

LONG UNDERGOING HEMODIALYSIS THERAPY AS A FACTOR RELATED TO FATIGUE IN KIDNEY FAILURE PATIENTS AT SAKINAH HOSPITAL

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ABSTRACT

Chronic Kidney Failure (CKD) is a disease characterized by a progressive decline in kidney function that requires hemodialysis therapy. One of the complications that patients often experience is fatigue. The purpose of this study is to determine the relationship between long-term hemodialysis and fatigue in GGK patients at Sakinah Hospital. This study uses a quantitative design with a cross-sectional approach. The research population was 215 GGK patients, with a sample of 69 respondents selected using consecutive sampling. The study variables were the length of time undergoing hemodialysis and fatigue. Data were collected using medical records and the Fatigue Assessment Scale (FAS) questionnaire, then analyzed using the Spearman Rho test. The results showed that most of the respondents underwent hemodialysis >2 years (84.1%) and experienced severe fatigue (53.6%). The value of $p=0.009$ with a correlation coefficient of $r=0.317$ showed that there was a significant relationship with the strength of the weak correlation and the direction of the positive relationship between the length of hemodialysis and fatigue in GGK patients.

Keywords: *Chronic Kidney Failure, Fatigue, Long Undergoing Hemodialysis*

INTRODUCTION

Chronic Kidney Failure (CKD) is a progressive and irreversible disease characterized by decreased kidney function so that in the final stages, kidney replacement therapy in the form of hemodialysis is required (S. P. Sari et al., 2022). Hemodialysis is performed regularly to maintain the balance of fluids, electrolytes, and remove the body's metabolic waste. Although it is useful to maintain patient survival, this therapy often causes complications, one of which is fatigue, which is a condition of physical and mental fatigue that can reduce the patient's ability to do activities and quality of life (Kallifah et al., 2024; Nugrahandari, Intan, Silfia et al., 2023).

Globally, the prevalence of GGK continues to increase. In 2021 it is estimated that more than 10% of the world's population or around 800 million people suffer from GGK (Kovesdy, 2022). Previous research has shown that fatigue is a complaint experienced by many hemodialysis patients. Luh et al. (2024) reported that 59% of patients experienced fatigue and 27% experienced extreme fatigue, while Karinda et al. (2025) found that around 68% of patients experienced moderate to severe category fatigue.

One of the factors suspected to be related to fatigue is the length of time undergoing hemodialysis therapy. Long-term hemodialysis can cause anemia, metabolic disorders, decreased physical capacity, and psychological stress that contribute to fatigue (Santoso et al., 2022; Nugrahandari, Intan, Silfia et al., 2023).

The results of a preliminary study at RSI Sakinah Mojokerto showed that there were 225 GGK patients who underwent hemodialysis in the last three months. Some patients complain of fatigue, weakness, and decreased daily activity with different levels of fatigue despite having undergone hemodialysis for a period of time. Research on the relationship between long-term hemodialysis and fatigue at Sakinah Mojokerto Hospital is still limited.

Therefore, this study aims to analyze the relationship between long-term hemodialysis therapy and fatigue in patients with Chronic Kidney Failure at Sakinah Hospital Mojokerto.

METHOD

This study uses a quantitative research design with a correlational analytical approach and a *cross-sectional* design, which aims to analyze the relationship between long undergoing hemodialysis therapy and fatigue in patients with chronic kidney failure at Sakinah Hospital. The *cross-sectional approach* was chosen because the measurement of both variables was carried out at the same time so that the relationships between variables could be analyzed simultaneously.

The study population was all patients with Chronic Kidney Failure who underwent hemodialysis therapy at Sakinah Hospital as many as 215 patients. The research sample totaled 69 respondents who were selected using *the non-probability consecutive sampling* technique for four weeks according to the inclusion and exclusion criteria that had been set. Inclusion criteria included COPD patients with *dyspnea* and adulthood, while patients with complications to decreased consciousness were not included in the study.

Data collection will be carried out in May 2026 at RSI Sakinah after obtaining ethical approval and research permits. Long data on hemodialysis was obtained through medical records, while fatigue levels were measured using the Fatigue Assessment Scale (FAS). All respondents were first given an explanation of the purpose of the research, then signed an agreement sheet to become a respondent before taking measurements and filling out questionnaires. The data obtained is then through *editing, coding, scoring, and tabulating* stages before being analyzed using SPSS. Univariate analysis was used to describe the characteristics of respondents and the distribution of each variable, while bivariate analysis was conducted using the Spearman's rho correlation test with a significance level (α) of 0.05 to determine the relationship between long-term hemodialysis therapy and *fatigue* in patients with chronic kidney failure at Sakinah Hospital.

