

ANALYSIS OF THE CORRELATION BETWEEN HEMODIALYSIS FREQUENCY AND STRESS LEVELS IN PATIENTS WITH CHRONIC KIDNEY DISEASE

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ABSTRACT

Chronic Kidney Disease is an irreversible condition that causes structural and functional impairment of the kidneys. CKD patients undergoing hemodialysis must undergo routine and ongoing treatment, which can lead to physical and psychological strain that risks increasing stress levels. This study employed a quantitative design with a cross-sectional approach. The study population consisted of 210 CKD patients undergoing hemodialysis, with a sample of 68 respondents selected using consecutive sampling. The Hemodialysis Stressors Scale (HSS) questionnaire was used to measure stress levels, while data on hemodialysis frequency were obtained from medical records. Data analysis was performed using the Spearman's Rho test. The results showed a p-value of 0.000 with $\alpha < 0.05$, indicating a significant association between hemodialysis frequency and stress levels in CKD patients. The correlation coefficient of $r = 0.798$ indicates a strong relationship. The higher the frequency of hemodialysis, the higher the patients' stress levels; conversely, patients undergoing hemodialysis once a week tended to have lower stress levels.

Keyword: *Chronic Kidney Disease, Hemodialysis Frequency, Stress Level*

INTRODUCTION

Chronic Kidney Disease is an irreversible and progressive decline in kidney function that is often asymptomatic and cannot be reversed until the disease reaches an advanced stage. Therefore, early detection and treatment are essential to improve the prognosis and extend patients' life expectancy. (Nishat et al., 2021). Fluid retention in the body caused by impaired kidney function can increase blood volume; therefore, common treatments for patients with CKD include kidney transplantation and hemodialysis (Cahyani et al., 2022). Hemodialysis is a procedure designed to correct biochemical imbalances in the blood caused by impaired kidney function, while also partially replacing the kidney's excretory function (Daurgidas et al., 2021).

Frequent hemodialysis sessions can affect stress levels in CKD patients because the more often patients undergo treatment, the greater the physical and psychological burden they experience (Ashar et al., 2023). In addition, stress in CKD patients can be triggered by the need to undergo hemodialysis for the rest of their lives, increased physical fatigue, exposure to repeated medical procedures, and the potential for various complications of CKD (D. Irawan & Suhartini, 2023).

The World Health Organization (WHO) has identified CKD as one of the top 10 causes of death worldwide, with the number of deaths from CKD rising from 13th place—with 813,000 deaths in 2000—to 10th place—with 1.48 million deaths in 2023 (WHO, 2024). According to the Indonesian Health Survey (2023), the prevalence of chronic kidney disease among Indonesians aged 15 and older reached 638,178 people, 20% of whom are

undergoing hemodialysis; East Java is the province with the highest number of CKD cases, totaling 98,738 people (Kemenkes, 2023).

Based on a preliminary study conducted in the Hemodialysis Unit at Gatoel Hospital in Mojokerto City on April 13, 2026, data obtained from the hemodialysis unit at Gatoel Hospital in Mojokerto City for January–March 2026 showed that 210 patients with chronic kidney disease (CKD) underwent hemodialysis, with an average of 70 patients receiving treatment per day. 204 patients (97.14%) underwent hemodialysis twice a week, and 6 patients (2.86%) underwent hemodialysis once a week, with each session lasting 4–5 hours. During interviews, it was found that 5 of the 35 patients were between the ages of 35 and 60. These 5 patients reported feeling tired after undergoing therapy, having difficulty sleeping before hemodialysis sessions, and feeling weak or lethargic, which limited their daily activities. However, 2 patients described additional symptoms such as nausea during the hemodialysis process, itching, and anxiety before hemodialysis.

Hemodialysis is a therapeutic method that functions as a substitute for the kidneys, designed to take over some of the kidneys' tasks in removing metabolic waste, toxic substances, and excess water from the body through the processes of diffusion and ultrafiltration. Hemodialysis is performed 2–3 times a week and takes several hours. This process causes patients to experience tension, anxiety, stress, and depression, which have a negative impact on their health (D. Irawan & Suhartini, 2023). Hemodialysis must be performed for the rest of a patient's life, and in addition, patients must cope with various complications arising from their underlying conditions, such as cardiovascular problems, anemia, hypertension, fertility issues in both men and women, skin and bone problems, and various other issues that cause patients to feel anxious and stressed when facing the reality they must confront.

