

Effectiveness of Problem-Focused Coping Strategies on the Burden on Caregivers of Hemodialysis Patients

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Abstract

Background: Studies have shown that family caregivers of hemodialysis patients experience high levels of burden. However, these caregivers are often neglected, and no studies are available on the effectiveness of coping strategies on the burden of care among these caregivers.

Objectives: This study aimed to examine the effectiveness of problem-focused coping strategies (communication skills, anger management, and deep breathing) on the burden on caregivers of hemodialysis patients.

Patients and Methods: A randomized controlled clinical trial was conducted on 76 family caregivers of hemodialysis patients referred to Shahid Hasheminejad hemodialysis center in Tehran, Iran. The subjects were equally allocated into two groups of 38. Through a coin-tossing method, caregivers of patients who referred on even or odd days of the week were randomly assigned into the intervention group or the control group, respectively. The intervention group received four training sessions on problem-focused coping strategies, but the control group did not receive any intervention. Both groups answered the caregiver's burnout inventory at the start and six weeks after the last educational session. Descriptive statistics, chi-square, Fisher's exact test, independent-samples t-test, and Mann-Whitney U test were used to analyze the data.

Results: The majority of caregivers (54%) were in the age range of 35 - 55 years, female (68.4%), and married (70%). No significant difference was found between the baseline mean caregivers' burden scores of the intervention and control groups (88.56 ± 11.74 vs. 84.97 ± 15.13 , $P = 0.308$). However, the mean caregivers' burden in the intervention group decreased, and the two groups were significantly different at the end of the study (58.77 ± 6.64 vs. 87.84 ± 11.74 , $P < 0.001$).

Conclusions: The current study showed the effectiveness of problem-focused coping strategies on reducing the burden on caregivers of hemodialysis patients. Authorities and policymakers in the healthcare system are responsible for developing strategies to integrate educational programs, such as the program implemented in the current study, into the country's healthcare system.

Keywords: Teaching, Coping Skill, Burden of Care, Caregivers, Hemodialysis, Patients

1. Background

A family member's chronic illness and its economic and psychosocial consequences involve the entire family and affect their lifestyle. Studies show that family caregivers of patients with a chronic illness experience a vast range of physical and emotional distresses and psychological symptoms, including depression, anxiety, anger, despair, and feelings of guilt and shame (1, 2).

Chronic renal failure (CRF) leads to significant changes in the lives of patients and their families. The need for frequent hemodialysis and its associated health problems reduce patients' energy and negatively affect their ability to work and to perform routine daily activities (3-5). About 2 to 3 percent of people worldwide and more than 10% of Americans are affected by CRF (6). The disease is increasing in developing countries; its prevalence in Iran increased from 238 cases per million people in 2000 to 354 cases per million in 2006 (7).

A few treatment options are available for patients with

CRF, including hemodialysis, peritoneal dialysis, and kidney transplantation. In Iran, 47.7% of all patients with CRF use hemodialysis; and a total of 25,934 patients were under chronic hemodialysis in 2013 (6-8). Although the widespread availability of hemodialysis saves and prolongs the lives of thousands of patients with end-stage renal diseases, these patients suffer from many problems and complications (9, 10). Hemodialysis patients experience a high degree of disability, loss of functions, and dependency on their caregivers, particularly family caregivers (11, 12). Studies showed that family caregivers have an exclusive role in caring for these patients and therefore are under considerable physical and psychological pressure (1, 13-15). In a recent study, Abbasi et al. investigated the burden on caregivers of hemodialysis patients and reported that 74.2% of them experienced severe burden (16). Over time, as patients worsen, their caregivers' burden also increases and they experience more physical and psychological problems, social isolation, and disruption in family relationships, which might finally lead to shortcom-

ings or discontinuing the patient care (1, 17). Therefore, these family caregivers are at risk of disease and are sometimes referred to as hidden patients (18).

