

Impact of hemodialysis therapy on quality of life in chronic kidney disease patients

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Abstract

Introduction: Kidney failure is a condition of sudden decline in kidney function. Kidney failure occurs when the kidneys are unable to remove metabolic waste from the body or perform their regular functions. Chronic kidney failure is treated by performing long-term hemodialysis which can have an impact on the patient's quality of life. The study aims to determine the relationship between the impact of hemodialysis therapy and the quality of life in chronic kidney disease patients.

Methods: The study was correlated with a cross-sectional approach. This study involved 34 patients on hemodialysis and was selected using consecutive sampling. Data were collected by questions and analyzed using the Spearman rho correlation test.

Results: Most female patients aged 30-45 years with a duration of hemodialysis therapy over 1 year. Most patients experience the effects of hemodialysis therapy badly. However, their quality of life is good. There is a significant relationship between hemodialysis therapy and the quality of life of patients (0.001).

Conclusion: Increasing the provision of counseling related to the impact of hemodialysis therapy and assisting patients to improve their quality of life.

Keywords: Hemodialysis; Quality of life; Chronic kidney disease; Counseling

1. Introduction

Kidney failure is a condition of sudden decline in kidney function. Kidney failure occurs when the kidneys are unable to remove metabolic waste from the body or perform their regular functions. A substance that is usually eliminated in the urine accumulates in body fluids due to impaired renal excretion and disrupts endocrine and metabolic functions, fluids, electrolytes, and acid-base.[1] Chronic kidney disease (CKD) is one of the world's major health problems, globally around 1 in 10 of the world's population is identified as having chronic kidney disease.[2] According to the United States Renal Disease Data System report in the United States, the prevalence of chronic kidney failure increases by 20-25% each year.[3]

In the United States, the incidence of CKD is estimated to reach 15% or 30 million people and it is recorded that 200,000 people in the United States are undergoing kidney replacement therapy with hemodialysis. According to, the incidence of CKD in Indonesia based on medical diagnosis in individuals aged ≥ 15 years has increased from 2.0% to 3.8% or 713,783 people.[4] North Kalimantan has the highest number of chronic kidney disease sufferers in Indonesia at 0.64%, followed by North Maluku at 0.56% and North Sulawesi at 0.53%.[5]

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In North Sumatra, the number of CKD sufferers is 0.33% or 45,792 people. A report from the Indonesian Renal Registry shows that the prevalence rate of new patients and CKD patients with active hemodialysis therapy from 2016 to 2018 has continued to increase. North Sumatra is in the fifth largest position with the number of new patients as many as 4,076 people. Through an initial survey conducted by researchers, data on CKD patients in 2021 were 181 inpatients and 392 outpatients, while in 2022 there were 299 inpatients and 154 outpatients. The number of patients undergoing hemodialysis in 2021 was 301 people, while in 2022 there were 376 people.[6]

Hemodialysis is given as an effort to extend the life expectancy of CKD patients. Hemodialysis is a procedure for blood flow from a patient through a dialysis machine, where this process is considered as a filter that has a thin membrane to separate the filtration for the patient's body and for the dialysate. Waste in the blood such as urea, creatinine, potassium, and other extra fluids are removed by the machine as waste products, and clean blood returns to the body. In the implementation of hemodialysis therapy, patient involvement is needed in controlling lifestyle such as limiting incoming fluids, regulating body diet, medication regimens, vascular access care, and patient hemodialysis continuity compliance.[7]

Kidney disease patients usually undergo hemodialysis 1-3 times a week for 3-4 hours in one therapy. This hemodialysis activity will continue throughout the patient's life.[8] Hemodialysis can cause patients to experience pain, sleep disorders, depression, decreased or increased blood pressure, and abdominal pain, thus reducing the quality of life. This causes reduced freedom, dependence on health services, family, changes in social life, and reduced income that affects the patient's quality of life, thus having an impact on decreasing the quality of life of sufferers both in terms of physical and psychological health domains.[9] Therefore, the study aims to determine the relationship between the impact of hemodialysis therapy and the quality of life in chronic kidney disease patients.

2. Material and methods

The study was correlated with a cross-sectional approach. The study was conducted at the regional hospital in Binjai from July to August 2024. This study involved 34 patients on hemodialysis and selected using consecutive sampling, Inclusion criteria are: 1) patients who are willing to be respondents by signing informed consent during data collection; 2) patients undergoing hemodialysis therapy; and 3) ages 30-45, 46-60, 61-75 years. Exclusion criteria: patients who are not willing to be respondents. The method of data collection in this study used a questionnaire with several questions. In this study, the researcher used the Guttman scale as a data measurement tool, the Guttman scale is firm, namely providing a "yes or no" answer. The purpose of the researcher using this scale is to make it easier for respondents to fill out the questionnaire, if the respondent answers "yes the value is 1, and if not the value is 0". Data were analyzed using the Spearman rho correlation test.

3. Results

Table 1 Characteristic respondent (n=43)

Characteristic	n	%
Gender		
Male	11	32.4
Female	23	67.6
Age (year)		
30-45	16	47.1
46-60	13	38.2
61-75	5	14.7
Underwent hemodialysis therapy (year)		
<1	6	17.6
>1	28	82.4
Total	34	100

Table 1 shows that the majority of respondents are female, 23 people (67.6%), the majority are aged 30-45 years, 16 people (47.1%), and the majority of respondents who underwent hemodialysis therapy for ≥ 1 year are 28 people (82.4%).