The physical stress experienced by individuals with CKD affects various aspects of their lives, including biological, psychological, social, and spiritual aspects (biopsychosocial) (Baransano & Tambunan, 2023). Prolonged stress can increase cortisol levels, which, if sustained over time, can weaken the immune system, cause fatigue, increase susceptibility to illness, and slow down the recovery process. This condition has a negative impact on both the physical and mental health of patients. Stress levels in CKD patients are influenced by various factors, such as the frequency of hemodialysis or the duration of treatment, changes in lifestyle, limitations on daily activities, and the patient's psychological state (Ashar et al., 2023). Repeated and long-term hemodialysis sessions can lead to patient fatigue, which may reduce the effectiveness of therapy due to decreased patient adherence to the recommended treatment and care program.

Nurses, as caregivers who provide nursing care, play a vital role in delivering holistic care to patients with CKD undergoing hemodialysis, encompassing physical, psychological, social, and spiritual aspects (Baransano & Tambunan, 2023). Monitoring physical conditions such as vital signs, fluid status, vascular access status, and the patient's response during and after hemodialysis is part of a nurse's professional responsibilities. In addition, nurses also play a role in providing emotional support through therapeutic communication and helping patients identify and manage the stress they experience (Baransano & Tambunan, 2023). However, in clinical practice, psychological factors—particularly stress—are often not adequately identified and have not been a primary focus of hemodialysis care (Saputra et al., 2024). Therefore, it is important to make efforts to

detect stress early and analyze the factors associated with stress levels, one of which is the frequency of hemodialysis (D. Irawan & Suhartini, 2023).

Based on the background described above, the research question for this study is: “Is there a relationship between the frequency of hemodialysis and stress levels in patients with chronic kidney disease in the IHC Hemodialysis Unit at Gatoel Hospital in Mojokerto City?” This study aims to determine the relationship between the frequency of hemodialysis and stress levels in patients with chronic kidney disease in the Hemodialysis Unit, as well as to analyze the relationship between these two variables. The results of this study are expected to contribute to the advancement of nursing science, particularly in addressing the psychological aspects of CKD patients, as well as identifying and managing stress levels in CKD patients undergoing hemodialysis. Additionally, this study can serve as a reference for patients regarding their psychological condition, thereby enhancing their comfort during hemodialysis therapy.

METHOD

This study employed a quantitative research design, specifically a cross-sectional study using a questionnaire. The study population consisted of all 210 CKD patients undergoing hemodialysis at Gatoel Hospital. In determining the study sample, clear subject selection criteria were required, namely inclusion and exclusion criteria, resulting in a sample of 68 respondents. This study used consecutive sampling. This study involved two variables: the independent variable, frequency of hemodialysis; and the dependent variable, stress level. The instrument used in this study was a questionnaire to measure stress levels using the HSS questionnaire. The study was conducted at Gatoel Hospital in Mojokerto City from March 9 to June 8, 2026. The data analysis process in this study involved the stages of editing, coding, scoring, and tabulating. Univariate analysis was used to determine frequency distributions and percentages, while bivariate analysis employed the Spearman’s Rho test, conducted using IBM SPSS Statistics 21. Limitations of this study: Some patients chose not to participate because they were concerned about the content of the questionnaire. The use of a cross-sectional design meant that the relationship between the frequency of hemodialysis and stress levels was assessed at only one point in time, so it cannot yet describe a causal relationship between the two. This study underwent an ethical review process and received Ethics Approval No. 97/KEP/UBS-PPNI/IV/2026.

