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Effect of Educational Program based on Self-Efficacy Theory on Improvement of Mental Health in Hemodialysis Patients

Tahereh Ramezani[1], Gholamreza Sharifirad[2], Zabihollah Gharlipour[3], Siamak Mohebi[4]*

Abstract

Aim: Many patients with chronic renal failure are prone to depression and anxiety. A self-efficacy promotion-training program can be effective in these mental disorders. Thus, the aim of this study was to investigate the effect of education based on self-efficacy theory on improvement of mental health in hemodialysis patients.

Methods: This interventional study that conducted in 2016 on 70 hemodialysis patients (35 in experimental group, 35 in control group). The data collection instruments consisted of demographic questionnaire, self-efficacy (SUPPH) and researcher-made validated and relied questionnaire of mental health (6 questions). The data were collected in two steps: before and three months after the training intervention. The educational program was performed for the experimental group in two half-hour sessions. The obtained data were analyzed by SPSS 16, Paired-test, Independent t-test, Chi-square and Mann-Whitney's test at the significance level of α=0.05.

Findings: The groups did not differ significantly regarding the mean of mental health before the study (p=0.56). However, three months after the intervention, the mean of self-care in the field of mental health in the experimental group was significantly higher than in the control group (p<0.001).

Conclusion: The research results showed that employing the educational program based on self-efficacy theory was positively effective as for promotion of self-care in the field of mental health in hemodialysis patients.

Keywords: Hemodialysis, Education, Self-efficacy, Mental health

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1. M.Sc. Student in Health Education, Department of Health Education & Health Promotion, Faculty of Health, Qom University of Medical Sciences, Qom, Iran Email: t_ramezani533@yahoo.com
2. Professor, Department of Health Education & Promotion, Faculty of Health, Qom University of Medical Sciences, Qom, Iran Email: sharifirad@hlth.mui.ac.ir
3. Assistant Professor, Department of Health Education & Promotion, Faculty of Health, Qom University of Medical Sciences, Qom, Iran Email: gharlipour@yahoo.com
4. Assistant Professor, Department of Health Education & Promotion, Faculty of Health, Qom University of Medical Sciences, Qom, Iran Email: mohebisiamak@yahoo.com

Background

Today, chronic renal disease has turned into one of the major health problems. It is an unpredictable disease, and patients may not notice the progression of the disease until the end stages of the disease [1]. It is estimated that, in 2020, the number of hemodialysis patients in the world will reach to 35 million [2]. According to statistics, currently, there are about 33,000 patients with end-stage renal disease in Iran; 54% of them are under continuous hemodialysis, and 46% have been introduced to transplant services [3]. Furthermore, 151 patients die for 1000 dialysis patients [4]. Although hemodialysis is known as the main treatment for chronic renal failure, it is still a stressful process, and there are several psychological and social problems that can create mental disorder in the patients. Studies show high prevalence of mental-social disorders in dialysis patients [5-7]. Cognitive changes often occur in renal failure patients [8]. Depression and anxiety are among the most common psychiatric disorders in humanistic societies, which can be revealed through life-threatening events, especially chronic physical problems [9]. Patients with chronic renal failure are often suffering from these problems because of changes in lifestyle due to illness and treatment [10, 11]. In addition to confronting different physiological problems, these patients encounter with a lot of stress that can make problems psychologically and personally. Most of these patients are not confused with problems and tensions; rather they have behavioral changes such as anxiety, stress, depression, seclusion and denial of the disease [12].

Tayyebi et al. found that 40-50% of hemodialysis patients have mild to severe stress [13]. Mollahadi et al. reported that 51.1% of these patients are stressed [14]. Depression is the most important psychological problem that, if not identified or treated, can lead to changes in nutritional status, directly or indirectly effect on the immune system, fail to comply with the treatment diet, increase the severity of the disease, and finally, may end with suicide or discontinue treatment. The frequency of depression in these patients has been reported between 20 to 30% [15]. In Cukor's study in the USA the prevalence of depression was 29% (20% had severe depression and 9% had mood depression disorders) [16]. Today, in hemodialysis patients, to reduce the effects of stress, anxiety, depression and relieve pain, sometimes drug interventions such as cognitive behavioral interventions, massage and acupressure are used to improve the comfort of patients [17]. Bare and Smeltzer stated that patients undergoing hemodialysis have urgent need for training [18] including proper education about the disease and the method of

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treatment as well as the cases to be followed by the patient in addition to improving the patient's emotional, mental and social status [19]. Since hemodialysis treatment is a long-term process, these patients need to use strategies to better cope with their illness [20]. Treatment of this disease without patients' participation and promotion of self-efficacy cannot be effective.

