Original Article

The effects of an interventional program based on self-care model on health-related quality of life outcomes in hemodialysis patients

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ABSTRACT

Background: Hemodialysis patients have lower quality of life and one of the ways to improve their quality of life is providing self-care education to them using some models including self-care model. This study aimed to determine and evaluate the effects of using self-care model on health and quality of life outcomes in hemodialysis patients. **Materials and Methods:** This was a quasi-experimental study conducted in 2012 on the patients who were referred to a military hospital in Tehran, Iran to be treated with hemodialysis. All 32 patients referred to this hospital in 2012 were selected and studied. Required data were collected using the Short Form-36 (SF-36) standard questionnaire and a researcher-made questionnaire. The educational intervention was implemented using self-care model. Collected data were analyzed using SPSS for Windows version 18.0 and some statistical tests including paired samples t-test, Wilcoxon and McNemar tests. **Results:** The results showed that the mean and standard deviation (SD) of patients' parameters including weight and blood pressure improved significantly after the educational intervention compared to before the intervention ($P < 0.001$). Also, all dimensions of the quality of life of hemodialysis patients, including physical function, role physical, bodily pain, general health, vitality, social function, mental health, and role emotional improved compared to those before the intervention ($P < 0.001$). **Conclusion:** Implementing the self-care model increased the quality of life of hemodialysis patients. Therefore, the use of this model in hemodialysis patients is recommended.

Key words: Health-related quality of life, hemodialysis patients, Iran, self-care model

INTRODUCTION

Advanced chronic renal failure is a progressive and irreversible disorder in which the kidneys' ability to excrete metabolic waste products and to maintain fluid and electrolytes is lost and can lead to uremia. Chronic renal failure and end-stage renal diseases (ESRDs) are progressive and irreversible disorders and one of the major problems around the world.[1-6] Chronic kidney disease (CKD) leads to an increased risk of cardiovascular disease.[7-9] The incidence of CKD in the USA, Taiwan, and some regions in Mexico is approaching 400 cases per million.[10] In Iran, the number of patients beginning maintenance renal replacement therapy (RRT) increased by 130% from 2000 to 2006. The incidence of ESRD linearly increased from 13.82 per million population in 1997 to 49.9 per million population in 2000

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and to 63.8 per million population in 2006.[11] Widespread and easy access of patients requiring hemodialysis treatment has resulted in increase in longevity of thousands of patients with ESRDs. Hemodialysis is the most common treatment for the patients suffering from the ESRDs or irreversible progressive renal failure.[12,13]

The quality of life in the hemodialysis patients is affected by different factors. Hemodialysis causes major changes in the life of patients with CKDs. Changes in living patterns and its limitations impose complex and changed lives on the patients and their families and, finally, reduce their quality of life.[14,15] In such situations, optimizing their quality of life will be one of the most important objectives of health care. Nowadays, hemodialysis patients, in addition to increasing the lifetime thanks to hemodialysis, want to improve their quality of life.[14,15] The results of studies on the health-related quality of life in the patients requiring hemodialysis have shown that related diseases have undesirable effects on patients' physical, mental, and social functions, and measuring the quality of life in such patients has special importance.[16,17]

Despite advances in the treatment of hemodialysis patients, their quality of life is affected by various factors that may make their physical and mental performances difficult. Therefore, applying methods that increase their quality of life is essential.[18] One of the ways of improving the patients' quality of life is through self-care education. Developing and using theories and models in nursing is one of the available training methods.[19-21] Development of strategic plans for hemodialysis patients for them to achieve efficient care is essential.[22] Those patients who have received self-care education, in comparison with those who have never received such training, have higher quality of life.[23] Hemodialysis patients in their own self-care do not have high self-efficacy.[24] Therefore, in order to improve their quality of life, training them in self-care programs has been taken into consideration as a strategy.[24]