In hemodialysis centers, health professionals are responsible for patient care. However, at home, the patients' relatives undertake this role. These caregivers are often deficient in knowledge and skills related to patient care and lack social support or support from the healthcare system. With disease progression, patients became more disabled and caregivers are confronted with more complex caring needs (19-21). With an increase in patients' caring needs, the burden on caregivers increases. Then, their quality of life is reduced (12) and they experience more anger, anxiety, and the inability to cope with their caring roles (22-24). However, few interventional studies are available on the alleviation of the burden on caregivers of hemodialysis patients. In a study in Turkey, Mollaoglu et al. investigated the effects of education related to home care in patients undergoing hemodialysis on caregiver burden and reported that education was effective in reducing caregivers' burden (20). In another study, Khorami markani et al. examined the effect of a family-centered educational program on the home care knowledge of the caregivers of patients under chronic hemodialysis and reported positive effects (25).

In addition to knowledge on caring, caregivers need appropriate skills in communicating with patients and dealing with stressful situations (12, 26) to cope with such a stressful and demanding life. There are two categories of coping strategies: problem-focused strategies (based on one's ability to manage the environmental event) and emotion-focused strategies (that focus on changing the emotions caused by a stressful situation) (27, 28). A number of studies have investigated the effectiveness of coping strategies on caregiver burden among caregivers of patients with dementia, mental disorders, heart failure, and cancer (23, 24, 29, 30) and demonstrated positive effects. However, the caregivers of hemodialysis patients have largely been neglected (22, 31). Although some descriptive and review studies are available and have reported moderate to severe levels of burden on these caregivers (14, 16, 31), only one interventional study is available on this group, and this study has no control group (20). No additional studies are available on the effectiveness of coping strategies on the burden of care among these caregivers.

2. Objectives

This study aimed to examine the effectiveness of problem-focused coping strategies (communication skills,

anger management, and deep breathing) on the burden on caregivers of hemodialysis patients.

3. Patients and Methods

A randomized controlled clinical trial was conducted on caregivers of hemodialysis patients referred to Shahid Hasheminejad hemodialysis center in Tehran, Iran. The study was conducted from February to August 2015.

Inclusion criteria for the caregivers were as follows: being a patient's first-degree relative, having the responsibility for the home care of his or her hemodialysis patient, willingness to participate in the study, at least 18 years of age, writing and reading literacy, having no known psychological or neurological disorders, having no severe family conflict, and not being a healthcare worker. Inclusion criteria for the patients were as follows: performing regular hemodialysis for at least two months, at least three times a week, and for 3 - 4 hours in each session; having no history of kidney transplantation; and having a family caregiver to do home care. The lack of appropriate cooperation by the caregiver, participation in similar training courses, the occurrence of a family crisis (i.e., divorce, financial crisis, the death of a first-degree family member) during the study, a subject's decision to withdraw from the study, the absence of even a training session, and booking the patient on the kidney transplantation list were selected as exclusion criteria.

Due to the lack of similar studies on caregivers of hemodialysis patients, the sample size was estimated based on a pilot study on 16 caregivers that were equally placed into two groups of eight. After administering the caregiver's burden inventory (CBI), four sessions similar to the main study were conducted in one group, and after one month, the CBI was again administered to both pilot groups. The mean burden in the intervention group was changed from 83.51 ± 12.47 to 63.21 ± 14.28 while it did not significantly change in the control group (84.64 ± 13.21 vs. 81.01 ± 12.67). Then, using the following parameters ($\beta = 0.10$, $\alpha = 0.01$, $\mu_1 = 81.01$, and $\mu_2 = 63.21$, $S_1 = 12.67$, $S_2 = 14.28$), 18 subjects were estimated to be needed in each group. However, considering the possible dropouts and for more confidence, we doubled the sample size and recruited 38 subjects in each group.

