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THE ENERGY CONSERVATION STRATEGIES CAN IMPROVE SELF CARE MANAGEMENT OF CHRONIC KIDNEY DISEASE PATIENTS WITH HEMODIALYSIS

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ABSTRAC

Chronic Kidney Disease (CKD) is one of the health problems in the world, with a prevalence of around 13.4% (11.7-15.1%), and end-stage kidney disease (ESKD) patients who require kidney transplant therapy are around 4,902 to 7,083 million. One of the treatments for CKD is hemodialysis. Hemodialysis is a treatment action performed on CKD patients in order to survive. However, these actions have side effects on the physical and psychological conditions of patients with CKD. To prevent the more severe impact of hemodialysis, CKD patients on hemodialysis require self care management including: diet monitoring, stress management, safe activities, good lifestyle, and medication monitoring. Self care management of CKD patients can be improved through the implementation of energy conservation strategies. Through this strategy, the patient will be empowered to be independent when carrying out their daily activities by carrying out the energy saving process, with prior teaching on the implementation of the energy conservation strategy itself. This study aims to knowing the effect of implementing energy conservation strategies on self care management of patients with chronic kidney disease with hemodialysis in the intervention group and the control group. This research is a quantitative research that uses a quasi-experimental method with a pre-test-post-test control group design approach. The number of samples was 32 people in the intervention group and 32 people in the control group. The type of bivariate analysis used is the dependent sample test (Paired t-test) and the independent t-test. Statistical test results obtained a p value of 0.010, it can be concluded that there is a significant difference between the value of self care management in the control group and the value of self care management in the intervention group after the energy conservation strategy was implemented.

Keywords: chronic kidney disease; energy conservation strategy; self care management

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INTRODUCTION

Chronic Kidney Disease (CKD) is a health problem in the world, with a prevalence of around 13.4% (11.7-15.1%), and end-stage CKD patients (ESKD) who require kidney transplantation therapy totaling around 4,902 to 7,083 million (Lv & Zhang, 2019). Based on the 2018 Riskesdas, the prevalence of chronic kidney failure based on a doctor's diagnosis in Indonesia was 2.0% in 2013 and experienced a significant increase of 3.8% in 2018 (Jawak et al., 2020). One of the functions of the kidneys is the production of erythropoietin, a signaling molecule that stimulates the production of red blood cells in response to reduced oxygen levels in the blood. Any disruption of this process, for example secondary to a functional disorder of chronic kidney disease, has the potential to cause anemia, a condition in which the number of circulating red blood cells is lower than normal (Fernando Rivera et al., 2016).

Dependence on dialysis machines for life, conditions of malnutrition and anemia that occur in dialysis patients result in fatigue that affects the function of daily life (Safruddin & Sri Asnaniar, 2020). The results showed that on average hemodialysis patients suffer from 14 side effects of hemodialysis with the three most common side effects being fatigue, itching and dry skin. The results also show that 78.3% of respondents have poor sleep quality, and there is a relationship between the side effects of hemodialysis and sleep quality (Oktavia, 2021). To prevent the more severe effects of hemodialysis, CKD patients with hemodialysis need self-care management including: monitoring of diet, stress management, safe activities, good lifestyle, and monitoring of medication. Most of the patients undergoing hemodialysis at Dr Soetomo Surabaya Hospital had moderate levels of self care management (Wijayanti, 2017).

Self-care management is important for CRF patients undergoing hemodialysis so that these results can be used to develop comprehensive health promotion and education about self-care management as an effort to increase the involvement and awareness of patients and families about adherence to their therapeutic treatment regimens. Self care management of CKD patients can be improved through the implementation of energy conservation strategies. Through this strategy, patients will be empowered to be independent when carrying out their daily activities by carrying out energy saving processes, by previously being given prior instruction on implementing the energy conservation strategy itself (Ritianingsih et al., 2019).

Conservation of energy makes work more efficient thereby reducing strain on the body and reducing the amount of energy needed to perform tasks. This helps to maintain a balance between rest and activity when energy levels are high so that meaningful activities can be carried out (Farragher, 2018). Energy conservation techniques with self-empowerment can also improve the quality of life of CKD patients (Ritianingsih et al., 2019). Based on this phenomenon, researchers are interested in conducting research on "The effect of implementing energy conservation strategies on self-care management of chronic kidney disease patients with hemodialysis".

