by a trained nurse for 6 weeks. Data collection tools included the Compassion Fatigue Questionnaire (ProQOL) and the Caregiver Self-Efficacy Scale. Data were analyzed using independent t-tests, paired t-tests, and repeated-measures analysis of variance.

Result: The result showed that in the experimental group, compassion fatigue significantly decreased ($p<0.001$) and self-efficacy for caregiving significantly increased ($p<0.001$), while no significant change was observed in the control group. Analysis of variance also showed a significant interaction effect between time and group ($p<0.05$).

Conclusion: Nursing telephone follow-up can be used as an effective intervention to reduce compassion fatigue and self-care self-efficacy of family caregivers of hemodialysis patients.

Keywords: Tele-nursing, Compassion Fatigue, Self-Care Self-Efficacy, Hemodialysis Patients, Nursing

Introduction

Evidence suggests that as the prevalence of chronic kidney failure increases and the population of hemodialysis patients grows(1), the role of family caregivers in the care process becomes more prominent(2). Due to constant exposure to the patient's pain and suffering, caregivers suffer from compassion fatigue and are exposed to emotional exhaustion, decreased motivation, and even abandonment of caregiving duties(3). Evidence has shown that caregiver self-efficacy, as a protective factor, can improve caregivers' tolerance levels, satisfaction with the caregiving role, and mental health(4, 5). Therefore, intelligent experimental s can play an important role in improving the mental health of caregivers of hemodialysis patients(6).

Telenursing, as a structured, low-cost, accessible, and non-clinical experimental , has great potential for education, psychological support, and improvement of care skills(7). Various studies have shown the effectiveness of telenursing in improving psychological outcomes(8-10). Telenursing involves regular, structured contact between a nurse and a patient's caregivers, and can simultaneously increase caregiver awareness, teach effective coping strategies, and strengthen belief in one's own ability to perform the caregiving role(11). Telenursing refers to the provision of nursing services through the use of communication technologies; this communication technology can be via telephone, computer, remote monitoring devices and the Internet; among these, telephone devices have been traditionally used as a tool; since this technology already exists in many clients' homes, it can be used in important aspects of health care(12, 13).

The innovation of the present study is in combining this technological approach with psychotherapy goals; in such a way that by providing regular supportive and educational contacts to caregivers of hemodialysis patients, it can have a direct impact on reducing compassion fatigue and increasing caregiver self-efficacy. This study can provide a new model in providing family-centered and community-based care in the context of mental health of caregivers of chronic patients. The present study aimed to investigate the effect of nursing telephone follow (Telenursing) on compassion fatigue and self-efficacy of family caregivers of hemodialysis patients in order to provide valuable results to improve the quality of care, prevent caregiver burnout, and promote the role of nurses in family-centered services.

Method

The present study was a quasi-experimental study with a pre-test and post-test design with a control group; the research population included all family caregivers of hemodialysis patients

referred to the dialysis department of Imam Reza Hospital in Amol (2025). This study received ethical clearance from the Ethics Committee of Nishapur University of Medical Sciences (IR.NUMS.REC.1404.062) and was conducted in accordance with the ethical principles of the Declaration of Helsinki. Written informed consent was obtained from all participants prior to their inclusion in the study. Sampling was done using a convenience method and considering the inclusion and exclusion criteria, and the participants were randomly divided into two groups: experimental (experimental) and control.

Sample size and method of calculation

Sample size based on a previous study(14), using the following formula and the values x1=56.07, s1=8.35, x2=68.80, s2=9.85, and considering a type I error (α) of 0.05 and a type II error (β) of 0.20, the required sample size for each group was estimated to be 25 participants, which included a total of 50 participants . However, due to the possibility of sample attrition, 30 Participants were selected in each group. The sampling method was as follows: First, 60 participants were selected from all caregivers eligible for inclusion in the study and then were randomly divided into two experimental group (n=30) and control group (n=30).

$$n = \frac{(s_1^2 + s_2^2)^2 (z_{1-\frac{\alpha}{2}} + z_{1-\beta})^2}{(\bar{x}_1 - \bar{x}_2)^2}$$

Sampling was done through convenience sampling and then simple random allocation to two experimental and control groups. When the patient referred to the dialysis unit, staff or researchers identified caregivers and selected them based on the study entry and exit criteria. After fully explaining the study objectives, written informed consent was obtained from all participants to participate in the study.

