



ORIGINAL ARTICLE

A survey of the Impact of using Orem self-care model on Adequacy of Dialysis in Hemodialysis Patients

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ABSTRACT

Inadequate dialysis is one of the main factors of mortality of dialysis patients and it is effective on Prognosis of dialysis patients. Various factors are effective on dialysis adequacy. This study is a semi-empirical, pre-test and post-test and control group design. The study is conducted in Valiasr and ShahidBeheshti hospitals of Zanjan city in 2013. 71 patients are selected by convenient method and are divided into experiment and control groups by block random allocation. After need assessment of patients regarding self-care, the training is given in six sessions for half hour for one week. The dialysis adequacy of the patients of both groups before and one month after intervention is investigated by Daugirdas formula. The data are analyzed SPSS, 19 software and the descriptive statistics include the frequency distribution table, dispersion and central measures, paired t-test, independent t and chi-square test. The age mean of people is 55.13±15.1 years, 63.38% men, 76.05% married and 47.88% with below Diploma education degree. The results of study showed that after intervention, dialysis adequacy is increased in experiment group ($P<0.001$) but this difference in control group is not significant. Based on the significant increase of dialysis adequacy after Orem self-care model, self-care skills are recommended about this group of patients and other patients with chronic diseases.

Keywords: Dialysis adequacy, Orem self-care model, Dialysis;

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INTRODUCTION

Renal chronic disease is a pathological process with various reasons and its result is non-stopping reduction of the number and function of nephrons and mostly leads to End Stage Renal Disease (ESRD) [1]. ESRD is a chronic progressive kidney dysfunction in which body ability to keep liquid and electrolyte balance is destroyed and it leads to Oremia or Azotemia [2]. This dysfunction is occurred when 90% of kidneys performance is destructed [3]. Kidney chronic deficiency in the world is 242 people per million people and it is increased annually 8% [2-3]. This value is different in various communities as among black people, it is 758 people per million and among white people as 180 people per one million [1]. According to the statistics in US, more than 400000 people suffer from ESRD and more than 300000 people need permanent dialysis [4]. In Iran, the growth of new cases of ESRD is very high and equal to 22.6% in year and the number of previous patients is also added. In Iran, there are more than 33000 ESRD patients as increasing to 40000 people in 2011 and 98% of these patients receive hemodialysis and 2% of them undergo *peritoneal* dialysis. In Iran, the patients receiving hemodialysis is more than 20 thousand people [5] and annually about 15% are added to the patients receiving hemodialysis [6]. By wide access to dialysis, the life of hundreds of ESRD patients is long but despite the progresses in medicine and dialysis, the mortality rate of this patients is high. The non-adequacy of dialysis is one of the main factors of mortality in these patients as shown by most of the studies [7]. In case of inefficient dialysis, the patient needs the increase of frequencies and hemodialysis duration and besides forcing extra therapy costs on health system of the country, the risks of transferring infectious diseases as hepatitis C,B, HIV and other blood contamination is increased and these issues can lead to the necessity of efficiency of hemodialysis to be effective in long life of these patients [8].

The better the dialysis, the better the life condition and life expectancy of patients. The identification of effective factors is important on improving the adequacy of dialysis and increasing this adequacy. Various factors affect dialysis adequacy as diet, sieve type, speed, dialysis time and training the patient [9].

The goal of caring these patients is increasing the quality of patient and one of the methods to modification of life quality is using nursing theories and models. Having a nursing caring model in Hemodialysis ward is necessary to support the individual needs of patients and guaranteeing the standard nursing care and maintaining the care quality [10].

