

# Fluid Restriction Compliance in Chronic Kidney Disease Undergong Hemodialysis

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## Abstract

*Introduction: Patients receiving hemodialysis must comply with the treatment program because non-compliance can cause complications. Hemodialysis patients who are not compliant with fluid restrictions can cause acute and chronic complications as well as increased morbidity and mortality. This study aims to identify compliance with fluid restrictions in patients undergoing hemodialysis. Method: The research design used is descriptive. The sampling technique used is purposive sampling, totaling 78 samples. Data are collected using Questionnaire of respondent demographic data and Fluid restriction questionnaire. Results: show that the majority of respondents complied with fluid restrictions, namely 61 respondents (78.2%), 13 respondents (16.7%) were in the less compliant category and 4 respondents (5.1%) were in the non-compliant category. Conclusion: It was concluded that compliance with fluid restriction in patients undergoing hemodialysis at the hospital. H Adam Malik Medan in the compliant category.*

**Keyword:** Compliance, Fluid Restriction, Hemodialysis

## Abstrak

**Pendahuluan:** Pasien yang menerima hemodialisa harus mematuhi program pengobatan karena ketidakpatuhan dapat menyebabkan komplikasi. Pasien hemodialisa yang tidak patuh dalam hal pembatasan cairan, dapat menyebabkan komplikasi akut dan kronis serta peningkatan morbiditas dan mortalitas. Penelitian ini bertujuan untuk mengidentifikasi kepatuhan pembatasan cairan pada pasien yang menjalani hemodialisa. **Metode:** Desain penelitian yang digunakan yaitu deskriptif. Teknik pengambilan sampel yang di gunakan adalah *Purposive Sampling*, yang berjumlah 78 sampel. Pengumpulan data menggunakan kuesioner data demografi responden dan kuesioner pembatasan cairan. **Hasil:** penelitian menunjukkan bahwa sebagian besar responden patuh dalam pembatasan cairan yaitu sebanyak 61 responden (78.2%), 13 responden (16.7%) berada dalam kategori kurang patuh dan 4 responden (5.1%) berada dalam kategori tidak patuh. **Kesimpulan:** Hasil penelitian disimpulkan bahwa kepatuhan pembatasan cairan pada pasien yang menjalani hemodialisa di RSUP. H Adam Malik Medan dalam kategori patuh.

**Kata kunci:** Kepatuhan, Pembatasan Cairan, Hemodialisa

## INTRODUCTION

Patients with chronic kidney disease experience complex problems in kidney function that impact the body's capacity to regulate chemical processes as well as fluid and electrolyte balance. Therefore, dialysis or kidney replacement therapy or even kidney transplantation is necessary for the patient's survival. One of the treatment methods for chronic kidney disease is hemodialysis, which is often referred to as dialysis. Hemodialysis is the process of cleansing the blood of waste that accumulates in patients with chronic kidney disease, especially in the final stage or stage 5 where the kidneys no longer function optimally. The duration of hemodialysis is adjusted to the needs of each individual, usually lasting 4-5 hours and carried out 2-3 times per week (Hioda et al., 2023).

Hemodialysis therapy does not fully restore kidney function to normal but maintains the patient's quality of life. Hemodialysis therapy is performed by utilizing a semi-permeable membrane (dialyzer), which functions like a filter unit. This membrane helps cleanse the body of biological waste products and correct fluid and electrolyte balance disorders (Prodyanatasari & Purnadianti, 2024)

According to data from the World Health Organization (WHO, 2018) chronic kidney failure disease kills 850,000 people every year, this figure shows that chronic kidney failure disease ranks 20th as a cause of death in the world. Globally, it is estimated that 1 in 10 people in the world have kidney failure disease. About 65% or 2.3 to 7.1 million people die due to kidney failure disease, while CKD patients who undergo hemodialysis are estimated to reach 1.5 million people worldwide, the incidence rate is increasing by 8% every year.