FINDINGS AND DISCUSSION

RESEARCH RESULTS

1. General Information

Characteristics of Respondents by Age, Gender, Occupation, and Duration of Hemodialysis

Table 1 Characteristics of Respondents Based on General Data

No	Characteristics	Frequency	Percentage (%)
1	Usia		
	18-25 years old	1	1,5
	26-35 years old	1	1,5
	36-45 years old	12	17,6
	46-59 years old	32	47,1
	≥60 years old	22	32,4
2	Gender		
	Male	37	54,4
	Female	31	45,6
3	Job		
	Work	15	22,1
	Not working	53	77,9
4	Length of time on hemodialysis		
	3-12 months	12	17,6
	>12 months	56	82,4
	Total	68	100

Source: Primary Data, 2026

Based on Table 1, the data collected during the study at IHC Gatoel Hospital in Mojokerto City from 68 respondents showed the following distribution: the majority of respondents were aged 46–59 years, totaling 32 people (4.1%). The majority of respondents in this study were male, totaling 37 people (54.4%). Most respondents were unemployed, totaling 53 people (77.9%), and most respondents had a history of hemodialysis lasting more than 12 months, totaling 56 people (82.4%).

2. Specific Data

1. Hemodialysis Frequency

Table 2 Frequency Distribution of Respondents Based on Hemodialysis Frequency in the IHC Hemodialysis Unit at Gatoel Hospital, Mojokerto City

Hemodialysis Frequency	Frequency	Percentage (%)
1x	6	8,8
2x	62	91,2
Total	68	100

Source: Primary Data, 2026

Results from Table 2: The study results show that the majority of respondents 62 people (91.2%) undergo hemodialysis twice a week, while a small number 6 respondents (8.8%) undergo hemodialysis once a week.

2. Stress Levels

Table 3 Frequency Distribution of Respondents Based on the Stress Levels of Patients with Chronic Kidney Disease in the Hemodialysis Unit at IHC Gatoel Hospital in Mojokerto City

Stress Level	Frequency	Percentage (%)
No stress	0	0
Mild stress	6	8,8
Moderate stress	58	85,3
Severe stress	4	5,9
Total	68	100

Source: Primary Data, 2026

The results in Table 3 show that 58 people (85.3%) experienced moderate stress, while a small proportion—6 people (8.8%)—experienced mild stress and 4 people (5.9%) experienced severe stress.

3. The Relationship Between Hemodialysis Frequency and Stress Levels in Patients with Chronic Kidney Disease

Table 4 Frequency Distribution of the Relationship Between Hemodialysis Frequency and Stress Levels in Patients with Chronic Kidney Disease in the IHC Hemodialysis Unit at Gatoel Hospital, Mojokerto City

Hemodialysis Frequency	Stress Level						Total	
	mild		Moderate		Severe			
	F	%	F	%	F	%	F	%
1x / week	6	100	0	0,0	0	0,0	6	100
2x / week	0	0,0	58	93,5	4	6,5	62	100
Total	6	8,8	58	85,3	4	5,9	68	100
Hasil Uji Statistik		p-value= 0,000			α: <0,05		r: 0,798	

Source: Primary Data, 2026

Table 4 shows the research results indicating that all 6 respondents undergoing hemodialysis once a week (100%) experienced mild stress. Meanwhile, among the respondents undergoing hemodialysis twice a week (62 people), the majority—58 people (93.5%)—experienced moderate stress, and 4 people (6.5%) experienced severe stress. Overall, out of a total of 68 respondents, the prevalence of stress levels was dominated by the moderate stress category, at 85.3%.

The Spearman's Rho statistical test yielded a *p*-value of 0.000 ($p < 0.05$), indicating a significant association between hemodialysis frequency and patients' stress levels. A correlation coefficient of 0.798 indicates that the relationship between the two variables is strong and positive. This suggests that an increase in the frequency of hemodialysis tends to be accompanied by an increase in the stress levels experienced by the respondents.

DISCUSSION

1. Hemodialysis Frequency in Patients with Chronic Kidney Disease Undergoing Hemodialysis

The results of the study show that the majority of respondents 62 people undergo hemodialysis twice a week, while a small number of respondents 6 people undergo hemodialysis once a week.

