Research Article

An Investigation Into the Impact of Orem's Self-Care Program on Life Satisfaction in Hemodialysis Patients: A Clinical Trial Study

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Abstract

Background: The life satisfaction of hemodialysis patients is correlated with their adherence to medical regimens and favorable health outcomes. Non-compliance is prevalent among these patients, and traditional training programs have not been adequate in achieving desirable results.

Objectives: This study aimed at determining the effectiveness of a new self-care program, based on Orem's model, in life satisfaction of hemodialysis patients.

Methods: This clinical trial was conducted in 59 patients. The subjects were undergoing hemodialysis and had referred to the Zabol Special Diseases Center (2017 - 2018). After the subjects were chosen via convenience sampling and their qualification was ensured, they were randomly assigned to either an intervention group or a control group. Data were gathered by means of a demographic questionnaire, a researcher-made inventory on self-care behaviors of hemodialysis patients based on Orem's model (meant to identify self-care needs), and Diener's satisfaction with life scale (SWLS). The questionnaires were filled out before and after the intervention. SPSS 22 was used to analyze the collected data. The statistical tests included independent *t*-test, paired *t*-test, Mann-Whitney U test, Fisher's exact test, and chi-square test.

Results: According to the independent *t*-test, there was no significant difference in the mean score of life satisfaction between the two groups before the intervention. However, after the intervention, the mean score of life satisfaction in the intervention group increased significantly from 16.12 to 41.18. This change was determined based on Cohen's kappa coefficient of 25.2 (P < 0.001).

Conclusions: The Orem-based self-care program could be effective in improving the life satisfaction of hemodialysis patients by enhancing self-care capacity, encouraging medical compliance, and reducing the dependency of these individuals. This program, being developed based on educational needs and the requirements of scientific methods, is proposed as a nursing intervention among these patients.

Keywords: Self-Care Program, Orem's Model, Hemodialysis Patients, Life Satisfaction

1. Background

Chronic kidney disease (CKD) is a progressive and irreversible renal dysfunction (1). It has become an epidemic all over the world (2), and its average global growth rate was around 8% annually over the past five years. The rate of this condition in Iran (12%) is higher than the average global growth rate (3). Treatment methods for CKD patients include peritoneal dialysis, kidney transplantation, and hemodialysis, which the latter is by far the most frequently used (4). Since Georg Haas (1886 - 1971) carried out the first human dialysis in 1924, it remains the most important treatment of choice for CKD patients (5). Only in 2009, 91.0% of patients were treated by hemodialysis in the United States. Similarly, in Iran, hemodialysis is the most common alternative treatment for kidney disease, and around 50% of patients across the country are cured with this method (6). The annual rate of hemodialysis patients in Iran has soared by 15% (1). CKD has a major impact on patients, forcing them to make big changes in their lifestyle. These patients require special training and empowerment programs to enable them to cope with their illness as they undergo multiple drug therapies and special dietary plans and need to adapt to physical and mental disabilities, besides controlling the disease and its complications (7).

A qualitative study by Saeedi et al. (8), aimed at explaining the perception of patients about hemodialysis, re-

ported the lack of life satisfaction as one of the themes extracted from patients' interviews. In this regard, Wasserfallen et al. (9) suggested that the satisfaction of patients with dialysis rises because of their awareness of possible side effects of offered treatments. Today, attention to patients' satisfaction with the provision of healthcare has burgeoned. Evidence suggests that increased patient satisfaction is associated with a reduction in hospitalization and mortality (10). Life satisfaction is part of mental health; it accounts for one's happiness in life and is related to positive health outcomes (11). Among patients with hemodialysis, satisfaction and favorable health outcomes are tied to complying with treatment regimens (9) while non-adherence to dietary and fluid constraints is common and causes serious problems. The results of several studies have shown the inefficiency of traditional training programs in helping patients modify their lifestyle and self-care behaviors (7).

Self-care is defined as a strategy for adapting to life events and tensions, and it can enhance one's independence and quality of life. Rather than relying on regular treatment procedures, it is imperative nowadays to foreground self-care and education in the overall healthcare structure of the community (12). One of the most comprehensive self-care approaches is Dorothea Orem's self-care deficit theory (SCDT), in which self-care is referred to as a regulatory function of the human species (13). SCDT underscores the role of the patient in taking care of himself/herself (14). The largest body of clinical research has been so far undertaken based on this model (15). Orem believes that humans are creatures who have the ability to take care of themselves, and whenever this ability is limited in the patient, the nurse has to provide direct compensatory care and training for rehabilitation (16). Studies in Iran indicate the positive impact of using this care model on the quality of life of hemodialysis patients (17, 18). Hemodialysis patients are not fully capable of looking after themselves. In fact, one of the main concerns of nurses in caring for these patients is their lack of independence. This problem has been addressed by Orem's model by engaging individuals in self-care activities (2). Patients should do their best to achieve a high level of independence via understanding and learning self-care behaviors (14).

