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The Relationship between Long Time Undergoing Hemodialysis and Stress Levels in Chronic Kidney Failure Patients Undergoing Hemodialysis at Bendan Regional Hospital, Pekalongan City

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Background: Chronic renal failure is characterised by irreversible decline in kidney function. Chronic renal failure requires haemodialysis therapy. Long time undergoing haemodialysis can cause psychological problems such as stress. The purpose of this study was to assess the relationship between length of haemodialysis and stress level in chronic renal failure patients undergoing haemodialysis at Bendan Hospital, Pekalongan City. **Methods:** The research design used descriptive correlative with cross sectional approach. The study population were all chronic renal failure patients undergoing haemodialysis at Bendan Hospital, Pekalongan City, as many as 70 people. The study sample were 70 patients with chronic renal failure who underwent haemodialysis at Bendan Hospital, Pekalongan City by total sampling. The research instruments were questionnaires and Perceived Stress Scale (PSS). Data analysis used spearman rank correlation test. **Results:** the majority of respondents, 36 people (51,4%) had undergone haemodialysis for ≤ 1 year and the majority of respondents, 58 people (82.9%) experienced moderate stress. The results showed that there was relationship between the length of undergoing haemodialysis with stress levels in chronic renal failure patients undergoing haemodialysis at Bendan Hospital, Pekalongan City with a p value: 0,000 with a correlation value of rho of -0,438, which means that the length of haemodialysis has a moderate strength of relationship with stress levels. **Conclusion:** length of haemodialysis is associated with stress levels of chronic kidney failure patients.

1. Introduction

Chronic kidney failure is one of the most prominent causes of death and suffering in the 21st century, partly due to increased risk factors, such as obesity and diabetes mellitus. The number of chronic kidney failure patients has increased by approximately 843.6 million people worldwide in 2017 (Kovesdy, 2022). Based on the 2021 Health Profile, it is known that the number of cases of chronic kidney failure in Indonesia is 1,417,104 cases (Ministry of Health, 2022).

Chronic renal failure is a clinical state characterized by irreversible decline in kidney function, to a degree that requires permanent renal replacement therapy. Chronic renal failure is a progressive and continuous destruction of kidney structures (Saputra et al, 2023). Patients with chronic renal failure must undergo lifelong hemodialysis therapy and require treatment time of approximately 12-15 hours every week (Siregar, 2020).

Patients with chronic renal failure undergoing hemodialysis therapy are at risk of stress. Stress becomes part of the response of chronic renal failure patients to hemodialysis therapy, the environment of the dialysis unit is busy and chaotic with the patient's physical status can change suddenly and even death can occur. Stress in chronic renal failure patients can underlie seemingly irrational or disruptive behaviors in the dialysis unit, which puts patients in conflict with doctors and dialysis unit staff (Cukor et al, 2021). Sandra's research (2020) entitled "Description of Stress in Terminal Kidney Failure Patients Undergoing Hemodialysis Therapy at Arifin Achmad Regional General Hospital Pekanbaru" states that patient stress at a mild level is 2 people (6%), moderate patient stress is 21 people (58%), severe patient stress is 13 people (36%), while Rahayu (2019) in a study entitled "Stress Response of Chronic Kidney Failure Patients Undergoing Hemodialysis in the Hemodialysis Room Dr. Hardjono Ponorogo Hospital" stated that there were 10 people (29.41%) experiencing normal stress, 19 people (55.88%) mild stress and 5 people (14.7%) moderate stress.

Social problems such as poverty, discrimination and other social risks can increase exposure to stress and inhibit allostasis, which is the body's ability to respond appropriately to stress through the endocrine, cardiovascular, metabolic, immune, and autonomic systems to maintain physiological stability. Increased allostatic load or increased activity in the stress response system can increase the risk of disease, including hypertension and cardiovascular disease and even death (Cukor et al, 2021). Research by Hedayati et al (2011) entitled "Prevalence of Major Depressive Episode in CKD," conducted in Dallas America states that patients undergoing long-term hemodialysis therapy with a clinical diagnosis of depression are twice as likely to die or require hospitalization within one year compared to those who do not have depression.