Hemodialysis is one of the methods of renal replacement therapy for patients with CKD. Hemodialysis is generally performed 1 to 2 times per week, depending on the patient's clinical condition. According to the guidelines (KDIGO, 2024), The frequency of hemodialysis is determined based on the patient's clinical condition, residual kidney function, fluid status, electrolyte balance, symptoms of uremia, and nutritional status. Patients with good residual kidney function can undergo hemodialysis less frequently, while patients with reduced kidney function or severe symptoms of uremia require more frequent hemodialysis. Accordingly, (PERNEFRI, 2021) states that the adequacy of hemodialysis is assessed based on a Kt/V value of at least 1.2 per session and a Urea Reduction Ratio (URR) of at least 65%. Therefore, the frequency of hemodialysis must be tailored to the patient's clinical condition to ensure optimal therapy and minimize complications resulting from chronic kidney disease.

Conducting hemodialysis once a week offers several advantages, particularly in terms of time efficiency. Patients only need to visit the hospital once a week, leaving them with more time for personal activities. However, this frequency has limitations in controlling the patient's physiological condition. Suboptimal removal of metabolic waste can lead to increased uremic levels, unstable blood pressure, swelling in the extremities, shortness of breath due to fluid buildup, and a decreased appetite. Additionally, patients face a higher risk of complications resulting from chronic kidney disease (Goran & Imallah, 2021).

Hemodialysis twice a week yields better results in maintaining patients' physiological condition. More optimal dialysis adequacy helps maintain stable blood pressure, reduce edema and shortness of breath, improve appetite, and make patients feel more energetic in carrying out their daily activities. These findings indicate that more frequent hemodialysis sessions can provide greater benefits to patients' physical health. However, this therapy also has some drawbacks, such as reduced free time because patients must undergo treatment more often. Additionally, patients remain at risk of experiencing side effects during hemodialysis, such as hypotension, muscle cramps, nausea, vomiting, headaches, and chest pain (PERNEFRI, 2021). In addition to affecting physical health, the frequency of hemodialysis also impacts patients' psychological well-being. Among CKD patients undergoing hemodialysis, various psychological issues are commonly observed, including anxiety, depression, social withdrawal, loneliness, feelings of helplessness, and despair. Therefore, in addition to addressing physical health, psychological support is also necessary to help patients adapt to hemodialysis therapy and maintain an optimal quality of life (Goran & Imallah, 2021).

The results of this study indicate that the frequency of hemodialysis is an indicator of a patient's clinical need to maintain physiological stability. Respondents undergoing hemodialysis twice a week generally require better management of fluids, electrolytes, and metabolic waste products; therefore, a higher frequency may have a positive impact

on their physical condition. However, increasing the frequency of therapy also has the potential to increase psychological burden, reduce free time, and limit patients' activities. Furthermore, the determination of hemodialysis frequency should be understood as a medical decision tailored to the patient's condition, rather than a demographic characteristic. Hemodialysis frequency depends more on the physician's advice and residual kidney function than on general patient characteristics. Thus, the variation in hemodialysis frequency in this study reflects the clinical conditions of the respondents.

2. Stress Levels in Patients with Chronic Kidney Disease Undergoing Hemodialysis

The research results show that of the 68 respondents (100%), nearly all—58 people—experienced moderate stress, 6 respondents experienced mild stress, and 4 people experienced severe stress.

According to (*World Health Organization*, 2023) Stress is a psychological state characterized by anxiety or mental strain that arises in response to a distressing situation. Stress in CKD patients undergoing hemodialysis is influenced by various multidimensional factors, including demographic (age and gender), biological, psychological, social, and environmental aspects that interact with one another (Saputra et al., 2024). Physiologically, hemodialysis imposes a significant physical burden, such as prolonged fatigue, lifelong dependence on hemodialysis machines, and various intradialysis complications including hypotension, hypertension, muscle cramps, nausea, vomiting, headaches, chest pain, and back pain which are significant sources of physical stress. Psychologically, coping mechanisms are a factor significantly associated with stress levels; patients with less effective coping mechanisms such as avoiding problems or blaming themselves experience more severe stress, while emotional regulation ability is the factor most strongly associated with stress levels, as patients with poor emotional regulation are more likely to experience anxiety, depression, and emotional instability (Pasaribu et al., 2025).

