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Effect of educating health promotion strategies model on self-care self-efficacy in elderly with kidney transplantation

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Abstract:

BACKGROUND: After kidney transplantation, older adults encounter numerous problems which can negatively affect their self-care self-efficacy. According to studies, behavior modeling training has an effect on patient's self-care. Therefore, the present study was conducted to determine the effect of implementing health promotion strategies on self-care self-efficacy in older adults undergoing kidney transplantation.

MATERIALS AND METHODS: This quasi-experimental study was conducted on 60 older adults undergoing kidney transplantation in Tehran's Shahid Doctor Labbafinejad Hospital in 2020. Patients were randomly divided into intervention and control groups by using block randomization method. For the patients of the intervention group, the educations were provided based on the model of individual health promotion strategies in eight sessions (i.e., 8 weeks, one session per week) for 40–60 minutes. The subjects of the control group received only their routine care. The two groups completed on-line the self-care self-efficacy questionnaire, before, immediately after and one month after the intervention. The results were analyzed by Chi-square, *t*-test and repeated measures analysis of variance in SPSS v19.

RESULTS: According to the results, no significant difference was observed between the two groups in terms of demographic characteristics and the mean score of self-care self-efficacy before the intervention ($P > 0.05$). The mean score of self-care self-efficacy ($P = 0.001$) and some of its dimensions including stress reduction ($P = 0.01$) and adaptability ($P = 0.01$) was significantly different in the two groups in the three time intervals. Moreover, the two dimensions of decision making ($P = 0.07$) and enjoying the life ($P = 0.20$) were not significant.

CONCLUSION: According to the results, education based on health promotion strategies can effectively improve self-care self-efficacy and some its dimensions. Therefore, teaching health promotion strategies as a low-cost and simple method can positively affect self-care self-efficacy in older adults undergoing kidney transplantation.

Keywords:

Frail elderly, health promotion, kidney transplantation, self-care, self-efficacy

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Introduction

Having chronic diseases such as high blood pressure and diabetes, older adults are more prone to chronic kidney disease. Age parameter has the greatest impact on the progression of this disease. In most countries, about 40% of patients with chronic renal failure are 65 years old and older.[1] Hemodialysis, peritoneal dialysis and kidney transplantation, are the main treatment methods for renal failure.[2]

In Iran, 48.5% of patients with kidney failure undergo kidney transplantation,

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48.3% hemodialysis, and 3.2% peritoneal dialysis.[3] Although hemodialysis and peritoneal dialysis improve the health of kidney patients and increase their survival, they do not change the course of the disease and cannot be considered a substitute for the kidney.[2] Moreover, they can cause more complications such as dependence, low self-confidence, low self-esteem, mental and social disorders, depression and anxiety, impotency, sleep disorders, decreased quality of life in the long run, hypotension, muscle cramp, headache, nausea, and vomiting.[4,5]

Kidney transplantation is another treatment method. In Iran, the number of annual kidney transplantations has increased from 100 in 1986 to more than 2000 in 2012.[6] According to studies, kidney transplantation improves the quality of life and the survival of these patients.[6,7]

Despite these benefits, many complications and problems have been reported for transplantation which include hyperglycemia after transplant, infection, transplant rejection, depression, high costs of medication and treatment, anxiety about transplant rejection and loss of transplanted organ, frequent visits, anxiety and stress, hard medication regimens, impotency, low self-efficacy, ocular complications, cataracts and glaucoma and skin complications. However, because of its lower costs and increasing the longevity and quality of life of patients, transplantation is more accepted treatment and is preferred over other treatment methods.[8]

Self-efficacy is one of the factors affecting a patient's recovery. According to the definition presented by Albert Bandura in 1977, self-efficacy is one's judgment about their ability in performing an action which can affect one's thoughts, feelings, actions, and motivations.[9] Few studies have hitherto examined posttransplant self-efficacy. Based on the results of these studies, self-efficacy plays a critically effective role in improving depressive symptoms, quality of life, and better follow-up in medication and treatment regimens.[10,11]

Side effects of the drugs, challenges, and high number of follow-ups after kidney transplantation have reduced the level of self-efficacy and self-care behaviors in these patients.[12] Many studies, however, emphasize that the best kind of care occurs only when the patients themselves are the active part of it.[10,11]