Several factors have effects on increasing the hemodialysis patients' quality of life, one of which is self-care education. Self-care is the patients' ongoing efforts to promote their health and welfare and to make their lives better.[25] The results of some studies have shown that there are positive and significant relationships between self-care ability and different aspects of quality of life.[26,27] The results of a study conducted in Taiwan in 2002 indicated that the quality of life in hemodialysis patients was lower than that in kidney transplant patients, and breast and colon cancer patients.[28] Several studies have been conducted in Iran to assess the quality of life in hemodialysis patients. Heidarzadeh *et al.* concluded in their study that more than half of hemodialysis patients had undesirable quality of life.[25] The results of Baraz *et al.*'s study showed that self-care educational program had effects on decreasing the hemodialysis patients' problems and improving their quality of life.[29] According to the results of Pakpour *et al.*'s study, the health-related quality of life in hemodialysis patients in Iran was lower than that in European

and Asian countries due to the differences in lifestyle, socioeconomic status, the general level of education of the patients, as well as physician–patient communication.[30] In another study conducted by Moattari *et al.* in Iran, the results showed a positive effect of empowerment on hemodialysis patients' self-efficacy and quality of life.[31]

Controlling the problems and complications and improving quality of life requires patients' participation in treatment and care. Increased patient awareness is a prerequisite for their participation.[32] Patients treated with hemodialysis need special and ongoing training as they have multiple drug treatments and a special diet, as well as for acquiring the required skills to cope with physical and mental disabilities.[32]

There are several models and approaches for educating and training patients. Considering the chronic problems of these patients, hemodialysis inefficiency and inadequacy in addressing these problems, as well as the need for continuous care, education and training should provide active and informed participation of patients in their own self-care. According to the problems mentioned above, including the type, extent, and frequency of such patients' physical and psychological problems and, on the other hand, the need for providing education to the patients so that they are qualified for their continuous self-care, this study aimed to determine how self-care education in these patients can be effective in reducing their problems and improving their quality of life, in order to provide more evidences in this area.

The use of a nursing model helps to evaluate patients' health status, establish good communications between patients and nurses, set goals of care, and improve the quality of care. The main goal of the self-care models is to improve the patients' quality of life.[33-35] One of the self-care models is partnership care model. The partnership care model focuses on the participation of the patient, his/her family, nurses, physicians, and other healthcare providers in the treatment processes and, based on the partnership approach, provides programs to ensure the continuity of this participation in order to promote and maintain the health of the patient. This model, in addition to explaining the collaborative approach, examines and explains the relationship between care and this participation, and in this regard, the assumptions, structure, basic concepts, and objectives are defined. This model pays special attention to the care and emphasizes two major dimensions including:[36]
- Skills, techniques, and special care
- The caring relationship developed among patients, physicians, and nurses to promote and maintain patients' health.

The first dimension has a hardware aspect and includes particular principles and skills. However, the second one is a software dimension, does not have a fixed and defined nature, and has a dynamic status. Although certain skills and activities are necessary in the care processes, caring relationship plays an important role in the quality of care

and promoting and maintaining the health. This model has several objectives, the most important of which is paying attention to the patients' quality of life. In other words, this model provides an overall strategy to utilize all the capabilities of those involved in the care and treatment, including physicians, nurses, and the patients, and based on this model, providing care is only possible when the relationship among physicians, nurses, patients, and their families is continued and all these people have the same common objectives and understanding of patient care activities. This model includes four stages: (1) Motivating, (2) Preparing, (3) Involving, and (4) Evaluating.[36]

The results of some studies have shown that using partnership care model in patients with cardiovascular disease and hypertension has had positive effects on the patients' quality of life, and given that using this model is not limited to a particular disease, implementing it for patients with diseases which reduce their quality of life has been considered as a necessity by researchers.[19,21,36] Therefore, this study aimed to determine and evaluate the effects of using this model on the quality of life in patients treated with hemodialysis. It was assumed that the implementation of the partnership care model has a positive impact on improving the quality of life in hemodialysis patients. In Iran, the researchers of this study had used this model for the first time for hemodialysis patients in a military hospital to determine how self-care education based on partnership care model could be effective in reducing problems and improving the quality of life of these patients.