When linked to the questionnaire results, nearly all 58 respondents with moderate stress showed mild to severe scores on the physiological and psychological aspects. On the physiological aspect, respondents did not feel particularly tired after hemodialysis, sometimes experienced sleep disturbances, felt pain during hemodialysis, and experienced weakness that limited their daily activities. On the psychological front, respondents undergoing hemodialysis twice a week tended to feel bored or fed up with the hemodialysis routine; for those still working, the hemodialysis schedule was certainly a hurdle, though one they were able to manage. None of the hemodialysis patients were burdened by treatment costs, as these were covered by BPJS. Some respondents felt they had become more emotional than before undergoing hemodialysis therapy. Respondents also found it difficult to enjoy activities and felt that much of their time was consumed by therapy; however, they understood the importance of routine check up.

The questionnaire results showed that a small proportion of 6 respondents with mild stress levels scored well on both physiological and psychological aspects. Respondents reported no fatigue after hemodialysis, no sleep disturbances, minimal disruption from fatigue, the ability to carry out daily activities well, and no issues with

fluid and dietary restrictions, due to fairly good residual kidney function and normal urination. The respondents did not feel that much time was wasted on therapy. They also maintained good social relationships and family support and were not worried about their condition worsening, so their perceived stress levels were relatively low.

A small proportion of 4 respondents experienced severe stress levels, with a hemodialysis frequency of twice a week and a duration of hemodialysis treatment of less than 12 months, exhibiting the following physiological and psychological symptoms: experiencing fatigue after hemodialysis and during daily activities, resulting in limited activity; and feeling bored with the hemodialysis routine. Respondents also felt bothered by restrictions on eating and drinking. Anxiety and fear often arose due to the worsening of their medical condition and the complications they anticipated. Routine check-ups twice a week also contributed to their stress levels, as did feelings of anxiety before undergoing hemodialysis.

The primary factor influencing stress levels is gender. The research data above shows that of the total 68 respondents experiencing mild, moderate, and severe stress, 37 were male and 31 were female.

Gender is one of the individual factors that influence the stress response. Differences in biological, psychological, and social conditions between men and women lead to differences in their ability to adapt to chronic illness and long-term treatment. Patients undergoing hemodialysis are required to adapt to various changes, such as limitations on daily activities, dependence on treatment, changes in their roles within the family and social environment, and the obligation to undergo continuous treatment (Cholankeril & Xiang, 2023). Previous research has shown that this condition is likely influenced by the social and economic burdens often placed on men; thus, when they experience chronic illness and must undergo routine hemodialysis, they may experience greater psychological stress. Consequently, for male patients, the burden of illness, limitations on activity, and a tendency to suppress emotions can prevent stress from being properly managed, making it feel more overwhelming; furthermore, the social and economic responsibilities often placed on men frequently lead to greater distress when they are ill and unable to carry out their normal activities (Graves et al., 2021).

The high number of male respondents suggests that gender may play a role in the stress response of hemodialysis patients. Theoretically, men often face greater social and economic responsibilities, so when suffering from a chronic illness, they may experience higher levels of psychological stress. In addition, the tendency to suppress emotional expression can lead to stress not being properly channeled and ultimately being perceived as more severe. Thus, gender is one factor that needs to be considered in relation to stress levels among hemodialysis patients.

The second factor influencing stress is age. The results of the above study also show that of the 68 respondents, 32 were aged 46-59 years. A small portion 22 people were aged ≥ 60 years, 12 respondents were aged 36-45, and 2 people were aged ≥ 24 years.

Within this age range, stress levels can affect an individual's health, particularly in terms of productivity and quality of life. Additionally, advancing age leads to a gradual decline in the function of bodily organs, including the kidneys, and can trigger the onset of chronic kidney disease (A. G. Irawan & Saputra, 2026). During this phase, there is a

gradual decline in physiological, psychological, and social functioning, which can affect an individual's ability to perform daily activities independently. This makes them vulnerable to various limitations and health issues that can impact their quality of life. Consequently, the risk of increased stress grows as they age (Tampubolon et al., 2021)

The majority of respondents were aged 46–59 years, indicating that as people age, their physical condition generally declines, their ability to adapt to chronic illness diminishes, and their dependence on others tends to increase. For hemodialysis patients, this situation can add to their physical and psychological burden, as they must undergo long-term therapy, adapt to lifestyle changes, and cope with limitations in performing daily activities.