To promote self-efficacy, health instructors, including nurses, must be aware of the factors influencing the formation of behavior. Behavioral theories and models such as the Health Belief Model, the BASNEF Model, the Health Promotion Strategies Model, and Diffusion of Innovation can contribute to this process.[13] Among the various models of health education, the model of health promotion strategies is the most comprehensive model for the investigation and identification of behaviors as well as creation of new behaviors to promote physical and mental health in clients.[11] The Health Promotion Strategies model was developed by Alice Liu in 1996. The Health Promotion Model aims to explain the factors underlying motivation to engage in health-promoting behaviors and it focuses on people's interactions with their physical and interpersonal environments during attempts to improve health. Factors influencing health-promoting behavior are divided into three categories: "individual characteristics and experiences," "behavior-specific cognitions and affect," and "behavioral outcome."[14] Using three levels of prevention, this model contributes to the promotion of self-efficacy and self-care. One of the most important features of this model is its comprehensive and systematic nature as well as its applicability to different groups of people. Stress reduction, adaptation, decision making, and enjoying life are emphasized in this model.[14] According to studies, traditional educations do not have the required efficiency to create self-efficacy without using educational models and a logical and regular procedure.[11] Because of its special attention to three levels of prevention (primary, secondary, and tertiary), this model of health promotion was selected by the researchers.[14] Azizi Fini *et al*.[11], that educating health promotion strategies improved self-care self-efficacy in patients undergoing bone marrow transplantation. However, they reported that this training could not significantly increase patients' enjoyment of life.

As studies have shown, educating health promotion strategies increases client and family satisfaction with the quality of care,[15] improves quality of life, increases self-efficacy, guarantees the continuity of care, reduces patient anxiety and the incidence of complications, increases participation in the care programs and client's independence in doing daily activities, lowers hospital stays, and reduces the related costs.[16] Based on other studies, despite education and application of these strategies, no significant improvement was observed in self-care behaviors, physical activity and adaptation skills of patients, and the rate of application of these strategies was different in the two sexes.[11]

Given the aging population of Iran in near future, the growing population of the older adults with kidney failure and the increased number of kidney transplantations in over 60-years-old people, the low level of self-efficacy in this age group, and considering the fact that no study has hitherto been conducted in this regard, the researchers decided to conduct a study

to determine the effect of educating health promotion strategies model on self-care self-efficacy in older adults undergoing kidney transplantation.

Materials and Methods

Study design and participants

This quasi-experimental study was conducted from August to December 2020 on 60 older adults undergoing kidney transplantation at Shahid Labbafinejad Hospital in Tehran, Iran. Convenience sampling method was used in this study. Then, using blocked randomization sites, these subjects were divided into 10 blocks of six subjects where 30 subjects were assigned to each intervention and control group.

Study participants and sampling

According to the standard deviation and the mean of the intervention group (9.65 and 135.81, respectively) in previous studies[17] and the standard deviation and the mean of the control group (17.59 and 118.58, respectively), the 95% confidence level and 80% test power, the sample size was calculated to be 11 subjects in each group by using the following formula. However, for more precision, the sample size was determined to be 30 subjects in each group.

$$N = \frac{(Z_{1-\frac{\alpha}{2}} + Z_{1-\beta})^2 \left(S_1^2 + S_2^2\right)}{d^2}.$$

Initially, 86 older adults were selected to participate in the study. However, after more investigations by the researcher, 26 of them were excluded from the study; 10 were excluded from the study as they were not willing to participate in the study and 16 more subjects were excluded because of not having the inclusion criteria. Then, the remaining 60 samples were randomly divided into the intervention ($n = 30$) and control ($n = 30$) groups. No drop was observed in the samples during the study [Figure 1]. Inclusion criteria were over 60-years-old older adults who underwent kidney transplantation at least 6 months ago and were willing to participate in the study, no cognitive problems including Alzheimer's, stroke, transient ischemic attack, no impaired hearing and vision so that they could read or write, and having a patient companion who was directly involved in the patient's care. Exclusion criteria included not attending more than two sessions, death of the patient, and hospitalization.