2. Objective

In general, considering the low level of life satisfaction among hemodialysis patients (8) and its relationship with adherence to medical regimens (9), reducing hospitalization and mortality (10), as well as obtaining favorable health outcomes (9), and finally given the inadequacy of conventional care training in meaningfully assisting patients to bring about lifestyle changes or developing self-care behaviors (7), the authors of the current research

made an attempt to specify the effect of implementing SCDT program on life satisfaction in these patients.

3. Methods

The present study is a clinical trial registered under the code Zbmu.1.REC.1396.220. The purpose of the study was to determine the effect of Orem's model of self-care on life satisfaction among hemodialysis patients. The statistical population consisted of all patients undergoing hemodialysis who had referred to Zabol Special Diseases Center between 2017 and 2018. According to the results of the study by Habibzadeh et al. (19) and consultation with a statistics expert, the sample size was computed using the following formula.

$$
\begin{aligned}
n &= 2(z_\alpha + z_\beta)^2 \times \left(\frac{\sqrt{SD_1^2 + SD_2^2}}{m_1 - m_2} \right)^2 \\
&= (1.96 + 0.84)^2 \times \left(\frac{\sqrt{4.1^2 + 3.3^2}}{53.3 - 52.8} \right)^2 \\
&= 19.11 \\
&\cong 20
\end{aligned}
$$

Thus, 20 subjects were estimated for each of the two groups. However, considering the probable dropout and to compare the results with higher certainty, 30 people were ultimately considered for each group (total of 60 people).

Based on the inclusion criteria, among patients referring to the center, 60 individuals who expressed their willingness to participate in the study were selected via convenience sampling and randomly allocated to an intervention group (n = 30) or a control group (n = 30). The criteria for entering the study included 18 to 65 years of age, understanding Persian, a minimum record of six months of dialysis, dialysis sessions three times a week (1), lack of dementia (13), lack of physical and mental disability, the ability to understand and answer questions (2), awareness of time and place, lack of severe disabling diseases such as diabetes or heart failure (4), not belonging to any healthcare team, and the possibility of establishing phone calls. On the other hand, the exclusion criteria were patient's unwillingness to cooperate further, patient's transfer to another center, failure to continue treatment for medical reasons, undergoing or being a candidate for kidney transplantation, and patient's death during the study (2, 13). Unfortunately, one patient in the intervention group passed away during the study. Finally, the research was carried out with 59 hemodialysis patients.

The data collection tools were as follows:

1. Demographic questionnaire: This self-made questionnaire contained 13 questions for obtaining personal information including age, sex, marital status, education

level, occupation, CKD duration, hemodialysis duration, family history of renal failure, the average cost of treatment, monthly income, and BMI ([13], [19]).

2. The researcher-made questionnaire designed for self-care behaviors in hemodialysis patients, adopted from Orem's self-care model for diabetic patients ([20]): This tool consisted of 23 questions that evaluated self-care activities of hemodialysis patients such as controlling daily weight and blood pressure, adherence to dietary and fluid restrictions, activity, rest and sleep, treatment follow-up, attention to side effects (itching, infection, hypotension) along with illness symptoms, and recognizing appropriate drugs. Authoritative sources including recent articles and publications were used concerning the research objectives in order to develop this inventory. Subsequently, the resultant questionnaire was presented to several professors of the Faculty of Nursing and Midwifery of Zabol University of Medical Sciences and a number of prominent individuals in this field. After obtaining confirmation and applying the comments, the authors finalized the questionnaire. Scoring was based on a four-point Likert scale ("never" (1), "sometimes" (2), "mostly" (3), and "always" (4)). The total score an individual could acquire based on this scale ranged from 23 to 92. The raw scores were converted to percentages, then classified into weak (1 to 50), moderate (51 to 75), and strong (76 to 100) degrees. In order to assess the scientific credibility of the questionnaire, the content validity index (CVI) of Waltz and Basel was employed. Accordingly, the relevance (0.94), clarity (0.90), and simplicity (0.91) of scale questions were established ([21]). The final CVI of the three domains of the scale was 0.92. To determine its reliability, the internal consistency measure was used, and the Cronbach's alpha coefficient was calculated to be 0.79.

