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Research Article

Evaluating the Effect of Combined Education on Blood Pressure and Dialysis Adequacy of Hemodialysis Patients Admitted to Special Diseases Center of Imam Khomeini Hospital in Zabol city, 2017

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Abstract

Introduction: Inadequate dialysis is one of the factors determining the survival rate of patients. Increasing the adequacy of dialysis is effective in improving dialysis patients. Blood pressure is one of the factors affecting the adequacy of dialysis. Thus, this research was conducted to evaluate the effect of combined education on blood pressure and dialysis adequacy in hemodialysis patients admitted to special diseases center of Imam Khomeini Hospital in Zabol city in 2017.

Methods: This is a quasi-experimental research, in which 34 hemodialysis patients were examined in two groups (each group included 17 patients). The intervention group received four routine educations for 4 sessions and the control group received only routine education during this period. At the start and at the end of the research, blood pressure and dialysis adequacy were checked by the KT / V formula and analyzed by t-test.

Results: The research results revealed that the mean of blood pressure decreased significantly in the intervention group two months after the implementation of combined education (P=0.001). In addition, the mean of dialysis adequacy in this group increased from 1.13 (0.35) to 1.27 (0.36) (P=0.007) after intervention.

Conclusion: Based on the research results, it can be concluded that combined education improves blood pressure and improves the dialysis adequacy of patients undergoing hemodialysis.

Keywords: Combined education; Blood pressure; Dialysis adequacy; Kidney failure; Hemodialysis

Introduction

End stage renal disease (ESRD) is a form of severe chronic kidney disease (CKD). Based on one definition, ESRD refers to irreversible reduction in kidney functioning [1], resulting in death without alternative kidney treatments [2]. Among alternative kidney treatments, hemodialysis is the most commonly used treatment in Iran and in the world [3], in which toxic nitrogen substances, water and additional electrolytes are refined through hemodialysis device [4].

The disease of small number of people with chronic kidney becomes evident at the end stage of this disease, while the disease of large number of these patients does not become evident. According to US Kidney Information System in 2011, the mean of incidence of this disease was 449 people per million people and there are 33000 end stage renal failure patients in Iran at present time, which 54% of them are undergoing continuous hemodialysis treatment [5].

New methods of hemodialysis have shown good efficacy, while there is evidence on dialysis inadequacy [3]. However, inadequate dialysis is one of the most important factors in increasing death in hemodialysis patients [6]. In fact, inadequate dialysis can increase the complications of the disease, the length of hospitalization, and the costs imposed on patients. Adequate hemodialysis can reduce the costs and complications [7].

One of the most important factors determining the dialysis adequacy is blood pressure. In general, 75-80 of patients with chronic kidney failure have high blood pressure and most of dialysis patients experience high blood pressure during dialysis, which might result in many complications and dialysis intolerance by the patient, affecting the dialysis efficacy [8]. Blood pressure is also a risk factor for heart disease, which is the most common cause of death in hemodialysis patients [9]. In fact, the control of high blood pressure is the most important intervention to slow down the development of kidney failure [8].

Shomali views that the most important nursing action for hemodialysis patients is providing education for patient [10]. Patient education is one of the basic needs of patients [11]. All patients have the right to receive education to maintain their health and prevent diseases [12]. In fact, this education improves the health behavior and changes the harmful behaviors and provides health for people living in a community [11]. Research suggests that with every one dollar spent to educate the patients, 3-4 dollars are saved in costs. For example, about 69-100 million dollars are spent in US on health problems, imposed due to lack of providing education for patients on the costs [12]. Moreover, the results of research in the educational-medical centers of the Iran University of Medical Sciences show that the important task of educating the patient is not performed well. This causes problems not only for patient, but also for his family and community [13].

One of the methods used to empower and educate the patients is the use of combined education [10]. It is one of the methods used in educational systems [14]. Combined education in fact uses two or more education methods, including individual education, group education, lectures, distance education, and the use of educational aids such as video presentation, pamphlet presentations, educational pamphlet, phone call follow-up and e-electronic learning. In this comprehensive program, the learner and the educator are more

motivated to learn and search the materials, leading to better and deeper learning [10].

Given what was stated above, the current research was conducted to evaluate the effect of combined education on blood pressure and dialysis adequacy of hemodialysis patients in the special diseases center of Imam Khomeini Hospital in Zabol city in 2017.

