

## The Effect of Cognitive Behavioral Therapy on Knowledge of Fluid Intake Restrictions in Hemodialysis Patients

Siti Hanifah<sup>1\*</sup>, N Suke<sup>2</sup>

Nursing Study Program, Widya Husada University, Semarang

**Corresponding Author:** Siti Hanifah [ihanifah180@gmail.com](mailto:ihanifah180@gmail.com)

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### ABSTRACT

Hemodialysis is a treatment for patients with chronic kidney failure. The study investigated how cognitive behavioral therapy affects patients' understanding of fluid intake restrictions. The CKD patient fluid restriction compliance questionnaire was tested. The study involved 20 valid questionnaires. The validity test produced 0.514, while the reliability test produced a result of 0.70, indicating that the data was very consistent with an alpha value of >0.6. The pre-experimental design with a One Group Pretest Posttest design with 60 participants. Before therapy, 35 (58.3%) were non-compliant, 17 (28.3%) were somewhat compliant, 8 (13.3%) were compliant. After therapy, 3 (5%) were non-compliant, 11 (18.3%) were somewhat compliant, and 46 (76.7%) were compliant. The results of the Wilcoxon Test p value of 0.000, indicating that there was an effect of cognitive behavioral therapy on knowledge of fluid intake restrictions.

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## INTRODUCTION

The most common type of kidney injury is chronic kidney failure, with hypervolemia being the primary problem. One of the treatment options for those diagnosed with chronic kidney failure is hemodialysis. Typically, this disease requires two stages of treatment. The first stage is conservative care, which attempts to address modifiable causes, keep the patient's health stable, and stop the disease from getting worse. Renal replacement therapy, which includes hemodialysis, kidney transplantation, and peritoneal dialysis, is the second stage.(Jaya, 2023).Chronic kidney disease often does not show symptoms in the early stages, so many patients are unaware of their condition until it reaches an advanced stage. Based on the glomerular filtration rate (GFR), chronic kidney disease is divided into five stages. Stage five, known as end-stage kidney disease, is the most severe and is characterized by azotemia, uremia, and uremic syndrome. In patients with this condition, hemodialysis (HD) therapy is used to replace kidney function, help remove harmful substances, and control fluid and electrolyte balance in the body.(Nainggolan, 2024).

According to the World Health Organization (WHO), chronic kidney disease is a health problem related to kidney function, causing between 5 and 10 million deaths each year, with 1.7 million deaths due to acute kidney damage. Based on Riskesdas data in 2021, out of a total of 19,617,272 cases, kidney failure ranked fourth in Indonesia with 1,417,104 cases, of which 713,783 people or 3.8% were part of the total cases. Among the 23 provinces, Central Java was recorded to have 65,755 routine hemodialysis procedures every month, making it the sixth most frequent province (Kusuma & Surakarta, 2023).

Compliance with fluid restriction is a key factor influencing the success of hemodialysis therapy. The main goal of fluid restriction is to maximize the benefits of therapy while preventing excessive fluid accumulation. Common complications that often occur due to fluid accumulation include heart failure, shortness of breath, and edema. Therefore, daily monitoring of the amount of fluid consumed by patients with kidney failure is very important, so that patients understand how much water they can consume to maintain fluid balance in the body.(Lestari et al., 2024). The success of hemodialysis therapy is influenced by several factors, compliance with fluid restrictions is one of them. In order for patients to live longer, chronic kidney failure treatment must involve limiting fluid intake. However, some patients do not do this, which can lead to fluid buildup and edema throughout the body. In addition, patients will not feel comfortable doing heavy or light physical activities. Therefore, patients undergoing hemodialysis are advised to reduce the amount of fluid they drink, including reducing salt intake. Hypertension, shortness of breath, chills, anxiety, panic, muscle spasms, and even sudden death are some of the consequences of pulmonary edema, a condition in which fluid enters the lungs.(Kumalasari & Stefanus, 2024).

Cognitive Behavior Therapy (CBT) is one of the most common forms of psychotherapy used to treat stress, focusing on two main aspects: cognitive distortions and maladaptive behaviors. As a form of psychotherapeutic intervention, by changing the client's cognitive processes, cognitive behavioral

therapy seeks to reduce psychological stress and maladaptive behaviors. CBT helps people create more positive and constructive thought patterns to replace unhelpful or unrealistic ones when dealing with stressful situations.(Prastowo, 2023).