The problem caused by hemodialysis therapy is the duration or duration of treatment that requires patients to undergo hemodialysis for life. Lifelong therapy changes the patient's life both physically, cognitively, psychologically, socially and spiritually (Saputra et al, 2023). The duration of hemodialysis therapy is divided into 3, namely less than 12 months, 12-24 months and more than 24 months. Hemodialysis in patients with chronic renal failure is usually programmed two to 3 times per week. The frequency of hemodialysis depends on the remaining kidney function (Rahmini et al, 2023). Sari's research (2022) conducted in the Hemodialysis Room of Bhayangkara Hospital Jambi City stated that most of the chronic kidney failure patients who had undergone hemodialysis were 16 people (55.2%)

undergoing hemodialysis for >12 months and 13 people (44.8%) undergoing hemodialysis ≤ 12 months.

Patients undergoing hemodialysis therapy find it difficult to undergo activities of daily living, entertainment, and social activities, loss of independence, must retire early, experience economic problems, role changes, and deterioration of family life, as well as changes in body image and self-esteem (Tayaz, 2019). This state gives rise to psychological disorders of the patient, discomfort and unfreedom for the patient. This condition over time causes anxiety, stress and even depression (Siregar, 2020). Patients with kidney disease undergoing long-term dialysis therapy have an increased risk of morbidity and mortality (Cukor et al, 2021).

Wahyuni's research (2018) conducted at Dr. M. Djamil Padang Hospital stated that there was a long relationship between hemodialysis and the quality of life of chronic kidney disease patients with diabetes mellitus (Wahyuni, 2018), Darmawan's research (2019) conducted at Sanglah Hospital Denpasar stated that there was a long relationship between hemodialysis and fatigue in patients with chronic kidney failure, as well as Chairunnisa's (2017) research conducted at RSUDZA Banda Aceh stated that there were The relationship between the duration of hemodialysis therapy and sleep quality in elderly patients, while a study conducted by Rajaguguk (2019) entitled "The Relationship between Hemodialysis Duration and Comorbidity Factors with Death of Chronic Kidney Failure Patients at Dr. Pringadi Hospital Medan" stated that the mortality of chronic kidney failure patients was influenced by comorbid diabetes mellitus type II, heart failure, and duration of hemodialysis.

Based on data from Bendan Hospital, Pekalongan City, it is known that the number of old patients who routinely undergo hemodialysis in the hemodialysis room of Bendan Hospital until May 31 is 62 people. From June 1 to August 7, 2023, there were 10 patients who died and the number of new patients with chronic kidney failure undergoing routine hemodialysis in the hemodialysis room of Bendan Hospital increased by 18 people, so that 70 patients who were still routinely undergoing hemodialysis until August 7, 2023. The results of a preliminary study on May 31, 2023 of 11 patients undergoing hemodialysis found that 7 people (63.6%) had undergone hemodialysis therapy > 12 months. In 11 patients were given and asked to fill out the Perceived Stress Scale (PSS) questionnaire and the results were obtained 7 people (63.6%) included in the severe stress category, 3 people (27.3%) included in the moderate stress category and 1 person (9.1%) included in the mild stress category.

The results of observations made by researchers since May 2014 until now, found that the majority of patients undergoing hemodialysis not only experience problems in their physical and health but also experience problems in their biopsychology, where they are required to adapt to dietary patterns and fluid restrictions that sometimes conflict or do not match the habits of patients before illness. There is also a feeling of fear because every time hemodialysis the patient has to feel pain when vascular access or needle injections are done, especially in patients who are still using femoral access. Hemodialysis routine with an average of twice per week patients feel that their lives have a very high dependence on hemodialysis machines and make patients afraid of sudden changes or deterioration in health and many even assume that their life will no longer be long. There was also a change in role, especially in male patients who used to be the backbone of the family but with their declining physical condition and had to routinely hemodialysis an average of twice per week, making patients have to quit their jobs so they could not earn a living like before illness. The majority of patients who have psychological problems will make their quality of life decrease, there will be more complaints and other health problems compared to patients

who can accept and can adapt to their disease. These things have the potential to cause stress in patients undergoing hemodialysis.