3.1. The Study Instrument

A two-part instrument was used. The first part included a demographic questionnaire including questions on the caregiver's and the patient's demographic data, such as the caregiver's age, gender, marital status, education level, job, type of family relationship with the patient, financial status, having a known physical illness, and the size of their

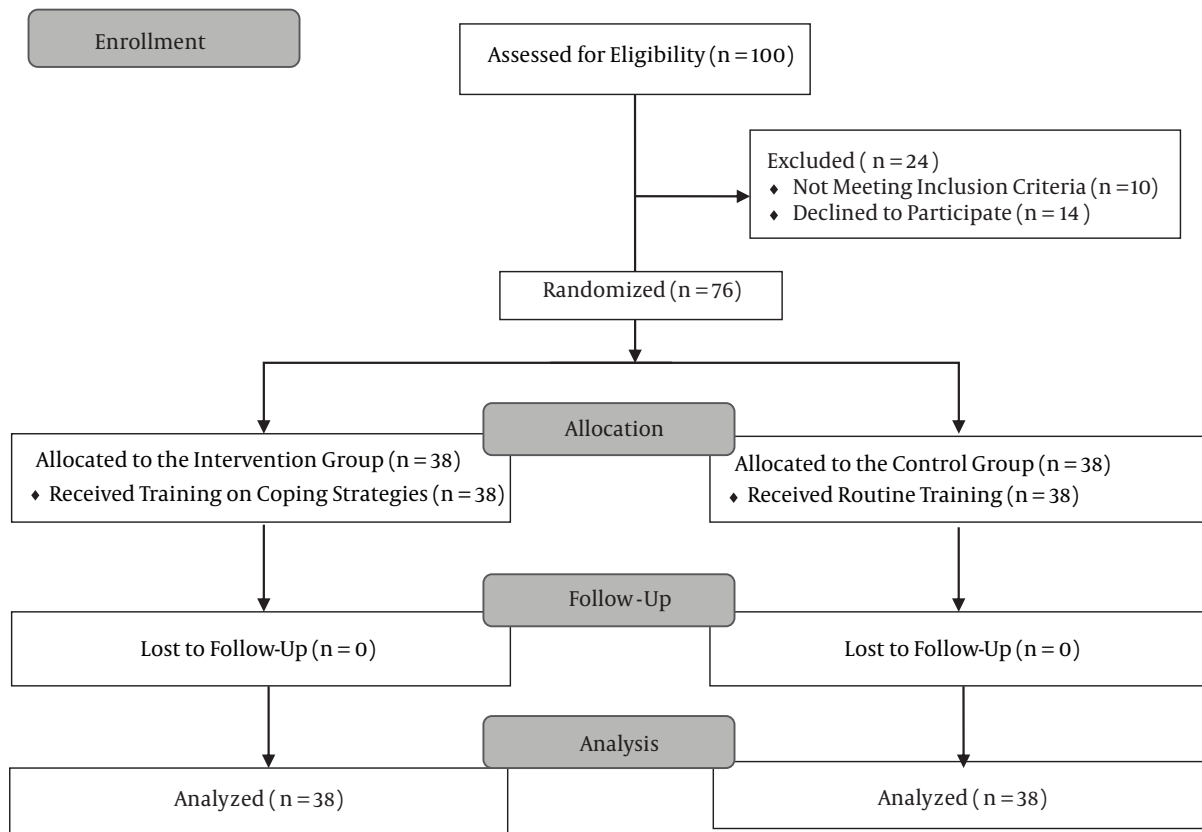


Figure 1. The Study Flow Diagram

family as well as the duration of the patient's disease, duration of using regular hemodialysis, history of kidney transplantation, dialysis association membership, having active insurance coverage, and the type of insurance coverage. In addition, there was a question on a four-point Likert scale on the patient's ability to perform his or her own personal tasks (very low, low, high, and very high). The Farsi version of the CBI was used as the second part of the study instrument.

The CBI is composed of 24 items in five subscales, including time-dependence burden (items 1 to 5), developmental burden (items 6 to 10), physical burden (items 11 to 14), social burden (items 15 to 19), and emotional burden (items 20 to 24). All items are responded on a five-point Likert scale ranging from 1 (= never) to 5 (= nearly always). The total score is between 24 and 120; higher scores indicate more burden. Moreover, the scores between 24 and 39, 40 and 71, and 72 and 120 are categorized as low, moderate, or severe burden, respectively (32, 33). This scale was translated to Farsi by Abbasi et al. and its validity and reliability were confirmed through content validity and internal con-

sistency (Cronbach's alpha = 0.90) (16).

