



The Effect of Fluid Management Application on Hemodialysis Patients with Excess Fluid

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ABSTRACT

Renal disease is a disorder occurs in the kidneys. Such disease caused by various factors, such as infections, tumors, congenital disorders, metabolic or degenerative diseases, and others. Chronic renal disease usually occurs slowly and is chronic. Patients suffering from chronic renal disease require renal replacement therapy (TPG) to maintain their life. The success of this chronic renal disease therapy depends on the patient's involvement in maintaining their diet and fluids. Fluid management experienced by hemodialysis patients is essential to decrease the risk of excess fluid and is a significant factor which can determine the success of hemodialysis therapy. This research was performed aiming to analyze the effect of implementing fluid management on excess fluid in hemodialysis patients. This study employed a quasi-experimental design through pre-test and post-test methods using control group. There were 90 respondents involved in this research as samples, who were divided into two groups, 45 respondents in the intervention group and another 45 respondents in the control groups. These samples were selected through purposive sampling. Furthermore, the research data were collected using fluid management guide instruments, fluid intake monitoring chart, and weight recording sheets. The results revealed that there was no effect of fluid management on IDWG values between the intervention group after fluid management and the control group of hemodialysis patients ($t = -1.58$; $p = 0.118$). The results of this study can recommend that the application of fluid management with family support can be an action to decrease excess fluid in hemodialysis patients.

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INTRODUCTION

Chronic renal failure is the world health issue, whose incident rate increases every year. The increase of the incident rate is caused by degenerative diseases such as diabetes mellitus and hypertension. Chronic renal failure disease ranked 27th in 1990 and 18th in 2010 among the most common disease in the world. Chronic renal disease causes the decrease of kidneys' ability in performing the body balance. The disruption of the body's balance results in complications (Brunner & Suddarth, 2010).

Chronic kidney disease is currently a serious issue in Indonesia. According to data issued by the Ministry of Health (Kemenkes) in 2015, the number of people suffering from renal disease ranked second after heart disease. The growth of this disease incidence increased by almost 100% in 2014 - 2015. The increase in the incidence of chronic renal disease

needs special attention because it has a significant effect on the community's morbidity, mortality, and socio-economic.

Indonesia Renal Registry (2017) claimed that data from 655 hemodialysis service units in Indonesia discovered that most patients undergoing hemodialysis are caused by hypertension by 8472 people, Diabetes Mellitus (DM) by 6994 people, glomerulopathy disease by 2887 people, and other causes by 1789 people. Furthermore, the mortality rate is mostly caused by cardiovascular comorbidities in 1480 patients. Medical record data reported by Imelda Hospital in 2017 obtained that patient who underwent regular hemodialysis therapy 2 times a week were 70 people, while in 2018 were 85 people.

Patients suffering from chronic renal disease require renal replacement therapy (TPG) to survive. The most TPG chosen by the community is hemodialysis. Hemodialysis therapy

requires a lot of costs and was the second highest after the cost of cardiac treatment (IRR, 2017). The success of chronic renal disease therapy depends on the patient's participation in maintaining their diet and fluids.

Fluid restriction is claimed to be the most difficult one to achieve and remains a major clinical problem in individuals suffering from chronic renal disease and will contribute to severe complications (Geldine Chironda & Busisiwe Bhengu, 2016).

Fluid management is the ability to monitor and manage symptoms to the body's physiological responses, including the ability to identify problems, set goals, and make decisions about the problem of lack of body fluids (Lindberg, 2010). Fluid management in hemodialysis patients is essential to reduce the risk of excess fluid and is an important factor that can determine the success of hemodialysis therapy. The success of hemodialysis depends on the patients' compliance with their fluid control (Wijayanti et al., 2017).

METHOD

This research was conducted quantitatively through a quasi-experimental method with pre-test and post-test methods using a control group. The population involved in this research was all patients suffering from chronic renal failure disease who underwent hemodialysis therapy at Imelda Hospital in August 2020. Among the population, 90 samples were chosen using purposive sampling.

This research has received ethical approval from the Health Research Ethics Commission, Faculty of Nursing, Universitas Sumatera Utara with Registration Number 1995/III/SP/2020. The intervention applied this study used fluid management guidelines and fluid intake monitoring charts adopted from fluid management guidelines according to TIME (Time to Inform, Motivate and Empower).

RESULTS AND DISCUSSION

Table 1
Characteristics of Respondents of Hemodialysis Patients at Imelda General Hospital