FINDING AND DISCUSSION

RESEARCH RESULTS

GENERAL DATA

Table 1: Frequency Distribution of Respondent Characteristics in COPD Patients at Sakinah Hospital

Yes	Characteristics Respondent Demographics	F	%
1	Age		
	Early Adult 26-35 Years	5	7,2
	Late Adults 36-45 Years	18	26,1
	Early Seniors 46-55 Years	21	30,4
	Late Elderly 56-65 Years Old	18	26,1
	Senior >65 years old	7	10,1
2	Gender		
	Male	31	44,9
	Women	38	55,1

3	Education		
	No School	2	2,9
	Elementary School (Equivalent)	18	26,1
	Junior High School	21	30,4
	High School	22	31,9
	Higher Education (S1)	6	8,7
4	Jobs		
	Not Working	24	34,8
	PNS	5	7,2
	Self-employed	28	40,6
	Retirees	12	17,4
5	HD Frequency		
	2x A Week	100	100
	Total	69	100

Source : Primary Data 2026

Table 1 shows that almost half of the respondents are in the category of early elderly 46-55 years, which is 21 people (30.4%). Most of the respondents were female, namely 39 people (56.5%). Almost half of the respondents had a high school education level, which was 22 people (31.9%). In general employment data, almost half of the respondents have self-employed jobs, namely 28 people (40.6%). Finally, respondents who underwent hemodialysis 2 times a week were 69 people (100%). Thus, the majority of respondents in this study underwent hemodialysis 2 times a week.

SPECIAL DATA

1. Characteristics of Respondents Based on Length of Time of Haemodialysis Therapy

Table 2: Frequency Distribution of Respondent Characteristics Based on Length of Duration of Hemodialysis Therapy at RSI Sakinah

Long Time Undergoing HD Therapy	Frequency	Present (%)
< 1 year	3	4,3
1-2 Year	8	11,6
>2 years	58	84,1
Total	69	100

Source : Primary Data 2026

Table 2 shows that almost all respondents underwent hemodialysis therapy for more than 2 years, namely 58 respondents (84.1%).

2. Characteristics of Respondents Based on Fatigue

Table 3: Frequency Distribution of Respondent Characteristics Based on *Fatigue* at RSI Sakinah

Fatigue	Frequency	Present (%)
Lightweight	5	7,2
Medium	27	39,1
Weight	37	53,6
Total	69	100

Source : Primary Data 2026

Table 3 shows most of the fatigue experienced by respondents in chronic kidney disease patients at Sakinah Hospital, namely severe fatigue as many as 37 respondents (53.6%).

3. The Long Relationship of Undergoing Hemodialysis Therapy with Fatigue in Patients at Sakinah Hospital

Table 4: Cross-tabulation of Old Relationships Undergoing Hemodialysis Therapy at Sakinah Hospital

Long Lived	Fatigue							
	Lightweight		Medium		Weight		Total	
	N	%	N	%	N	%	N	%
< 1 year	0	0,0%	2	66,7%	1	33,3%	3	100%
1-2 years	2	25,0%	5	62,5%	1	12,5%	8	100%
>2 years	3	5,2%	20	34,5%	35	60,3%	58	100%
Total	5	7,2%	27	39,1%	37	53,6%	69	100%
	<i>p value 0.009 r 0.314</i>							

Source : Primary Data 2026

Table 4 shows that from 69 respondents, it was found that patients who underwent hemodialysis therapy for less than 1 year mostly experienced moderate fatigue, namely 2 people (66.7%), while 1 other person experienced severe fatigue (33.3%) and none experienced mild fatigue.

The results of the statistical test using Spearman rho correlation showed that p value = 0.009 (<0.05), so it can be concluded that there is a significant relationship between the length of hemodialysis therapy and fatigue in patients with chronic kidney failure. The correlation coefficient value of $r = 0.314$ indicates that the relationship is weak and unidirectional (positive), which means that the longer you undergo hemodialysis therapy, the more fatigue levels you feel tend to increase.

DISCUSSION

1. Identification of Length of Undergoing Hemodialysis Therapy in Patients with Chronic Kidney Failure

The results showed that most of the respondents underwent hemodialysis therapy for more than 2 years (58 respondents; 84.1%). These findings show that the majority of patients have undergone long-term therapy so they have the potential to experience various physical and psychological changes due to continuous exposure to therapy. The length of time undergoing hemodialysis (vintage dialysis) describes the duration of the patient undergoing therapy repeatedly, so that the longer the therapy is carried out, the greater the risk of complications such as anemia, sleep disorders, decreased physical capacity, nutritional problems, and fatigue (Jhon, 2018). The distribution of respondent characteristics also showed that patients undergoing hemodialysis for more than 2 years were dominated by the age group of 46–55 years, which is a group with a high risk of developing chronic kidney disease due to decreased kidney function and increased comorbidities, such as hypertension and diabetes mellitus (Almayra et al., 2024; Awdishu et al., 2025). These findings show that the length of time to undergo hemodialysis is an important aspect that needs to be considered in monitoring the patient's condition.