3. Satisfaction with life scale (SWLS) introduced by Diener et al.: It is the most common tool for measuring life satisfaction ([22]). Instead of focusing on negative experiences, SWLS deals with the positive aspect of individuals' experiences. This self-report tool measures the cognitive component of well-being. This scale initially comprised 48 questions, but it was later reduced to 10 questions after being analyzed by factor analysis. Due to the semantic similarity between the 10 questions, the final version was reduced to five questions. The answers are scored based on a five-point Likert scale (ranging from one representing "I totally agree" to five indicating "I totally disagree"). Higher scores suggest a greater level of one's life satisfaction. In a review study by Bayani et al., the reliability of SWLS was confirmed via Cronbach's alpha (0.83) and test-retest method (0.69). The construct validity of the scale has also been established through its positive correlation with the Oxford happiness inventory (OHI) and its negative correlation with the Beck depression inventory (BDI). Finally, it has been reported that SWLS is a useful measure in psychological research in Iran ([23]).

The objectives of the study and its method of implementation were explained to the participants, and the research units were assured regarding the confidentiality of their information. Besides, written consent forms were obtained from the patients. Subsequently, the subjects filled out the questionnaires during interviews under the supervision of the researcher. After the self-care behavior questionnaire was completed and patients' self-care needs were identified, their levels of life satisfaction were calculated. Then, given the needs of patients, the intervention was designed so that it would take into account Orem's model of self-care, as well as the relevant nursing and medical literature. The self-care program consisted of a supportive educational nursing system. Individual and face-to-face training was performed through discussion and question and answer sessions. Totally, six sessions were organized for each patient, each lasting 30 to 45 minutes. The topics addressed in each session are listed in Table 1. Emphasis was placed on each issue depending on the individual requirements of each patient (determined through need assessment conducted earlier) (Table 1).

Table 1. Topics Raised in Every Single Session Held for the Intervention Group

Session	Topic
Session 1	General information about kidneys, types of kidney failure, and their treatment
Session 2	Vascular pathways and caring for them, fluid restrictions
Session 3	Nutritional guidelines for hemodialysis patients
Session 4	Medication and hemodialysis
Session 5	Exercise and physical activity hemodialysis
Session 6	Hemodialysis and travel

At the end of each session, patients were given the related pamphlets. The interval between every two sessions was one week. There was no intervention in the control group and the patients in this group received only the routine training. Patients' follow-up was performed over the phone for one month ([2], [24]), and the final assessment was carried out one-month post-intervention. Meanwhile, the researcher phoned the patients in the intervention group once a week to raise their self-care awareness and answer their self-care questions. Afterward, Diener's SWLS was completed again by the patients in both groups. Eventually, the obtained data were analyzed via SPSS 22. The statistical tests included independent t-test, paired t-test, Mann-Whitney U test, Fisher's exact test, and chi-square test.

4. Results

A total number of 59 patients who were undergoing hemodialysis in the Zabol Special Diseases Center took part in this study. The findings showed that the median (interquartile range) of patients' age in the intervention and

control groups was 51 (19.5) and 52 (20.25) years, respectively. Moreover, in both groups, 25 individuals (42.2%) were male, 34 individuals (57.6%) were female, eight patients (13.6%) were single, and 51 patients (86.4%) were married. The median (interquartile range) of hemodialysis duration in both intervention and control groups was 4 (0) (Table 2). The statistical tests did not reveal any significant difference between the intervention and control groups in terms of quantitative and qualitative demographic variables.

Moreover, given the P values obtained from independent *t*-test, before applying the intervention, the two groups did not differ significantly with regard to the mean score of life satisfaction (P = 0.921) and self-care behaviors (P = 0.172). Nevertheless, the results of this test suggested a significant difference in the mean values of life satisfaction between the intervention and control groups after implementing the Orem-based self-care program (P < 0.001), so that the average score of life satisfaction in the intervention group increased from 16.12 to 41.18; statistically, this increase was significant (P < 0.001). This change was based on Cohen's kappa coefficient of 2.25 (Table 3).

5. Discussion

The results of the current study proved the effectiveness of the Orem-based self-care program in promoting the life satisfaction of hemodialysis patients. The results are discussed in details in the following.

In this research, Orem's model of self-care could improve the life satisfaction of hemodialysis patients. It seems that restoring one's self-care capacity and reducing dependence on other people have been conducive to enhancing life satisfaction. According to Sujoodi et al. (25), dependence constitutes one of the essential components of life satisfaction. Confirming the likelihood of a relationship between improved life satisfaction and reduced dependence following the application of Orem's self-care program, Poodine Moghadam and Nasiri (2) observed that self-care programs could lead to restoring the autonomy of patients and dispelling their doubts and hesitations about their capacities. This is because the purpose of Orem's theory is to prepare and assist patients to take care of themselves and attain independence. In addition, Habibzadeh et al. (19) proposed that due to the dependence of hemodialysis patients on receiving care services, recognizing self-care requirements of these individuals based on coherent nursing theories would aid them to adapt to their new circumstances. Rezaie Shahsavarloo et al. (26) also believes that life satisfaction is closely related to individual needs. Similarly, the results of the study by Mohamed et al. (14) substantiated the effect of their developed self-care program on the dependence level of hemodialysis patients. Asghari et al. (3) pointed out that

hemodialysis patients need mental support to adapt to their current situation, and nurses can employ emotional support and training to help these people overcome their problems and fears caused by the disease. All of these studies are consistent with the results of the present research.

