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ORIGINAL RESEARCH

THE EFFECT OF THE ESNE (EDUCATION STRUCTURED NUTRITION AND ELECTROLYTE) METHOD ON IDWG CHANGES IN CHRONIC KIDNEY FAILURE PATIENTS

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ABSTRACT	Keywords
Chronic kidney disease is a condition when kidney function begins to decline gradually. The condition of the decline in kidney function occurs due to many factors, one of which is because the kidney damage that has occurred intensely for many years. Patients with chronic renal failure need a management or hemodialysis therapy, which is the cleansing process of blood from waste substances, through a screening process outside the body using an artificial kidney in the form of a dialysis machine. Hemodialysis therapy is needed in the management of patients with chronic renal failure who cannot be treated again (terminal). The success of hemodialysis is based on various elements, one of which is compliance with fluid restrictions. Limitation of fluid intake in patients with chronic renal failure is very important. The provision of structured education can be given to patients with chronic kidney failure who are undergoing hemodialysis therapy. Education structured nutrition and electrolyte (ESNE) is a structured health education on nutrition and electrolyte management for chronic renal failure patients undergoing hemodialysis. ESNE is done to improve patients' understanding of diet and electrolyte compliance to prevent an increase in IDWG and to improve patient compliance with fluid restrictions. The stages of service activities that have been carried out are to explain fluid requirements and fluid restriction in patients with chronic renal failure using the Education structured nutrition and electrolyte (ESNE) method, the next recourse is an evaluation after continuous or ESNE administration of respondents given treatment and respondents who were not treated.	**Diet, Chronic Kidney Disease, Hemodialysis**

PRELIMINARY

Patients with chronic renal failure need a management or hemodialysis therapy, which is the cleansing process of blood from waste substances, through a screening process outside the body using an artificial kidney in the form of a dialysis machine. Hemodialysis therapy is needed in the management of patients with chronic renal failure who cannot be treated again terminalIn 2013 in Indonesia, a total of 150,000 patients with chronic kidney failure performed hemodialysis therapy, and according to the ministry of health, more than 2 trillion rupiahs of BPJS funds were spent to finance hemodialysis during 2014(Denhaerynck, K., Manhaeve, D., Dobbles, F., Garzoni, D., Notle, C., Degeest, 2007).

During 2015 there were 1,243 people died because of undergoing hemodialysis therapy (Center for Data and Information of the Indonesian Ministry of Health, 2017). From the results of a preliminary study at the Sakinah Islamic Hospital in Mojokerto, there are some chronic kidney failure patients undergoing hemodialysis who have increased weight. The results of the study showed that patients did not know the cause of weight gain in a fast time (between dialysis or 2-3 days). According to in his research, shows that the success of hemodialysis is based on elements that are diverse such as adherence to fluid restrictions, routine hemodialysis, patient health management, and patient empowerment. Limitation of fluid intake in patients with chronic renal failure is very important. Excessive fluid intakes can cause severe increases (exceeding 5%) and cause clinical manifestations such as edema, tightness, and hypertension (Smeltzer, S.C., Bare, B.G., Hinkle, J.L., Cheever, 2002).Interdialytic weight gain (IDWG) is an increase in fluid volume that can be manifested as an increase in body weight. This increase in body weight is an indicator to determine the fluid entering during the interdialysis period and to show patient compliance with fluid restrictions. IDWG which increases more than 5% of dry BB can cause several complications of diseases such as ascites, left heart failure, Pru edema, pleural effusion, and intradialytic hypotension. The value that can be tolerated from IDWG is 0.9-1.3 Kg and many various factors influence the IDWG, including internal factors (age, education level, stress, thirst, and self-efficacy) and external factors (knowledge, motivation, and family support).

RESEARCH METHODOLOGY

The research design used in this study is a pre-experimental method with a type of post-test with control group design (queasy experiment with control) or referred to as a quasi-experiment namely experimental design using a control group but the control group is not fully functional to control the

external variables that can influence it. (the researcher did the respondent as an experimental group)(Hidayat, 2012).

The researcher intervened in the form of education structured nutrition and electrolyte to determine its effect on changes in interdialytic weight gain in patients with chronic renal failure undergoing hemodialysis. Differences that exist in the control group and intervention group are an assumption of the effects of the intervention carried out. This is in accordance with the aim of the researcher, namely to find out the effectiveness in giving the education. In this study, observations were made twice in the control group and in the Arikunto intervention group, 2010) (Arikunto, 2006)

The population in this study were all patients undergoing hemodialysis at Sakinah Mojokerto Hospital. Samples are objects that are studied and are considered to represent the entire population (Notoatmodjo, 2010). Samples consist of parts of an affordable population that can be used as a sub-research subject through sampling (Nursalam, 2009).The sampling technique in this study uses probability sampling techniques with a simple random sampling approach.