3.2. Intervention

After approval of the study was obtained, the first researcher referred to the aforementioned hemodialysis center, and through a file review and interviews with the patients, those with inclusion criteria were found. Then, the researcher made telephone contact with the patients' main caregivers and, through telephone interviews, assessed their eligibility, informed them that a study is starting to investigate caregiver's burden, and invited them to participate in the study. Caregivers who agreed to take part were informed that they would be involved the study for about two months and would be asked to complete the questionnaires two times during the study. Then, all of them were invited to attend a session in the hall of the dialysis center to complete the study instrument and were informed that after a while they would be invited to attend several educational sessions. Subsequently, through a coin-tossing method, caregivers of the patients who referred on even or odd days of the week were randomly

assigned to either the intervention group or the control group, respectively. Then, the 38 caregivers in the intervention group were allocated into five small subgroups of five to eight, and each subgroup participated in four training sessions on problem-focused coping strategies (i.e., proper communication, anger management, and deep breathing) that were held twice a week, in two consecutive weeks, and each session lasted for about an hour. All training sessions were delivered by an expert psychiatric nurse who was previously trained and tested to facilitate group discussions. Each session consisted of a combination of a short PowerPoint facilitated lecture, a group discussion, a question and answer period, and a role playing. At the end of the first session, an educational booklet related to the issue was given to all the participants to be read and exercised at home. The content validity of the educational booklet was confirmed by 10 nursing professors in the Tehran, Iran and Shahid-Beheshti Universities of Medical Sciences. The outline of training sessions is presented in [Table 1](#).

Six weeks after the last educational session, all subjects in the experimental group and the control group were again invited to attend a session in the hall of the dialysis center and responded to the study instrument. The control group received no training during the study.

3.3. Ethical Considerations

This study was approved by the ethics committee of Iran University of Medical Sciences (grant no. 93-D-105-6175). Permission was also sought from the authorities in the university and the Shahid Hasheminejad dialysis center. All participants were briefed about the study's purposes and the voluntary nature of their participation. They all signed a written informed consent, were assured of the anonymity and confidentiality of the data, and were also reminded that they can withdraw from the study at any time. The researchers were sensitive to preserving the participants' rights according to the Helsinki ethical declaration. To observe ethics, the caregivers in the control group also received the educational booklet after the last assessment.

3.4. Data Analysis

Statistical analysis was performed using SPSS software version 13. Descriptive statistics such as frequencies, percentage, mean, and standard deviation were calculated. The Kolmogorov-Smirnov test was used to examine the normal distribution of quantitative variables. The chi-square test was used to compare the nominal and categorical variables, such as gender, marital status, education level, job, and having a chronic co-morbidity, between the two groups. Fisher's exact test was used to compare the two

groups in terms of the patients' duration of hemodialysis, type of insurance coverage, dialysis association membership, and caregivers' relationship with the patient and financial status. The independent-samples t-test was used to compare the caregivers' mean age and mean burden scores in the two groups. The Mann-Whitney U test was also used to compare the patients in the two groups in terms of their ability to perform their own personal tasks. $P < 0.05$ was considered significant in all tests.

4. Results

The majority of caregivers (77.6%) had no physical disorder; most of their patients had a low or very low ability to perform their own personal tasks (79%) and were using regular hemodialysis for more than two years (76.35%), and all had insurance coverage ([Table 2](#)).

No significant difference was found between the two groups' baseline mean caregivers' burden scores before the intervention ($P = 0.308$). However, the mean caregivers' burden in the intervention group was reduced, and the two groups were significantly different at the end of the study ($P < 0.001$) ([Table 3](#)).

Overall, 0%, 15.8%, and 84.2% of the caregivers in the control group and 0%, 10.5%, and 89.5% of caregivers in the intervention group experienced low, moderate, or severe burden before the intervention ($P = 0.497$). However, at the end of the study, the rates of low, moderate, or severe burden in the intervention group were reduced to 0%, 94.7%, and 5.3%, whereas these rates did not significantly change in the control group ($P < 0.001$).

The two groups' mean scores on caregivers' burden were also compared in terms of their demographic variables, and no significant differences were found ([Table 4](#)).