The results of the above study show that of the 68 respondents experiencing mild, moderate, and severe stress, 12 had been undergoing hemodialysis for 3–12 months, while the other 56 respondents had been undergoing hemodialysis for more than 12 months.

The duration of hemodialysis is one of the factors that can affect a patient's stress levels. According to Lazarus and Folkman's stress theory, stress arises when an individual perceives that the demands they face exceed their ability to adapt. For hemodialysis patients, the longer the therapy continues, the more they must continually adapt to their treatment routine, activity restrictions, and the condition they are living with, which can trigger stress. However, for some patients, the duration of therapy can also help them become more accustomed to it and adapt more effectively (D. Irawan & Suhartini, 2023).

The results of the study show that the majority of respondents had been undergoing hemodialysis for more than 12 months. These findings suggest that the duration of therapy may affect patients' stress levels. In hemodialysis patients, the longer the duration of therapy, the greater the likelihood that patients will adapt to routine treatment and activity restrictions, thereby reducing stress. Thus, the longer patients undergo hemodialysis therapy, the lower their stress levels.

3. The Relationship Between Hemodialysis Frequency and Stress Levels in Patients with Chronic Kidney Disease Undergoing Hemodialysis

Based on the results of the study, of the 6 respondents undergoing hemodialysis once a week, all (100%) experienced mild stress. Meanwhile, of the 62 respondents undergoing hemodialysis twice a week, the majority 58 respondents (93.5%) experienced moderate stress, and a small minority 4 respondents (6.5%) experienced severe stress. The results of the Spearman's Rho test showed a p-value of $0.000 < \alpha = 0.05$ with a correlation coefficient of $r = 0.798$; therefore, H_0 was rejected and H_1 was accepted. This indicates that there is a significant relationship between the frequency of hemodialysis and stress levels among CKD patients in the IHC Hemodialysis Unit at Gatoel Hospital in Mojokerto. A correlation value of 0.798 indicates a strong, positive relationship, meaning that the more frequently patients undergo hemodialysis, the more their stress levels tend to increase.

According to (Saputra et al., 2024), More frequent hemodialysis sessions are associated with increased stress levels because patients must undergo repeated treatment procedures, limit their social and work activities, and cope with concerns about their

health. The frequency of hemodialysis is one of the factors contributing to stress levels in CKD patients undergoing hemodialysis. Repeated and ongoing hemodialysis sessions each week can lead to burnout, a feeling of dependence on the dialysis machine, changes in lifestyle, and limitations in performing daily activities. These conditions have the potential to create a psychological burden that can increase stress levels in patients (Ashar et al., 2023). The results of this study are consistent with the findings of (Ashar et al., 2023) which found a significant association between the frequency of hemodialysis and stress levels in patients with chronic kidney disease ($p\text{-value} = 0.001$). The study indicated that the frequency with which patients undergo hemodialysis is associated with varying levels of stress among hemodialysis patients.

The results of a study conducted on CKD patients undergoing hemodialysis at IHC Gatoel Hospital in Mojokerto City showed that among those undergoing hemodialysis twice a week, 4 respondents (6.5%) had severe stress levels. The first respondent with severe stress had high questionnaire scores on both physiological and psychological aspects, particularly on items 1, 2, 4, 5, 7, 8, 9, 11, 17, 18, 24, 26, and 29. The respondent indicated that the stress experienced stemmed not only from physical complaints resulting from the disease and the hemodialysis process but also from the psychological burden arising from having to undergo continuous therapy. According to the researchers, these conditions caused the respondents to feel a loss of freedom in their daily lives because they had to adjust their activities, diet, fluid intake, and regular treatment schedules. The accumulation of these various demands can lead to prolonged feelings of boredom, worry, and anxiety, placing the respondents in the severe stress category.