The authors came across a number of studies that investigated the impact of Orem's self-care model on patients' quality of life. Since health-related quality of life and life satisfaction are often used synonymously, and, according to one of the experts in the field, the quality of life refers to happiness, fulfillment of desires, achieving personal goals, benefiting the community, and maintaining physical and spiritual power (27), the authors of the present study discuss such studies here. It should be noted that most of these studies have been conducted on non-hemodialysis patients, but they are still addressed, given the paucity of research in this area.

Mahmoudzadeh Zarandi et al. (28) suggested the effect of this model on all aspects of the quality of life of patients with migraine. Borji et al. (29) concluded that due to the impact of Orem-based self-care on the quality of life of diabetics, it is suggested that this program be integrated into the nursing care of these patients. Hamidizadeh et al. (30) and Masoudi et al. (31) found that designing and implementing self-care programs based on Orem's model can affect physical and psychological aspects of multiple sclerosis patients. Karbaschi et al. (32) demonstrated that Orem's model of self-care program based on educational needs is effective on the quality of life of cancer patients undergoing chemotherapy. Rahimi et al. (33) inferred that the implementation of Orem's model of self-care could improve the quality of life of patients with hypothyroid goiter. Similar to the present research, Naroie et al. (13) revealed the positive impact of Oram's self-care model on the quality of life among hemodialysis patients. As mentioned above, all of these findings are compatible with the current study findings.

The major limitation of this study was the possibility of acquiring self-care information by patients through other sources (books, radio, television, etc.) during the intervention. However, it was not possible to control the impact of these confounding variables.

5.1. Conclusions

Owing to improving self-care capacity, raising regimen adherence, and reducing dependency, Orem's model of self-care increases the life satisfaction of hemodialysis patients. Being developed based on educational needs in accordance with the principles of the scientific method; this program is recommended as an effective nursing intervention for hemodialysis patients.

Table 2. Demographic Information of Hemodialysis Patients in the Two Groups

Variable	Intervention Group	Control Group
Quantitative Variable, Median (Interquartile Range)		
Age	51 (19.5)	52 (20.25)
Duration of chronic kidney disease, y	2 (2.3)	3 (3.6)
Duration of hemodialysis	4 (0)	4 (0)
Average monthly treatment cost	100 (350)	200 (237)
BMI	47.23 (80.3)	76.25 (22.5)
Qualitative Variable, No. (%)		
Gender		
Female	16 (55)	18 (60)
Male	13 (45)	12 (40)
Marital status		
Single	4 (14)	4 (13)
Married	25 (86)	26 (87)
Monthly income, Rials		
Without income	13 (7.46)	15 (7.51)
Below 10 million	5 (7.16)	7 (14.24)
10 million or more	11 (7.36)	7 (1.24)
Family history of kidney failure		
Yes	6 (7.20)	4 (3.12)
No	23 (3.79)	26 (7.86)
Education		
Illiterate	4 (8.13)	12 (40)
Primary school	6 (7.20)	6 (20)
Secondary school	9 (31)	4 (3.13)
High school diploma	5 (2.17)	4 (3.13)
Associate degree or higher	5 (2.17)	4 (3.13)
Occupational status		
Unemployed	11 (7.36)	8 (5.27)
Housewife	10 (3.33)	12 (3.41)
Self-employed	5 (7.16)	7 (1.24)
Employee	3 (10)	3 (9.6)

Table 3. Comparison of the Mean Score of Life Satisfaction in Hemodialysis Patients in Both Groups Before and After the Intervention

Life Satisfaction	Intervention Group[a]	Control Group[a]	Intergroup Changes		Effect Coefficient (Cohen's Kappa)
			P Value	**Test**	
Before intervention	12.16 ± 3.63	10.68 ± 3.06	0.097	Independent *t*-test	
After intervention	18.41 ± 2.99	11.90 ± 2.78	< 0.001	Independent *t*-test	
P value	< 0.001	0.290			
Test	Paired *t*-test	Paired *t*-test			

[a] Values are expressed as mean ± SD.

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