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The effect of education of health promotion behaviors on quality of life in hemodialysis patients

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ABSTRACT

Background: Today more than ever, the importance of health promoting behaviors is considered. Maintaining the function, independence and increasing the quality of life of chronic patients such as hemodialysis patients is influenced by health promoting behaviors. The current study was conducted to determine the effect of education of health promoting behaviors on the quality of life in hemodialysis patients.

Methods: In the current quasi-experimental study, 70 hospitalized patients were selected through convenient sampling in hemodialysis wards of two Therapeutic-Educational Centers in Hamadan in 2014. Then, the subjects were randomly allocated into two intervention and control groups of 35 persons. In intervention group, 6 educational sessions were held during the hemodialysis. Quality of life of patients in two groups was measured through Ferrans and Powers Quality of Life Index-dialysis version before and three months after the intervention. Data were analyzed in SPSS 16, and using chi-square test, independent T-test and paired-T test.

Results: In intervention group, the mean score of quality of life after intervention was changed from 18.85±5.4 to 20.11±5.46 ($p<0.001$) and in control group from 19.41±4.67 to 18.39±4.10 ($p=0.08$). After intervention, quality of life of patients in intervention group was increased in health and functioning domain (18.6±5.7) ($p<0.001$) and was increased in psychological/spiritual domain to 19.3±7.02 ($p=0.041$).

Conclusion: Education of health-promoting behaviors improved the quality of life of hemodialysis patients. Therefore, according to chronic nature of disease, the education of these behaviors can be effective in improving the quality of life.

1. Introduction

Today, increased life expectancy has brought chronic diseases to the attention of medical experts as a major health concern. These long-term, debilitating diseases with untreatable pathologies are responsible for 60% of mortalities across the world.[1] Chronic kidney disease (CKD) is a chronic disease that significantly affects the mental and physical conditions of patients throughout life.[2]

According to statistics, global prevalence rate of CKD is 260 cases per million population annually, which increases by approximately 6% each year. It is predicted that per each million individuals in the United States, more than three quarters will develop CKD by 2020, imposing heavy treatment costs on the healthcare system. Therefore, necessary measures regarding dialysis and kidney transplant are required.[3] According to the scientific data presented by the Iranian Ministry of Health and Medical Education, annual growth rate of CKD in our country is 20%.[4] Meanwhile, more than 18,000 patients are currently receiving hemodialysis in Iran.[5]

Various methods are available for the treatment of CKD, and hemodialysis is considered the most common and effective therapeutic approach in this regard. Although hemodialysis increases the life expectancy of CKD patients, it has been shown to cause several complications. As an inherent element of CKD treatment, hemodialysis leads to changes in the lifestyle, health status and social role of the patients. Moreover, it is a costly treatment method with significant impact on the quality of life.[6, 7]

Quality of life encompasses the physical and mental wellbeing of individuals and is influenced by personal, social and clinical factors. Furthermore,

personal experiences and life perception play a pivotal role in enhancing the quality of life of individuals. On the other hand, adverse effects of chronic diseases on the health of patients ultimately decrease their quality of life.[8] In chronic patients, assessment of quality of life helps healthcare providers address their issues effectually. If chronic patients are content with their life and do not feel depressed due to their disease, they have greater energy for self-care, which improves their quality of life.[9]

Overall health and quality of life are essentially correlated, as physical disorders and symptoms directly influence all the aspects of quality of life.[10] According to the literature, patients undergoing hemodialysis have lower quality of life compared to healthy individuals and even other chronic patients, and quality of life indices are lower in hemodialysis patients compared to those with other chronic diseases, such as breast cancer, colon cancer and leukemia.[11, 12]

Hemodialysis causes significant changes in the life of CKD patients, including the loss of functionality, inability to perform daily tasks, general weakness and fatigue, social isolation, immobility, low self-esteem and sense of despair toward the future. Continuance of these issues could deteriorate the health status of CKD patients, adversely affect their roles in life, and lower their quality of life over time. With this background in mind, and considering the long-term process and dependence of patients on hemodialysis, special attention must be paid to enhancing the quality of life of CKD patients.[9]