The mean scores of the different domains of caregivers' burden were also compared between the two groups. Before the intervention, no significant difference was observed between the two groups except in the domain of emotional burden. However, the mean scores of the intervention group decreased in all domains after the intervention, and all domains were different in the two groups at the end of the study ($P < 0.001$) ([Table 5](#)).

5. Discussion

This study is the first to evaluate the effectiveness of a training program involving problem-focused coping strategies on the burden on caregivers of hemodialysis patients. The present study showed that learning coping strategies can reduce caregivers' burden of care. This finding, along with previous studies, shows the importance of

Table 1. The Outline of the Educational Sessions

No.	Title of Sessions	Content of Each Session
1	Greeting, explaining the rules and basic concepts	Greeting, introducing the sessions' facilitator and the caregivers to each other, and explaining the numbers and the structure of the training sessions; presenting the importance of caregivers' roles and the basic concepts of adaptation and coping as well as types of coping strategies; group discussion on caregivers' experiences, and problems with patient care; giving them the educational booklet and explaining how to use it.
2	Problem-focused coping strategies and effective communication skills	Greeting and reviewing the content of the previous session, the concept of problem-focused coping and its importance in stress reduction, the role of good communication in stress reduction; discussing the principles of effective communication and its barriers, the importance of good communication in appropriate coping, and the consequences of poor communication; group discussion on caregivers' experiences and problems in communicating with patients and role playing in effective communication; summarizing of the session (by the psychiatric nurse).
3	Strategies for anger management	Greeting and reviewing the content of the previous session, a short lecture on anger, its alarming symptoms, stress, and anger situations in patient care; the consequences of anger and stress in daily life; a group discussion on caregivers' experiences of anger and stress related to patient care and how to management anger; role playing in effective anger management; summarizing of the session (by the psychiatric nurse).
4	Stress reduction and anger management strategies	Greeting and reviewing the content of the previous session; a short lecture on stress reduction and anger management strategies; teaching the deep breathing method for anger management; question and answer period and group discussion on caregivers' experiences of stress reduction and anger management strategies; role playing of effective anger management and stress reduction; practicing the deep breathing and other anger management strategies; summarizing of the session (by the psychiatric nurse).

training in supporting caregivers of patients with chronic disorders, such as users of regular hemodialysis (13, 31, 34). Family caregivers should not only take care of themselves, but also simultaneously meet the patients' caring needs. Consequently, they experience high levels of physical, emotional, financial, and social burden, which change their lifestyle (14). At the start of the current study, more than 80% of the family caregivers demonstrated symptoms of severe burden. This finding is consistent with some of the previous studies that investigated the burden on caregivers of hemodialysis patients (14-16, 20). In contrast, in a study by Rioux et al. caregivers of hemodialysis patients experienced low levels of burden (35), which might be attributed to the patients' and caregivers' characteristics, such as higher levels of caregivers' education, higher levels of patients' self-caring abilities, and performing hemodialysis at night. A number of the earlier studies investigated the relationship between caregivers' burden and certain demographic variables. For instance, Abbasi et al. showed a direct relationship between caregivers' burden and income (16). Bayoumi et al. (14) and Mollaoglu et al. (20) also reported an association between caregivers' burden and education, indicating caregivers with higher education levels experience lower levels of burden. However, in the current study, we did not find any significant relationship between caregivers' burden and demographic vari-

ables.

At the beginning of this study, no significant difference was observed between the two groups in different domain of caregivers' burden except for emotional burden, which was higher in the intervention group. Moreover, both groups expressed the highest levels of burden in the domains of developmental, physical, and time dependence. However, in a previous study by Abbasi et al. caregivers experienced higher levels of burden in the emotional, social, and developmental domains (16). These inconsistencies might be attributed to the age of the caregivers, which was higher on average in the present study. Previous studies have also shown that caregivers' burden in the physical, developmental, and time-dependence domains increases with age, whereas the burden in the emotional domain decreases.