The goal of cognitive behavioral therapy, sometimes known as CBT, is to help a person change the way they think and behave. CBT has become an important element of preventative medicine, with its primary goal being to address negative thoughts. It is evidence-based and helps a person gain new perspectives and change the way they think. CBT helps individuals change their behaviors and thought patterns, so they can feel better and be better able to manage emotional or psychological problems.(SE Wahyuni, 2020).

The purpose of this study was to determine the level of knowledge of chronic kidney failure patients regarding fluid intake restrictions, evaluate the effect of cognitive behavioral therapy on patient understanding of fluid restrictions in hemodialysis patients, and determine the relationship between cognitive behavioral therapy and knowledge of hemodialysis patients at KRMT Wongsonegoro Hospital, Semarang City.

## **LITERATURE REVIEW**

### ***Definition of Hemodialysis***

Hemodialysis is a method of dialysis therapy when the kidneys cannot perform the dialysis process. For chronic kidney failure, hemodialysis is usually programmed two to three times a week. This is more suitable for patients who have stable hemodynamics and can withstand more aggressive fluid transfers for 3-4 hours with about 300 milliliters of blood in the filter at the same time. (Pratama et al., 2020).

### ***Definition of Cognitive Behavioral Therapy***

Cognitive behavioral therapy is a type of therapy that aims to change a person's thoughts, assumptions, and attitudes. Cognitive behavioral therapy argues that the network in the human brain is formed by the interaction between stimulus, cognition, and response. These processes shape the way humans act, think, and behave.(Natural, 2019).

### ***Definition of Fluid Intake Restriction***

Fluid intake restriction is one of the actions taken by patients undergoing hemodialysis. This is done to control and limit the amount of fluid they consume to maintain fluid and electrolyte balance and to reduce complications associated with excess fluid, such as shortness of breath, edema, and increased blood(Lathifah, 2022).

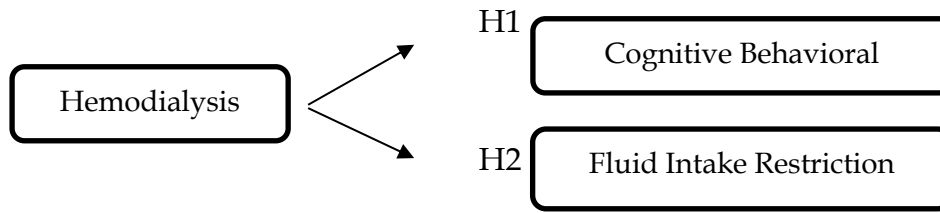


Figure 1. Conceptual Framework

## METHODOLOGY

This study used a descriptive technique with a One Group Pretest-Posttest pre-experimental design. The sample was taken using the Purposive Sampling formula with a total population of 60 respondents. The instruments used were the SOP for Cognitive Behavioral Therapy and the Fluid Intake Restriction questionnaire. The SOP for cognitive behavioral therapy was taken from Wakanno et al., (2024) and a questionnaire on compliance with fluid restrictions was taken from Meistatika, (2019). Validity test of the Compliance Questionnaire for Fluid Restriction in PGK Patients with a result of 0.514. Reliability test with a result of 0.70, indicating that the data is very reliable with an alpha value above 0.6 (Meistatika, 2019).

Inclusion criteria included respondents aged 30-85 years who suffered from chronic kidney failure and underwent hemodialysis. Exclusion criteria included patients with decreased consciousness, weak conditions such as shortness of breath, headache, nausea, or vomiting.

The effect of cognitive behavioral therapy on hemodialysis patients' knowledge of fluid intake limitations was identified and assessed using univariate analysis. Bivariate analysis was performed using the Wilcoxon test because the data were ordinal and required non-parametric testing. The Ethics Test was conducted at the KRMT Wongsonegoro Hospital in Semarang City with No. 042/Kom.EtikRSWN/V/2024.

## RESEARCH RESULT

### 1. Respondent Characteristics

It can be explained that the highest proportion of gender in this study was female with 34 respondents (34%). The highest proportion of age level was the late elderly (56-65 years) with 25 respondents (41.7%). The highest proportion of education level was at the high school level with 19 respondents (31.7%). The highest proportion of housewife employment level was 18 respondents (30%).