Data collection tool and technique

Education in the intervention group was based on the model of health promotion strategies. The intervention

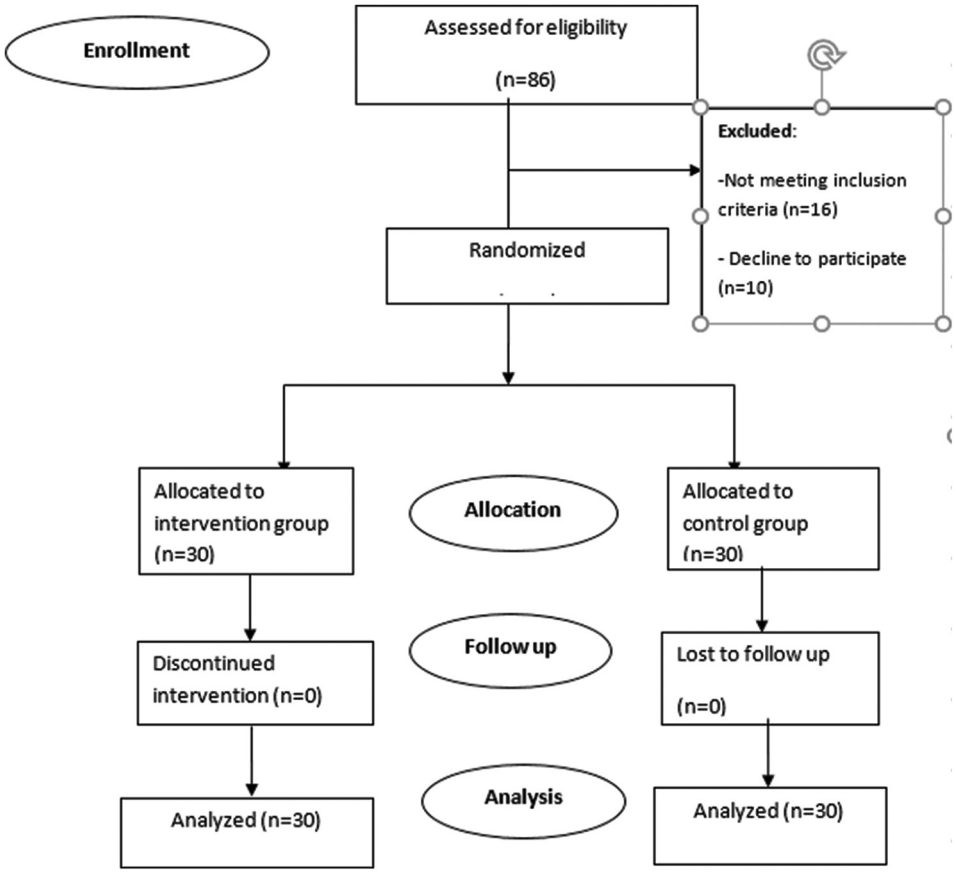

Figure 1: CONSORT flow diagram of participant enrollment, allocation, follow-up and data analysis

method was such that each individual patient (together with an active family member involved in patient care) was educated using the methods of lecture, discussion and question and answer in eight 40–60-minute sessions (for 8 weeks and one session per week). The sessions were performed in the mornings and in coordination with the patient in the training room of the Hospital. The intervention was designed based on the model of health promotion strategies and based on the interventions conducted in the studies of Azizi *et al*.[11] and Soltannezhad *et al*.[17] The patients of the intervention group were educated through health promotion strategies and considering three levels of prevention in the areas of stress reduction, adaptation, decision making, enjoying life, activity, rest, nutrition, and medication [Table 1]. Attempts were made to ensure that all individuals participated in all stages, and the patients were asked to perform health promotion strategies according to what the researcher had taught them. To motivate and involve patients, they were reminded of the benefits of prevention and behavior change. Moreover, to follow-up the implementation of the given educations, the researcher was informed about the implementation of the health promotion program and answered the possible questions of the patients. The presence of the person directly involved in patient care was also compulsory. At the end of each session, an educational booklet about the educated topics was given to the patients. The researcher's telephone number was also given to the patients so that they can ask their questions when needed. It should be noted that at the end of the study, the items taught to the intervention group were given to the control group in the form of an educational booklet. Before, immediately after the sessions and one month after the intervention, the self-efficacy questionnaire was again completed by the two groups online and they were compared.