A report from the Indonesia Renal Registry shows that the prevalence of chronic kidney failure patients who are actively undergoing hemodialysis therapy from 2016 to 2019 continues to increase. In

2016 there were 52,835 patients actively undergoing hemodialysis. In 2017 there were 77,892 patients actively undergoing hemodialysis. In 2018 patients actively undergoing hemodialysis increased to 135,486. In 2019 patients actively undergoing hemodialysis increased to 185,901.

Hemodialysis is a type of treatment applied to replace kidney function. However, this procedure can cause side effects if performed on an ongoing basis. Some of the complications that may arise from hemodialysis include decreased blood pressure, especially in patients with diabetes, as well as increased blood pressure in patients with a history of hypertension. Other complications include nausea and vomiting due to accumulation of toxins in the blood and hypotension, red blood cell deficiency, muscle tension, and skin disorders such as xerosis which causes itching.

The success of hemodialysis is highly dependent on the patient's commitment to make dialysis lifestyle changes, especially with regard to fluid restriction. Hemodialysis patients are required to adhere to the treatment plan as failure to do so can lead to problems. Patients who ignore the guidelines in terms of fluid restriction are at risk of acute and long-term problems and even an increased percentage of morbidity and mortality. Patients undergoing hemodialysis should be aware that the body's metabolism results in the accumulation of toxic chemicals in the blood when they are not compliant in terms of fluid restriction. Therefore, patients feel pain all over their body, and if left untreated the condition can be fatal. Thus, limiting fluid intake is very important to prevent such complications (Hermawati, 2023).

The type of food and fluids consumed will have a significant influence on patient morbidity and survival. There will be a lethal impact if fluid restriction and drug intake are not controlled. Data shows that more than half of patients receiving

hemodialysis have not been able to control their fluid and electrolyte consumption, resulting in weight gain faster than 5% or even beyond the limit. Examination results often show swelling of the eyelids, wet wheezing in the lungs, shortness of breath, and fluid accumulation in the limbs (edema). Inability to limit fluid intake is the cause of this disease. In addition, uremic signs are found that pose a serious risk to life, especially for people who already suffer from chronic kidney failure (Sitopu et al., 2023)

Patients receiving hemodialysis may choose to control fluid intake as an intervention. Patient morbidity and survival can be affected by fluid restriction, maintenance, and therapy failure (Khumaeroh et al., 2023) .

Since the fluid limit is correlated with the glomerular filtration rate, the restriction of fluid intake is differentiated according to the severity of the disease. The lower the glomerular filtration rate, the less fluid is excreted as indicated by a small volume of urine. If fluid restriction is not applied to patients with chronic renal failure, they may experience a buildup of fluid that cannot be excreted from the body and is increasingly accumulated, characterized by the appearance of edema in various parts of the body. The importance of fluid management in CKD patients undergoing HD is certainly a challenge in the management of CKD patients.

## METHOD

This study is a cross-sectional descriptive, for CKD patients undergoing HD at H Adam Malik Hospital Medan from November 25 to December 14, 2024. The inclusion criteria in this study are as follows: 1. Patients who undergo hemodialysis according to a schedule. 2. Patients with compos mentis consciousness. 3. Patients who can read and. 4. Patient willing to be a. The technique for

calculating the number of samples needed from the total population can be calculated using the Slovin formula. Based on this value, the sample used amounted to 78 respondents. The variable of this study is fluid restriction compliance.

The instrument used in this research is a questionnaire. The questionnaire used in this study is Respondent demographic data questionnaire and Fluid restriction questionnaire. The tool used to measure fluid restriction compliance was the fluid restriction compliance questionnaire from previous researcher Siela (2017). This questionnaire is closed, meaning that the answers have been provided in advance and the respondents describe the mark (□) in the appropriate column. This questionnaire consists of 16 questions consisting of 7 favorable statements (1,3,4,5,6,8,15) and 9 unfavorable statements (2,7,9,10,11,12,13,14,16). The assessment in this questionnaire uses a Likert scale with 5 answer choices, namely the score for the answer to the favorable statement is always (score 4), often (score 3), sometimes (score 2), rarely (score 1), and never (score 0) while for the score for unfavorable statement is always (score 0), often (score 1), sometimes (score 2), rarely (score 3), and never (score 4). The total minimum range is (0) and the maximum range is (64). Then the score obtained from the results of the fluid intake restriction compliance study is as follows Not compliant = 0-20, Less compliant = 21-41, Compliant = 42-64.

