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THE RELATIONSHIP BETWEEN THE LONG IN HEMODIALIZATION WITH STATUS OF EXCESS VOLUME OF LIQUID IN CHRONIC KIDNEY FAILURE PATIENTS

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Research Report

A B S T R A C T

Introduction: *Chronic kidney disease is a chronic disease that progresses damage to the kidneys which disrupts the body's fluid and electrolyte balance which affects all body systems. PGK is currently it is one of the many diseases that have become a concern in the world including in Indonesia. One phenomenon that often occurs is an increase in fluid volume between two times of dialysis. The purpose of this study was to find out the long relationship between hemodialysis and excess fluid volume status in patients with chronic renal failure in the Hemodialysis room at Ibnu Sina Gresik Hospital.* ***Methods:*** *This was an analytical study with a correlative analytic design. Data were collected by using the contingency coefficient.* ***Results:*** *That that older respondents underwent <1 year of hemodialysis with excess fluid status >2,5 BB post HD as much 81,2%, which is more dominant than patients who undergo > 1-year hemodialysis with excess fluid status >2,5 BB post HD as much 58% of the total resulting in p-value 0,103 where p>0,05 so it can be concluded that there is no long relationship to undergo hemodialysis with excess fluid volume status in patients with chronic kidney disease.* ***Conclusion:*** *It is expected that patients undergoing hemodialysis can be more obedient to the recommended diet so that it does not cause other complications and can improve the quality of life patients.*

A R T I C L E I N F O

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INTRODUCTION

Chronic Kidney Disease (CKD) is a chronic disease that progressively damages the kidneys so that it disrupts the body's fluid and electrolyte balance which affects all body systems. CKD is currently one of the most common diseases and is a concern in the world, including in Indonesia (Bayhakki & Hasneli, 2017). One of the phenomena that often occurs in patients with chronic renal failure is an increase in fluid volume between two dialysis times (Welch et al., 2006). Chronic kidney failure patients who undergo routine HD often experience excess fluid volume in the body, this is due to decreased kidney function in excreting fluids. Although patients with chronic renal failure at the beginning of undergoing HD have been given health education to reduce fluid intake for a day, at the next HD, patients often come with complaints of shortness of breath due to excess body fluid volume, which is an increase of more than 5% of the patient's dry body weight. (Kresnawan, 2001).

According to the latest data from the Ibnu Sina Hospital in 2018, it was stated that as many as 3,026 chronic kidney failure patients were undergoing hemodialysis therapy in the Hemodialysis room of the Ibnu Sina Gresik Regional General Hospital. In research Meiliana (2013) stated that 54% of patients undergoing HD in the HD room at Fatmawati Hospital had a history of fluid overload. In research (Aisara et al., 2018) mentioned that patients with CKD complained of symptoms such as lack of energy (76%), pruritus (74%), drowsiness (65%), dyspnea (61%), edema (58%). The problem of increasing fluid volume between two dialysis times occurs in patients at dr. M. Djamil Padang, from the observations of 13 people who underwent hemodialysis 7 patients came with weight gain of more than 5% and came with complaints of shortness of breath, 4 people experienced a weight gain of 4% and 2 people experienced a weight gain of 2% (Suryaningsih, 2010).

Several specific factors that cause an increase in the fluid between two dialysis times include factors from the patient himself, and also the family as well as several psychosocial factors that are very influential including demographic factors, fluid intake or fluid diet, thirst, social support, self-efficacy and stress (Sonnier, 2000). Weight gain between two dialysis times is also influenced by several factors, namely: environmental, nutritional, physiological, and psychological (Hwang et al.,

2007). One of the treatment options for CKD patients is hemodialysis (HD). Hemodialysis is carried out to remove metabolic wastes or certain toxins from the human blood circulation, such as excess urea, creatinine, uric acid, and other substances through a semipermeable membrane. Hemodialysis is believed to increase the survival or survival of CKD patients (Widianti et al., 2017).

The survival ability of CKD patients undergoing hemodialysis is influenced by various factors, such as the severity of the disease experienced, the condition of various body systems that are disturbed by toxins due to CKD, regulation of fluid and food intake, adherence to the hemodialysis schedule (Wijayanti et al., 2017). There are hemodialysis patients who do not survive long, but there are also those who survive for years to live by undergoing hemodialysis (Wahyuni et al., 2014). Approximately 60% to 80% of hemodialysis patients die from fluid overload (Istanti, 2014). The increase in fluid volume between two dialysis times can cause new problems in patients including hypertension, hypotension, impaired physical function, shortness of breath, pulmonary edema which can increase the possibility of hemodialysis emergencies, increase the risk of ventricular dilatation, and hypertrophy and heart failure (Suryaningsih, 2010). In addition, people receiving hemodialysis who do not comply with fluid restrictions resulting in the excess fluid are at risk of premature death (Welch et al., 2006).