The research tool was demographic information questionnaire including age, gender, education, occupation, marital status, economic status, history of hospitalization for the present disease, cause of renal failure, and type of donor. The health promotion strategies in self-care self-efficacy questionnaire was also used in this study. This standard tool has been designed by Ms. Lev to measure self-care self-efficacy and is used both in research and clinical practice.[14] The internal consistency of this 29-item self-report questionnaire has been reported to be 0.94 by using Cronbach's alpha calculation. The correlation coefficient of the resulting scores with the scores obtained from the Health Behavior Scale was also obtained to be $r = 0.61$.[18] The questions of this questionnaire are based on 5-point Likert scale ranging from "I am completely sure" (5) to "I am not sure at all" (1) and include four dimensions of adaptation, stress reduction, decision making, and enjoying life. The questions of this questionnaire examine one's level of confidence in doing the items mentioned in the tool and its total score is 145. This questionnaire has been translated into Persian for the first time and its content validity has been approved by 10 professors of the Iran University of Medical Sciences. The reliability of the tool was obtained to be $r = 0.61$ by using test–retest method with a week interval.[11] Cronbach's alpha was calculated to be 92% in this study.

Data were entered SPSS v19 software (SPSS Inc., Chicago, IL, USA) and the normality of quantitative variables was examined using Kolmogorov–Smirnov test. Descriptive statistics (e.g., number, percentage, mean, and standard deviation) were used for the description and classification of the data. Fisher's exact test and Chi-square were used to compare demographic information. Independent *t*-test was used for comparing the quantitative normal variables in the two groups. The mean score of self-care self-efficacy before, immediately after and 1 month after the intervention was compared between the two groups using repeated measures analysis of variance (ANOVA). The significance level was considered to be 0.05.

Ethical consideration

Permission to conduct the present study was obtained from the Vice Chancellor for Research of Kashan University of Medical Sciences with the code of ethics IR.KAUMS.NUHEPM.REC.1399.004. Moreover, after obtaining a license from Kashan University of Medical Sciences, the researchers were introduced to Shahid Labbafinejad Hospital in Tehran. After introducing herself and explaining the research objectives to the patients with inclusion criteria, the researcher obtained their written consent for participating in the study. The participants were also ensured that their information would remain confidential and that they had the right to withdraw from the study at any time. They were also assured that participating in the study would not cost them anything.

Results

Based on results of the present study, the mean age of the subjects was 63.63 ± 5.16 and 63.41 ± 4.07 in the intervention and control groups, respectively. In both groups, 22 subjects (73.3%) were male. There was no statistically significant difference between the two groups in terms of the demographic characteristics including age, gender, education, occupation, marital status, economic status, history of hospitalization for the present disease, cause of renal failure and type of transplant donor [Table 2]. Before immediately after the sessions and one month after the intervention, a statistically significant difference was observed in the mean score of self-care self-efficacy

Table 1: Content of the educational sessions based on the model of health promotion strategies