Various strategies have been proposed to improve the quality of life of patients with chronic diseases, one of the most important of which is health-promoting behaviors.[13, 14] Health-promoting behaviors are defined as activities that enable individuals to have better control over their health, which results in the improvement of the overall health of the individuals and society.[15] In fact, health-promoting behaviors are the science and art of changing one's lifestyle in order to achieve perfection through committing to certain health-promoting activities, including proper nutrition, regular exercise, avoidance of risky behaviors, improving performance, controlling emotions, coping with the stress and complications of disease, and developing independence and adaptability despite the disease.[16, 17] Today, with the increased life expectancy in the society, health-promoting behaviors have raised in importance in order to maintain the efficiency and independence of individuals and enhance their quality of life.[18, 19]

Health-promoting behaviors have a significant implication for nurses since they play a critical role in incorporating education and promoting health care, the ultimate goal of which is to help patients, their families and communities to reach the maximum healthcare potential.[20] Correspondingly, in addition to increasing life expectancy, treatment of chronic diseases aims to enhance the quality of life of the patients.[12] Disease prevention and health promotion are the major concerns among healthcare providers, including nurses.[21] CKD has a chronic and debilitating nature requiring long-term hemodialysis. Considering the remarkable impact of hemodialysis on the quality of life of CKD patients, as well as the key role of nurses in this regard, this study aimed to evaluate the effects of a training intervention regarding health-promoting behaviors on the quality of life indices of hemodialysis patients.

2. Methods

2.1. Design

This quasi-experimental study was conducted with a pretest-posttest design on two study groups. Sample population consisted of hemodialysis patients referring to the teaching hospitals affiliated to Hamadan University of Medical Sciences, Hamadan, Iran during 2014-2015.

2.2. Participants and setting

In this study, Sample size was calculated at 35 patients per each group (total: 70) based on the study by Aghakhani *et al.* (2011)[22] using the sample size formula ($d=6$, $\sigma=7.8$, $Z_{1-\beta}=1.28$, $Z_{1-\alpha}=1.96$). Participants were selected via convenience sampling and randomly divided into two groups of intervention and control. Since Hamadan city has only two hemodialysis centers in two teaching hospitals, patients in one center were randomly selected as controls, and those in the other center were considered as the intervention group.

Inclusion criteria of the study were as follows: 1) age range of 18-60 years; 2) ability to communicate verbally; 3) basic literacy (primary education); 4) married patients (due to the type of questions in data collection tools); 5) lack of mental disorders or functional disabilities (based on the review of medical history); 6) no malignancies (as reported by patients and review of medical history) and 7) receiving hemodialysis 2-3 times per week for at least six months. Exclusion criteria were the transfer of patients to another center, death of patients, and participation in similar interventions at the same time.

2.3. Instruments

Data were collected using demographic questionnaires and Ferrans and Powers Quality of Life Index (QLI) dialysis version. Demographic data included age, gender, marital status, education level, number of dialysis sessions per week, duration of dialysis (year), causes of CKD, and length of dialysis sessions.

QLI (dialysis version) is a self-report instrument, which was first developed by Ferrans and Powers in 1985[23] to measure quality of life. This scale has two main sections; the first section includes propositions to evaluate the life satisfaction of patients, and the second part focuses on the importance of each preposition to the patients. Items in this questionnaire are scored based on a six-point Likert scale, from very unsatisfied (score one) to very satisfied (score six) in the first section, and from without any importance (score one) to very important (score six) in the second section. This questionnaire is composed of 68 propositions (34 propositions in each section). In Ferrans and Powers QLI, quality of life is assessed in four dimensions of health and functioning (14 items), social and economical (7 items), psychological/spiritual (7 items), and family (5 items). Overall score of quality of life is calculated based on a standardized instrument by subtracting 3.5 points from the responses to each item regarding patient satisfaction (score range: -2.5-+2.5). Afterwards, obtained score of satisfaction for each proposition is multiplied by the score of propositions in the importance section, and total score is determined by summing up the scores of all 34 propositions and adding 15 scores to each response. verall quality of life is calculated within a score range of 0-30 as unfavorable (scores 0-9), relatively favorable (scores 10-19), and favorable (scores 20-30). Face and content validity of this instrument have been confirmed by Dehesh et al. (2014), with the reliability determined at the Cronbach's alpha of 0.95.[24] In order to verify the reliability of this questionnaire in the present study, we used the test-retest method. Correlation-coefficients of overall quality of life and indices of satisfaction and importance were 0.97, 0.96, and 0.94, respectively, which confirm the reliability of this measurement tool. In addition, internal consistency of the questionnaire was calculated at the Cronbach's alpha of 0.83.