Inclusion Criteria

1. Conscious awareness

2. Implement hemodialysis therapy twice a week

3. Age> 18 years

4. Average IDWG increase> 1.3 Kg (3 times consecutive hemodialysis)

5. Able to communicate effectively

6. Able to read and write

Sample size:

$n1 = \dfrac{N.z2.p.q}{d2\ (N-1) + z2.p.q}$

$= \dfrac{39 \times (1.96)\ 2 \times 0.5 \times 0.5}{(0.05)\ 2 \times (39 - 1) + (1.96)\ 2 \times 0.5 \times 0.5}$

$n = \dfrac{37,4556}{1.0554}$

n = 35.49 rounded to 36

Information:

n = estimated sample size

N = estimated population size

Z = normal standard value for $\alpha = 0.05$ (1.96)

P = approximate proportion, if unknown is considered 50%

q = 1 - p (100% - p)

d = The chosen error rate (d = 0.05).

The dependent variable in this study is the change in interdialytic weight gain in patients with chronic renal failure undergoing hemodialysis. While the independent variable is education structured nutrition and electrolyte. In addition to the dependent and independent variables, there are confounding variables including age, level of education, motivation, knowledge, and periods of hemodialysis.

The time of research is starting in August-October 2017 in RSI Sakinah Mojokerto

Data Collection Tool

The data collected in this study uses a weighing scale, a motivation and knowledge questionnaire, and a questionnaire on the demographic characteristics of the respondents.

Research instrument :

1. KaraketristikDemografi Patient Questionnaire

   Questionnaires of respondents' characteristics in this study included age, education level, and hemodialysis period.

2. Motivational instruments are used to measure the motivation of patients undergoing hemodialysis therapy and efforts to prevent complications as well as adherence to recommended fluid intake. These instruments consist of 20 items of questions using the Likert scale namely 1) strongly disagree (STS); 2) disagree (TS); 3) doubt (R); 4) agree (S); 5) Strongly agree (SS) The assessment score on this instrument is 20-100 and categorized into 3, namely lack motivation (<60), moderate motivation (60-80), and good motivation (> 80). before respondents get research intervention.

3. Knowledge instruments to determine the level of knowledge of patients on hemodialysis which includes the definition,

complications, and diet of food and beverages. These instruments consist of 20 items of questions using the Likert scale, namely 1) strongly disagree (STS); 2) disagree (TS); 3) doubt (R); 4) agree (S); 5) Strongly agree (SS) The assessment score on this instrument is 20-100 and categorized into 3, namely less knowledge (<60), moderate knowledge (60-80), and good knowledge (> 80). before respondents get research intervention.

Research Intervention

1. Researchers and research members (2 people) conducted data collection in the SakinahMojokerto RSI hemodialysis unit by identifying prospective respondents by looking at the patient's medical record data according to the prescribed inclusion criteria.

2. Data collection is done before the patient undergoes hemodialysis (pre-test), during hemodialysis (education is done), and after hemodialysis (post-test). Prospective respondents who are in accordance with the criteria are asked to fill in the consent form to become respondents.

3. After the respondent signs the approval sheet, the researcher explains the purpose of the study. The pre-test conducted was weighing the patient's BB when dating and

filling out the questionnaire of respondents' characteristics, motivation, and knowledge.

4. Intervention (ESNE) is carried out when the patient is undergoing hemodialysis in the RSI SakinahMojokerto hemodialysis unit which takes about 30 minutes (procedure attached in the form of SAP)

5. After the respondent runs hemodialysis (post-hemodialysis), the researcher measures BB to dry the patient and document it

6. During the activity, no respondent experienced complaints such as tightness, fatigue

7. Data obtained (questionnaires and others) were collected back to the researcher and the researcher saw the completeness of the instrument. If there is something incomplete, the researcher immediately asks the respondent to complete the data.