Inclusion and exclusion criteria

Inclusion criteria included: age over 18 years, caring for a patient for at least the past 3 months, willingness to participate in the study, having minimal literacy, and access to a mobile phone. Exclusion criteria included severe mental disorders (based on the case file or family declaration), absence from more than two sessions of telephone experimental , and failure to cooperate in completing the questionnaires.

Intervention

The experimental group received two telephone calls per week for 6 weeks, lasting approximately 20–30 minutes. The calls were made by a nurse trained in chronic care and psychosocial experimental s. The research experimental was designed as a telenursing follow-up and included 12 structured telephone call sessions that were conducted twice a week over a period of six weeks. These calls were made on pre-determined days, with prior coordination with the family caregiver, so as not to interfere with their personal or family schedules. The telenursing experimental was conducted by the researcher (first author), who holds a master's degree in psychiatric nursing and is the main project implementer. Before the experimental began, the researcher designed the necessary training in the fields of telenursing, emotional support, improving self-efficacy in care, and reducing compassion fatigue using scientific resources and clinical experiences, and based on that, presented the content of the sessions in a targeted and gradual manner. Thus, the calls not only included psychosocial education and care information, but also included supportive, motivational, and facilitating aspects to achieve maximum effectiveness in improving the caregivers' mental state.

The educational content of the sessions is designed using the principles presented in the book Health Psychology: Concepts, Theories, and Applications (Rahbar and Maleki, 2019) and the study by Khalidi et al.,2014(15), which includes disease education, skills to cope with stress and burnout, relaxation techniques, communication skills, and strengthening caregivers' self-efficacy.

Content of experimental sessions:

Session 1: Introduction to chronic kidney failure and the hemodialysis process - Introduction to the disease, causes and consequences - The importance of the role of the family caregiver in patient care

Session 2: Understanding compassion fatigue and its symptoms - Defining compassion fatigue and its impact on caregiver mental health - Identifying early signs and prevention

Session 3: Stress management and coping strategies - Introducing cognitive-behavioral techniques for stress reduction - Teaching effective coping methods with caregiving pressures

Session 4: Effective communication skills with the patient and the treatment team - Improving listening skills and expressing emotions - Strategies for resolving conflict and maintaining constructive communication

Session 5: Relaxation and emotion control techniques - Deep breathing training, meditation, and physical relaxation methods - Managing negative emotions in difficult situations

Session 6: Self-care training for caregivers - The importance of self-care in maintaining physical and mental health - Planning for rest and recreation

Session 7: Strengthening caregiving self-efficacy - Increasing belief in the ability to manage caregiving situations - Providing exercises and positive feedback

Session 8: Dealing with Fatigue and Emotional Burnout - Understanding the Causes of Burnout and Methods of Prevention and Treatment - Techniques for Recovering Mental Energy

Session 9: Social support and support resources - Identifying family and community support resources - Teaching how to ask for help and benefit from support

Session 10: Healthy nutrition education and its importance for caregivers and patients - Principles of proper nutrition to maintain health - The impact of nutrition on the caregiver's energy and morale

Session 11: Planning for time management and caregiving tasks - Task organization and prioritization techniques - Reducing caregiving burden through effective planning

Session 12: Review of materials, answers to questions and planning for continuity of care - Summarizing key points - Developing a plan for continued support and continuous improvement.

During the study period, the control group received only usual care and no telephone experimental . After the study ended, they were provided with a similar educational package in the form of a brochure.