2.4. Data Collection

Patients in the intervention group received training on health-promoting behaviors. In accordance with the dimensions of quality of life, our educational intervention focused on dietary habits, physical activity, sense of responsibility toward individual health, spiritual growth, interpersonal relationships and stress management, which were determined based on available scientific resources and dialysis references (Table 1).[25, 26] Each of the dimensions in the manuals was evaluated by a specialist. Dimensions of nutrition, physical activity and responsibility toward health promotion were evaluated by two nephrology assistant professors, while the dimension of spiritual growth was approved by a religious expert, and aspects of interpersonal relationships and stress management were reviewed by a master's graduate of clinical psychology.

In this study, intervention was performed in six sessions (30 minutes each) for three consecutive weeks via face-to-face interviews during the hemodialysis sessions of the patients. After the completion of training sessions, discussed subject matters regarding health-promoting behaviors were presented in booklets, and patients were asked to follow the provided instructions for three months at home. In order to encourage the patients to follow the training program, they were followed-up via phone contact to answer relevant questions and remove ambiguities regarding health-promoting behaviors. After the three-month follow-up, patients were contacted and asked to attend the treatment centers at specific times so as to complete the QLI again through the same method.

In this study, patients in the control group received no training on health-promoting behaviors; meanwhile, they were provided with the booklets of educational content, and the researcher answered their questions in relation to the study subject.

2.5. Ethical considerations

After obtaining the required permit from the hemodialysis centers of Hamadan University of Medical Sciences and selecting the participants, the researcher introduced himself to the patients and explained the study objectives. Informed consent was provided from all the patients, and they were assured of confidentiality terms regarding their personal and medical information. Additionally, patients were allowed to withdraw from the study at any time.

2.6. Statistical analysis

Data analysis was performed in SPSS version 16 using Chi-square to assess the differences in the demographic variables of the two groups and paired T-test to compare the differences in the mean scores of quality of life before and after the intervention. Moreover, independent T-test was applied to evaluate the mean scores of quality of life between the intervention and control groups.

Table 1. Content of training sessions

Sessions	Topics	Sessions
First	Nutrition	Importance of nutrition in hemodialysis Do's and Don'ts of nutrition Importance of knowing dry weight Guidelines on nutrition
Second	Physical activities	Importance of exercise during hemodialysis Appropriate exercises for hemodialysis patients Types of sports
Third	Sense of responsibility toward personal health	Dialysis catheter care Fistula care Infection control
Fourth	Spiritual growth	Importance of prayer Importance of spiritual matters in physical and mental health Importance of patience and faith in God
Fifth	Interpersonal relationships	Definition of interpersonal communication and its variant forms Basic skills in interpersonal relations Recommendations and guidelines for improving interpersonal relationships
Sixth	Stress management	Definition of stress, stress management and various stressors Strategies and coping skills

3. Results

Demographic characteristics of the participants are shown in Table 2. According to the information in this table, no statistically significant differences were observed in the demographic characteristics of the two groups before the intervention. Moreover, results of Kolmogorov-Smirnov test were indicative of the normal distribution of data.

After the intervention, scores of quality of life in the intervention group changed from 20.11±5.46 to 18.85±5.4 (P=0.001), while in the control group, they changed from 18.93±4.10 to 19.41±4.67 (P=0.08).