Materials and Methods

Ethical approval

This project was approved by Ethics Committee of Zabol University of Medical Sciences with code of Zbmu.1.REC.1396.67.

After approval of the plan by the Ethics Committee of Zabol University of Medical Sciences and obtaining necessary licenses, among the hemodialysis patients admitted to dialysis center of Amiralmomen in Hospital in Zabol, 34 patients were selected (based on the study conducted by Saei et al. [15] and according to the formula of

$$N = 2 \mathrm{X} (Z_\alpha + Z_\beta)^2 \mathrm{X} \left(\frac{\sqrt{SD_1^2 + SD_2^2}}{M_1 - M_2} \right), Z_\alpha = 1.96, Z_\beta = 0.84, SD_1 = 0.34, SD_2 = 0.34, M_1 - M_2 = 0.6$$

Inclusion criteria of study included willingness to participate in research, age between 18 and 65 years, hemodialysis treatment for at least 6 months and 3 sessions per week, lack of acute and chronic infections, inflammatory diseases, malignancies and cognitive and psychological problems, having arteriovenous fistula and reading and writing literacy. After completing the informed written consent form, they were randomly assigned into two groups of control and intervention. Then, required explanations on research objectives and the interventions were provided to the participants in each group. Then, the demographic information of participants of two groups was extracted using researcher-developed questionnaire. Blood pressure was measured using digital Sphygmomanometer (Clever Check, US) and adequacy of dialysis was measured by the KT/V formula. The demographic information questionnaire included 8 questions including age, gender, marital status, job status, educational level, income, living place, and history of hemodialysis. Its content validity was confirmed by 10 professors of Nursing and Midwifery Faculty of Zabol and its reliability was examined using test re-test method implemented on 10 patients with a 15 min interval and confirmed by the reliability of r = 1. The validity of America Clever Check digital Sphygmomanometer was approved by the American FAD Organization, and to examine its reliability, the blood pressure of 10 people at a time interval of 15 min without changing their position (wrist position was in parallel with the heart) was measured by control the main Sphygmomanometer and it was confirmed a correlation coefficient of 0.85. The KT/V (Clearance time/volume) index is a non-unit ratio, showing the ratio of volume of cleared plasma on the volume of distribution of urea during the duration of dialysis. Based on National Kidney Foundation (NKF-DOQI) in 2015, the target value of KT/V for a person with three times of dialysis per week is 1.4 and at least 1.2 is acceptable [16]. Then, the control group received only routine educations, while the intervention group, in addition to routine educations, received combined education, including individual education and group education in the form of lectures and educational pamphlets during 4 sessions. The used educational content was

prepared by using authoritative scientific resources and approved by ten experts of kidney disease and nutrition (Table 1). Two months after the intervention, blood pressure and dialysis adequacy were re-assessed in two groups. Then, SPSS 22 software was used to analyze the data and t-test with a significant level less than 0.05 was used.

It should be noted that in order to answer the questions on intervention, the samples were examined each week by phone call and educational pamphlet was given for control group subjects after the completion of the intervention in order to observe the ethical principles of research.

Session	Educational content
Session 1 (Individual)	Educational needs assessment
	Stating the role of diet and fluids in hemodialysis and blood pressure control
Session 2 (Group)	Stating the complications of lack of control of blood pressure and its role in hemodialysis
Session 3 (Individual)	Stating the importance of compliance with the medicinal diet
Session 4 (Group)	Educating the care through vascular access paths and its importance
	Stating the importance of aerobic and anaerobic exercises in hemodialysis

Table 1: Educational content

Results

Out of the 34 patients who were examined in the intervention group, 6 people were male and 11 people were female, and in the control group, 7 people were male and 10 people were female. There was no significant difference between the studied groups in terms of gender. The mean age of the patients was 46.3 and 45.7 years in the intervention group and in the control group, respectively, and no significant difference was found between the two groups in terms of age.

Based on the research results, the mean of systolic blood pressure in the intervention group was 129.89 (20.8) at the start of the study, while it was reduced to 112.34 (15.88) after two months, which this difference was significant based on the paired t-test. In the control group, the mean systolic blood pressure was 137.22 (20.57) at the start of the study and 144.01 (16.02) after two months, which significant difference was not seen in this group.

The mean diastolic blood pressure in the intervention group was 74.68 (10.78) at the start of the study and 74.23 (8.65) after 2 months, which this difference was significant based on the paired t-test. In the control group, the mean diastolic blood pressure was 77.00 (8.90) at the start of the study and 83.00 (7.87) after 2 months and this difference was not significant (Table 2).