The purpose of this study was to determine the relationship between the length of hemodialysis and stress levels in chronic kidney failure patients undergoing hemodialysis at Bendan Hospital, Pekalongan City.

2. Research Method

The study design used descriptive correlation with a cross sectional approach. The study sample was 70 chronic kidney failure patients undergoing hemodialysis at Bendan Hospital in Pekalongan City with total sampling techniques. The research instrument used the Perceived Stress Scale (PSS) questionnaire. Data analysis using frequency distribution and spearman rank.

3. Result and Discussion

3.1. Characteristics of Respondents

a. Age

Table 1 Frequency Distribution of Respondents' Characteristics by Age at RSUD Bendan Kota Pekalongan, December 2023 (n= 70)

Age	Frequency (f)	Percentage (%)
Early adulthood (21-40 years)	12	17,1
Middle adult (41-60 years old)	43	61,4
Senior (over 60 years old)	15	21,4
Total	70	100

Table 1 shows that the majority of respondents, namely 43 people (61.4%) belong to the middle adult age category (41-60 years).

b. Gender

Table 2 Frequency Distribution of Respondents' Characteristics by Sex at RSUD Bendan Kota Pekalongan, December 2023 (n= 70)

Gender	Frequency (f)	Percentage (%)
Man	43	61,4
Woman	27	38,6
Total	70	100

Table 2 shows that the majority of respondents, namely 43 people (61.4%) are male.

c. Education Level

Table 3 Frequency Distribution of Respondents' Characteristics Based on Education Level at Bendan Hospital in Pekalongan City, December 2023 (n= 70)

Education Level	Frequency (f)	Percentage (%)
Did not finish elementary school	4	5,7
Graduated from elementary school	18	25,7
Graduated from Junior High School / MTs	9	12,9
Graduated from High School/SMK/MA	29	41,4
Graduated from academy / PT	10	14,3

Education Level	Frequency (f)	Percentage (%)
Total	70	100

Table 3 shows that the majority of respondents, namely 29 people (41.4%) have high school / vocational / MA education.

3.2. Univariate Analysis

a. Duration of Hemodialysis

Table 4 Frequency Distribution of Respondents' Characteristics Based on Hemodialysis Duration at Bendan Hospital in Pekalongan City, December 2023 (n= 70)

Duration of Hemodialysis	Frequency (f)	Percentage (%)
≤ 1 year	36	51,4
2-3 years	12	17,1
≥ 3 years	22	31,4
Total	70	100

Table 4 shows that the majority of respondents, namely 36 people (51.4%) have undergone hemodialysis for ≤ 1 year.

b. Stress Level

Table 5 Frequency Distribution of Respondents' Characteristics Based on Hemodialysis Duration at RSUD Bendan Kota Pekalongan, December 2023 (n= 70)

Stress Level	Frequency (f)	Percentage (%)
Mild stress	6	8,6
Moderate stress	58	82,9
Severe stress	6	8,6
Total	70	100

Table 5 shows that the majority of respondents, 58 people (82.9%) experienced moderate stress.