The researcher adopted the fluid restriction compliance questionnaire from Siela (2017) and had tested its validity based on the results of the trial to 10 respondents obtained the largest corected item total value of 0.932 at the 5% error level and the smallest obtained was 0.640 with  $n = 10$  obtained  $r$  table = 0.632. Thus, the questionnaire is considered valid. The reliability test of the fluid restriction compliance questionnaire has been tested for reliability by Siela (2017). Based on the trial of 10 patients, the Cronbach's Alpha value was 0.964 so that it could be

concluded that the questionnaire was reliable.

Primary Data procedure data, namely data obtained directly by the researcher to the target, namely patients undergoing hemodialysis. Secondary Data, which is data obtained by researchers from medical records. Then a questionnaire was held directly by looking at compliance with fluid restrictions in patients undergoing hemodialysis at H. Adam Malik Hospital Medan in 2024.

The type of data analysis applied in this context is univariate analysis. In this study, a univariate statistical approach was applied to determine the independent variable of fluid restriction compliance. Percentage and frequency distributions represent the results of univariate analysis.

This research has also been approved by the Ethical Exemption Commission of the School of Health Research Ethics of Santa Elisabeth College of Health Sciences Medan with letter number No. 206/kepk-se/pe-dt/x/2024: 206/KEPK-SE/PE-DT/X/2024.

## RESULTS

The results of this study are to explain the description of fluid restriction compliance in patients undergoing hemodialysis at H. Adam Malik Medan Hospital with a total of 78 respondents. Researchers made tables and explanations regarding the frequency distribution of the characteristics of patients undergoing HD. Data obtained from primary sources were processed from the questionnaire of all respondents. After the data is processed, the results of the study are analyzed by means of univariate analysis and the results are described as follows

**Table 1. Frequency Distribution of Demographic Data in Patients Undergoing Hemodialysis at H. Adam Malik Hospital Medan in 2024 (n = 78).**

Characteristics	<i>f</i>	(%)
<b>Age</b>		
17-25 Years	4	5.1
26-35 Years	11	14.1
36-45 Years	19	24.4
46-55 Years	25	32.1
56-65 Years	17	21.8
>65 Years	2	2.6
<b>Total</b>	<b>78</b>	<b>100</b>
<b>Gender</b>		
Male	51	65.4
Female	27	34.6
<b>Total</b>	<b>78</b>	<b>100</b>
<b>Education</b>		
Elementary school	11	14.1
Junior High School	6	7.7
Senior High School	35	44.9
College	26	33.3
<b>Total</b>	<b>78</b>	<b>100</b>
<b>Duration of Hemodialysis</b>		
<12 months	24	30.8
12-24 months	20	25.6
> 24 months	34	43.6
<b>Total</b>	<b>78</b>	<b>100</b>
<b>Weight Gain</b>		
Lightweight	61	78.2
Medium	13	16.7
Weight	4	5.1
<b>Total</b>	<b>78</b>	<b>100</b>

**Table 2. Frequency Distribution of Fluid Restriction Compliance in Patients Undergoing Hemodialysis at H. Adam Malik Hospital Medan in 2024 (n = 78).**

Fluid Restriction Compliance	<i>f</i>	(%)
Non-compliant	4	5.1
Less Compliant	13	16.7
Compliant	61	78.2
<b>Total</b>	<b>78</b>	<b>100</b>

Based on table 2, it shows that as many as 61 respondents (78.2%) are in the non-compliant category, 13 respondents (16.7%) are in the non-compliant category and 4 respondents (5.1%) are in the non-compliant category.