Table 1. General Data Characteristics of Respondents

Characteristics	Amount	%
<b>1 Gender</b>		
Man	26	43.3
Woman	34	56.7
<b>2 Age</b>		
26-35 years	3	5
36-45 years	7	11.7
46-55 years	16	26.7
56-65 years	25	41.7
>65	9	15
<b>3 Education</b>		
No school	2	3.3
SD	15	25
JUNIOR HIGH SCHOOL	9	15
SMAD3/D4/S1/S2	19	31.7
	15	25
<b>4 Work</b>		
Doesn't work	10	16.7
Housewife	18	30
Self-employed	12	20
Private	3	5
Farmer	2	3.3
Civil Servant/Retiree	14	23.3
Security	1	1.7

## 2. Before intervention is given

Patients undergoing hemodialysis have not fully complied with fluid intake restrictions. Based on the table, 35 respondents (58.3%) did not comply with the restrictions, 17 respondents (28.3%) were less compliant, and 8 respondents (13.3%) were compliant.

Table 2. Restricting Fluid Intake Before Cognitive Behavioral Therapy

No	Fluid Intake Restriction Category	Frequency (n)	Presentation	Information
1	<20	35	58.3%	Not obey
2	21-29	17	28.3%	Less Compliant
3	30-40	8	13.3%	Obedient
	Total	60	100%	

## 3. After Given Intervention

Hemodialysis patients receiving cognitive behavioral therapy showed improvement in reducing fluid intake. Of the respondents, 3 (5%) were non-compliant, 11 (18.3%) were less compliant, and 46 (76.7%) were compliant with fluid restrictions.

Table 3. Fluid Intake Restriction After Cognitive Behavioral Therapy

No	Fluid Intake Restriction Category	Frequency (n)	Presentation	Information
1	<20	3	5%	Not obey
2	21-29	11	18.3%	Less Compliant
3	30-40	46	76.7%	Obedient
	Total	60	100%	

#### 4. How cognitive behavioral therapy affects hemodialysis patients' understanding of fluid intake restrictions

There were no respondents (0%) with negative ratings in the table, indicating no decrease from pre-test to post-test. On the other hand, Positive Ratings were shown by 43 respondents (22%) indicating an increase from pre-test to post-test. Furthermore, after undergoing cognitive behavioral treatment, the fluid intake limitations of 17 respondents with the same value (tie) remained unchanged. It was found that the p-value was 0.000 or less than 0.05. As a result,  $H_0$  was rejected and  $H_a$  was accepted, indicating that hemodialysis patients' understanding of fluid intake limitations was affected by cognitive behavioral therapy.

Table 4. The Impact of Cognitive Behavioral Therapy on Hemodialysis Patients' Understanding of Fluid Intake Restrictions

		N	Presentation	Asymp. Sig. (2-tailed)
Pre Test	Negative Ranks	0	0%	0,000
Post Test	Positive Ranks	43	22%	
	Ties	17		
	Total	60		

## DISCUSSION

### 1. Respondent Characteristics

#### a. Gender

At RSUD KRMT Wongsonegoro, Semarang, hemodialysis patients were more female than male. As many as 34 respondents (56.7%) were male and 26 respondents (43.3%) were female. This finding is in line with previous research findings. (Yuli Oktaviani, 2021) Eleven respondents or 57.9% stated that hemodialysis patients at Permata Bekas Hospital were mostly women. In addition, research shows that women often experience more weight gain than men. According to Rantepadang, (2021) The research results show that the majority of people are women. Sexual problems such as irregular orgasm, pain during intercourse (dyspareunia), and decreased libido and lubrication can also be experienced by 25 (57%) women with chronic renal failure receiving

hemodialysis. Disturbed calcium metabolism can affect LH secretion in women with chronic renal failure, LH secretion increases but LHRH secretion is inhibited, which causes the hypothalamus to experience negative feedback on estrogen. Women have kidneys that are affected by the hormone estrogen, which causes them to be taller. This hormone acts as a vasodilator, vascular inhibitor, and activator of endothelial cell growth in the kidneys. According to Probosiwi et al., (2023) The results showed that 67 respondents were female, so the majority of respondents about female CKD patients. In addition, because the female urinary tract is shorter than men, women are more susceptible to chronic kidney failure. Hormonal differences between men and women can play a major role in the cause of long-term kidney failure. The hormone estrogen, which is more abundant in women, can protect kidney function and increase the risk of autoimmune disorders that can damage the kidneys. Estrogen affects the immune system and the inflammatory process. Excessive or unbalanced use of estrogen can cause inflammation, which can interfere with kidney health.