Self-efficacy theory is based on the individual's judgment. It is about managing self-care affairs to achieve the desired outcomes. This judgment creates a bridge between the individual's knowledge and his/her self-care behaviors. This theory is valid for dialysis patients, and it can be argued that if these patients have enough self-confidence about care, they can better do it [21]. People, who are strong in self-efficacy, believe that they are able to effectively manage their life events. This understanding and opinion gives them a different view of those who are weak in self-efficacy. Because it has direct impact on their behavior; therefore, self-efficacy can be a crucial factor in success and failure throughout life [22]. Kimmel and Poeterson reported, in a review article titled "Depression in end-stage renal disease patients treated with hemodialysis", that the reduction of self-care behaviors in hemodialysis patients is associated with increased level of depression; this means that patients with more self-care have fewer signs and symptoms of depression [23]. It is because people who have high levels of self-efficacy can better manage dialysis related mental problems.

Objective

The aim of this study was to determine the effect of an educational program based on self-efficacy theory on improving the mental health of hemodialysis patients.

Materials and Methods

The present study was conducted interventional in 2016 on 70 hemodialysis patients of Kamkar-Arabnia Hospital in Qom, Iran at the significance level of 0.05 and the test power of 0.8. Simple randomization was performed on 35 subjects in the experimental group and 35 in the control group. To prevent diffusion effect between the two groups, patients referred on the even days were placed in the test group and those who referred in the add days were put in the control group. To do this research, the researchers with ethics license from the Ethics Committee of Qom University of Medical Sciences referred to the Dialysis Department. Before entering the study, they explained the research after receiving written consent from the people who had the criteria for entering the study. Then they were invited to collaborate in study.

The inclusion criteria to this study were 20-60

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years of old patients under hemodialysis treatment for at least 6 months and 3 sessions of 4 hours in one week, and lack of chronic diseases such as heart, respiratory, liver disabling diseases as well as psychiatric disorders like severe depression. Exclusion criteria included inability of the patient to attend the training sessions, immigration, renal transplantation, patient's death, and not using a type of dialyzer or dialysis fluid as prescribed by the doctor. Data collection was done by the form of individual features, health promotion strategies questionnaire, researcher-made questionnaire on mental health assessment and manometer. Individual characteristics form included age, sex, marital status, education level, occupational status and duration of renal disease. Strategies Used by People to Promote Health (SUPPH) used by Lev and Owen in 1996 to study self-efficacy, contained 29 questions with a scale of 1 to 5 options of *Quite agree* to *Quite disagree*. The questions were designed in two domains, and the acquired range was from 29 to 145. The questions of confidence level in Likert scale examined from *very much* to *very little* [24]. Validity and reliability of the tool were calculated by Khalili et al. with Cronbach's alpha coefficient of 0.96% [25].

The third part of the researcher-made questionnaire was psychological health assessment with 6 questions, which was tested based on 5-option scale *(always, sometimes, often, rarely, never),* and the scores to the answers were from 0 to 4 for each question. Therefore, each person in the mental health area gained a score from 0 to 24. Reliability of the questionnaire was obtained through internal consistency, using the Cronbach's alpha (0.76), and its validity was approved and modified by the use of 8 members of the Scientific Committee of Qom University of Medical Sciences and dialysis nurses. The fourth part of the checklist was the measurement of systolic blood pressure in patients.

The patient's blood pressure was measured and recorded by the dialysis nurses using Microlife barometer. This study was conducted in three phases. In the first phase, the individuals were divided into two groups of control and experimental. When they were in the dialysis unit, they were evaluated by research tools and organized interviews. All patients participated in this study consciously and with consent, and the research objectives were described before the completion of the pre-test questionnaires for the subjects. In the second step, the health promotion training program was done in a group form, during two 30 minutes sessions in a form of lecture, group discussion, questions and answers, and practical exercise. The researcher developed a booklet after reading related books and articles and consulting with dialysis nurses. The content of the curriculum

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included stress management methods such as relaxation, visualization techniques, deep breathing and resignation. In the training sessions, we discussed about stress and depression, and the practical skills of stress and anger management were taught. In order to prevent depression, the patients were encouraged to do their favorite cultural, social and recreational activities. During the sessions, the researcher encouraged the patients to ask questions, and group discussions were held about ambiguities and questions. Then deep breathing and relaxation were performed in the form of practical exercises at the end of the session. The patients were asked to practice and repeat these skills at home. More details were provided if the participants had ambiguity about the educational content. At the end of the sessions, in addition to the summaries of the educational contents, the participants received an educational pamphlet. All sessions were monitored by the nurse who was responsible for patient education, and the patients were referred to experts in case of special educational needs.