3.3. Bivariate Analysis

The results of the study of the relationship between the length of hemodialysis and the stress level of chronic renal failure patients undergoing hemodialysis can be seen in the following table:

Table 6 The Relationship Between Hemodialysis Duration and Stress Level of Chronic Kidney Failure Patients Undergoing Hemodialysis at Bendan Hospital in Pekalongan City, December 2023, (n= 70)

Duration of Hemodialysis	Stress Level								ρ value	Rho
	Light		Keep		Heavy		Total			
	f	%	f	%	f	%	f	%		
≤ 1 year	4	11,1	1	3,3	2	5,6	3	10,0	0,00	-0,38
2-3 years	0	0	1	3,3	0	0	2	6,7		

> 3 years	3	5	22,7	15	68,2	2	9,1	2	10
Total		9		39		2		7	0

Based on table 6, it is known that of respondents who underwent hemodialysis ≤ 1 year with mild stress of 4 people (11.1%), moderate stress of 12 people (33.3%) and severe stress of 20 people (55.6%). Respondents who underwent hemodialysis for 2-3 years with moderate stress amounted to 12 people (100%) and there were no respondents with mild stress and severe stress. Respondents who underwent hemodialysis > 3 years with mild stress of 5 people (22.7%), moderate stress of 15 people (68.2%) and severe stress of 2 people (9.1%).

The results of the *spearman rank test* between the duration of hemodialysis and the level of stress obtained ρa value of $0.000 < 0.05$, which means that H_0 is rejected, so there is a relationship between the length of undergoing hemodialysis with the level of stress in chronic kidney failure patients undergoing hemodialysis at Bendan Hospital in Pekalongan City. The correlation value (*rho*) is -0.438 which means the relationship of the length of hemodialysis with the stress level of chronic renal failure patients undergoing moderate hemodialysis. This study has a negative relationship direction, so the longer the hemodialysis, the lighter the stress level of chronic kidney failure patients.

Discussion

Univariate Analysis

a. Duration of Hemodialysis

The results showed that The majority of respondents, namely 36 people (51.4%) have undergone hemodialysis for ≤ 1 year. Research conducted in the Hemodialysis Room of Bhayangkara Hospital Jambi City stated that Chronic renal failure patients who had undergone hemodialysis were mostly 16 people (55.2%) undergoing hemodialysis > 12 months and 13 people (44.8%) undergoing hemodialysis ≤ 12 months (Sari, 2022).

Hemodialysis is One of the artificial kidney replacement therapies that aims to correct fluid and electrolyte balance disorders (Safrudin, 2019). The duration of hemodialysis therapy that has been undertaken by hemodialysis patients is divided into three groups based on the length of time undergoing hemodialysis, namely patients who have undergone new hemodialysis (≤ 1 year), patients who have undergone moderate hemodialysis (2-3 years) and patients who have undergone long hemodialysis (> 3 years) (Kusuma, 2022).

Patients with chronic kidney failure need hemodialysis therapy every week and for a long period of time and even a lifetime because the patient can no longer filter fluids in the body. The process of hemodialysis can also have a physical and psychological impact on patients. Long time undergoing hemodialysis can be a stressor of psychological disorders such as stress. In chronic renal failure patients who undergo hemodialysis ≤ 1 year, more people experience stress than patients who have undergone hemodialysis for a long time. This can be because the patient has not been able to accept the doctor's diagnosis of the disease, which requires the patient to undergo hemodialysis throughout life and must adjust to the hemodialysis therapy he

undergoes. Patients must take time out of their routine activities because they have to undergo hemodialysis. This is according to research Goran (2021) which mentions that condition illness causes the emergence of demands to adjust, compared to other diseases chronic diseases involve adjusting for a certain period of time, even forever. Some of these forms of self-adjustment include: self-adjustment in terms of behavior related to aspects of limitations and recommendations of the disease and its treatment. Aspects of limitations include physical capacities that can interfere with work, family and sexual function. In addition, the condition of the disease suffered and continuous dependence on the treatment undertaken will provide pressure and negative influences in the form of stressors for patients.