8. After the data collection is complete, the researcher analyzes the data using statistical tests

Data analysis consists of editing, coding, scoring, tabulating,data entry, cleaning data and statistical tests. The statistical test in this study consisted of Univariate Analysis of Bivariate Analysis Analysis of Repeated Measure ANOVA

Table 1. Distribution of Respondents by IDWG in the Intervention and Control Groups Before and After ESNE

Variabel	Kelompok	Pengukuran	Mean	Median	SD	Min-Maks	95% CI Lower-Upper
IDWG	Intervensi	1	1,57	1.25	0.84	0,40-3,20	1,15-1,98
		2	1,75	1,65	0.74	0,06-3,20	1,30-2,12
	Kontrol	1	2,07	2.10	0.62	0,80-3,20	1,76-2,38
		2	2,06	1.90	0.78	0,70-3,80	1,67-2,44

RESEARCH RESULT

showed a change in mean IDWG in the intervention group before and after ESNE was given. The mean IDWG measurement 1 after the intervention was given was 1.57 Kg with a standard deviation of 0.84 and the mean IDWG measurement 2 was 1.75 Kg with a standard deviation of 0.74 Kg.

Table 2. Analysis of the Difference of IDWG of Respondents Before and After ESNE in the Intervention and Control Groups

Variable	Type Group	n	Mean±SD	Diferent Mean	95% CI Lower	95% CI Upper	p-value
	Measurement 1						
IDWG	Intervensi	18	1,57±0,84	-0,50	-0,95	-0,05	0,030
	Control	18	2,07±0.62				
	Measurement 2						
	Intervensi	18	1,75±0,74	-0,31	-0,86	0,25	0,263
	Kontrol	18	2,06±0,78				

showed that the difference in mean IDWG 1 measurements between the intervention and control groups was -0.50 Kg with the mean intervention group 1.57 Kg and the standard deviation of 0.84 Kg. the control group

means was 2.07 Kg with a standard deviation of 0.62 Kg. The results of the further analysis showed that there were no significant differences in the IDWG 2 measurements in the intervention group and the control group (PV = 0.263; α <0.05).

Table 3. Repeated ANOVA Test Results Analysis in the Intervention and Control Groups

IDWG Intervention Group	Mean±SD	P value
Measurement1	1,57±0,84	0,027
Measurement2	1,75±0,74	
IDWG Control group	**Mean±SD**	*P value*
Measurement 1	2,07±0.62	0,906
Measurement2	2,06±0,78	

showed that there were significantly 2 different measurements in the intervention group (pv = 0.027; α <0.05). Whereas in the control group there was no significant difference in the 2 measurements (pv = 0.906; α <0.05).

DISCUSSION

1. Motivation and Knowledge of patients with Chronic Kidney Failure

Based on table 4.1 Respondents who had moderate hemodialysis motivation in both groups were 19 respondents (52.7%), respondents with good motivation as many as 14 respondents (39.0%), and respondents with less motivation as many as 3

respondents (8.3%). Respondents with a moderate level of knowledge about hemodialysis were 18 respondents (50.0%), respondents with a good level of knowledge were 11 respondents (30.6%), and respondents with less knowledge level were 7 respondents (19.4%). External factors affecting the IDWG is motivation and knowledge, (Kugler, C., Valminck, H., Haverich, A., Maes, 2005). According to mentioning the motivation of someone in carrying out an action is influenced by several factors, namely: 1) Gender, people who are selfish and indulgent, in women usually will be less sensitive in accepting the motivation given so it is rather difficult to cooperate. 2) Level of education, someone who has a higher level of education will usually be more motivated because they already have broader insights than someone who is lower in their level of education. 3) Personal desires and expectations, Someone wants to work hard if there is a personal expectation manifested into a reality.4) Needs, the greater one's needs to be fulfilled, the greater the person's motivation to work hard.5). Fatigue and boredom, affect the passion and morale that in turn will also affect motivation. 6) Environment, all the facilities,and infrastructure around our homes that can affect activities include cleanliness, lighting, tranquility, including relationships between people in the environment **(Black, J.M, Hawks, 2009).** Based on the results of the study

shows that the majority of respondents with male sex in the intervention group and the control group were 21 respondents (58.3%). The proportion of the marital status of the respondents who were mostly married was 33 respondents (91.7%). Respondents with elementary education level as many as 15 respondents (41.6%), respondents with junior high school education level as many as 14 respondents (38.8%), respondents with high school education level Motivation and knowledge of patients with chronic kidney failure influenced by as many as 19 respondents (19 , 6%).