It is to be noted that the educational intervention was carried out based on the constructs of self-efficacy theory. In order to increase the self-efficacy of the patients, successful experiences' structures, breaking behaviors to smaller components and substitute experiences were used. Also, in each group, one to two patients with desirable mental health status were placed to share their experiences with the other patients and encourage them. At the training sessions, a member of the family of patients was present to have more mental and emotional support from the patient by using the educational materials. In this study, no intervention was performed for the control group; this group only received routine training including educational pamphlets. After the end of the second stage, the experimental group was followed-up for dialysis by the researcher. At the last stage, three months after the training, the researcher completed the questionnaires again. Also, to control the ethical issues, the educational pamphlet was provided to the control group. The data were analyzed by descriptive statistics (mean, variance, and standard deviation) and inferential statistics (Chi-square, Mann-Whitney, Independent t-test, and Paired t-test) after collecting and entering into the SPSS software (ver. 16). The significance level was set at $P< 0.05$.

Results

The results showed that most of the subjects under study were male and married with the mean and ±SD age in the control and experimental groups of 41.80±9.68 and 43.74±11.65, respectively. The difference between the two groups was not significant in

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terms of age (P=0.45). The mean ±SD of the duration of renal disease in experimental and control groups was 8.48±7.54 and 9.91±7.91, respectively. There was no significant difference between the two groups (P=0.44). The difference between the experimental and control group was not statistically significant in terms of personal characteristics (Table 1).

Table 1: Distribution of frequency and percentage of demographic variables in the experience and control groups

Variables / Group		Experimental		Control		P value
		Number	Percent	Number	Percent	
Gender	Male	20	57.1	26	74.3	0.13*
	Female	15	42.9	9	25.7	
Educational level	Elementary	12	34.3	16	45.7	0.23**
	Junior School	7	20.0	8	22.9	
	High School	13	37.1	9	25.7	
	Academic	3	8.6	2	5.7	
Marital status	Married	29	82.9	27	77.1	0.55*
	Single	6	17.1	8	22.9	
Employment status	Employee	3	8.6	2	5.7	0.08*
	Worker	3	8.6	2	5.7	
	Unemployed	9	25.7	8	22.9	
	Housewife	11	31.4	7	20.0	
	Retired	2	5.7	3	8.6	
	Free Job	7	20.0	11	31.4	
	Other	0	0.0	2	5.7	
Smoking	Yes	5	14.3	7	20.0	0.52*
	No	30	85.7	28	80.0	
Insurance status	Yes	33	94.3	34	97.1	0.55*
	No	2	5.7	1	2.9	

* Chi-square test
** Mann-Whitney's test

Analysis of Independent t-test data presented that the mean mental health score in the experimental group was significantly increased three months after the intervention (P<0.001). Before the intervention, the mean mental health score of the experimental group was 13.20±2.04, while the control group, it was 13.57±3.24. Also the mean score of self-efficacy in the two groups was 86.28 ± 12.38 and 84.24±11.88, respectively.

The difference between the two groups in mental health score and self-efficacy before the intervention was not significant (P>0.001); however, after the intervention, the mean score of mental health and self-efficacy in the experimental group was significantly higher than in the control group (P<0/001). The analysis of the data did not show a significant difference in the mean systolic blood pressure in the experimental group in the second stage after the intervention compared to the previous stage (P=0/05) (Table 2).

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Table 2: Comparison of the mean and standard deviation of variables in the experience and control groups

Variables / Group		Experimental		Control		P value*
		Mean	SD	Mean	SD	
Self-efficacy	Before	86.28	12.38	84.24	11.88	0.524
	After	100.05	11.82	83.68	10.21	<0.001
	P value**	<0.001		0.454		
Mental health	Before	13.20	2.04	13.57	3.24	0.569
	After	15.91	2.45	13.74	2.99	<0.001
	P value**	<0.001		0.487		
Systolic blood pressure	Before	126.00	18.50	126.28	27.55	0.960
	After	132.71	23.30	126.00	29.52	0.295
	P value**	0.056		0.953		

* Independent t-test
** Paired t-test

As for the independent t-test, the mean changes in the score of self-efficacy and mental health variables in the experimental and control groups were significant different after training (P<0.001). However, there was no significant difference in systolic blood pressure between the experimental and control group after training (P=0.241) (Table 3).

Table 3: Comparison of the mean and standard deviation of the variables' score changes in the experience and control groups

Variables	Experimental		Control		P value*
	Mean	SD	Mean	SD	
Self-efficacy	13.77	10.38	0.74-	5.79	<0.001
Mental health	2.54	0.54	2.54	0.54	<0.001
Systolic blood pressure	6.71	20.03	-0.28	28.64	0.241

* Independent t-test

Discussion

This study aimed to determine the effect of educational program based on self-efficacy theory on improving the mental health of hemodialysis patients. The results indicated the positive effect of the educational program on improving the mental state of patients. The mean mental health of the participants in the experimental group was significantly increased compared with the control group. This finding suggests that education based on self-efficacy theory can be effective in reducing the psychological symptoms of problems such as anxiety and depression in dialysis patients. This study is one of the few studies that has focused on the effect of psychological interventions on the improvement of patients' conditions. Banies' study showed that both individual and group psychotherapy reduced the level of depression in dialysis patients [26]. Cukor's research revealed that cognitive and behavioral therapy had a significant effect on

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decreasing depression in patients [16], which is in agreement with the findings of the present study. The above study further showed that the psychological training program improved the mental health of hemodialysis patients [27].