MATERIALS AND METHODS

This was a quasi-experimental study conducted in 2012 on patients who were referred to a military hospital in Tehran, Iran to be treated with hemodialysis. All 32 patients referred to this hospital in 2012 were selected and studied. Inclusion criteria were: Willingness to participate in this study, loss of function of both kidneys based on clinical evidence, laboratory tests, and expert opinions, glomerular filtration rate (GFR) <10%, having passed at least 6 months from starting hemodialysis, performing hemodialysis two times per week, and not suffering from any underlying acute or chronic diseases.

Required data were collected using two questionnaires. The first one was a researcher-made questionnaire. The first questionnaire consisted of three sections. The first section was related to the demographic data, including age, sex, marital status, employment status, education level, and duration of hemodialysis. The second section included data on weight, blood pressure, sleep, itching, and doing exercise by patients. The third one was related to the biochemical compositions of the blood. The second questionnaire was the Short Form-36 (SF-36) standardized questionnaire consisting of eight dimensions, including general health, vitality, physical function, physical role, bodily pain, mental health, social function, and emotional role. Generally, this questionnaire has

two components, including physical and mental components. Its scales are scored from 0 to 100 in which 0 represents the worst quality of life and 100 represent the best quality of life. The content validity of the first questionnaire was approved using the opinions of 15 faculty members of Nursing and Midwifery School of Tehran University of Medical Sciences, and its reliability was confirmed using test–retest reliability coefficient ($r = 0.85$). Validity and reliability of SF-36 questionnaire have been confirmed in previous studies.[37,38]

The model used in this study as one of the self-care models was partnership care model. This model consists of four stages: (1) Motivating, (2) Preparing, (3) Involving, and (4) Evaluating.

During the motivating stage, patients became aware of their disease and its outcomes and consequences by attending a training session. At the preparing stage, the objectives, schedules, and time tables of partnership education programs, as well as how to track them were determined.

During the involving stage, the educational meetings were held and, finally, at the evaluating stage, achieving the objectives of the model was evaluated.

Detailed description of the partnership care model

The first stage of the partnership care model is the motivating stage. Each partnership system is a voluntary system. Individuals should attend such a system based on their desire and motivation. On the other hand, care is also a voluntary relationship initiated and formed by choosing a physician, a nurse, or even the type of care and treatment by the patient. Because all care and treatments are considered as activities invading patients' privacy, giving informed choices to the patients is the prerequisite for providing care and treatment. Explanation of what should be done, how, why, who, where, and when is essential.

The second stage of the model is developing an appropriate plan to engage all members of the partnership team, including patients, nurses, and physicians, because the best ideas and programs, even with the strongest and most well-intentioned people and with the best working facilities, cannot be implemented without members' involvement or they will lead to very poor results. To create appropriate opportunities for involving and engaging all members, because care and treatments involve a series of specialized activities, it is necessary to define the required activities and their relationship with the members' duties and responsibilities according to their abilities and skills. Therefore, at this stage, it is required to do proper planning before any other action. One other important step at the preparing stage is planning for educational partnership visits, as well as following the achievement of this model's objective, i.e., ensuring the participation and compliance.

At the next stage, time and content planning of collaborative visits will be done as follows:
* These visits are conducted according to prior planning. Therefore, the objectives of the educational content and

the teaching methods and tools required are determined. This plan can be classically developed according to the patients' problems and diagnoses, and in collaboration with the physician, nurse, and the patients. However, it should be noted that it is not essential to implement the education plan classically and formally