METHOD

This research is a quantitative study using a quasi-experimental method with a pre-test – post-test control group design approach. This research was conducted in the hemodialysis room at PMI Hospital, Bogor City. The time of the research was from January to December 2022. The sampling technique used was purposive sampling, the number of research samples was 34 respondents to the intervention group and 34 respondents to the control group. How to Measure Self Care Management using the Hemodialysis Patients Self Care Measurement Scale instrument. The data collection process was carried out after the pre-conditions, respondents were selected according to the inclusion criteria and signed an informed consent form. The intervention group and the control group were measured for the value of self care management. Furthermore, the intervention group received teaching energy conservation techniques for 2 meetings (60 minutes) in the hemodialysis room, while the control group still received nursing care according to hospital standards and received an energy conservation strategy booklet. The intervention group carried out a conservation strategy at home for a month and filled out an energy conservation activity diary. After 4 weeks, a second measurement was carried out for each group. The results of each group were then compared. Data analysis used for univariate analysis of numerical data was performed by calculating the mean, median, standard deviation, minimum and maximum values. As for categorical data, it is done by calculating the frequency and percentage. Statistical tests for all analyzes were carried out with a significance level of 95% (alpha 0.05). The type of bivariate analysis used

is the dependent sample test (Paired t-test) and the independent t-test. A proper ethical statement has been issued under Number 03/KEPK/EC/VIII/2002.

RESULTS

Before being analyzed, the normality test of the pre-intervention self-care variable was carried out in the control group with a value of 0.109 and the intervention group with a value 0.809. This shows that the data is normally distributed with a p value > 0.05. Pre-intervention self-care variable homogeneity test 0.282. This shows that the data is homogeneous with a p value > 0.05. Bivariate analysis using t dependent test and independent t test.

Table 1
Frequency distribution of respondents based on gender and level of education (n=32)

Variable	Group	f	%
Gender	Control		
	Man	20	62,5
	Woman	12	37,5
	Intervention		
	Man	16	50,0
	Woman	16	50,0
Level of education	Control		
	Basic Education	3	9,4
	Middle Education	18	56,3
	Higher Education	11	34,4
	Intervention Basic Education	11	34,4
	Middle Education	12	37,5
	Higher Education	9	28,1

The results of the analysis were obtained from 32 respondents in the control group as many as 20 people (62.5%) were male, of 32 respondents in the intervention group there were 16 people (50%) were male and 16 people (50%) were male. female genital The results of the analysis were obtained from 32 respondents in the control group, 18 people (56.3%) with secondary education, of the 32 respondents in the intervention group, there were 12 people (37.5%) with secondary education

Table 2.
Frequency distribution of respondents based on age and length of illness (n=32)

Variable	Mean	SD	Min-Max	95% CI
Age				
Control	51,31	10,81	32-69	47,41-55,21
Intervention	50,41	11,86	26-78	46,13-54,68
Long sick				
Control	12,88	11,74	2-48	8,64-17,11
Interventin	19,91	10,91	7-48	15,97-23,84

For the control group, the results of the analysis showed that the mean age of the control group respondents was 51.31 years (95% CI: 47.41-55.21), with a standard deviation of 11.81 years. The youngest is 32 years old and the oldest is 69 years old. While the results of the analysis showed that the mean age of the respondents in the intervention group was 50.41 years (95% CI: 46.13-54.68), with a standard deviation of 11.86 years. The youngest is 26 years old and the oldest is 78 years old. For the control group, the results of the analysis showed that the mean duration of illness for the control group was 12.88 months (95% CI:

8.64-17.11), with a standard deviation of 11.74 months, length of illness between 2-48 months. While the results of the analysis showed that the mean duration of illness for the intervention group was 19.91 months (95% CI: 15.97-23.84), with a standard deviation of 10.91 years. Length of illness between 7-48 months.