Most of the caregivers in this study were females who were daughters or wives of the hemodialysis patients. This finding was consistent with previous studies (14, 15, 20). Evidence shows that most caregivers of chronic patients in Asian families are females (5). Mollaoglu et al. have also reported that female caregivers who are family members of patients are usually more sentimental and sensitive to patients' caring needs and also have a greater ability than men to manage problems and establish intimate relationships with patients (20).

Table 2 (Part 1). The Distribution of the Two Groups' Demographic Variables^a

Variables	Group		Test Result
	Control	Intervention	
Age, y			0.269 ^b
< 35	5 (13.1)	7 (18.4)	
35 – 45	15 (39.5)	8 (21.1)	
45 – 55	12 (31.6)	12 (31.6)	
> 55	6 (15.8)	11 (28.9)	
Gender			0.99 ^b
Female	26 (68.4)	26 (68.4)	
Male	12 (31.6)	12 (31.6)	
Relationship with patients			0.341 ^c
Child	17 (45.9)	19 (59.4)	
Spouse	11 (29.7)	10 (31.2)	
Sister/brother	3 (8.1)	0	
Father/mother	6 (16.2)	3 (9.4)	
Marital status			0.132 ^b
Single	6 (15.8)	11 (28.9)	
Married	27 (71.1)	26 (68.4)	
Divorced or widowed	5 (13.1)	1 (2.7)	
Education level			0.858 ^b
Elementary school	4 (10.5)	6 (15.8)	
Intermediate school	8 (21.1)	6 (15.8)	
High school	15 (39.5)	16 (42.1)	
Academic	11 (28.9)	10 (26.3)	
Job			0.793 ^b
Employed	14 (36.9)	13 (43.2)	
Unemployed	4 (10.5)	6 (15.8)	
Homemaker	20 (52.6)	19 (50)	
Financial status			0.785 ^c
Unfavorable	4 (10.5)	6 (16.2)	
Relatively favorable	30 (79)	28 (75.7)	
Favorable	4 (10.5)	3 (8.1)	

^aValues are expressed as No. (%).

^bChi-square test was performed.

^cFisher's exact test was performed.

The caregiving role can be associated with feelings of compassion, love, and intimacy in relationships. It also helps caregivers to find meaning in their lives (36). However, an increase in the patients' and caregivers' caring needs along with the caregivers' lack of knowledge and skills related to coping strategies can increase their burden (16, 22). Studies have shown that family caregivers' burden

can not only increase their physical complaints, but also may lead to feelings of guilt, disappointed, loneliness, depression, anger, stress, and a lack of freedom, which may result in severe psychological problems (2, 35). The present study, along with several previous investigations, confirmed that family caregivers are often lacking appropriate coping strategies and need to be supported. Sev-

Table 2 (continued). The Distribution of the Two Groups' Demographic Variables^a

Variables	Group		Test Result
	Control	Intervention	
Duration of hemodialysis			0.528 ^b
Less than one month	2 (5.2)	2 (5.2)	
A few months to a year	6 (15.8)	8 (21.1)	
2 to 4 years	15 (39.5)	9 (23.7)	
Over 4 years	15 (39.5)	19 (50)	
Size of family			0.116 ^c
1	6 (15.6)	11 (28.9)	
2	12 (31.6)	17 (44.7)	
3	10 (26.3)	4 (10.5)	
4 and over	10 (26.3)	6 (15.8)	
Type of insurance			0.763 ^c
Social security	24 (66.7)	28 (73.7)	
General health insurance	12 (33.3)	10 (26.3)	
Dialysis association membership			0.086 ^b
Yes	36 (94.7)	30 (81.1)	
No	2 (5.3)	8 (18.9)	

^aValues are expressed as No. (%).^bFisher's exact test was performed.^cChi-square test was performed.**Table 3.** Comparison of the Mean Caregivers' Burden Scores in the Study Groups Before and After the Intervention

Caregiver's Burden	Groups		95% of CI the Difference		T Value	P Value
	Intervention	Control	Lower	Upper		
Baseline assessment	88.56 ± 11.74	84.97 ± 15.13	-10.54	3.36	1.027	0.308
Post assessment	58.77 ± 6.64	87.84 ± 11.74	24.70	33.43	13.282	< 0.001