- The implementation of the education plan should be based on the philosophy and approach of participation and partnership, so that both patients and other participants are active. In other words, only the nurse and the physician are not responsible for training
- The methods of undertaking the visits and providing education can be according to the patients' conditions and by applying appropriate methods of explaining, question and answer methods, or based on problem solving and problem-based learning model
- Collaborative visits are undertaken with the presence of those patients who have similar conditions. After the planning stage, care and treatments are provided according to the defined objectives. Each partnership plan should be properly implemented to achieve its objectives. If the partnership plan is implemented without applying an effective management, the concept and principles of participation will be forgotten over time or will be filed and archived in the patients' charts as a few slips of useless instructions. Since a manager or coordinator should be selected for implementing each plan in the groups, the following steps should also be taken in the partnership plan:
  - Determining the head and manager of the partnership team
  - According to the nurses' capabilities, it is better to give the responsibility of the team to its nurse based on members' consensus
  - Team members' consensus on delegating the responsibility of the team to its head and manager, as well as cooperating with him/her
  - Implementing the plan and undertaking the educational visits and required follow-ups.

To identify patients' problems, the measurement of biochemical compositions of the blood, weight gain between two hemodialysis sessions, edema, and hypertension was used. The patients were weighed before and after hemodialysis with predetermined dress and with a scale that was calibrated and was constant during the intervention. For measuring edema, the patients' edema in the wrist, leg, and around the eyes was measured using the pitting edema grading scale. The edema in the hip and abdominal circumference was also measured by the meter. To gain more confidence in the data collected, blood biochemical compositions were measured within 2 months before training and other variables were measured two to four times with 2-week intervals before training and their mean values were considered as the data before training. Also, after training, the blood biochemical compositions were measured within 2 months and other variables were measured for two to four times with 2-week intervals and their mean values were considered as the mean after training. Quality of life

was measured after training for two times, at 6th and 8th weeks after training, and their mean was calculated as the data after training. The study patients' blood pressure was measured after 5 min of rest, in sitting mode, from the arm which did not have any fistula, in a position at heart level, and in a position in which the patient had an appropriate support and backrest.

The education was provided to the patients through a training manual which had been prepared based on valid and scientific articles about exercise, sleep, nutrition, stress, hemodialysis equipment, hemodialysis methods, and psychology. Educating patients was conducted in eight 120-min sessions during 2 months. Patients' companions were also trained for 2 h in a class, and then, practical and additional training was provided for them during hemodialysis. The study patients were trained in all educational topics including the topics of nutrition, exercise, sleep, ways to prevent itching, etc., based on predetermined schedules and curriculums. For example, for training the patients in the topic of exercise, a physiotherapist and the researcher gave theoretical and practical training to all the patients of a work shift (eight patients) for 2 h. Afterward, in the next session, the researcher evaluated those patients, responded to their related questions, and explained that topic again to them (if needed) so that they learned the topic completely. Then, the researcher started training the other topic. Between the 1st and 2nd weeks, the topic that was dealt with in the 1st week was evaluated. In all stages of the research, attending a physician, a nurse and the patients together were necessary.

Collected data were analyzed using SPSS for Windows version 18.0 (SPSS Inc., Chicago, IL, USA) and some statistical tests including paired samples *t*-test, Wilcoxon and McNemar tests. Paired samples *t*-test was used for analyzing and comparing the data collected on weight and blood pressure before and after the intervention. In order to assess insomnia, edema, and the itching status before and after the intervention, required data were collected through another part of the questionnaire with Yes/No items and analyzed using McNemar test. A $P \leq 0.05$ was considered statistically significant. Informed consent was obtained from all patients participating in this study.

RESULTS

The results showed that most of the study patients were men ($n = 17$, 53.1%), in the 56-65 years age group, illiterate ($n = 9$, 28.1%), married ($n = 23$, 71.9%), employees ($n = 18$, 56.3%), and being treated with hemodialysis for 1-3 years ($n = 13$, 40.6%) [Table 1]. Also, the results showed that the mean and standard deviation (SD) of patients' parameters including weight and blood pressure improved significantly after the educational intervention compared to before the intervention ($P < 0.001$). In addition, the mean of systolic and diastolic blood pressure decreased after the intervention ($P < 0.001$) [Table 2].