Based on Table 2, shows that respondents who had mild impacts from hemodialysis therapy were 9 people (26.5%), respondents who had moderate impacts from hemodialysis therapy were 9 people (26.5%), and respondents who had severe impacts from hemodialysis therapy were 16 people (47.0%).

Table 2 Impact of Hemodialysis Therapy on chronic kidney disease patients

Impact of Hemodialysis Therapy	N	%
Category		
Mild	9	26.5
Moderate	9	26.5
Severe	16	47.0
Total	34	100

Based on table 3, shows that respondents with poor quality of life are 8 people (23.5%), respondents with sufficient quality of life are 12 people (35.3%), and respondents with good quality of life are 14 people (41.2%).

Table 3 Quality of Life in Chronic Kidney Disease Patients

Quality of life	n	%
Category		
Good	14	41.2
Sufficient	12	35.3
Poor	8	23.5
Total	34	100

Based on table 3 shows that the Sig. (2-tailed) value is 0.001. Because the Sig. (2-tailed) value < 0.05 or $0.001 < 0.05$, it can be concluded that there is a significant relationship between hemodialysis therapy and quality of life. From the table above it is also known that the correlation coefficient number is 0.557, which means that the level of correlation/relationship strength is quite strong.

Table 4 Correlation between the impact of hemodialysis therapy and quality of life in chronic kidney disease patients

		Impact of Hemodialysis Therapy	Quality of life
Impact of Hemodialysis Therapy	Koefisien Korelasi	1.000	0.557**
	Sig. (2-tailed)	.	0.001
	N	34	34
Quality of life	Koefisien Korelasi	0.557**	1.000
	Sig. (2-tailed)	0.001	.
	N	34	34

4. Discussion

Kidney failure is caused by increasing age, and decreasing kidney function and is associated with a decrease in the rate of glomerular excretion and worsening tubular function. This is in line with previous research which suggested a relationship between age factors and chronic kidney disease ($p < 0.05$). [10] Age > 45 years has a greater risk of chronic kidney disease compared to age < 45 years. At the age of 40 years, the number of functioning nephrons decreases by about 10% every 10 years, and at the age of 80 years, only 50% of nephrons are functioning. [11] CKD becomes more common with age. After age 40, kidney filtration declines by about 1% each year. The odds ratio (OR) of CKD for Medicare patients ages 75–79 is 40% higher than for patients ages 65–74, and 1.75 times higher for patients over 80. [12]

The duration of hemodialysis is closely related to the efficiency and adequacy of hemodialysis, so the duration of hemodialysis is also influenced by the level of uremia due to the progressive deterioration of kidney function and comorbid factors, as well as the blood flow rate and dialysate flow rate. [13] However, the longer the hemodialysis process, the longer the blood is outside the body, so more anticoagulants are needed, with the consequence that side effects often arise. [14]

The duration of hemodialysis is defined as how long a person has undergone hemodialysis. The purpose of hemodialysis therapy is not to cure clients of chronic kidney disease because this disease is irreversible. Its main purpose is as a kidney replacement to maintain the homeostasis of the human body. The longer a client undergoes hemodialysis therapy, the greater the quality of life of the client with terminal kidney disease. This is because the level of anxiety and stress of the client increases. After all, they think that hemodialysis should be able to cure the client. [15]

Hemodialysis therapy takes a long time, is expensive, and requires client compliance with fluid and diet restrictions. Clients will lose their freedom due to various rules, clients are very dependent on healthcare providers. Income will decrease or even disappear due to unproductive clients. Supported by several other aspects such as physical, psychological, and environmental aspects, this can affect the quality of life of kidney failure clients. [16]

The results of the study showed that there were several facts, namely that almost all patients felt the impact of therapy on chronic kidney failure patients with the distribution of respondents based on the impact of hemodialysis therapy with a mild category of 9 respondents (26.6%), a moderate category of 9 respondents (9%), and a severe category of 16 respondents (47.0%). This study is in line with previous studies showing that the impact of hemodialysis therapy on most respondents was the impact of heavy hemodialysis therapy, as many as 16 respondents (47.0%). [17]

The quality of life of chronic kidney failure patients often decreases because patients are forced to change their routine habits. Moreover, patients who have just undergone hemodialysis usually feel unprepared to accept and adapt to changes in their physical and psychological. Quality of life is an individual's perception of their position in life, in the context of culture, or the value system in which they are located and its relationship to life goals, expectations, and standards. [18] The results of a study conducted by researchers on the quality of life of patients undergoing hemodialysis found that the majority had a good quality of life, with as many as 14 respondents (41.2%) who underwent hemodialysis for more than 24 months. This study is in line with previous studies showing that the quality of life of the respondents was mostly good quality of life, with as many as 15 respondents (88.9%) respondents who had undergone hemodialysis for more than 24 months. [18].

5. Conclusion

There is a relationship between the impact of hemodialysis therapy and the quality of life in patients with chronic kidney diseases (0.001).

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study."

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