CKD patients undergo hemodialysis two to three times a week, where each time hemodialysis takes an average of four to five hours. (Rahman et al., 2016). In patients with different lengths of time undergoing hemodialysis. the longer undergoing HD, the higher the potential for complications that can hinder adherence to the therapy program. On the other hand, the duration of hemodialysis also provides an opportunity for the patient to be more adaptable to the therapy program that he has been undergoing so that it affects the patient's fluid status between two dialysis times or called IDWG. How to calculate IDWG is calculated in a one-week cycle period undergoing hemodialysis using a scale and recorded on an observation sheet, where in one week all respondents undergo hemodialysis twice. IDWG is calculated by means after the first hemodialysis is completed, then the patient's weight is weighed and recorded. Then before the second hemodialysis begins, the patient's weight is weighed again and then the difference is calculated with the weight after the first hemodialysis, based on the IDWG value is said to be mild if < 2.5%, moderate if 2.5% - 3.5%, and heavy if >3.5%.

MATERIALS AND METHODS

This study used a correlative analytic design with a population of all patients suffering from chronic kidney failure who underwent hemodialysis therapy in the Hemodialysis room of RSUD Ibnu Sina Gresik as many as 81 patients. Gresik with a sample of 67 patients. The sampling technique in this study used the Simple Random Sampling technique. The independent variable of the study was the length of time undergoing hemodialysis and the dependent variable was fluid status. Collecting data using a duration hemodialysis questionnaire and weight observation using a scale. The statistical test used is the contingency coefficient with a value of 0.05.

RESULTS

Characteristics of respondents by age

Table 1. Distribution of Data by Age of Respondents in the Hemodialysis Room of RSUD Ibnu Sina Gresik

Age	Amount	Percentage (%)
< 40 year	16	23,9
40-50 year	25	37,3
> 50 year	26	38,8
Total	67	100

Based on table 1 shows that almost half of the respondents (38.8%) are >50 years old, and a small portion (23.9%) are <40 years old.

Characteristics of respondents by gender

Table 2. Distribution of Data by Gender of Respondents in the Hemodialysis Room of RSUD Ibnu Sina Gresik

Gender	Amount	Percentage (%)
Male	33	49,3
Female	34	50,7
Total	67	100

Based on table 2 shows that the distribution by gender, the number of males and females is almost the same with each female (50.7%), and male (49.3%).

Characteristics of respondents based on education level

Table 3. Distribution of Data Based on the Education Level of Respondents in the Hemodialysis Room of RSUD Ibnu Sina Gresik

Qualification	Amount	Percentage (%)
Not completed in primary school	6	9
Primary school	24	35,8
Junior high school	12	17,9
Senior High School	16	23,9
University	9	13,4
Total	67	100

Based on table 3 shows that the distribution by education level is almost half of the respondents (35.8%) with elementary school education, and a small portion (9%) did not finish elementary school.

Characteristics of respondents by occupation

Table 4. Distribution of Data Based on Respondents' Occupations in the Hemodialysis Room of RSUD Ibnu Sina Gresik

Work	Amount	Percentage (%)
Does not work	42	63
Farmer	7	10
Government employees	2	3
Private sector	16	24
Total	67	100

Based on table 4, it shows that the distribution of respondents by occupation is almost 63% not working, and a small proportion (3%) are civil servants.

Characteristics of respondents based on marital status

Table 5. Distribution of Data Based on Respondents' Marital Status in the Hemodialysis Room of RSUD Ibnu Sina Gresik

Marital status	Amount	Percentage (%)
Not married yet	1	1,5
Married	60	89,5
Widow/widower	6	9
Total	67	100

Based on table 5 shows that the distribution of respondents based on marital status, almost all (89.5%) are married and a small proportion (1.5%) are unmarried from the total.