Table 3.
Frequency distribution of respondents based on self-care management values of hemodialysis patients (n=32)

Variable	Mean	SD	Min-Max	95% CI
Selfcare pre Intervention				
Control	73,28	11,85	47-92	69,01-77,55
Intervention	76,19	9,43	53-96	72,79-79,59
Selfcare post Intervention				
Control	73,13	12,10	47-92	68,77-77,48
Intervention	80.00	8,11	60-94	77,08-82,,92

For the control group, the results of the analysis showed that the mean value of pre-intervention self-care management for the control group was 73.28 (95% CI: 69.01-77.55), with a standard deviation of 11.85, pre-intervention self-care between 47-92. While the results of the analysis showed that the mean pre-intervention self-care of respondents in the intervention group was 76.19 (95% CI: 72.79-79.59), with a standard deviation of 9.43. Selfcare pre intervention between 53-96. For the control group, the results of the analysis showed that the mean post-intervention self-care management score for the control group respondents was 73.13 (95% CI: 68.77-77.48), with a standard deviation of 12.10, post-intervention self-care between 47-92. While the results of the analysis showed that the mean pre-intervention self-care of respondents in the intervention group was 80.00 (95% CI: 77.08-82.92), with a standard deviation of 8.11. Post intervention selfcare management scores between 60-94.

Table 4.
Distribution of mean pre and post self care management scores in the control group (n=32)

Variable	Mean	SD	SE	P value
Self care management				
pre	73,28	11,85	2,09	0,903
post	73,13	12,09	2,14	

The mean value of pre-intervention self-care management in the control group was 73.28, with a standard deviation of 11.85. In the second measurement of the value of self-care management in the control group, the mean value of patient self-care management was 73.13 with a standard deviation of 12.09. The mean value of the difference between the first and second measurements of self-care management values is 0.156 with a standard deviation of 7.19. The statistical test results obtained a value of 0.903, so it can be concluded that there was no difference in the value of pre and post selfcare management in the control group.

Table 5.
Distribution of the mean scores of pre and post self care management in the interventio group (n=32)

Variable	Mean	SD	SE	P value
Self care management				
pre	76,19	9,43	1,67	0,035
post	80,00	8,11	1,43	

The mean value of pre-intervention self-care management in the intervention group was 76.19, with a standard deviation of 9.43. In the second measurement of the value of self-care

management in the intervention group, the mean value of patient self-care management was 80.00 with a standard deviation of 8.11. The mean difference between the first and second measurements of the self-care management score was 3.81 with a standard deviation of 9.77. The statistical test results obtained a value of 0.035, so it can be concluded that there are differences in the value of pre and post selfcare management in the control group.

Table 6.
Distribution of the mean value of self care management before energy conservation strategy intervention in chronic kidney failure patients (n=32)

Energy conservation strategy	Mean	SD	SE	P value
Control	73,28	11,85	2,09	0,282
	76,19	9,43	1,67	

The mean value of pre-intervention self-care management in the control group was 73.28 with a standard deviation of 11.85. In the first measurement of the value of self-care management before the energy conservation strategy was carried out in the intervention group, the mean value of patient self-care management was 76.19 with a standard deviation of 9.43. The results of the statistical test obtained a p-value of 0.282, so it can be concluded that there was no significant difference between the self-care management values of the control group and the self-care management values of the intervention group before the energy conservation strategy was carried out.

Table 7.
Distribution of the mean value of self care management after energy conservation strategy intervention in patients with chronic kidney failure (n = 32)

Energy conservation strategy	Mean	SD	SE	P value
Control	73,13	12,09	2,14	
	80,00	8,11	1,43	0,010

The mean value of self-care management after intervention in the control group was 73.13 with a standard deviation of 12.09. In the first measurement of the value of self-care management after the energy conservation strategy was carried out in the intervention group, the mean value of patient self-care management was 80.00 with a standard deviation of 8.11. The statistical test results obtained a p-value of 0.010, so it can be concluded that there was a significant difference between the self-care management value of the control group and the intervention group's self-care management value after the energy conservation strategy was carried out.