While 46.8% of the study patients did exercise rarely before the intervention, 59.4% of them started doing exercise after

the educational intervention. Before the intervention, all study patients were complaining of insomnia. However, after the educational intervention, only 59.4% patients had this problem (*P* < 0.001). Also, the number of study patients with edema and itching before and after the educational intervention had significant differences (*P* < 0.001) [Table 3].

Table 4 shows that the differences between the mean values of the study patients' laboratory tests before and after the intervention were statistically significant (*P* < 0.001).

The mean and SD of the quality of life dimensions (including general health, vitality, physical function, role physical, bodily pain, mental health, social function, and role emotional) had been improved after the educational intervention. These differences were statistically significant before and after the intervention (*P* < 0.001) [Table 5].

DISCUSSION

Due to the low quality of life in hemodialysis patients, taking some measures to improve the quality of life of these patients

Table 1: Demographic characteristics of the patients referred to the hospital for hemodialysis

Variables	Frequency (%)
Age, years	
23-44	8 (25)
45-55	8 (25)
56-65	9 (28.1)
>66	7 (21.9)
Sex	
Male	17 (53.1)
Female	15 (46.9)
Marital status	
Married	23 (71.9)
Single	4 (12.5)
Lone persons	5 (15.6)
Employment status	
Worker	2 (6.3)
Employee	18 (56.3)
Housewife	4 (12.5)
Self-employment	1 (3.1)
Unemployed	7 (21.8)
Education level	
Illiterate	9 (28.1)
Elementary school degree	6 (18.8)
Guidance school degree (cycle)	7 (21.8)
Diploma	6 (18.8)
Academic and university degrees	4 (12.5)
Duration of hemodialysis (years)	
1-3	13 (40.6)
3-5	12 (37.5)
>5	7 (21.9)

Table 2: Mean and standard deviation of the parameters considered (weight and blood pressure) in the study patients before and after the intervention

Time of study Patients' parameters	Before intervention		After intervention		Sig.
	Mean	SD	Mean	SD	
Weight (kg)					
Before hemodialysis	59.71	11.35	58.93	11.26	*P*<0.001
After hemodialysis	57.82	11.48	57.01	11.43	*P*<0.001
Blood pressure (mmHg)					
Systolic	137.5	2.8	124.5	1.6	*P*<0.001
Diastolic	82.6	3.26	74.4	3.9	*P*<0.001

SD = Standard deviation

Table 3: Comparison of the percentages of the study patients based on changes in their exercise, sleep, edema, and itching before and after the educational intervention

Time of study The percentage of patients with the following	Before intervention (%)	After intervention (%)	Sig.
Exercise	46.8	59.4	*P*<0.001
Insomnia	100	59.4	*P*<0.001
Edema	34.4	0	*P*<0.001
Itching	56.2	0	*P*<0.001

Table 4: Mean and standard deviation of the study patients' laboratory test results before and after the intervention

Time of study Laboratory tests	Before intervention		After intervention		Sig.
	Mean	SD	Mean	SD	
Sodium	140.18	19.83	138.66	4.66	*P*<0.001
Potassium	7.49	1.53	5.89	1.92	*P*<0.001
Phosphorus	5.69	1.82	4.44	1.66	*P*<0.001
Calcium	9.19	1.53	7.88	1.38	*P*<0.001
Sugar	126.59	70.29	105.46	37.11	*P*<0.001
Hemoglobin	10.13	1.32	11.35	1.42	*P*<0.001
Hematocrit	31.64	4.59	35.56	4.10	*P*<0.001
Urea	122.87	26.40	98.43	28.05	*P*<0.001
Creatinine	11.64	5.99	9.22	4.59	*P*<0.001

SD = Standard deviation

Table 5: Mean and standard deviation of the dimensions of the study patients' quality of life before and after the educational intervention