Characteristics of respondents based on family support

Table 6. Distribution of Data Based on Respondents' Family Support in the Hemodialysis Room of RSUD Ibnu Sina Gresik

Family Support	Amount	Percentage (%)
Husband/wife	51	76
Child	16	24
Others	0	0
Total	67	100

Based on table 6 shows that the distribution based on family support is almost all (76%) cared for by husband/wife and a small portion (24%) is cared for by their children.

Characteristics of respondents based on comorbidities

Table 7. Distribution of Data Based on Respondents Comorbid Diseases in the Hemodialysis Room of RSUD Ibnu Sina Gresik

Co-morbidities	Amount	Percentage (%)
Hypertention	35	52
Diabetes Mellitus	7	10
Gout	4	6
Hypertention + Diabetes	12	19
No co-morbidities	9	13
Total	67	100

Based on table 7 shows that the distribution based on comorbidities almost half (52%) have comorbid hypertension, a small proportion (6%) have comorbid uric acid of the total.

Characteristics of respondents based on fluid intake for 24 hours

Table 8. Distribution of Data Based on Respondent's Fluid Input for 24 Hours in the Hemodialysis Room of RSUD Ibnu Sina Gresik

Liquid 24 hours	Amount	Percentage (%)
< 300 ml	8	12
300-500 ml	16	24
> 500 ml	43	64
Total	67	100

Berdasarkan tabel 8 menunjukkan bahwa distribusi berdasarkan masukan cairan selama 24 jam hampir seluruhnya (64%) masukan cairan >500 ml dan sebagian kecil (12%) masukan cairan < 300 ml.

Special Data

Table 9. Distribution of Data Based on Length of Respondent's Hemodialysis in the Hemodialysis Room of RSUD Ibnu Sina Gresik

Old HD	Amount	Percentage (%)
< 1 year	24	36
> 1 year	43	64
Total	67	100

Based on table 9, it shows that the distribution according to the length of time undergoing hemodialysis is almost entirely (64%) undergoing hemodialysis >1 year.

Status of excess fluid volume

Table 10. Distribution of Data Based on the Status of the Excess Fluid Volume of Respondents in the Hemodialysis Room of RSUD Ibnu Sina Gresik

Excess Fluid Volume	Amount	Percentage (%)
<2,5% BB Pasca HD	16	24
>2,5% BB Pasca HD	51	76
Total	67	100

Based on table 10 shows that the distribution based on excess fluid volume is almost entirely (76%) i.e. > 2.5% BW after hemodialysis.

Long-term relationship with hemodialysis with excess fluid volume status

Tabel 11. Tabulation Results Between Length of Undergoing Hemodialysis and Status of Excess Fluid Volume in the Hemodialysis Room of RSUD Ibnu Sina Gresik

Old HD	Excess fluid		Total	Statistical Test Resultsl
	< 2,5% BB post HD	> 2,5 BB post HD		
< 1 year	3 (18,8%)	13 (81,2%)	16 (100%)	
> 1 year	21 (41,2%)	30 (58,8%)	51 (100%)	0,196
Total	24 (35,8%)	43(64,2%)	67 (100%)	

Based on table 11 that this study with 67 respondents showed the results of the study that respondents who underwent hemodialysis <1 year with excess fluid status> 2.5 BW after HD were 81.2% which was more dominant than patients undergoing hemodialysis > 1 year with excess fluid status >2.5% BW post HD as much as 58 % of the total. And based on the contingency coefficient test which produces a p-value of 0.103 where p>0.05, it can be concluded that there is no relationship between the length of hemodialysis and the status of excess fluid volume in patients with chronic kidney failure.

DISCUSSION

distribution according to the length of time undergoing hemodialysis is almost entirely (64%) undergoing hemodialysis >1 year. This agrees with the research Bayhakki & Hasneli (2017) which shows the mean or average length of time undergoing hemodialysis is 26.65 months. Results as with some previous research results Riyanto (2011) in his research also found that some hemodialysis patients had an average length of time undergoing hemodialysis of two years (32.19%). Mailani et al. (2015) also revealed that the majority of patients in their study had undergone hemodialysis for more than one year. Rambod & Rafii (2010) revealed that the majority of hemodialysis patients underwent this therapy in the range of two to four years (67.8%). The high number of years undergoing hemodialysis also shows that

most hemodialysis patients are able to survive for a long time even though their kidneys are not functioning properly and various health problems due to kidney damage are experienced.