Wicks' study also found therapeutic insight to be effective in reducing depression and anxiety symptoms in hemodialysis patients [28]. However, the results of the study by Campbel on the effect of short-term psychotherapy in hemodialysis patients showed no significant difference between the two groups in the control and experimental groups [29], which is not consistent with the results of this study.

In Iran, Hashemi Fesharaki et al. reported that group training significantly reduced stress and depression in the experimental group compared to the control group [30]. Malekshahi et al. in a study with the title of "The effect of participation in peer group on the mental health of patients undergoing hemodialysis" showed a significant difference between the two groups in terms of mental status and mental health scores [31]. In the study of Alishahi et al. there was a significant difference between the two groups in the mean score of stress after the intervention [32].

Paired t-test also showed a significant increase in the mean score of mental health before and after the intervention in the experimental group. But this test did not show any significant difference in the mean score of mental health before and after the training intervention in the control group. Study of Duarte in Brazil on the effect of cognitive and behavioral group therapy on depression in dialysis patients showed that group therapy improved the quality of life of depressed patients, improved their sleep and increased the quality of their social interactions. Also the mean of Beck test scores after the intervention was significantly reduced compared to the before intervention; this finding is consistent with the results of this study [33]. Nasiri et al. reported a significant difference in the mean score of mental health before and after the intervention, which indicates the positive impact of the intervention [34]. Rostami et al. showed that training on reducing the stress of dialysis patients before and after the intervention was effective in the experimental group [35]. The study of Malekshahi et al. indicated improvement in the mental health status of hemodialysis patients in the intervention group before and after the intervention [31]. The results of some studies have shown that psychological factors such as relaxation techniques have been effective in reducing depression and stress in hemodialysis patients [36, 37].

Independent t-test showed a significant difference in the mean score of mental health before and after the educational intervention between the two groups. In Rostami et al,

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study, the difference in the mean score of stress between the experimental and control groups was significant after the intervention [35]. In the present study, the results of statistical tests showed that demographic variables such as age, gender, level of education had no significant statistical difference; in the two experimental and control groups; in other words, the two groups were homogenous in this regard.

Also the results of this study showed that the mean score of self-efficacy after training was significantly increased in the experimental group. This significant difference can be a good indication of the effect of training on improving self-efficacy in the test group. It was also stated that the implemented training program increased the self-efficacy of patients in self-care behavior [27]. The results of Feizi et al. revealed that there was a significant difference between the mean scores of self-efficacy before and after the intervention between the two groups [38]. The results of Lii et al. [39], Chen et al. [40], and Aliasgharpour et al. [41] also confirmed this issue. Of course, the results of Habibzadeh et al. [42], are contrary to these results.

Analysis of the study data did not show a significant difference with the mean systolic blood pressure in the experimental group in the post-intervention phase compared to the before intervention. In accordance with our study, Zarurati et al. reported that the mean of systolic blood pressure did not show significant difference before the intervention in the two groups, and after the intervention, it was not significant either [43].

Among the strengths of the present study were the appropriateness of the educational content with low level of education level in most of the hemodialysis patients, use of group training method with the presence of a family member, and completing the questionnaire by the researcher in an interview with them. Its limitations include problems associated with follow-up during dialysis, bringing the patients together during the dialysis sessions, and lack of collaboration among some patients. Due to the dependence of these patients on dialysis device in order to maintain life, implementation of training in the dialysis room can help them to adapt to illness for the rest of their lives. In addition to creating a sense of self-sufficiency in them, it can further reduce the symptoms of depression and increase self-confidence in them.

Conclusion

The results of this study indicated that the use of education based on self-efficacy theory improved in the mental state of hemodialysis patients. Therefore, due to high prevalence of depression and anxiety in hemodialysis patients and the need of hemodialysis patients

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to learn about psychological issues (depression, stress management etc,), the use of psychometric training sessions by self-efficacy learning theory is recommended.

Conflict of interest

The authors declare there is no conflict of interest.

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Authors' contributions

Tahereh Ramezani designed the questionnaire, collected the data and conducted the intervention. Siamak Mohebi was responsible for designing and conducting the research and participated in preparing and editing the manuscript, as the corresponding author. Other authors have read and approved the final manuscript.

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