Data collection tools

Initially, both groups were assessed using the Professional Quality of Life (ProQoL) Scale and the Caregiver Self-Efficacy Scale. After the end of the experimental period, both groups were assessed again using the same instruments. Follow-up was conducted one month later and both groups completed the questionnaires again.

ProQoL Scale: This questionnaire was developed by Figley in the mid-1900s to determine the level of compassion fatigue and post-traumatic stress(16). This questionnaire consists of three subscales: satisfaction with compassion (10 questions), burnout (10 questions; some questions

were reverse scored), and secondary traumatic stress (10 questions). The scale for answering the questions in this questionnaire is a 5-point Likert scale from one (never) to five (most of the time). Each subscale is independent and the scores of the subscales cannot be summed together. Each subscale consists of 10 questions and the scores for each item are obtained by summing all of its questions. The total score thresholds based on the 25th and 75th percentiles are as follows: A score of 22 or less on each subscale indicates low compassion satisfaction, a score of 23 to 41 is in the medium range, and more than 150 indicates high compassion satisfaction. This questionnaire was translated in Iran by Mohammadi et al., 2014 and used in their study. Its validity was evaluated by 10 experts and its content validity index was reported as 0.87. Its reliability was also calculated using the Cronbach's alpha internal correlation coefficient of 0.80(17).

Caregiver Self-Efficacy Scale: The Self-Care Self-Efficacy Questionnaire was first designed by Lu et al., 1996 specifically for cancer patients(18) and was translated into Persian by Azizi Fini(19). This questionnaire has 29 questions with 5 options on a Likert scale ranging from ((I am completely confident)) 5 points to ((I am a little confident)) 1 point. This questionnaire includes four dimensions: "adaptability, stress reduction, decision-making, and enjoyment of life." The questions in this questionnaire assess the individual's level of confidence in performing the tasks mentioned in the tool, and the total score ranges from 29 to 145. This tool is self-reported and its internal correlation in the original study was reported as 0.94 by calculating Cronbach's alpha. Also, in the original study, the correlation coefficient of the scores from the questionnaire with the scores from the health behavior scale was 0.61(19).

Statistical analysis

Data were analyzed using SPSS software version 23. Descriptive analysis included mean, standard deviation, frequency, and percentage. Inferential analyses included independent t-test, paired t-test, and analysis of covariance (ANCOVA) were used to control for the effect of pretest on posttest results. The significance level was considered to be $p < 0.05$.

Result

The mean age of caregivers in the experimental group and control were 46.30 ± 7.22 and 45.41 ± 7.69, respectively, and the t-test did not show a significant difference in this respect ($p = 0.642$). Other demographic characteristics are summarized in Table 1.

Table 1. Demographic variables in the control and experimental groups.

Variables		Groups		Test results (p-value)
		Experimental group (%)	Control group (%)	
Sex	Woman	22 (73.3)	24 (80)	0.51 (Fisher's exact test)
	Men	8 (26.7)	6 (20)	
Marital status	Single	10 (33.3)	9 (30.0)	0.721 (Pearson chi-square)
	Married	12 (40)	10 (33.3)	
	Divorced	5 (16.6)	7 (23.3)	
	His wife died	3 (10.0)	4 (13.3)	
Education	Illiterate	2 (6.7)	2 (6.7)	0.384 (Pearson chi-square)
	Elementary	0 (0)	3 (10.0)	
	Secondary school	11 (36.6)	10 (33.3)	
	High school	10 (33.3)	8 (26.7)	
	University	7 (23.3)	7 (23.3)	
Work	Employee	2 (6.7)	2 (6.7)	0.676 (Pearson chi-square)
	Retired	1 (3.3)	2 (6.7)	
	Worker	4 (13.3)	2 (6.7)	
	Self-employed	10 (33.3)	10 (33.3)	
	Student	1 (3.3)	0	
	Housekeeper	7 (23.3)	11 (36.7)	
	Unemployed	5 (16.7)	3 (10.0)	
Family income	More than adequate	0	1 (3.3)	0.395 (Pearson chi-square)
	Adequately	14 (46.7)	13 (43.3)	
	Less than adequate	16 (53.3)	16 (53.3)	
Home caregiver	Spouse	4 (13.3)	4 (13.3)	0.788 (Pearson chi-square)
	Father	9 (30.0)	9 (30.0)	
	Mother	12 (40.0)	9 (30.0)	
	Parents	3 (10.0)	3 (10.0)	
	Brother/ sister	2 (6.7)	5 (16.7)	
The client's history of underlying diseases	Yes	15 (50)	10 (33.3)	0.108 (Fisher's exact test)
	No	15 (50)	20 (66.7)	
	Yes	10 (33.3)	9 (30)	0.641