Overview of Fluid Volume Excess Status

Based on table 10 the results of research in the Hemodialysis Room of RSUD Ibnu Sina Gresik, that the distribution based on excess fluid volume is almost entirely (76%) i.e. > 2.5% BW after hemodialysis, meaning that most hemodialysis patients have excess fluid of 2 kg to more. The normal value of excess fluid that can be tolerated by the body is 1.0-1.5 kg or less than 2.5% of dry body weight (Istanti, 2014). One of the most common problems faced by hemodialysis patients is the increase in fluid volume between two dialysis times which is manifested by weight gain. (Suryaningsih, 2010). The average interdialytic weight gain of hemodialysis patients in the Dialysis Unit of Wates Hospital was 2.7 kg with a minimum value of 0.5 kg, a maximum of 7 kg. This means that the average interdialytic weight gain of hemodialysis patients at Wates Hospital is more than the normal limit (Pagalla, 2017).

Many factors influence IDWG, such as environment, nutrition, patient behavior, physiological factors, and psychological factors (Hwang et al., 2007; Sarkar et al., 2006). The ability of hemodialysis patients to maintain a normal IDWG is influenced by the patient's compliance in maintaining weight, self-awareness not to be negligent or forgetful, and supported by family and strong expectations of getting a better quality of life. Associated with the age of the respondent, in this study the excess fluid was high (Andrianti & Rohimi, 2016). This is probably because most of the respondents are aged > 50 years and over. Sarkar et al. (2006) age was inversely related to IDWG. The older the patient, the less or smaller the IDWG. This is due to a decrease in the sensation of thirst due to increasing age, so that fluid consumption decreases and has implications for minimal weight gain.

The Relationship of Long Undergoing Hemodialysis with Excess Fluid Volume Status in Chronic Kidney Failure Patients

Based on table 11 that this study with 67 respondents showed the results of the study that respondents who underwent hemodialysis <1 year with excess fluid status> 2.5 BB after HD were 81.2% where this was more dominantly high than patients undergoing hemodialysis > 1 year. with excess fluid status > 2.5% BW post HD as much as 58% of the total. And based on the contingency coefficient test which produces a p value of 0.103 where p>0.05, it can be concluded that there is no relationship between the length of hemodialysis and the status of excess fluid volume in patients with chronic kidney failure.

This study contradicts the results of research Sulistini et al. (2014) where they found that there was a relationship between the length of time undergoing hemodialysis and IDWG. This difference in results could be caused by several factors, such as the difference in the number of respondents in which their study had fewer respondents and the average IDWG and length of time spent undergoing this study was lower than the results of this study. In addition, the different characteristics of respondents and different inclusion criteria are factors that can cause differences in the results of this study and that study. This difference in results may also be caused by several other factors, such as the level of patient knowledge about fluid restriction and weight control, patient compliance with fluid intake control, and others which of course can affect the IDWG of hemodialysis patients were not analyzed further in this study. this.

There are several things that may affect the results of this study. The results in table 6 show that almost all (76%) are cared for by husband/wife and a small portion (24%) are cared for by their children, so it is possible that family support affects that there is no relationship between length of time undergoing hemodialysis with excess fluid volume status in patients with chronic kidney failure. The results in table 3 show that almost half of the respondents (35.8%) have elementary school education, and a small part (9%) have not finished elementary school and in table 5.8 shows that almost all (64%) fluid intake is >500 ml and a small portion (12%) fluid intake < 300 ml. so it is possible that the level of education and fluid intake for 24 hours can affect the absence of a long-term relationship with hemodialysis with the status of excess fluid volume in patients with chronic kidney failure. Patients with higher education levels will have broader knowledge and also allow patients to be able to control themselves in overcoming their problems, have high self-confidence and easily understand what is recommended by health workers. So in this study there was no relationship between the length of hemodialysis and the status of excess fluid volume in patients with chronic renal failure (Kamaluddin & Rahayu, 2009).

The absence of a relationship between the length of HD and IDWG implies that the longer the patient undergoes HD, it does not guarantee that the patient will understand and comply with the restrictions that should be adhered to, such as restriction of fluid, protein, and salt intake or intake that can aggravate the patient's condition.

CONCLUSION

After conducting research on the relationship between prolonged hemodialysis and excess fluid volume status in patients with chronic renal failure, it can be concluded most patients with chronic renal

failure who underwent hemodialysis >1 year, most patients with chronic renal failure undergoing hemodialysis have excess fluid volume. There is no relationship between the length of time undergoing hemodialysis with excess fluid volume status in patients with chronic kidney failure at RSUD Ibnu Sina Gresik.

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