The number of chronic kidney failure patients at Bendan Hospital in Pekalongan City who underwent hemodialysis \leq 1 year was 36 people (51.4%). This is because Bendan Hospital in Pekalongan City has developed hemodialysis therapy services by adding hemodialysis machines, so that new chronic kidney failure patients can be accommodated or get hemodialysis services. New chronic renal failure patients are patients who are referred from the inpatient room to undergo hemodialysis, not transfer or referral from another hospital.

b. Stress Level

Result research indicates that The majority of respondents, 58 people (82.9%) experienced moderate stress. Research Sandra (2020) with the title "Description of Stress in Terminal Kidney Failure Patients Undergoing Hemodialysis Therapy at Arifin Achmad Regional General Hospital Pekanbaru" stated that Mild patient stress was 2 people (6%), moderate patient stress was 21 people (58%), severe patient stress was 13 people (36%).

Patients undergoing hemodialysis therapy find it difficult to cope with activities of daily living, entertainment, and social activities, lose independence, must retire early, experience economic problems, change of roles, and deterioration of family life, as well as changes in body image and self-esteem (Tayaz, 2019). This state gives rise to psychological disorders of the patient, discomfort and unfreedom for the patient. This condition can cause anxiety, stress and even depression (Siregar, 2020).

Hemodialysis is a stressor for psychological problems in patients with chronic kidney failure, because patients have to undergo hemodialysis every week as needed 2x per week or even some patients who have to undergo therapy 3x per week. This hemodialysis therapy activity interferes with the daily activities of chronic kidney failure patients because they have to spend time regularly undergoing hemodialysis therapy, causing stress, especially for patients who have just undergone hemodialysis therapy. This is according to research Rahayu (2019a) which states that there is a relationship between hemodialysis frequency and stress levels of chronic renal failure patients with $p: 0.041$. Patients who were often on hemodialysis therapy and experienced moderate stress by 48.3%, even experienced severe stress (22.4%).

The results of cross-tabulating age with stress levels of chronic renal failure patients found that the majority (35.7%) of respondents were aged 41-60 years and experienced moderate stress. This is because a person at the age of 41-60 years is a middle adulthood marked by physical decline and the emergence of fear that he cannot be productive again, but must take care of children into adulthood, he must also achieve achievements and maintain satisfactory achievements in work. Chronic kidney failure causes decreased function and disrupts a person's productivity, resulting in

stress. This is in accordance with the opinion of Hurlock (1987) in Masykuroh et al (2022) which states that the task of madaya adult development is to achieve and achieve significant achievements in work, perform tasks according to their roles with social responsibility, and nurture and help adolescents to become responsible and happy villages.

2. Bivariate Analysis

From the results of the study, it was found that chronic kidney failure patients who underwent hemodialysis ≤ 1 year were known to the majority (55.6%) to experience severe stress, while those who underwent hemodialysis > 3 years were known to the majority (68.2%) to experience moderate stress.

Hemodialysis therapy often causes problems such as the duration or length of treatment that requires patient undergo hemodialysis for life. Lifelong therapy changes the patient's life physically, cognitively, psychologically, socially and spiritually (Saputra et al, 2023). Based on the theory above, chronic kidney failure patients who must undergo hemodialysis therapy for life will experience changes in their lives, both physically, socially and psychologically. This is because kidney failure patients must undergo hemodialysis therapy 2x a week, so that the time for activities or social interaction decreases. This condition can cause psychological problems, especially in the early days of hemodialysis therapy.

Stress in kidney failure patients undergoing hemodialysis ≤ 1 year can be caused by changes in roles and daily activities, because patients must undergo hemodialysis therapy regularly 2-3 times per week. Patients diagnosed with chronic kidney failure feel sad, anxious and must rely on hemodialysis therapy in their treatment program. The patient should also do *Self Care Management* by changing lifestyle and fluid restriction. Changes that occur in patients can be stressors of stress in patients with chronic renal failure who undergo hemodialysis. This is according to research Kintan (2023) which mentions between *Self Management* Related stress levels in patients with chronic renal failure undergoing hemodialysis with a p: value of 0.001.