Family history of the disease	No	20 (66.6)	21 (70)	(Fisher's exact test)
Number of times the client was hospitalized	Once	11 (36.6)	12 (40.0)	0.280 (Pearson chi-square)
	Twice	11 (36.6)	10 (33.3)	
	Three times and more	8 (26.6)	8 (26.6)	

The mean of compassion fatigue of family caregivers of hemodialysis patients after routine care in the control group decreased from 34.53 ± 5.34 to 32.93 ± 4.10 (p=0.747). However, in the experimental group after telenursing, it decreased from 34.86 ± 5.6 to 20.03 ± 3.72 and this difference was statistically significant ($p < 0.0001$) (Table 2). Compassion fatigue was significantly reduced in the experimental group after telenursing compared to control group ($p < 0.0001$).

Table 2. Mean and standard deviation (SD) of compassion fatigue and self-care self-efficacy of family caregivers of hemodialysis patients in the control group and experimental group.

Variable		Mean ± SD		Independent t-test results
		Experimental group	Control group	
compassion fatigue	Pre-test	34.86 ± 5.6	34.53 ± 5.34	0.544
	Post-test	20.03 ± 3.72	32.93 ± 4.10	<0.001
	Paired t-test	<0.001	0.747	-
	Follow-up	19.43 ± 2.63	31.53 ± 4.40	<0.001
self-care self-efficacy	Pre-test	81.50 ± 10.30	82.76 ± 12.90	0.816
	Post-test	107.13 ± 11.86	83.10 ± 11.26	<0.001
	Paired t-test	<0.001	0.398	-
	Follow-up	110.43 ± 14.86	83.27 ± 11.38	<0.001

The mean of self-care self-efficacy of family caregivers of hemodialysis patients after routine care in the control group increased from 82.76 ± 12.90 to 83.10 ± 11.26 (p=0.398). However, in the experimental group after telenursing, it increased from 81.50 ± 10.30 to 107.13 ± 11.86 and this difference was statistically significant ($p < 0.0001$) (Table 2). self-care self-efficacy also increased significantly in the experimental group compared to the control group ($p < 0.0001$).

Before the experimental , there was no significant difference between the two groups in terms of compassion fatigue and self-care self-efficacy ($p>0.05$) (Table 2).

After one month of follow-up, the mean of compassion fatigue had significantly decreased compared to the control group ($p>0.001$), and the mean of self-care self-efficacy significantly increased compared to the control group ($p>0.001$); these findings indicate that the telenursing experimental has lasting effects (Table 2). Repeated-measures variance analysis is illustrated in Figures 1 and 2. Significant decrease in mean compassion fatigue scores after the intervention and one month later in the experimental group compared to the control group (Figure 1).