According to the results of paired T-test, after the intervention, quality of life of patients increased in dimensions of health and functioning (P<0.001) and psychological/spiritual (P=0.041), which was indicative of a significant difference between the intervention and control groups (Table 3)

Table 2. Demographic characteristics of participants

Variable		Intervention N (%)	Control N (%)	P-value
Gender	Female	17 (48.6)	20 (57.1)	0.4
	Male	18 (51.4)	15 (42.9)	
Marital status	Married	27 (77.1)	30 (85.7)	0.3*
	Divorced	2 (5.7)	3 (8.6)	
	Widowed	6 (17.2)	2 (5.7)	
Education level	Literate	11 (31.4)	15 (42.9)	0.1*
	Below high school diploma	14 (40)	7 (20)	
	High school diploma	8 (22.9)	7 (20)	
	Undergraduate	2 (5.7)	6 (17.1)	
Number of dialysis sessions per week	Twice	13 (37.1)	10 (28.6)	0.4*
	Three times	22 (62.9)	25 (71.4)	
Dialysis duration (year)	1-2 years	16 (45.7)	17 (48.6)	0.7*
	3-5 years	13 (37.1)	10 (28.6)	
	>5 years	6 (17.12)	8 (22.8)	
Causes of disease	Unknown to patient	7(20)	4 (11.4)	0.8*
	Hypertension	11 (31.4)	9 (25.7)	
	Diabetes	10 (28.5)	10 (28.6)	
	Polycystic kidney disease	1 (2.9)	3 (8.6)	
	Chronic glomerulonephritis	1 (2.9)	2 (5.7)	
	Chronic pyelonephritis	1 (2.9)	2 (5.7)	
	Other	4 (11.4)	5 (14.3)	
Age (year)	M±SD	48.4±11.4	48.7±11.3	0.9**
Length of dialysis (hour)	M±SD	3.3±0.5	3.4±0.5	0.1**

*Chi-square test; **independent T-test

Table 3. Comparison of mean scores of quality of life in hemodialysis patients in two groups before and after training intervention

Group	Variable	Before Intervention M±SD	After Intervention M±SD	P-value
Health and functioning	Intervention	16.3±6.2	5.7±18.6	<0.001
	Control	16.6±5.2	15.34±5.3	0.13
	**P-value	0.83	0.01	
Social and economical	Intervention	18.8±5.4	19.1±5.4	0.07
	Control	19.6±5.06	19.8±5.4	0.59
	**P-value	0.51	0.84	
Psychological/spiritual	Intervention	17.42±7.3	19.3±7.02	0.041
	Control	20.8±6.7	20.7±6.8	0.09
	**P-value	0.36	0.046	
Family	Intervention	22.5±6.7	22.8±5.8	0.40
	Control	25.02±4.6	24.64±4.5	0.07
	**P-value	0.13	0.34	
Overall quality of life	Intervention	18.85±5.4	20.11±5.46	<0.001
	Control	19.41±4.67	18.93±4.10	0.08
	**P-value	0.44	0.08	

*Paired T-test; **independent T-test

4. Discussion

According to the results of the present study, quality of life in hemodialysis patients of the intervention group was relatively favorable before training on health-promoting behaviors and reached the desirable level after the intervention.

This finding is in congruence with the results of previous studies in this regard. For instance, in a prospective study by Alikari et al. (2015), implementation of a training program through consultation, lectures and educational videos positively affected the quality of life of patients undergoing hemodialysis.[27] In another research, De Moura Reboredo et al. (2010) demonstrated that training on stretching exercises improved the quality of life of patients with end-stage renal disease and those receiving hemodialysis.[28] In this regard, Narimani (2009) claimed that training of hemodialysis patients on self-care behaviors could enhance their quality of life.[29] Despite the consistency of the aforementioned findings regarding the effectiveness of healthcare training on the improvement of quality of life, different scores have been reported for quality of life dimensions, which could be due to the implementation of various training programs, use of different questionnaires to evaluate quality of life, and dissimilarity of the follow-up and needs of the studied patients.