DISCUSSION

Gender

The results of the analysis were obtained from 32 respondents in both the control group and the intervention group, the number of male sex was greater than the female sex. The results of the same study were also found where of the 89 respondents who underwent hemodialysis, the majority of respondents were male (52.8%) compared to female (47.2%) (Ipo & Aryani, 2016). Men are more susceptible due to a lack of volume in urine or an excess of natural compounds containing calcium, influenced by hormones, physical condition and activity intensity. Narrower urinary tract causes more frequent blockages. Men's lifestyle patterns l habits of smoking and drinking alcohol also affect. Alcohol carcinogens that are filtered out of the body through the kidneys change DNA and damage kidney cells so that it affects kidney function (Hartini, 2016).

Level of education

The education level of the respondents in both the control and intervention groups was mostly secondary education. This is in line with other research which states that 50% of CKD patients have secondary education (Jawak et al., 2020). There is a relationship between education level, knowledge and family support with adherence to limiting fluid intake in CKD patients undergoing hemodialysis (Umayah 2016).

Age

The mean age of the respondents was 50.41 years. This result is in line with previous research, that is, from 30 responses of CKD patients, 36.7% were in the age range above 50 years. Age and race are important risk factors for anemia in CKD patients. The prevalence of anemia is greater in those older than 60 years, compared with those aged between 46 and 60 years (Fernando Rivera et al., 2016).

Long sick

The average length of illness for respondents was 19.91 months with a duration of illness between 7-48 months. This result is in line with previous research, namely that of 120 respondents, the average length of illness for CKD patients was in the range of 3 to 5 years (Satria Hadi, 2016.)

Self Care Management

The mean value of pre-intervention self care management for the control group respondents was 73.28. Meanwhile, the average pre-intervention selfcare respondent in the intervention group was 76.19 (high self-care management). The mean post-intervention self-care management score of the control group respondents was 73.13 while the pre-intervention self-care management mean of the intervention group respondents was 80.00 (high self-care management). Self care management of patients with chronic kidney disease undergoing hemodialysis at RSUD Dr. Most of Soetomo Surabaya (53.8%) have reached the moderate category (Wijayanti, 2017). Hemodialysis causes the appearance of physical, mental and social problems in patient. Likewise with psychiatric disorders such as anxiety, depression, fatigue, and dizziness which involve these patients causing a loss of motivation and desire to do activities in them (Royani 2013). The ability of self-care management in CKD patients is influenced by factors; age, gender, developmental conditions, health conditions, socio-cultural orientation, health care system, family system factors, lifestyle, environmental factors, available resources (Nurcahyanti, 2016).

Bivariate analysis

The results of the statistical test obtained a p value of 0.282, so it can be concluded that there was no significant difference between the self care management value of the control group and the self care management value of the intervention group before the energy conservation strategy was carried out. The results of the statistical test obtained a p value of 0.010, so it can be concluded that there was a significant difference between the self care management value of the control group and the self care management value of the intervention group after the energy conservation strategy was carried out. Kidney failure is caused when most of the nephrons (including the glomeruli and tubules) are damaged. Intact nephrons will experience hypertrophy and the volume of filtration and reabsorption will increase even though there is a decrease in the glomerular filtration rate, the load of material that must be dissolved becomes greater than what can be reabsorbed (Lemone et al., 2015).

Self-care is defined as a person's activities to initiate and demonstrate with self-awareness to maintain life, function health, continue self-development and well-being by finding the need for regulation of its function and development (Queirós et al., 2014). Self care management is important to note for CKD patients as an effort to increase the involvement and adherence of patients and families in their therapeutic regimen (Arova, 2014). Self care management has several advantages, namely: improving coping or adjustment to disease, increasing a sense of well-being, improving control symptoms, reducing the risk of complications, increasing control and autonomy, and improving body function (Mahmoud & Abdelaziz, 2015). Energy conservation techniques with self-empowerment can be given to CRF patients with the aim of increasing energy, reducing fatigue and increasing quality of life. 8 Implementation of energy conservation techniques strategies can be given to CRF patients with the aim of increasing energy, reducing fatigue and increasing patient self-care management abilities.

CONCLUSION

There was a significant difference between the value of self care management in the control group and the value of self care management in the intervention group after the energy conservation strategy was implemented (p value = 0.010)

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