2. Hemodialysis and age period

The results of the analysis are based on table 4.2 The average length of undergoing the intervention group hemodialysis is 11.89 years with a standard deviation of 9.92 years. The interval estimation can be concluded that 95% is believed that the duration of hemodialysis intervention group is between 3.00 to 48 years. While the mean hemodialysis duration of the control group was 6.33 years with a standard deviation of 3.63 years. The interval estimation can be concluded that 95% is believed that the duration of the hemodialysis control group is between 1.00 and 12.00. It shows that the age of the intervention group is 46.00 years with a standard deviation of 10.39 years. The interval estimation can

it was concluded that 95% were believed that the age of the intervention group was between 24.00 and 67.00 years. While the

average age of the control group was 56.22 years with a standard deviation of 9.38 years. There is an interval estimate that is 95% believed that the age of the control group is between 42.00 and 79.00 years. IDWG is an increase in fluid volume which is manifested by an increase in body weight as a basis for knowing the amount of fluid entering during the interdialytic period (between two sessions dialysis).According to (Wong, M. M. Y., McCullough, K. P., Bieber, B. A., Bommer, J., Hecking, M., Levin, N. W., ... Robinson, 2017).IDWG that can be tolerated by the body is no more than 3% of dry weight. According to (Denhaerynck, K., Manhaeve, D., Dobbles, F., Garzoni, D., Notle, C., Degeest, 2007). IDWG can be classified based on the percentage increase in patient weight, where IDWG is said to be mild if weight gain <4%, moderate IDWG if weight gain is 4-6%, and IDWG is heavy if weight gain > 6%. (Kugler, C., Valminck, H., Haverich, A., Maes, 2005). Classified the addition of body weight into 3 groups, namely mild 2%, moderate 5%, and weight 8%. Various factors affecting IDWG include factors from the patient itself (internal) and external factors such as physical and psychosocial factors. According to..(Özdemir, F. N., Akçay, A., Elsurer, R., Sezer, S., Arat, Z., & Haberal, 2005).The factors that influence interdialytic weight gain are

1. Fluid intake, fluid intake plays an important role in increasing interdialytic weight. The results of the study conducted state that there is a significant relationship between fluid intake and weight gain where more fluid input increases the interdialytic body weight. The percentage of water in the human body is 60%, where a healthy kidney will excrete and reabsorption of water to balance blood osmolality. Whereas in patients with chronic kidney disease who undergo hemodialysis, damage in the formation of urine can cause the excess volume of fluid in the body (Smeltzer, S.C., Bare, B.G., Hinkle, J.L., Cheever, 2002)

2. Thirsty, patients with CRF even with hypervolemic conditions, often experience excessive thirst. Responding to normal thirst is to drink, but CKD patients are not permitted to respond in a normal way to the thirst they feel. Thirst or desire to drink is caused by various factors such as sodium input, high sodium levels, decreased potassium levels, angiotensin II, increased plasma urea, post-dialysishypovolemia and psychological factors Family and social support are needed for patients. Family support can improve the quality of life of patients and relate to patient compliance to carry out therapy. Self Efficacy, namely the power that comes from someone who can issue positive energy through cognitive, motivational, effective, and selection processes. Self Efficacy can affect the patient's confidence in undergoing treatment (hemodialysis). High Self Efficacy is needed to bring motivation from within in order to

be able to adhere to therapy and control fluids properly, so as to prevent an increase in IDWG.Stress can affect the fluid and electrolyte balance in the body. Stress increases aldosterone and glucocorticoid levels, causing retention of sodium and salt. The stress response can increase fluid volume due to decreased cardiac output, blood pressure, and tissue perfusion. The fluid is one of the main stressors experienced by patients undergoing hemodialysis (Price, S.A., Wilson, 2006)The psychological impact of CRF patients who undergo HD can be manifested in a series of behavioral changes, including being passive, dependent, feeling insecure, confused, and suffering. Patients feel that they have lost their freedom, longevity, and sexual functioncan cause anger which eventually arises a state of depression(Bellomo, Coccetta, Pasticci, Rossi, & Selvi, 2015).

3. IDWG differences in the control and intervention groups

The results of the analysis based on Table 5.3 show a change in the mean IDWG in the intervention group before and after ESNE was given. The mean IDWG measurement 1 after the intervention was given was 0.84 Kg with a standard deviation of 1.25 and the mean IDWG measurement of 2 was 1.75 Kg with a standard deviation of 0.74 Kg. there were 2 different measurements in the intervention group (PV = 0.027; α <0.05). Whereas in the control group there was no significant difference in the 2 measurements

(PV = 0.906; α <0.05)(Cahyaningsih, 2009)stated that there was a significant relationship between fluid intake and weight gain was more fluid input then interdialytic weight more increasing. The most influential factor in increasing the initial dialysis is fluid intake. According to(Cahyaningsih, 2009)stress in hemodialysis patients can cause patients to stop monitoring fluid intake, some even stop

doing hemodialysis therapy, this incident can directly affect the IDWG.

CONCLUSION

There was a mean change in IDWG in the intervention group before and after the ESNE method was given. Based on the results of statistical tests showed that there were significantly 2 different measurements in the intervention group. Whereas in the control group there was no significant difference in the 2 measurements

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