Time of study Dimensions of the study patients' quality of life	After intervention		Before intervention		Sig.
	Mean	SD	Mean	SD	
General health	49.62	18.2	79.76	16.1	*P*<0.001
Vitality	49.74	23.8	56.17	19.9	*P*<0.001
Physical function	44.24	29.3	57.52	23.6	*P*<0.001
Role physical	47.67	32.1	66.16	29.6	*P*<0.001
Bodily pain	56.50	26.9	49.45	17.9	*P*<0.001
Mental health	45.98	19.6	55.08	16.8	*P*<0.001
Social function	45	40.6	49.21	37.7	*P*<0.001
Role emotional	53.59	22.08	58.90	19	*P*<0.001
SF-36	49.04	26.57	59.03	22.57	*P*<0.001

SD = Standard devaition

is essential.[39] The results of studies show that the quality of life indicates the quality of health care provided and is a part of hemodialysis patient care program. Measuring these patients' quality of life will provide more information for the health team.[40]

In the field of nursing, conducting studies on the patients' quality of life and forming interventions that would result in improved quality of life are growing rapidly, which leads to improvements in the lives of people with such chronic diseases.[41]

In the present study, the mean of quality of life in patients treated with hemodialysis was 49.04. In Baraz *et al.*'s study, it was 46.69.[29] In another study which was conducted by Pakpour *et al.*, this was 44.35. In their study, the performance of mental component was more than that of physical component.[30] According to the results of Rostami *et al.*'s study, the mean of hemodialysis patients' quality of life was 44.29.[42] Therefore, the results of the present study and other studies conducted in Iran show that the quality of life in hemodialysis patients in Iran is not at a desirable level. In other words, it can be concluded that the psychological and physical quality of life in the patients treated by hemodialysis for a long period has been poor.[43-46] The results of Fujisawa *et al.*'s study showed that the mean of all eight dimensions of the quality of life was higher than 50% and the overall mean of quality of life was 68.38.[47] In Diaz-Buxom *et al.*'s study, the mean of hemodialysis patients' quality of life was more than that in the present study and other similar studies conducted in Iran.[48] Overall, the mean of quality of life in Iranian hemodialysis patients compared to that in other countries is at a lower level, and the difference may be related to the factors such as study patients' lifestyle, socioeconomic status, low level of awareness, and lack of appropriate self-care.[30]

Despite the lower quality of life of the patients in the present study, the mean of quality of life after implementing the educational plan significantly increased and indicated that the provided education was effective. In Baraz *et al.*'s study, the mean of quality of life had increased from 46.69 to 54.64 after education,[29] indicating its lower effectiveness compared to that in the present study results. Although these two studies have been conducted with the same methodology, their results are slightly different because of the differences in the factors among the study patients, such as sex, education level, and socioeconomic status.

Daily fluid intake in patients undergoing hemodialysis is of the utmost importance. If they do not pay careful attention to their daily fluid intake, they are faced with fluid retention and problems such as general body swelling, shortness of breath, cardiac and pulmonary disorders, weight gain, etc., which would endanger their health.[49] The present study results show that using the partnership care model had positive effects on some parameters in the study patients, such as their sleep, exercise, weight, and blood pressure. For instance, all these patients had sleep problem before the educational intervention; however, this problem decreased significantly and only 40.6% of them had it after the intervention. Iliescu *et al.*'s study results showed that insomnia was a common problem in hemodialysis patients which had significant relationship with their low quality of life.[50] Results of another study[51] showed that implementing continuous care model had a positive effect on the quality of sleep in the hemodialysis patients.

Edema in these patients' hands and feet was reduced after the intervention. Braz found in his study that self-care education decreased the amount of edema significantly in hemodialysis patients.[52] In the present study, itching in the study patients was reduced after the intervention. The results of Lugon's study showed that itching is an annoying sensation which is the common problem in most of the hemodialysis patients and can affect their quality of life and cause depression.[53]