Abbreviation: CI, Confidence Interval.

eral previous studies on the caregivers of patients with cancer, diabetes, and cardiac and mental disorders have shown that training the caregivers on coping strategies can significantly reduce their burden and increase their self-esteem, perceived health, and quality of life and eventually increases the quality of patient care (12, 23, 24, 26, 27, 30, 37). Confirming the intervention used in the present study, a previous study on family caregivers of hemodialysis patients revealed that those who often use problem-focused coping strategies experience fewer burdens than those who use emotion-focused coping strategies (38). Furthermore, Etemadifar et al. (30) and Navidian et al. (37) reported that supportive educative group interventions and group psycho-educational programs, such as the program

implemented in the current study, are more effective in reducing caregivers' burden, enhancing their own perceived health, and improving patient care. It seems that learning problem-focused coping strategies helps caregivers gain more control, not only over stressful situations, but also over their own behaviors and time management, allowing them to feel less burdened in all aspects of their lives, particularly in the developmental, emotional, social, and time-dependence domains. As the present study showed, the beneficial effects of learning problem-focused continues for weeks or perhaps for months, and the longevity of the effects might be augmented through some reinforcement strategies, such as intermittent repetition of the program.

Table 4 (Part 1). Comparison of the Two Groups' Mean Caregivers' Burden in Terms of Demographics^a

Variables	Caregivers' Burden		P Value
	Control Group	Intervention Group	
Age, y			
< 35	91.20 ± 11.21	87.57 ± 9.25	0.553
35 – 45	87.73 ± 13.13	90.75 ± 15.04	0.623
45 – 55	82.58 ± 8.94	91.78 ± 14.76	0.078
> 55	77.66 ± 28.20	84.07 ± 19.43	0.587
Gender			
Female	90.33 ± 14.11	85.58 ± 18.48	0.478
Male	82.50 ± 15.20	89.93 ± 13.78	0.071
Relationship with patients			
Child	89.16 ± 14.58	87.07 ± 14.90	0.661
Spouse	82.00 ± 17.27	91.14 ± 17.76	0.217
Sister/brother	79.00 ± 7.54	-	-
Father/mother	80.83 ± 15.09	88.00 ± 9.96	0.431
Marital status			
Single	87.09 ± 17.81	83.37 ± 12.83	0.569
Married	84.11 ± 14.18	90.95 ± 15.96	0.105
Education level			
Elementary school	66.50 ± 16.21	102.30 ± 17.32	0.011
Intermediate school	90.12 ± 14.41	96.91 ± 13.88	0.393
High school	83.66 ± 14.69	88.18 ± 11.95	0.354
Academic	89.72 ± 11.64	75.90 ± 9.99	0.009
Job			
Employed	89.00 ± 11.47	82.92 ± 13.94	0.226
Unemployed	-	89.16 ± 23.84	-
Homemaker	82.62 ± 16.68	92.22 ± 12.50	0.043
Financial status			
Unfavorable	82.50 ± 18.44	96.00 ± 23.35	0.362
Relatively favorable	83.26 ± 14.28	86.05 ± 13.03	0.442
Favorable	100.25 ± 12.73	94.60 ± 18.40	0.649

^aValues are expressed as mean ± SD.

Studies have shown that besides knowledge and skills on coping strategies, caregivers of hemodialysis patients need counseling, empathy, and psychological support to cope with their caregiving roles (31, 34). Isenberg et al. (19) and Khanjari et al. (27) showed that group discussions and sharing experiences among caregivers are effective in providing ways to give and receive empathy and psychological support. Confirming the findings of previous studies, the present study also showed that these strategies, along

with educating the caregivers on problem-focused coping strategies, were significantly effective in reducing the burden on caregivers of hemodialysis patients.