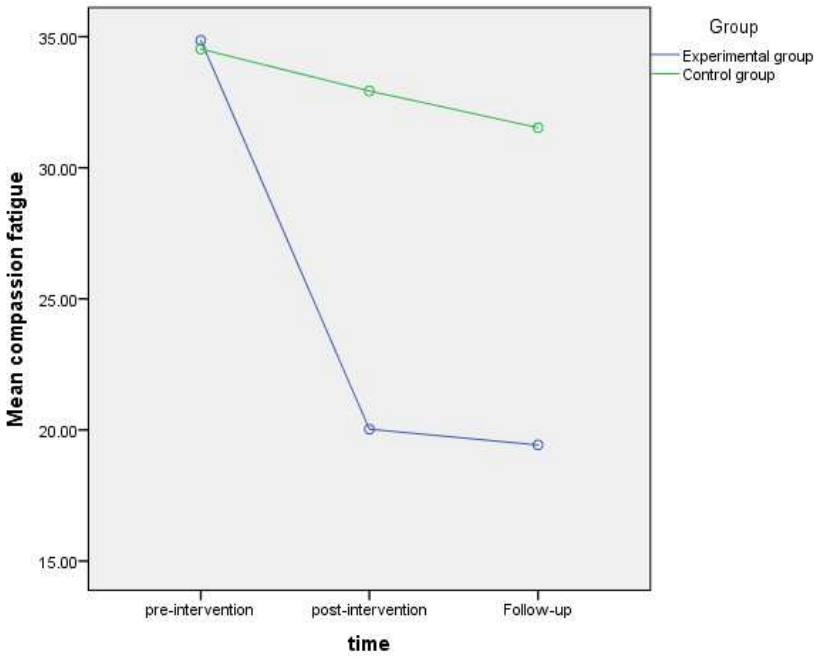

Figure 1. Changes in mean compassion fatigue scores in the experimental and control groups at pre-intervention, post-intervention, and one-month follow-up.

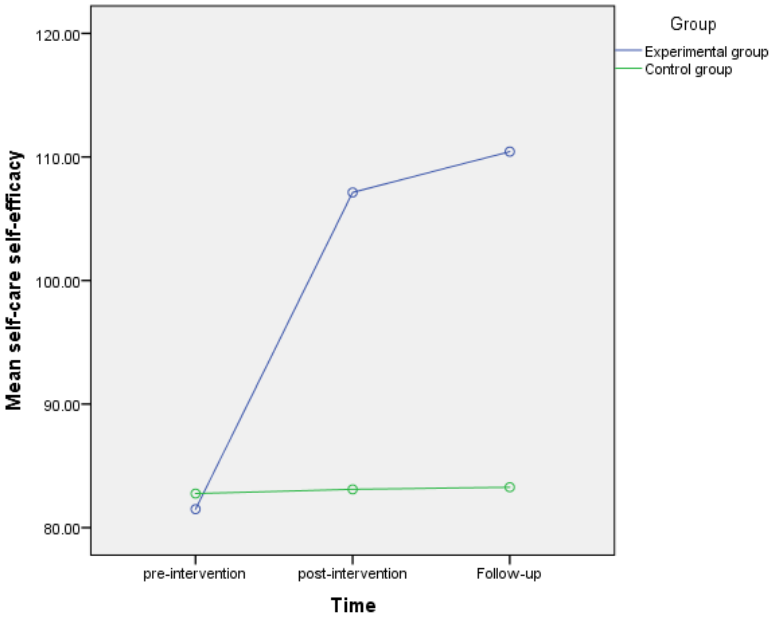

Figure 2. Changes in mean self-care self-efficacy scores in the experimental and control groups at pre-test, post-test, and one-month follow-up.

Discussion

The result of the present study showed that telenursing was able to significantly reduce compassion fatigue and increase self-care self-efficacy in family caregivers of hemodialysis patients. First, regarding the reduction of compassion fatigue, the results of present study confirm the report of Akbari et al., 2024, which showed that more than 50% of caregivers of dialysis patients suffer from some degree of emotional fatigue, and this rate increases gradually with the lack of educational and psychological support(20). In this regard, a study by Fereydouni Sarijeh et al., 2025 showed that telenursing can effectively reduce caregiving pressure and increase resilience in caregivers of bipolar patients(14). These similarities may indicate a consistent pattern of telenursing effectiveness across different care groups. From a health psychology perspective, telenursing, through emotional support and cognitive-behavioral training, helps caregivers identify and modify their dysfunctional beliefs about caregiving, which in turn leads to a reduction in “emotional exhaustion” and an increase in “caregiving role satisfaction.” These findings are also consistent with the Lazarus stress-coping theoretical model and the concept of “caregiver burden”(21).