## DISCUSSION

### 1. Demographic Characteristic of Respondent

Based on table 1, it was found that most respondents with an age range of 46-55 years were compliant with fluid restriction, namely 21 respondents (26.9%).

Researchers assume that respondents with an age range of 46-55 years tend to be compliant with fluid restrictions due to various supporting factors, such as awareness of better health. This age range is usually more able to adapt to lifestyle changes needed to support health, especially in terms of fluid restriction and along with increasing age and risk of complications, they are more compliant with fluid restrictions because they understand the consequences.

The results of this study are supported by Herlina's research (2021) which shows that the average respondent aged 48 years is more compliant than younger patients. This is because at a young age, individuals tend to feel more independent and reluctant to depend on hemodialysis, diet, and fluid restrictions. Young patients also usually take longer to accept the reality of their illness, which may lead to non-adherence. In contrast, older patients have gone through various phases of development and maturity, so aging is perceived as a decline in bodily functions, where their physical condition and health decline, especially after being diagnosed with chronic renal failure.

This study is in line with the research of Trisnaningtyas et al (2023) which shows that the majority of respondents are between 46-55 years old. In

this group, kidney function decreases with age and the risk of complications makes them more compliant with fluid restrictions because they understand the consequences.

Based on table 1, it is found that most respondents experienced mild weight gain, namely 61 respondents (78.2%) and most respondents with mild weight gain were in the category of adherence to fluid restriction, namely 61 respondents (78.2%).

That compliance with fluid restriction is related to weight control of patients undergoing hemodialysis. The better the compliance with fluid restriction, the less likely excessive weight gain will occur which can reduce complications that may arise. Therefore, proper fluid restriction and education to patients is very important in preventing excessive weight gain.

This statement can be seen from the results of observations of weight gain and respondents' answers when interviewed which show that, most respondents with mild weight gain, namely 61 respondents (78.2%), are in the category of compliant with fluid restrictions, namely as many as 61 respondents (78.2%). Moderate weight gain as many as 13 respondents (16.7%) fell into the category of less compliant, and heavy weight gain as many as 4 respondents (5.1%) fell into the category of non-compliant with fluid restrictions. Based on the results obtained, it can be concluded that weight gain is related to fluid restriction compliance.

The results of this study are in line with the research of Rizani et al (2019), which showed that the majority of respondents experienced an increase in IDWG in the normal category, namely as many as (74.5%). These results show that more than half of the respondents experienced an increase in IDWG in the normal category, so it can be concluded that these patients have complied with the recommended fluid restrictions.

## 2. Fluid restriction compliance

Based on table 2, it was found that of the 78 respondents, most were in the compliant category, namely 61 respondents (78.2%), the less compliant category was 13 respondents (16.7%) and the non-compliant category was 4 respondents (5.1%).

This research is in line with the research of Lestari et al (2024), on the Compliance Level of Fluid Restriction in CKD (Chronic Kidney Disease) Patients based on the results of his research on 22 respondents in the Hemodialysis Room of Dr. Soekardjo Hospital, Tasikmalaya City, found that most of the 17 respondents (77.3%) were in the compliant category of fluid restriction. The duration of hd is one of the elements that affect the level of compliance in this research. Patients on hd with a long period tend to be more compliant with fluid restriction and will be aware of the dangers of non-compliance.

This research is in line with Sinambela's research (2020), regarding Compliance with Fluid Intake Restrictions in Hemodialysis patients, based on the results of his research on 40 respondents in the Hemodialysis Room of RSUP HAM Medan found that most respondents were compliant with fluid restrictions, namely 33 respondents (82.5%). This is because patients consume fluids as recommended by health workers, patients can also control the balance of cairan and patients routinely pay attention to body weight and urine.