In the current study, while the study patients were not exercising before the intervention, a large number of them (59.4%) started exercising after the intervention. The results of Jennen and Uhlenbruck's study showed that exercising increased the sense of satisfaction and the scores of quality of life dimensions.[54] The mean of blood pressure and weight loss had significant difference before and after the intervention, as they improved after the intervention. The results of Salehi's study showed that education had a positive effect on weight loss between two hemodialysis sessions.[55] In the present study, the mean of serum urea decreased after training. Sarafi,[56] Ashvandi,[57] and Kozlowska *et al.*[58] indicated in their studies that the mean of serum urea decreased significantly after training, which is similar to the present study results. Uremia causes irritability, loss of appetite, insomnia, drowsiness, fatigue, memory loss, confusion, making mistakes in judgments, and lack of focus, each of which has effects on the patients' quality of life.[56-58] The results of Salehi's[55] study showed that unlike the present study results, the mean of potassium levels did not show any statistically significant decrease after training. Advanced chronic renal failure is the main cause of increased blood potassium because the kidneys are unable to excrete excess potassium in the blood. However, in the present study, the blood potassium levels of the study patients decreased because of following correct nutrition and diet patterns.[59] The results of the current study showed a statistically significant decrease in the mean of serum phosphorus levels after training. The study results of Shichiri *et al.*[60] also showed that the serum phosphorus levels of the study patients decreased significantly after 5 weeks of training. One of the major complications of renal failure is renal osteodystrophy which occurs as a result of decrease in blood calcium and increase in blood phosphorus levels. Since hemodialysis cannot remove excess blood phosphorus, choosing the proper diet is important in reducing this type of disorder.[60]

In the present study, the mean of serum uric acid levels decreased significantly after training. The results of Shichiri *et al.*'s[60] study showed that following a low-protein

diet reduced the serum uric acid levels significantly. In the current study, systolic and diastolic blood pressures showed statistically significant decreases after training.[60] The results of Sarafi's[56] study also indicated the positive effects of the training program on decreasing the blood pressures in hemodialysis patients. In the present study, the mean weight gain between two hemodialysis sessions had a significant decrease after training.[56] The weight gain between two hemodialysis sessions increased the patients' blood pressures by 3 mm Hg/kg at the same time.[61] The results of Oka *et al.*'s study showed that the control of feeding behavior had significant negative correlations with blood urea nitrogen, potassium, phosphorus, as well as the weight gain between two hemodialysis sessions.[62] The results of Durose *et al.*'s study indicated that training hemodialysis patients in nutrition and diet, as well as in fluid intake can result in fluid intake restrictions and, subsequently, weight loss.[63]

The present study results show that the use of self-care model had a positive and significant effect on the study patients, as all quality of life dimensions improved after the educational intervention. Rahimi's study results showed that using continuous care model had positive effects on several parameters and indicators of the hemodialysis patients, such as their quality of life.[64] Levendoğlu *et al.* found in their study that after a 12-week exercise program, the psychological status, quality of life, and work capacity in hemodialysis patients significantly improved, which confirms the present study results.[65] The results of Tsay and Lee's study showed that implementing an adaptation training program for patients with ESRD decreased their stress and increased the physical and mental dimensions of their quality of life significantly,[27] which is similar to the results of the current study.

This study had a limitation. Learning rate of the study patients was different due to their individual and motivational differences and could not be controlled.

CONCLUSION

Use of care models, especially those models which are compatible with the culture of our society, can increase the quality of life in the hemodialysis patients.

Assisting the hemodialysis patients should be taken into consideration by hemodialysis centers. Helping these patients and, also, their education should be relevant to the management of their health problems.

The results of the present study showed that using self-care model had significant effects on all quality of life dimensions, including social and physical function, general health, etc., Therefore, matrons and nursing managers in their planning for applying different education methods can use the self-care model in their units to improve the inpatients' overall health status. In order to show the positive effects of using the self-care model and develop strategies for better implementation of this model, it is recommended to compare the effects of using

this model with those of providing traditional physician visits and also conduct similar studies on hemodialysis patients in other hospitals with larger sample sizes. Also, conducting a study on the problems of and barriers to using this model is suggested. It is also suggested conducting similar studies using different educational methods and models to determine and compare their effectiveness.

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