According to the findings of the current study, training of the patients in the intervention group resulted in the improvement of the sub-indices of health and their functions. This is in line with the results of previous studies in this regard. Similarly, in the study by Narimani (2009), training intervention reinforced the aspects of general health and physical functionality in terms of quality of life in hemodialysis patients.[29] According to the findings of Ghavidel et al. (2009), self-care education based on the collaborative care model raised the quality of life of patients in dimensions of general health and physical functionality.[30] Furthermore, in the study by Braz et al. (2008), mean score of quality of life in patients undergoing hemodialysis significantly increased in the dimension of physical functionality following an educational intervention.[31] Contrary to our findings, in the study by Aghakhani et al. (2011), while the mean score of patients increased in dimensions of physical performance and overall quality of life after the intervention, this increase was not statistically significant.[22] Although the aforementioned findings confirm the results of the current research, there are major differences in the educational content, environmental conditions, implementation of educational content and quality of life assessment tools between studies. Similarities in the findings could be due to the positive effects of any form of patient training with appropriate educational content and proper implementation.

According to the results of the present study, training of patients in terms of health-promoting behaviors had a positive impact on the psychological and spiritual sub-indices of health in the intervention group. In another research, Tsay et al. (2005) reported that the mental health dimension of quality of life in hemodialysis patients requires special attention and should be promoted. Moreover, it was stated that training sessions and reducing stress levels could improve the mental conditions of these patients.[32] In the study by Narimani (2009), educational intervention was reported to enhance the quality of life of hemodialysis patients in terms of mental health.[29]

According to the findings of Ghavidel et al. (2009), self-care education based on the collaborative care model increased the quality of life of patients in the dimension of mental health. Consistent with the mentioned study, Naroui et al. (1391) reported that self-care education based on Orem's model raised the quality of life of patients in terms of mental health.[33] Despite the differences in the type of interventions and investigation methods, results of the aforementioned studies are in line with our findings. Most mental disorders stem from the inability of individuals to accurately explore their conditions and cope with health challenges. Therefore, proper training of patients in terms of self-care behaviors could lead to a better perception of quality of life, especially in terms of mental and spiritual health.[34]

In the current study, training of patients on health-promoting behaviors improved the score of social/economical dimension of quality of life in the intervention group; however, this increase was not statistically significant. In the study by Braz et al. (2008),[31] educational intervention enhanced the quality of life of patients in the dimension of social functioning, which is consistent with the results obtained by Narimani (2009)[29] in this regard. Furthermore, findings of Ghavidel et al. (2009)[30] indicated that self-care education based on the collaborative care model significantly increased the score of quality of life in the dimension of social functioning. Similarly, Naroui et al. (2012) reported that self-care training based on Orem's model increased the quality of life of hemodialysis patients in terms of social performance, which is in congruence with the results of the present study.[33] Implementation of educational interventions regarding chronic diseases and self-care behaviors not only enables the patients to perform health-promoting behaviors, but it also reinforces their role in self-care, thereby building a sense of usefulness, which prevents feelings of despair and depression. Moreover, such educational programs encourage patients to partake in social activities and reduce the economic burden of chronic diseases on patients and their families.[35]

Findings of the current research suggested that training of CKD patients on health-promoting behaviors increased the score of quality of life in the dimension of family in the intervention group; however, this difference was not considered statistically significant. Narimani (2006) emphasized on the significance of the family dimension of quality of life, proposing that education and consultation could be largely beneficial in this regard. This finding is consistent with the results of the present study.[36]

One of the limitations of the current research was the small sample size since the patients were selected from only one city, which might restrict the generalizability of the results.

5. Conclusion

According to the results of this study, implementation of an educational intervention regarding health-promoting behaviors improved the quality of life of patients undergoing hemodialysis. However, due to the chronic and debilitating nature of CKD and need for long-term hemodialysis, such training programs should be carried out periodically in order to enhance the quality of life of the patients effectively. Therefore, it is recommended that future studies apply other training methods, such as group education, in this regard. Additionally, presence of family members of the patients could be beneficial in the effectual implementation of such training programs.

Conflicts of interest

The authors declare no conflicts of interest.

Authors' contributions

Seyed Reza Borzou: study design, participation in the drafting of manuscript. Sahar Zonoori: data collection, implementation of the project, participation in the drafting of manuscript. Gholam Hosein Falahinia: scientific editor of the manuscript, participation in the drafting of manuscript. Ali Reza Soltanian: data analysis, participation in the drafting of manuscript.

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