**b. Age**

A study conducted at KRMT Wongsonegoro Hospital in Semarang found that 25 respondents (41.7%) said that the majority of patients undergoing hemodialysis were between 56 and 65 years old. The results are consistent with previous studies conducted in other fields (Amanda, 2022). According to research conducted at RSUD Harapan dan Doa Kota Bengkulu, 65% of the 55 people surveyed were forty-five years old or older. Chronic kidney failure is more common in people with an average age of over 45 years. Because kidney function often deteriorates with age, many respondents were older. As people age, their organ function often deteriorates and their risk of disease usually increases. Life expectancy and disease prognosis are also affected by age. Chronic kidney failure can affect anyone at any age, but it is more common in people over fifty than in people under 40. According to Komariyah et al., (2024) Based on the results of the study, 26 respondents (81.3%) were aged between 20 and 60 years. Based on the assumption that this condition usually develops with age, increasing age can increase the risk of chronic diseases such as kidney failure because this condition sometimes takes a long time to develop. According to Srijaya & Malia, (2024) The average age of respondents was between 15 and 69 years (70.5%). The majority of patients with chronic kidney failure receiving hemodialysis were between 15 and 64 years old. The risk of experiencing decreased kidney function increases with age. This is because the structure, physiology, and cytology of the kidneys change with age, which can cause a decrease in the function of the Glomerular Filtration Rate (GFR). The risk of chronic kidney failure increases in patients of productive age as a result of unhealthy lifestyles, such as consuming coffee, supplements, and alcoholic beverages. According to Rantepadang, (2021) The results showed that 17 people (39%)

experienced chronic renal failure more often with increasing age. Kidney function decreases approximately 1% per year after the age of 40, and renal filtration gradually decreases. However, physiological and anatomical changes that occur during the age of forty to eighty years cause a decline in renal function, including a 20% decrease in renal mass, increased permeability of the filtration membrane, and the use of connective tissue as a substitute for renal tubules. In addition, physiological changes such as electrolyte imbalance, decreased creatinine clearance, and decreased metabolites occur.

**c. Education**

The results of the study conducted at RSUD KRMT Wongsonegoro Semarang showed that 19 respondents (31.7%) were high school students, the most of whom were hemodialysis patients. This result is in accordance with the results of research conducted by researchers elsewhere (Amanda, 2022).as many as 43 people who answered, or 78.2% of respondents, had completed high school education at RSUD Harapan dan Doa Kota Bengkulu. Education is an effort to influence others and meet expectations. Education can significantly change a person's perspective and behavior. With the help of higher education, a person can gain a better understanding and apply it to their actions and lifestyle. A person's level of education is one of the main determinants of health. The higher their education, the more they understand the need to maintain good health. According to Sefrina et al., (2023) The research findings show that the majority of respondents 41.7% have a high school or vocational school education. It is expected that their educational background will make it easier for them to recognize and avoid unhealthy behaviors. Hemodialysis patients with higher education usually show better self-control and understanding of the information provided by medical personnel. Respondents with higher levels of education also often show more logical attitudes and actions. According to Dwi & Arifianto, (2024) The results showed that 13 out of 30 respondents, or 43.33% of the total, had at least a high school education. This shows that education covers all aspects of life, from birth to death. In addition, education aims to encourage behavior to shift from ignorance to knowledge and understanding to understanding. Conversely, the findings of the study showed a favorable correlation between self-acceptance and education level. In other words, respondents had higher self-acceptance in relation to their education level. The physiology of intelligence states that humans will usually submit and accept whatever they need to live and recover. The higher a person's education level, the sooner they understand the importance of maintaining health.

**d. Work**

According to the research results, housewives are the majority of hemodialysis patients at KRMT Wongsonegoro Semarang Regional Hospital, as many as 18 respondents (30%). The results of this study are

consistent with findings elsewhere ((Astuti, 2022). At PKU Muhammadiyah Gombong Hospital, the majority of hemodialysis patients are housewives, with 60 respondents (41.7%). Hemodialysis patients often experience decreased body function, which generally results in job loss. However, if chronic kidney failure patients continue to adhere to the established hemodialysis therapy schedule, they can still do work and other activities(Utomo, 2024). According toCipto et al., (2024)The results of the study showed that 13 study participants (43.3%) worked as housewives. This finding is in line with previous research findings showing that most chronic kidney failure patients undergoing hemodialysis work as housewives. Most housewives do not have enough time to maintain their health because they are busy taking care of household chores. According toFitriani Tanjung & Ladesvita, (2023) research resultThe majority of respondents (66, or 81.5% of the total) were housewives or unemployed. If a person's economic level is good, they can more easily get health services and get information about health, which leads to better behavior. Poor physical condition and heavy workload caused most respondents to be unemployed or lose their jobs. because chronic kidney failure patients need more rest than people who work.