In line with the research of Aji et al (2022), about the Compliance Level of Fluid Restriction in Pasien Undergoing Hemodialysis at Dr. Soedirman Kebumen Hospital based on the results of his research on 122 respondents obtained data that most respondents were compliant with fluid restrictions, namely 72 people (52.8%). In his research, it shows that the form of respondent compliance is to regulate fluid intake according to the amount of urine output, reduce potassium, sodium and protein consumption.

The results of this study are supported by research by Wensi & Wijaya (2023), which shows that of the 90 respondents who were sampled, the majority of clients (CKD) were compliant in limiting fluid intake, namely 61 respondents (67.8%). The majority of respondents were compliant with fluid restriction because they adhered to the rules set to prevent weight gain during hemodialysis between two dialysis times. In addition, respondents also received information from family or medical personnel regarding the importance of fluid restriction.

The results of this study are in line with the research of Pane et al (2023), based on the results of their research on 48 respondents at Harapan Siantar Hospital obtained that most respondents were compliant in fluid restriction, namely 38 respondents (79.2%).

We assumed that the majority of respondents were compliant with fluid restriction because they received adequate education and guidance from the medical team. Respondents also have a good understanding of the health consequences of fluid restriction and have a good understanding to follow the recommendations that must be obeyed. In addition, there is an effective interaction between patients and medical personnel so that it can increase respondents' compliance with fluid restrictions. This can be seen from the respondents' answers to positive statement number 15 regarding following the recommendation to limit fruits with high water content found as many as 67 respondents (85.9%) answered always and in negative statement number 16 regarding drinking energy-enhancing drinks found as many as 78 respondents answered never.

The respondents who were less compliant in fluid restriction were because they could not control thirst such as hot weather, were not used to the amount of fluid intake that had to be limited and sometimes did not measure the amount of urine (urine) in a day and the occurrence of

weight gain in two dialysis times. As evidenced from the respondents' answers to positive statement number 5 regarding measuring the amount of urine every day, 18 respondents (23.1%) answered sometimes, followed by positive statement number 3 regarding consuming fluid intake of no more than 1000 cc in a day, 16 respondents (20.5%) answered sometimes, and in negative statement number 7 regarding weight gain, 42 respondents (53.8%) answered sometimes, which means that some patients experience weight gain because sometimes patients consume more than 1000 cc of fluid.

Based on the results of the interview, it was found that respondents who were less compliant with fluid restriction because the respondents could not control thirst such as hot weather, so respondents sometimes consumed more than 1000 cc.

Meanwhile, respondents who were not compliant with fluid restriction because respondents sometimes felt bored and bored with the recommendations given in the course. This can be seen from the client's response to positive statement number 8 regarding to relieve thirst, I usually swallow ice cubes or brush my teeth and rinse my mouth, 50 respondents answered never and in negative statement number 12 regarding consuming more than 1 egg a day, 23 respondents (29.5%) answered always.

Based on the results of the interview, it was found that respondents who were not compliant with fluid restriction because when the fluid requirement had reached the limit, to relieve thirst, respondents never swallowed ice cubes or toothbrushes and rinsed their mouths, but respondents immediately consumed fluids without counting them, this was because the respondents felt bored and bored regarding the amount of fluid that had to be limited.

## CONCLUSION

Based on the results of the study on compliance with fluid restrictions in hemodialysis patients at H. Adam Malik Hospital Medan in 2024, it was obtained that the majority of respondents were aged 45–56 years, male, educated in high school/vocational school, had undergone hemodialysis for more than 24 months, and experienced weight gain in the light category. The level of compliance with fluid restrictions was relatively high, with most respondents (78.2%) in the compliant category, while the rest were in the non-compliant (16.7%) and non-compliant (5.1%) categories. This shows that most patients have good awareness and compliance with the recommendations for fluid restriction in undergoing hemodialysis therapy.

This study should be used as a basis for further research and develop further research on factors affecting fluid restriction compliance, namely family support using different research methods to see comparisons with the current study.

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