This study was conducted only on caregivers of patients in a dialysis center; the small sample size and the relatively short follow-up period can be considered limitations to generalize the findings of this study. Therefore, the replication of similar studies with larger sample sizes and longer periods of follow-up is recommended. Moreover,

Table 4 (continued). Comparison of the Two Groups' Mean Caregivers' Burden in Terms of Demographics^a

Variables	Caregivers' Burden		P Value
	Control Group	Intervention Group	
Duration of hemodialysis			
Less than one month	109.00 ± 2.82	65.00 ± 9.89	0.026
A few month to a year	85.66 ± 11.11	89.87 ± 17.04	0.610
2 to 4 years	83.73 ± 16.53	87.66 ± 15.02	0.566
Over 4 years	82.73 ± 14.05	90.91 ± 13.92	0.100
Size of family			
1	93.00 ± 19.93	88.66 ± 17.62	0.650
2	88.75 ± 10.09	89.29 ± 14.98	0.914
3	86.40 ± 10.71	86.00 ± 22.13	0.963
4 and over	74.20 ± 16.98	88.00 ± 9.57	0.092
Type of insurance			
Social security	85.23 ± 14.25	88.05 ± 16.04	0.499
General health insurance	87.50 ± 17.53	89.98 ± 14.52	0.743
Dialysis association membership			
Yes	85.33 ± 13.38	89.31 ± 13.69	0.239
No	78.50 ± 14.95	87.71 ± 22.09	0.681

^aValues are expressed as mean ± SD.

Table 5. Comparison of the Mean of Different Domains of Caregivers' Burden in the Study Groups Before and After the Intervention

Caregiver's Burden	Groups		95% CI of the Difference		P Value
	Intervention	Control	Lower	Upper	
Time-dependence burden					
Baseline assessment	3.93 ± 0.85	3.83 ± 0.77	-0.47	0.27	0.595
Post-assessment	2.96 ± 0.69	3.91 ± 0.68	0.63	1.26	< 0.001
Developmental burden					
Baseline assessment	4.01 ± 0.71	3.98 ± 0.69	-0.34	0.29	0.871
Post-assessment	2.42 ± 0.42	4.08 ± 0.57	1.43	1.89	< 0.001
Physical burden					
Baseline assessment	3.76 ± 0.87	4.00 ± 0.85	-0.15	0.63	0.237
Post-assessment	2.62 ± 0.47	4.05 ± 0.57	1.14	1.69	< 0.001
Social burden					
Baseline assessment	3.45 ± 0.83	3.21 ± 0.82	-0.61	0.14	0.218
Post-assessment	2.27 ± 0.48	3.41 ± 0.77	0.84	1.43	< 0.001
Emotional burden					
Baseline assessment	3.28 ± 0.84	2.74 ± 0.74	-0.90	-0.17	< 0.001
Post-assessment	1.99 ± 0.36	2.90 ± 0.57	0.68	1.13	< 0.001

Abbreviation: CI, Confidence Interval.

as in any questionnaire study, the caregivers' responses to the questionnaire might have been affected by their psychological condition, and this was not under the full control of the researchers.

In conclusion, the current study showed the effectiveness of problem-focused coping strategies on reducing the burden on caregivers of hemodialysis patients. Presently, there are no ongoing programs focused on educating family caregivers in the healthcare system of Iran, and caregivers of hemodialysis patients are completely ignored.

Authorities and policymakers in the healthcare system are responsible for developing strategies to integrate educational programs, such as the program implemented in the current study, into the country's healthcare system. Moreover, educating the family caregivers should be integrated into all patient education programs running for all chronic patients, including chronic renal failure and hemodialysis patients. The importance of educating and empowering family caregivers should also be emphasized in in-service and continuing nursing education. Particu-

lar courses of training family caregivers with a special focus on problem-focused coping strategies is also recommended to be integrated into the curriculum of nursing, both at the undergraduate and postgraduate levels.

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Footnotes

Authors' Contribution: The study concept and design was performed by Golnar Ghane, Mansoureh Ashghali Farahani, and Naime Sydfatemi; Data acquisition was performed by Golnar Ghane. The statistical analysis and data interpretation were conducted by Golnar Ghane, Hamid Haghani, and Mansoureh Farahani. The drafting of the manuscript and critical revision of the manuscript for important intellectual content were performed by Golnar Ghane, Mansoureh Farahani, and Naime Sydfatemi.

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