## **2. *Before Intervention Is Given***

The results of the study before being given cognitive behavioral therapy showed that 35 people (58.3%) were not compliant, 17 people (28.3%) were less compliant, and 8 people (13.3%) were compliant with fluid intake restrictions. Ongoing health education is very important for hemodialysis patients, because without comprehensive education, patients may have difficulty remembering and following the care instructions given ((Lutfiana Arum Putri Marini, 2024).Tolerance to fluid restriction is greatly influenced by positive affirmations, self-awareness, and professional medical support. Hemodialysis patients with kidney disease require ongoing assistance from medical specialists to help them comply with fluid restrictions and better manage their condition. Nurses have a responsibility to help change patients' behavior and direct their activities, with the aim of enabling patients to adapt to the fluid restrictions imposed, both consciously and unconsciously.(Junika, 2024).

## **3. *After Being Given Intervention***

The results of the study after being given cognitive behavioral therapy showed that fluid restriction was effective in helping most hemodialysis patients. Before cognitive behavioral therapy was applied, 3 respondents (5%) were non-compliant, 11 respondents (18.3%) were less compliant, and 46 respondents (76.7%) were compliant with fluid restrictions. According toLutfiana Arum Putri Marini, (2024)In this study, following instructions was shown to improve compliance. This was due to increased participant knowledge of the instruction program, which helped them to be more compliant in restricting fluid intake and improved their cognitive

understanding. The instructions provided were intended to motivate participants to change their behavior, with the hope of improving their cognitive understanding. Factors that influence compliance include sociodemographic aspects such as age, gender, education level, occupation, and history of food and fluid consumption, which may affect the effectiveness of dietary and fluid restrictions in hemodialysis patients. According to E. Wahyuni et al., (2024) In this study, people with kidney disease had to consistently monitor the amount of fluid they consumed, so it was no longer accurate to measure how much fluid they ingested due to thirst. There are a number of ways to manage fluid overload in people with chronic kidney disease, including sucking on ice to quench thirst. Mouthwash and boiling water are two other techniques. It is important to keep a thorough record of fluid intake and output to maintain stability and evaluate the efficacy of fluid control.

#### **4. Cognitive Behavioral Therapy Influences Hemodialysis Patients' Understanding of Fluid Intake Restrictions**

The results of the study entitled "The Effect of Cognitive Behavioral Therapy on Knowledge of Fluid Intake Restrictions for Hemodialysis Patients at KRMT Wongsonegoro Hospital Semarang" showed that out of 60 respondents, none experienced a decrease in knowledge from pre-test to post-test (negative rank). On the contrary, 43 respondents (22%) experienced an increase in knowledge (positive ranks).

In addition, 17 respondents did not experience changes (ties), which was caused by a lack of awareness of the importance of fluid intake restrictions, although some patients already understood the importance of the restrictions. Because the p value of 0.000 is smaller than 0.05,  $H_a$  is accepted while  $H_o$  is rejected. This shows that patient understanding of fluid intake restrictions during hemodialysis at KRMT Wongsonegoro Hospital, Semarang, is greatly influenced by cognitive behavioral therapy.

## **CONCLUSION AND RECOMMENDATIONS**

The following conclusions from this study are:

1. The characteristics of the research participants show that the majority of respondents were female, the largest age group was the late elderly (56–65 years), and the highest level of education was graduate. High school, and most jobs are housewives.
2. Cognitive behavioral therapy has a significant effect on hemodialysis patients' understanding of fluid intake limitations.

The recommendations from this study are as follows:

1. For RSUD KRMT Wongsonegoro, Semarang City: Research shows that patients undergoing hemodialysis who consume little fluid can benefit from including cognitive behavioral therapy in their treatment plan.
2. It is believed that patients undergoing hemodialysis for chronic renal failure will be able to regulate their fluid intake by using cognitive

behavioral therapy techniques, such as self-affirmation and realizing the importance of fluid limitation in hemodialysis treatment.

3. It is intended that this study will be used to investigate how cognitive behavioral therapy influences patients' understanding of fluid intake limitations while undergoing hemodialysis.

#### **ADVANCED RESEARCH**

The results of this study are expected to help undergraduate and professional students study the effect of cognitive behavioral therapy on knowledge about fluid intake restrictions in patients suffering from hemodialysis.

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