Sessions based on model structures	Content of the sessions	Educational strategy
Onset of study	Familiarity of patients with the study process, completing the informed consent form, completing the questionnaire	-
1: Adaptation to the disease	Members get to know each other, talking about identification of the problems, expressing their feelings, opinions and thoughts about kidney transplantation and life, motivating the patients to change their behavior, explaining the methods of adaptation to the disease, accepting the disease and talking about experiences of the patients, and describing posttransplantation life.	Group discussion
2: Stress reduction	Explain stress and various types of stressors, identify stressful situations, identify signs and symptoms of stress, describe the strategies and methods of dealing with stress, explain stress and its causes, clarify the methods of reducing anxiety and coping with it, educate and practice mental imagery, educate and perform progressive muscle relaxation, educate and perform diaphragmatic breathing, talk about the significance of prayer and spiritual issues in the health of body and soul, emphasize the significance of patients and trust in God, talk about basic skills in interpersonal relationship, explain the behaviors of patients with regard to a healthy lifestyle in accordance with kidney transplantation and in terms of stress and anxiety management, stress reduction education in patients undergoing transplantation, educate light exercise programs to reduce stress.	Face to face and group discussion
3: Decision making	Coping with negative ideas and cognitive reconstructing through negative thought challenging techniques, adaptation strategies and problem-solving techniques, explain thinking, feeling and behavior, explain the concept of forming positive and negative behavioral habits, explore the relationship between thoughts and feelings and the idea that our feelings are created by our thoughts, explain methods of fighting with negative thoughts including recorded thoughts, get read of negative thoughts by writing them down, replace negative thoughts with positive ones, Looking from another angle and considering the fact that if this thought is true, what is the worst thing which could happen?, explain the expected behaviors of patients in the area of nutrition, exercise and self-care in the presence of a family member, educating how to behave (the expected behavior was divided into small components so that the subjects could have a clear and unambiguous understanding of it and be able to behave accordingly), and the necessity of making a decision to change the behavior of the patient.	Problem-solving
4: Nutrition	Provide a list of permissible and impermissible foods, emphasize the control of weight, edema and blood pressure and their significance, explain food and liquid/fluid restrictions as well as its significance and the complications related to its violation, explain protein, sodium, potassium and phosphorus limitations, provide nutritional recommendations, explain strategies for preventing and recognizing liquid overload, explain the concept of dry weight and how to weigh and evaluate edema, explain methods of weight and cholesterol control, explain the symptoms of infection and blood clots and preventing its related complications.	Face to face and Group discussion
5: Complications of the disease and the need for rest	Describe the behaviors expected from the patients with regard to the complications, prevention and treatment of the disease by members of the treatment team, recognize the prevalent complications of kidney transplantation, explain the methods of preventing the occurrence of mild complications and symptoms, explain the methods of treating mild complications and symptoms, describe appropriate levels of physical activity and rest.	Face to face
6: Activity	Time management training, explain the significance of weekly planning, goal setting, list daily, non-daily and office activities, prioritization based on significance and urgency, inclusion of work and activity schedules in case of having physical abilities, individual information and skills were also prepared during the sessions and provided to patients and their family members in the form of pamphlets and booklets, explain the importance of exercise, and explain various types of exercise and those exercises which are suitable for transplantation.	Group discussion
7: Medication	Know about the prescribed medicines, how and when to use them, the logic of prescription, potential side effects and informing the treatment team about them, explain transplant rejection symptoms, advise not to take drugs arbitrarily and explain their side effects, provide guidance in case of not taking the medicines, instruct how to prevent or treat side effects.	Group discussion

Contd...

Table 1: Contd...

Sessions based on model structures	Content of the sessions	Educational strategy
8: Enjoying the life	Evaluate patients in terms of effort and beneficial empowerment steps, effort to change patients' beliefs, attitudes, and thoughts about the transplant and life by practicing what has been taught in previous sessions and receiving feedback, investigate and, then, provide or support patient empowerment factors such as money, time, information, facilities, personal skills, available resources, etc., informing patients about how to use the services of health centers and financial support if necessary, we also informed patients that many transplant-related services, such as follow-up tests and training, are provided in the ward for free or at a minimal cost, remove problems and barriers and encourage the participants to create the best lifestyle in the face of kidney transplantation, answer the participants' questions, encourage them to be with their friends and family, provide travel guide for the patients undergoing kidney transplantation.	Group discussion and problem-solving

Table 2: Absolute and relative frequencies of the older adults undergoing kidney transplantation in terms of demographic characteristics of each group