The results of this study are in line with the theory that patients undergoing hemodialysis have an average life expectancy of 5–10 years with good management (Dewi et al., 2025). The KDOQI guidelines also affirm that patients undergoing long-term hemodialysis require regular monitoring of dialysis adequacy and therapeutic complications. In addition, Hasballah et al. (2023) report that longer duration of hemodialysis therapy requires optimal monitoring as it relates to the risk of complications, although a dialysis duration of at least 240 minutes per session is associated with a reduced risk of mortality.

This research has several limitations. First, cross-sectional design only describes the relationships between variables at a time and therefore cannot explain cause-and-effect relationships. Second, the study was conducted in one hospital with a limited number of respondents so that the results could not be generalized. Third, other factors that can affect the patient's condition, such as nutritional status, comorbidities, hemodialysis adequacy, hemoglobin levels, and therapy adherence have not been analyzed in depth.

The implications of this study show that the length of time undergoing hemodialysis needs to be one of the considerations in monitoring the patient's condition, especially to detect complications such as fatigue. Health workers are expected to periodically evaluate the physical and psychological condition of patients undergoing long-term hemodialysis. Further research is recommended using a longitudinal design with a larger sample count and considering other confounding factors so that the relationship between long-term hemodialysis and fatigue can be explained more comprehensively.

2. Identification of *Fatigue* in Chronic Kidney Failure Patients

The results showed that most of the patients with Chronic Kidney Failure who underwent hemodialysis experienced severe fatigue (37 respondents), followed by moderate fatigue (20 respondents) and mild fatigue (12 respondents). These findings show that the majority of respondents have experienced severe fatigue that has the potential to reduce their ability to carry out daily activities and quality of life. Fatigue in hemodialysis patients is a multifactorial condition that is influenced by physiological

changes due to chronic kidney disease, such as anemia, accumulation of uremic toxin, metabolic disorders, decreased physical capacity, and psychological stress. In addition, the characteristics of respondents, who are dominated by the age of 46–55 years, who have undergone hemodialysis for more than two years, and are still working are suspected to contribute to the high level of fatigue. These findings show that fatigue is an important indicator that needs to be considered in the evaluation of the clinical condition of hemodialysis patients.

The results of this study are in line with Kartika and Hayati (2024) who stated that fatigue in hemodialysis patients is influenced by age, physical activity, length of time undergoing hemodialysis, and comorbidities. This finding is also supported by Hinkle and Cheever (2022) who explain that fatigue is one of the most common symptoms experienced by chronic kidney disease patients due to anemia, metabolic disorders, and decreased physical capacity. In addition, Almayra et al. (2024) reported that increasing age is associated with a decrease in physiological function and an increase in degenerative diseases so that patients are more susceptible to fatigue. Research by Mailani et al. (2025) also shows that patients who remain at work during hemodialysis tend to experience higher fatigue because they have to balance work activities with a routine therapy schedule. The results of this study reinforce that fatigue in hemodialysis patients is influenced by the accumulation of physiological, clinical, and individual characteristics.

This research has several limitations. First, the cross-sectional design only describes the condition at one time and therefore cannot explain the cause-and-effect relationship. Second, the study was conducted in one hospital with a relatively limited number of respondents so that the results could not be generalized. Third, several factors that have the potential to affect fatigue, such as hemoglobin levels, sleep quality, nutritional status, hemodialysis adequacy, depression, and comorbidities have not been analyzed in depth.

The implications of this study show that fatigue assessment using the Fatigue Assessment Scale (FAS) needs to be carried out periodically as part of the evaluation of hemodialysis patients. Early detection of fatigue allows health workers to provide appropriate interventions, such as education, anemia management, increased physical activity according to tolerance, and non-pharmacological therapies to reduce fatigue and improve the quality of life of patients. Further research is recommended to use a longitudinal or cohort design with a larger sample count and consider other confounding factors so that changes in fatigue during hemodialysis can be evaluated more comprehensively.