In terms of increasing self-care self-efficacy, present study showed that the tele-nursing led to a significant increase in caregivers' confidence in their ability to manage caregiving situations. This finding was consistent with the study by Madadkar et al., 2021 on cardiac patients(22);

The aforementioned study showed that family-centered education combined with telenursing significantly increased patients' self-efficacy. From a theoretical perspective, increasing caregivers' self-efficacy gives them the feeling that they can cope with challenges, utilize support resources, and ultimately, increase the quality of care provided to the patient. Bandura, the founder of self-efficacy theory, emphasizes the role of "positive feedback" and "successful role models" in strengthening this feeling, features that were included in the telenursing intervention in present study(23, 24).

Interestingly, even at one-month follow-up, the results showed sustained effectiveness of the intervention (tele-nursing). This is similar to the findings of Fereydouni Sarijeh et al., 2025 who found tele-nursing interventions to be effective in caregivers of bipolar patients(14). Given the high prevalence of chronic diseases and the increasing need for non-professional caregivers at home, telenursing can be an effective health strategy that can be extended to other diseases(25, 26). tele-nursing not only improves caregivers' psychological outcomes, but can also elevate the nurse's role from that of a mere caregiver to that of a coach and supporter, and can be considered a step towards family-centered and national health-centered care.

The current study had limitations in using self-report instruments. Instruments such as the ProQOL and the self-care self-efficacy scale are completed based on participants' self-reports. This may introduce response bias (such as prosocial responses) and affect the accuracy of the data. The sample size was relatively limited and single-center; this study was conducted in a single medical center (Imam Reza Amol Hospital) and the samples were selected on a convenience basis. This may limit the generalizability of the findings to other centers or different cultural populations. The inability to fully control psychological and family intervening variables was another limitation of the study. Such as the level of family support, caregiver personality traits, and the degree of patient mental disorder, which could have affected the results but were not controlled for in the final analysis. The lack of long-term evaluation of the effectiveness of the intervention is also a limitation, and the current study had a one-month follow-up, which is not sufficient to examine the sustainability of the effects of telenursing. It is suggested that future studies benefit from longer follow-ups (3 to 6 months).

Conclusion

The results of the present study showed that telenursing can significantly reduce compassion fatigue and increase self-efficacy in family caregivers of hemodialysis patients. These positive effects were observed in both within-group and between-group comparisons and were

sustained at one-month follow-up. These findings emphasize the importance of non-face-to-face, low-cost, and accessible approaches in promoting the mental health of caregivers of chronic patients. Given the increasing number of hemodialysis patients and the vital role of caregivers in the care process, the use of new methods such as telenursing can improve the quality of life of caregivers, prevent their emotional burnout, and improve the level of care provided to patients. present study shows that through structured telephone calls, nurses can play not only the role of therapist, but also the role of psychological support and facilitator, and take an effective step towards family-centered and community-centered care.

Declarations

Ethics approval and consent to participate

This study received ethical clearance from the Ethics Committee of Nishapur University of Medical Sciences (IR.NUMS.REC.1404.062). Written informed consent was obtained from all participants prior to their inclusion in the study.

Consent for publication

All participants provided written informed consent for the publication of anonymized data and study findings. No identifiable personal information has been disclosed in this manuscript.

Competing interests

The authors declare no competing interests.

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Data availability

The datasets generated and analyzed during the current study can be obtained from the corresponding author upon reasonable request.

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