Patients with chronic renal failure who underwent hemodialysis therapy ≤ 1 year there were 12 people (33.3%) who experienced moderate stress and 4 people (11.1%) experienced mild anxiety. This can be caused by chronic kidney failure patients who are ≤ 1 year old and experience mild anxiety, can be caused by patients getting good social support from family or the environment Patients who experience mild anxiety can also be caused by patients having good coping mechanisms, such as accepting their health condition, getting closer to God and increasing their spiritual activities. This is according to research Suprihatiningsih (2021) which states that there is a significant relationship between coping mechanisms and stress levels in chronic renal failure patients undergoing hemodialysis at RSU Nirmala Purbalingga (ρ value = 0.000) and there is a significant relationship between family support and stress levels in CRF patients undergoing hemodialysis at RSU Nirmala Purbalingga (ρ value: 0.001).

Stress is often accompany Chronic diseases and require treatment and affect psychological conditions and treatment outcomes. Chronic kidney failure can be a stressful diagnosis with psychological challenges including: Intermittent acute stress on top of chronic disease, decreases quality of life, depends on treatment throughout life and generates feelings of sadness, anxiety and guilt. Patients can present with common stress-related illnesses, as well as non-compliance with medical prescriptions,

decreased quality of life and increased morbidity and mortality (Saggi & Salifu, 2022).

Test results *spearman rank* between the length of hemodialysis and the level of stress Retrieved ρ value of $0.000 < 0.05$, which means H_0 rejected, so that There is a relationship between the length of hemodialysis and the level of stress in chronic kidney failure patients undergoing hemodialysis at Bendan Hospital, Pekalongan City. The results of this study are in accordance with research Irawan (2024) with the title "The Long Relationship of Undergoing Hemodialysis Therapy with the Stress Level of Chronic Kidney Failure Patients" states that aand the relationship between the length of hemodialysis therapy and the stress level of chronic kidney failure patients at the Dialysis Unit of RSUD dr. Haryoto, Lumajang Regency. The longer the hemodialysis therapy, the milder the stress level of chronic kidney failure patients.

Correlation value (*Rho*) between the length of hemodialysis and the level of psychological stress of -0.438 which means the relationship of the length of hemodialysis with the stress level of chronic renal failure patients undergoing moderate hemodialysis. This study has a negative relationship direction, so the longer the hemodialysis, the lighter the stress level of chronic kidney failure patients. Chronic renal failure patients who undergo hemodialysis longer, the milder the stress level. This can be caused to be more adaptive in undergoing hemodialysis therapy because you already have experience in dealing with complications caused during hemodialysis therapy. The patient has also surrendered to God for his illness, so he does not feel depressed because of his health condition. This is in accordance with opinion Bayhakki & Hasneli (2017) which states that chronic renal failure patients are getting old Undergoing hemodialysis, provides opportunities for patients to be more adaptive to the hemodialysis program, but on the other hand, the longer the hemodialysis is also the higher the potential for complications that can actually hinder the development of the hemodialysis therapy program.

Patients with chronic renal failure who underwent hemodialysis > 3 years were known to the majority (68.2%) experience moderate stress. This can be caused by chronic kidney failure patients who have long undergone hemodialysis will experience quality of life, which is characterized by decreased kidney function causing complications such as not being able to pass urine. Patients with chronic kidney failure for a long duration can also cause complications such as calcium deficits, resulting in bone pain. This is according to research Sari (2022) There is a relationship between the length of hemodialysis and the quality of life of chronic kidney disease patients with a p-value of 0.001.

4. Conclusion

1. The length of undergoing hemodialysis in kidney failure patients at Bendan Hospital, Pekalongan City, is known to the majority of respondents, namely 36 people (51.4%) have undergone hemodialysis for ≤ 1 year.
2. The stress level of kidney failure patients undergoing hemodialysis at Bendan Hospital in Pekalongan City is known to the majority of respondents, namely 58 people (82.9%) experiencing moderate stress.
3. There is a relationship between the length of hemodialysis and stress levels in chronic renal failure patients undergoing hemodialysis at Bendan Hospital in Pekalongan City with ρ value: 0.000 with a rho correlation value of -0.438 .

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