Group	Variable	Intervention (*n*=30) *n* %	Control (*n*=30) *n* %	*P*
Gender	Female	8 (26.7)	8 (26.7)	1.00*
	Male	22 (73.3)	22 (73.3)	
Marital status	Single	3 (10)	4 (13.3)	0.668*
	Married	27 (90)	26 (86.7)	
	Widow	5 (13.9)	6 (16.2)	
Occupation	Retired	13 (43.3)	20 (66.7)	0.33*
	Housewife	8 (26.7)	5 (16.7)	
	Manuel worker	1 (3.3)	1 (3.3)	
	Employee	2 (6.7)	0	
	Other occupation	6 (20.0)	4 (13.3)	
Cause of kidney failure	Diabetes	9 (30)	8 (26.7)	0.641*
	Hypertension	11 (36.7)	14 (46.7)	
	Other	10 (33.3)	8 (26.7)	
Hospitalization history for the same disease	First time	8 (26.7)	10 (33.3)	0.755*
	Second time	4 (13.3)	6 (20.0)	
	Third time	2 (6.7)	2 (6.7)	
	Fourth time and more	16 (53.3)	12 (40.0)	
Monthly income (Toman)	0-2 million	7 (23.3)	7 (23.3)	0.789*
	3-5 million	11 (36.7)	14 (46.7)	
	More than 5 million	12 (40.0)	9 (30.0)	
Type of donor	Brain death	14 (46.7)	15 (50.0)	0.796*
	Alive	16 (53.3)	15 (50.0)	
Education	Primary	16 (53.3)	17 (56.7)	0.787*
	Diploma	8 (26.7)	9 (30.0)	
	Academic degree	6 (20.0)	4 (13.3)	
Age	Mean±SD	63.63±5.16	63.41±4.07	0.33**

*Chi-square, **_t_-test

and some of its dimensions (stress reduction and adaptation) in the two groups ($P < 0.05$). The mean score of self-care self-efficacy ($P = 0.001$) and some of its dimensions including stress reduction ($P = 0.01$) and adaptability ($P = 0.01$) was significantly different in the two groups in the three time intervals. As indicated by the repeated measures ANOVA, changes in the mean score of self-care self-efficacy and some of its dimensions (stress reduction and adaptability) were different over time, and group-by-time interaction was significantly different with regard to the variable of self-care self-efficacy score and its mentioned dimensions ($P < 0.001$). Moreover, the two dimensions of decision making ($P = 0.07$) and enjoying the life ($P = 0.20$) were not significant [Table 3].

Discussion

According to the results of the present study, the implementation of health promotion strategies model significantly increased the total score of self-care self-efficacy and some of its dimensions (stress reduction and adaptation improvement) in the older adults undergoing kidney transplantation. Moattari *et al*.[19]

Table 3: Comparison of the mean score of in self-care self-efficacy in the older adults undergoing kidney transplantation between the two groups in three times

Variable	Group	Mean±SD			**P		
		Before	Immediately after	One month after	Time	Group-by-time	Group
Stress reduction	Intervention	27.00±4.22	31.56±2.94	23.16±3.52	*P*<0.001	*P*<0.001	*P*<0.001
	Control	27.56±4.19	26.80±3.93	27.90±4.75			
	*P**	0.60	0.01	0.01			
Adaptation	Intervention	51.13±56.90	65.11±90.16	60.10±90.45	*P*<0.001	*P*<0.001	*P*<0.001
	Control	52.03±52.50	55.12±03.92	54.12±76.83			
	*P**	0.78	0.01	0.01			
Decision making	Intervention	10.16±2.16	11.06±1.63	11.00±2.18	*P*>0.05	*P*>0.05	*P*>0.05
	Control	9.66±2.33	9.86±2.25	9.96±2.23			
	*P**	0.39	0.02	0.07			
Enjoying life	Intervention	6.00±2.51	6.43±1.85	6.90±1.91	*P*>0.05	*P*>0.05	*P*>0.05
	Control	5.50±2.01	5.46±2.09	5.66±2.07			
	*P**	0.39	0.09	0.20			
Total score of self-care self-efficacy	Intervention	94.16±73.08	111.14±96.22	110.12±96.77	*P*<0.001	*P*<0.001	*P*<0.001
	Control	95.18±23.16	94.13±16.77	94.14±30.52			
	*P**	0.91	0.001	0.001			