3. Analysis of the Long Relationship of Undergoing Hemodialysis Therapy with Fatigue in Chronic Kidney Failure Patients at Sakinah Hospital

The results showed that there was a significant relationship between the length of hemodialysis therapy and the level of fatigue in patients with Chronic Kidney Failure at Sakinah Hospital, with a value of $p=0.009$ (<0.05) and a correlation coefficient (r) of 0.317 which showed the strength of the weak relationship with the direction of the positive relationship. These findings suggest that the longer the patient undergoes hemodialysis therapy, the higher the tendency to fatigue. Clinically, these results illustrate that long-term exposure to hemodialysis therapy accompanied by the progression of chronic kidney disease contributes to increased fatigue due to the accumulation of physiological and psychological changes. However, the strength of the weak relationship

suggests that fatigue is not only influenced by the length of hemodialysis, but also by various other factors, such as age, hemoglobin levels, nutritional status, sleep quality, physical activity, comorbidities, depression, dialysis adequacy, and family support. In this study, it was also found that some patients who had undergone hemodialysis for more than two years only experienced mild to moderate fatigue, while some patients with less than two years of hemodialysis duration had experienced severe fatigue. The findings show that each patient's response to hemodialysis therapy varies according to their biological, psychological, and social conditions.

The findings of this study are in line with Mailani et al. (2025) who reported a significant relationship between the length of hemodialysis and the level of fatigue in GGK patients. These results are also supported by Jhamb et al. (2009) who stated that fatigue is one of the most common symptoms experienced by hemodialysis patients with a prevalence of 60–97% and is influenced by various factors, such as anemia, uremic toxin accumulation, sleep disorders, depression, inflammation, malnutrition, and comorbidities. In addition, Bossola et al. (2024) explain that fatigue can occur before, during, or after the dialysis process due to hemodynamic changes, hormonal disorders, inflammation, and low physical activity. These findings reinforce that length of hemodialysis contributes to fatigue, but is not the only factor that determines the level of fatigue in patients.

Although this study has been successful in showing a meaningful relationship between length of hemodialysis and fatigue, there are some limitations that need to be considered. The study used a cross-sectional design so it could not explain the cause-and-effect relationship. In addition, the study was only conducted in one hospital with a limited number of respondents, so the results could not be generalized. This study also did not control for several confounding factors, such as hemoglobin levels, sleep quality, nutritional status, depression, comorbidities, and hemodialysis adequacy that have the potential to affect fatigue levels.

The results of this study provide important implications for the nursing services of hemodialysis patients. Fatigue assessment using the Fatigue Assessment Scale (FAS) needs to be done periodically as part of the patient's routine evaluation. In addition to maintaining the adequacy of hemodialysis, health workers need to optimize anemia management, fulfillment of nutritional status, increase physical activity according to ability, energy management education, and psychosocial support to reduce fatigue and improve the quality of life of patients. Further research is recommended using a longitudinal or prospective design with a larger sample count and involving several hospitals so that the relationship between long-term hemodialysis and fatigue can be evaluated more comprehensively by considering various confounding factors.

CONCLUSION

Based on the results of a study on 69 patients with Chronic Kidney Failure (CKD) who underwent hemodialysis at Sakinah Hospital, most of the respondents had undergone hemodialysis therapy for more than 2 years, as many as 58 respondents (84.1%), while 11 respondents (15.9%) underwent hemodialysis ≤ 2 years. Meanwhile, most of the respondents experienced severe fatigue as many as 37 respondents (53.6%), followed by moderate fatigue as many as 20 respondents (29.0%), and light fatigue as many as 12 respondents (17.4%). The results of the analysis using the Spearman's rho test showed a p value of 0.009 ($p < 0.05$) with a correlation coefficient of 0.317, which showed a positive relationship with weak strength between the length of treatment of hemodialysis and the level of fatigue. These findings suggest that the longer the patient undergoes hemodialysis therapy, the higher the tendency to fatigue.

The results of this study show that the length of time undergoing hemodialysis therapy is one of the factors related to the level of fatigue in GGK patients. However, the strength of the relationship that is in the weak category indicates that fatigue is not only influenced by the length of time they undergo hemodialysis, but also by other factors such as age, hemoglobin levels, nutritional status, sleep quality, physical activity, comorbidities, dialysis adequacy, and the psychological condition of the patient. Therefore, the management of fatigue in hemodialysis patients needs to be carried out comprehensively by considering various factors that affect the patient's condition.

The findings of this study are expected to be the basis for health workers to conduct routine fatigue assessments as part of the evaluation of patients undergoing hemodialysis. In addition, optimizing anemia management, fulfilling nutritional status, increasing physical activity according to ability, energy management education, and psychosocial support need to be improved to reduce fatigue and improve the quality of life of patients. Further research is suggested to involve a larger number of respondents, using longitudinal or prospective designs, and adding other variables that have the potential to affect fatigue so as to obtain a more comprehensive picture of factors related to fatigue levels in GGK patients undergoing hemodialysis.

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