Data	Intervention (n=45)		Control (n=45)	
	F	%	F	%
Age				
Late Teenager 17-25 years old)	5	11.1	4	8.9
Initial Adult (26-35 years old)	6	13.3	6	13.3
Late Adult (36-45 years old)	14	31.1	11	24.4
Initial Elderly (46-55 years old)	11	24.4	7	15.6
Late Elderly (56-65 years old)	7	15.6	15	33.3
Seniors (>65 years old)	2	4.4	2	4.4
Mean ± SD	3.33 ± 1.33		3.64 ± 1.41	
Min – Max	1.0-6.0		1.0– 6.0	
Gender				
Male	31	68.9	27	60.0
Female	14	31.1	18	40.0
Education				
Primary School	6	13.3	6	13.3
Junior High School	9	20.0	8	17.8
Senior High School	18	40.0	21	46.7
Diploma	7	15.6	6	13.3
Undergraduate	5	11.1	4	8.9
Occupation				
Unemployed	22	48.9	20	44.4
Housewife	6	13.3	8	17.8
Entrepreneur	12	26.7	13	28.9
Civil Servant	5	11.1	4	8.9
Length of Undergoing Hemodialysis				
<12 months	9	20.0	13	28.9
>12 months	36	80.0	32	71.1
Number of fluid intake in 24 hours				
< 500 cc	0	0	0	0
500 – 1000 cc	21	46.7	16	35.6
>1000 cc	24	53.3	29	64.4

Based on the table 1, respondent characteristics according to the age, it shows that most of the respondents in the intervention group (31.1%) are late adults (36-45 years), while most of the respondents in the control group (33.3%) are late elderly (56-65 years). More than half of the respondents were male, which is 31 respondents (68.9%) in the intervention group and 27 respondents (60%) in the control groups. Based

on the educational level, both groups generally have a senior high school education level by 18 respondents (40%) in the intervention group and 21 respondents (46.7%) in the control group. Furthermore, based on the occupation, the majority of respondents are unemployed by 48.9% in the intervention group and 44.4% in the control group. More than half of the respondents had undergone hemodialysis therapy for more

than 12 months. In addition, 24 respondents (53.3%) in the intervention group and 29 respondents (64.4%) in the control

group had fluid consumption of more than 1000 cc for 24 hours.

Table 2
IDWG Value Before and After Fluid Management Intervention of Hemodialysis Patients

IDWG	Intervention Group (n=45)				Control Group (n=45)			
	M	SD	t	p	M	SD	t	p
Pre-Test	3.87	0.34	7.56	.000	2.89	1.28	-1.03	.309
Post-Test	2.64	1.09			3.02	1.17		

Table 2 shows that the intervention group experienced a decrease in IDWG values after receiving fluid management compared to before receiving fluid management (Mean=2.64 (SD=1.09). Meanwhile, the control group did not have a

decrease in IDWG values. These results indicate that there were differences in IDWG values in the intervention groups before and after treatment ($t = 7.56$; $p = 0, 00$).

Table 3
Effect of Fluid Management Intervention in the Intervention and Control Group on IDWG Value (n=90)

IDWG	M	SD	t	p
Intervention Group (n=45)	2.64	1.09	-1.58	.118
Control Group (n=45)	3.02	1.17		

Based on the table 3 presenting the analysis results using independent t-test test, there was no effect of fluid management on IDWG values between the intervention group after receiving fluid management and the control group of hemodialysis patients ($t = -1.58$; $p = 0.118$).

fluid management so that they experienced excess fluid. The results of this study are supported by the previous research done by Isroin (2016), that the effect of IDWG values before and after treatment both in the treatment group (p -value = 0.936) and control group (p -value = 0.062) is not significant.

DICUSSION

Current research discovered that there was an effect of IDWG values between before and after fluid management in the intervention group ($t=7.56$; $p=0.00$). However, no effect was found in the control group regarding the IDWG values ($t=-1.03$; $p=0.309$).

Previous research performed by Istanti (2011) claimed that IDWG has a significant relationship to fluid intake ($r = 0.541$; p -value = 0.000). The average respondents' fluid intake was 1409.92 ml per day (SD=379.26), in which the lowest input was 633 ml per day and the highest input was 2333 ml per day. IDWG is closely related to the patient's fluid intake. Fluid restriction is one of the therapies provided to patients suffering from end-stage renal disease for prevention and treatment of comorbidities that can worsen the patient's condition.

Interdialytic Weight Gains (IDWG) is an increase in fluid volume manifested by an increase in body weight as a basis for determining the amount of fluid that enters during the interdialytic period. The patient's weight is routinely measured before and after hemodialysis to determine the condition of the fluid in his body, then IDWG is calculated based on dry weight before hemodialysis (Neuman, 2013).

No effect of fluid management was found on IDWG values between the intervention group after receiving fluid management and the control group of hemodialysis patients ($t = -1.58$, $p = 0.118$). These results indicate that respondents experienced maladaptive responses where respondents were unable to adapt to the current situation, namely performing

CONCLUSIONS AND RECOMMENDATIONS

Fluid management intervention can decrease IDWG values in hemodialysis patients. However, the effect of fluid management intervention in decreasing IDWG values can be maximally achieved if the family supports the patients.

It is suggested that in terms of nursing services, this research results can be part of nursing interventions in overcoming excess fluid in hemodialysis patients. In addition, procedures for applying fluid management can also be constructed in the form of leaflets or booklets to be distributed so that many nurses know about these interventions. Furthermore, this research is expected to add scientific references, especially in medical surgical nursing references in dealing with excess fluid in hemodialysis patients. For further research, it is expected that future researchers are able to perform research by paying attention to the characteristics of respondents whose homogeneity is the same between the groups to be studied.

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Conflict of Interest Statement

The authors declare that there is no potential conflict of interest in connection with the writing and publication of this article

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