Like the first respondent, the second respondent was classified as experiencing severe stress due to high questionnaire scores on physiological aspects, particularly items 1, 2, and 5. The respondent reported physical complaints such as fatigue after undergoing therapy and feelings of weakness. In addition, regarding the psychological aspect, the questionnaire results also showed high scores, particularly for statements 7, 8, 11, 12, 17, 18, 23, 24, 27, and 29. The respondent often felt bored with activities during hemodialysis and felt dependent on the hemodialysis machine. Respondents rarely avoid physical activities that cause fatigue, such as standing or walking for too long, because they work odd jobs. Fluid and dietary restrictions significantly disrupt respondents' activities; due to fluid restrictions, the alternative approach respondents take is to rinse their mouths or drink small sips as recommended by their doctors. Respondents often find it difficult to enjoy activities due to fatigue, and at times, they feel worried about their condition.

The third respondent also fell into the severe stress category due to high questionnaire scores on physiological and psychological aspects, particularly on items 2, 4, 5, 11, 17, 18, and 26. The respondent believed that their difficulty sleeping was caused by body aches as their hemodialysis appointment approached, and that this discomfort disrupted their sleep quality. The respondent explained that their daily activities had become more limited due to the need to adjust to their health condition and regular hemodialysis schedule. Additionally, the respondent felt quite burdened by the restrictions on fluid and food intake that must be adhered to every day. The obligation to undergo regular check-ups and therapy also causes stress and burnout. Nevertheless, the

respondents continue to follow all these recommendations because they recognize that adherence to treatment is a crucial part of maintaining their health and preventing more severe complications.

Like the third respondent, the fourth respondent—who was classified as experiencing severe stress—had a score nearly identical to that of the third respondent. The questionnaire scores were high in the physiological and psychological aspects, particularly for items 2, 5, 7, 11, 12, 20, 23, and 24. The respondent reported that during hemodialysis, they frequently experienced sleep disturbances and felt physically weaker than before becoming ill. The respondent also felt bored due to having to undergo repeated hemodialysis sessions over a long period. In addition, limitations in performing daily activities and difficulties at work made the respondents feel restricted in fulfilling their roles. The respondents also admitted to being concerned about the possibility of complications arising from their illness. The significant amount of time consumed by therapy made it difficult for the respondents to enjoy their favorite activities, leading to feelings of boredom and increased stress levels.

The findings from the four respondents in the severe stress category revealed relatively similar patterns of complaints, both in physiological and psychological aspects. In general, they experienced physical fatigue after undergoing hemodialysis, a feeling of weakness, sleep disturbances due to physical discomfort leading up to their treatment schedule, and limitations in performing daily activities. In addition, restrictions on fluid and food intake were also perceived as disruptive, as respondents had to constantly adjust their eating and drinking habits to medical recommendations. From a psychological perspective, all respondents expressed feelings of boredom and weariness due to the hemodialysis routine, which continued over a long period of time. They also felt dependent on the hemodialysis machine, worried about their health, and anxious about the possibility of complications. Furthermore, the limitations on working and engaging in activities freely led to a sense of loss of freedom and role in daily life. The accumulation of these physical and psychological complaints was reflected in high questionnaire scores on the physiological and psychological scales, placing all four respondents in the severe stress category.

CONCLUSION

The results of this study indicate a significant relationship between the frequency of hemodialysis and stress levels, with a strong, positive correlation. These findings suggest that the frequency of hemodialysis influences stress levels, given that this therapy requires patients to undergo long-term routine treatment, adhere to fluid and dietary restrictions, face limitations on their activities, and rely on hemodialysis machines.

This study offers several practical and academic implications. For respondents, it is hoped that they can maintain adherence to their hemodialysis schedule and manage stress optimally through self-acceptance, a healthy lifestyle, and the utilization of social support. For hospitals, particularly the IHC Hemodialysis Unit at Gatoel Hospital in Mojokerto, it is recommended to improve the quality of holistic care that addresses patients' physical and psychological needs, including through regular education and counseling programs. Meanwhile, future researchers are encouraged to expand on this study by analyzing other factors such as family support, coping strategies, quality of life, duration of therapy,

socioeconomic status, and educational level using a larger sample size and a qualitative approach to explore patients' subjective experiences and adaptation processes in greater depth.

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