One of the common self-care plans is using Orem self-care model. This model of nursing self-care model is used in chronic diseases and most of the research activities at bed are based on this model. This model is based on practical abilities of people and their needs for self-care [11]. The aim of this model is encouraging the patients to self-care and helping the patient to receive responsibility for self-care and the role of nurses is the investigation of the need of self-therapy and determining self-care force and the existence and lack of defect of self-care among chronic patients. The various studies have shown that nursing theories namely Orem model modifies caring quality, reduction of nursing care costs and finally modification of life quality of patients [3]. Using this caring model in various patients shows positive effects of this caring method at bed. According to the study of Hamedanizade *et al.*, (2010) investigating the impact of Orem care model on headache indices of the patients with migraine and applied this care model for two months and reduced headache attacks among the patients with migraine [12]. Also, using this caring model can reduce fatigue and increasing self-esteem among patients with multiple sclerosis [14-15]. Based on the study of Baraz *et al.*, (2005) with the aim of investigation of the impact of self-care training on life quality and physical problems among the patients receiving hemodialysis, the findings of the study showed that after intervention, life quality was increased in all aspects and reduced the problems of these patients considerably in terms of high urea, creatinine, potassium, systolic blood pressure, skin rash and edema [11]. Other studies also dealt with the impact of using this caring model on life quality of patients receiving hemodialysis [9, 12, 27].

STUDY METHOD

The present study is a semi-empirical study of pre-test and post-test with a control group performed to determine the impact of orem self-care model on dialysis adequacy of the patients receiving hemodialysis. The study population is non-emergency hemodialysis patients referring to dialysis ward of Valiasr and ShahidBeheshti hospitals affiliated to Medical Sciences University of Zanjan. The sampling is convenient method. All the patients meeting the criteria of study were selected in the study. To control the intervening variables and maximum equality of samples in experiment and control groups, after selection of each sample, the selected sample is selected by random method and blocking in experiment and control groups to find suitable sample study.

The inclusion criteria of study include the age of patient is above 18, the patient is with chronic kidney dysfunction, at least three months are passed from the first period of hemodialysis, they are in the list of patients receiving hemodialysis of Valiasr hospital or Shahid Beheshti hospital, and they can participate in the study. The exclusion criteria include: They don't need training based on educational need assessment based on Orem model (according to educational need assessment questionnaire), the study unit can transfer to another therapy center and kidney transplant recipients were excluded from study. Also, the participant can reject participation for any reason.

A three-part questionnaire and a checklist of the educational items application are used for data collection. The first part of questionnaire includes the demographic information of people. The second part of questionnaire is the data of dialysis adequacy including weight before and after dialysis, filter clearance coefficient, blood flow speed and urea before and after hemodialysis. To measure dialysis adequacy, Daugirdas formula 2 is applied.

The third part of questionnaire includes 20 questions regarding educational needs of the patients receiving hemodialysis based on Orem self-care model. This questionnaire is designed by the researcher. The validity of the questionnaire is determined by content validity and its reliability by Cronbach's alpha coefficient .89. Scoring is based on Likert scale and responses are as high, average, low and never and the scores are divided ranging from the need to high training to the lack of need to training (never) ranging 3 to 0. Achieving score 0-10 independent patient, 11-30 semi-dependent and 31-60 dependent in terms of educational aspects.

During intervention stage, after obtaining consent of patients, they are divided into experiment and control groups. At first, dialysis adequacy of both groups is measured and then intervention of experiment group was performed.

Intervention is including using the educational role of nurse in caring patients. The patients of experiment group were trained for 6 sessions in various fields and based on their educational needs. Each session takes 30 to 45 min and the sessions were one week interval. Totally, the educational sessions continued for 6 weeks. The various fields of training included the reasons of kidney dysfunction, treatment, hemodialysis, caring Fistul and catheter, diet, sexual issues, sleep problems, anemia, activity and rest,

short breath during dialysis and vomiting and nausea. This training was face to face during dialysis. At the end of training sessions, a book including all the items was given to the patients. One month was given to the patients to use the trained items in daily activities. In the days in which the patient referred for dialysis to hospital, the amount of using training items in self-care activities and the lack of using them were interviewed. During this one month, as patients were referring for dialysis, the applications of training items were also followed up in routine activities. After one month of intervention end, the dialysis adequacy was measured again. The collected data are analyzed by SPSS software, version 19 and paired t tests, independent t and chi-square test.