**t*-test, ***P*eated measures AN

also showed that empowerment training improved the total score and the two mentioned dimensions of self-care self-efficacy in hemodialysis patients. In terms of the total score of self-care self-efficacy and stress reduction, this study is in line with our study. Different research samples and educational content is the reason why the two dimensions of decision making and enjoying life in the present study were not significant. Accordingly, whereas older adults with kidney transplantation were the subjects of our study, patients undergoing hemodialysis were the subjects in the study of Moattari *et al*.[19] and, thus, different educational content and care were employed in these two studies. Moreover, the educational model of health promotion strategies was used in the present study, but no specific model was used in the study of Moattari. Therefore, the comprehensiveness and precision of the health promotion model, compared to routine training, is perhaps the reason why the two dimensions of decision making and enjoying life were not significant. In the study of Soltannezhad *et al*.[17], teaching health promotion strategies increased the total score of self-care self-efficacy and all its dimensions except decision making. While this study is in line with our study, the two dimensions of decision making and life enjoyment were not significant in our study. It was mentioned in another study that environmental and social conditions could influence patients' decisions about their disease.[20] Thus, insignificant dimension of decision making in this study is maybe due to the different environmental and social conditions of patients and different educational content as well.

According to Azizi Fini *et al*.[11], health promotion strategies increased the total score of self-care self-efficacy except the dimension of enjoying life in patients undergoing bone marrow transplantation. It was revealed in the present study that health promotion strategies could increase self-care self-efficacy in the patients undergoing kidney transplantation. However, these educations were not able to have a significant effect on the dimension of life enjoyment and decision making. The results of the present study in terms of enjoying life are consistent with the results of Lev[14] and Azizi *et al*.[11] These two dimensions were insignificant in the present study since patients undergoing kidney transplantation are supposed to use immunosuppressive drugs and, hence, cannot make important decisions because of having a weak body. They also have a low sense of life enjoyment caused by numerous physical symptoms of kidney transplantation. Additionally, patients' perception of enjoyment is influenced by many factors such as economic status, cultural conditions and the progression and non-progression of the disease,[20, 21] which can affect the results of the study. Based on the results of the present study, most of the elderly participants of the study were retired and had a low economic status. On the other hand, kidney transplantation process and the required treatments for reducing the transplant complications, such as the cost of immunosuppressive drugs, which impose a huge burden on families, can increase the problems of these patients and may affect their quality of life and life enjoyment negatively.

According to some studies, self-care self-efficacy behaviors are the main key to a successful transplantation and the consequent survival, which can cause greater adaptation,[11,22] decrease physical and mental symptoms, and increase of self-care behaviors[23] and life enjoyment. Moreover, interventions for enhancing the sense of self-efficacy can positively increase this feeling in patients.[24] Thus, patients with high levels of self-efficacy,

stability, self-confidence, and adaptability can better deal with their difficult conditions.[11] As revealed in the present study, education and empowerment of patients based on health models can lead to higher self-efficacy[25] and self-care, stress reduction[11] and adaptation to the disease.[19]

Although the results of the above studies are indicative of the effectiveness of education on promoting patients' self-care, different self-care scores have been reported in these studies, which can be due to the different methods of implementing educational programs, utilizing different questionnaires for self-care assessment, different follow-up methods, and different needs of patients. Perhaps the reason for the similarity is that any educational program, offered with a suitable content and method, can lead to positive results. In this regard, it has been indicated in a study that providing the necessary education about illness, self-care and other positive behaviors, such as health-promoting behaviors, can activate self-care in patients. Creating a feeling of usefulness, self-care can prevent the formation of emptiness and hopelessness in patients. It can also make patients more present in society, thereby preventing further problems which can cause more economic burdens to patients and society.[26] Therefore, the hypothesis of the research "the model of health promotion strategies has an effect on the self-efficacy of self-care in the elderly with a kidney transplant" was confirmed.

Since the present study was conducted in only one city with a limited sample size, it can limit the generalizability of the findings. The prevalence of Covid-19 at the time of the intervention was other of the limitations of the research.

Conclusion

Based on the results of the study, it can be concluded that education based on health promotion strategies can affect self-care self-efficacy in the older adults undergoing kidney transplantation. It also shows the significance of educational interventions in increasing self-efficacy of these patients. Thus, increasing self-care self-efficacy of these patients, health system can improve treatment outcomes and lower hospitalization rate and related treatment costs. As such, health promotion strategies, as a low-cost and simple method, can positively affect the self-care self-efficacy of the older adults undergoing kidney transplantation.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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