Based on the results, the mean systolic and diastolic blood pressure in the intervention group and the control group showed significant difference after 2 months based on the independent t-test (P< 0.05).

The mean of adequacy of dialysis in the intervention group was 1.13 (0.35) at the start of the study and 1.28 (0.36) after 2 months, which this difference was significant. In the control group, the mean

adequacy of dialysis was 1.09 (0.27) at the start of the study and 1.08 (0.29) after two months, which this difference was not significant (Table 3). The mean of adequacy of dialysis in the intervention group and the control group after 2 months showed significant difference based on the independent t-test (P<0.05).

Systolic Blood Pressure				Diastolic Blood Pressure			
Group	Before Intervention Mean (SD)	After Intervention Mean (SD)	Test Result	Before Intervention Mean (SD)	After Intervention Mean (SD)	Test Result
Intervention (Combined Education)	129.89 (20.8)	112.34 (15.88)	0.001	74.68 (10.78)	74.23 (8.65)	0.001
Control	137.22 (20.57)	144.01 (16.02)	0.08	77.00 (8.90)	83.00 (7.87)	0.56

Table 2: Comparison of systolic and diastolic blood pressure index in intervention and control groups before and after intervention.

Groups	Mean and standard deviation of dialysis adequacy		Test result
Intervention (combined education)	Before intervention	After intervention	0.007
	1.13 (0.35)	1.28 (0.36)	
Control	1.09 (0.27)	1.08 (0.29)	0.06

Table 3: Comparison of adequacy of dialysis index in intervention and control groups before and after intervention.

Discussion

In this research, the implementation of combined education reduced systolic and diastolic blood pressure in patients of intervention group compared to the control group (this reduction in blood pressure means the placement of blood pressure in the standard range recommended and none of the patients experienced blood pressure drop lower than normal level). Low blood pressure during dialysis is one of the problems of hemodialysis patients. In addition, with increasing weight of these patients, the blood pressure is also increasing. With providing education for patient and personnel, the blood pressure of these patients can be controlled and returned to normal status. The research conducted by Jafari et al. [9] in 2014 showed that food diet education reduced systolic and diastolic blood pressure in hemodialysis patients [9]. The consistency in results of the mentioned research and those of our research might be due to similarity in the educational content of the food diet.

The results of this research also showed that the adequacy of dialysis after the implementation of combined education in the intervention group was increased compared to that in the control group. A research conducted by Saei et al. [15] in 2012 showed that combined education using a follow-up care model improved the adequacy of dialysis in the intervention group. The reason for consistency of results might be due to the use of similar educational content in the food diet, recommended exercises, and care of vascular access. In a research conducted in 2002, Talebi Pour et al. [17] also showed that food education improved dialysis adequacy in the intervention group. The reason for the consistency of the results of this research and those of our research might be due to similarity in educational content of the food diet. The research conducted by Mohseni et al. [18] in 2013 and the research conducted by Parson et al. [19] in 2006 showed that adding exercise to the educational program of dialysis patients improved the adequacy of dialysis in patients. The reason for consistency of the results of these studies might be due to the exercise itself. Exercise can increase the permeability of the cell membrane into water-soluble molecules and blood flow to active muscles and open capillaries, and cause more withdrawal of waste and excreted substances from the tissue to vessels and thereby improve the adequacy of dialysis [20]. The research conducted by Reddy et al. showed that nutritional education did not significantly caused variations in adequacy of dialysis in the intervention group [21]. Perhaps the reason for not matching the results of this study with the present study is to evaluate the adequacy of dialysis 1 month after intervention (short duration). The research showed that educational program along with exercise during the hemodialysis caused significant changes in improving the dialysis adequacy [20]. The reason for consistency of results of this research and those of present research might be due to examining the adequacy of dialysis one month after the intervention (short period). In the current research, patients with history of 6 months of hemodialysis were included, but in the mentioned research, patients with history of three years of hemodialysis were included. In the current research, it was impossible to use the same dialysis machines to assess the adequacy of dialysis, which could affect the research results and this is considered as limitation of the research.

Conclusion

The research results showed that providing combined education for hemodialysis patients can improve the blood pressure and dialysis adequacy. Given the important role of nurses in educating the patients, it is recommended for them to use combined education methods to improve the quality of life of patients.

Acknowledgements

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