RESULTS AND DISCUSSION

The results of study showed that the mean and standard deviation of age of the study samples are 55.13 ± 15.10 and most of them (63.38%) were men, 76.05% married and 98.58% had below Diploma education. 70.42% of samples had income below 800 thousands Toman per month. 14.08% of samples were unemployed. The mean of suffering from chronic kidney dysfunction is 5.43 ± 5.97 years and 71.83% of them underwent below 5 years hemodialysis. Also, according to the results, the highest diseases were diabetic (16.9%) and cardio-vascular disease (15.49). The comparison of the individual features of study samples between experiment and control groups is shown in Table 1. As shown in the table, there is no significant difference between the individual features of two studied groups.

By Daugirdas formula 2 and BUN information and the weight before and after dialysis, the dialysis adequacy was computed by the following formula:

$$Kt/v = (-1) \times \log(\text{Ratio} - 0.03) + (4 - (3.5 \times \text{Ratio})) \times (\text{Ultrafiltrate Volume} / \text{Weight})$$

$$\text{Ratio} = \text{Post BUN} / \text{Pre BUN}$$

In this study, dialysis adequacy index before intervention is homogenous in two groups and there was no significant difference. Data analysis by paired t-test between the mean of scores of dialysis adequacy of the study samples before and after intervention showed significant difference in intervention group but there was no significant difference in control group.

Table 1- The comparison of some of individual features between experiment and control groups

Group Individual features		Experiment		Control		P - value
		N	%	N	%	
Gender	Man	22	61.11	23	65.71	0.687=p
	Woman	14	38.88	12	34.28	
Education	Illiterate	14	38.88	12	34.28	0.584=p
	Below diploma	18	50	16	45.71	
	Diploma and above	4	11.11	7	20	
Marital status	Married	29	80.55	25	71.42	0.368=p
	Single	7	19.45	10	28.58	
Employed	Employed	19	52.77	19	54.28	0.985=p
	Housewife	12	33.33	11	31.42	
	Unemployed	5	13.88	5	14.28	
Income	No financial autonomy	29	80.55	21	60	0.058=p
	Financial autonomy	7	19.44	14	40	
Chronic kidney dysfunction	6 months to 4 years	20	44.44	22	71.42	0.59=p
	4-8 years	10	27.77	5	14.28	
	8 years and above	6	27.77	8	14/28	
Dialysis experience	Less than 5 years	24	66.66	27	77.14	0.954=p
	5-10 years	11	30.55	6	17.14	
	Above 10 years	1	2.77	2	5.71	
Age	Man	55.83		54.4		0.692=p
	SD	16.96		13.13		

Table 2- The comparison of dialysis before and after intervention in experiment and control groups

Group	Before study	After study	Result of paired t-test
	Mean and SD	Mean and SD	
Test	0.96±0.23	1.14±0.22	p<0/001 df= 35 t=-4/47
Control	1.3±0.26	1.31±0.25	p= 0/09 df= 34 t=-1/6

DISCUSSION AND CONCLUSION

The results of the study showed low dialysis adequacy among the patients. As shown in various studies, this result is indicated. Barzo *et al.*, in the study in Hamedan showed that only 16.6% of patients had good dialysis adequacy [19]. Delavari *et al.*, in the study in Kordestan found the similar results regarding the dialysis non-adequacy. 78.9% of patients had dialysis adequacy less than 1.2 [20]. IN the study of Ebrahimi *et al.*, in Shahrood, 70.4% of patients had adequacy less than standard [21]. All the studies showed dialysis adequacy less than standard in various regions of Iran.

The findings of our study showed that Orem self-care model in patients can increase adequacy of dialysis among experiment group patients. Saei *et al.*, in the study showed that care model in patients receiving hemodialysis can increase dialysis adequacy in these patients and it is in line with the present study [22]. Baraz *et al.*, (2006) in the study showed that self-care activities among the patients receiving hemodialysis can reduce some problems as high urea, creatinine, potassium, high systolic blood pressure, itching and edema [15]. The results of the study of Heidarzade *et al.*, (2010) showed positive relationship between using self-care model of Orem and life quality [23]. Using the models encouraging the patient and patient participation in self-care can increase dialysis adequacy and reduction of complications of dialysis. This model can provide valuable information and can be used in nursing researches, investigation and evaluation of care system of hemodialysis patients.

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