



## The Relationship Between The Hemodialysis Span and The Stress Level and Sleep Quality of Chronic Kidney Failure Patients In Hemodialysis Room At Tk. III Slamet Riyadi Hospital Surakarta

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### ARTICLE INFO

#### Article history:

Received Oct 30, 2023  
Revised Nov 9, 2023  
Accepted, Apr 19, 2024

#### Keywords:

Hemodialysis;  
Sleep quality;  
Stress.

### ABSTRACT

Hemodialysis will affect stress levels and sleep quality in chronic kidney failure patients. The longer a patient with chronic kidney failure undergoes hemodialysis therapy, the patient's stress level and sleep quality will worsen. The study aimed to analyze the relationship between the term hemodialysis and the stress level and sleep quality of chronic kidney failure patients at Tk.III Slamet Riyadi Hospital, Surakarta. The research adopted a quantitative descriptive analytical design with a cross-sectional approach. The sampling technique used total sampling with 57 respondents. Data collection methods utilized the Depression Anxiety Stress Scale (DASS-42) and Pittsburgh Sleep Quality Index (PSQI) questionnaires. The statistical test operated the gamma test. The results revealed the relationship between the term hemodialysis and stress levels and sleep quality with a p-value of 0.009 and 0.006. It inferred a relationship between the hemodialysis span, stress levels, and sleep quality. The correlation value between variables is 0.431 and 0.410. The longer the hemodialysis, the higher the stress level and the worse the patient's sleep quality.

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### 1. Introduction

Chronic renal failure is a chronic, progressive disease in which the kidneys lose their ability to regulate the body's fluid and electrolyte balance, which results in disruption of the body system as a whole. Chronic kidney disease or chronic kidney disease is a condition of progressive disruption of kidney function and cannot function before, where the the kidneys are unable to maintain metabolism, fluid, and electrolyte balance which results in uremia (retention of urea and other nitrogenous waste in the blood) (Fitri et al., 2018)

According to the (World Health Organization, 2015), the number of chronic kidney failure sufferers in 2014 increased by 50% from the previous year. According to ESRD Patients (End-Stage Renal Disease) in the world in 2012 there were 3,018,860 people and in 2013 there were 3,200,000 people.

Chronic kidney failure is ranked the 10th cause of death in Indonesia with a prevalence in 2016 of 2% (499,800 people) (Kemenkes RI, 2018) population of 252,124,458 people, there are 713,783 people suffering from chronic kidney failure in Indonesia, while for Central Java Province it is 0.3%.

Chronic renal failure is one of the final stages where the kidneys are unable to metabolize optimally, disrupting fluid and electrolyte balance which can lead to things that can threaten life or death. Chronic kidney failure can result in complex medical, economic and social problems for patients and their families (Fitri & Irnawati, 2019). Therefore, medical management is needed to replace kidney function in the body, such as hemodialysis (Syahrizal et al., 2020)

The hemodialysis medical therapy most often used by CKD patients cannot restore complete kidney function. Hemodialysis has therapeutic effects such as anemia, hypertension, decreased libido and disease throughout life (Fitri et al., 2018). So hemodialysis is only limited to medical efforts to control the symptoms of uremia and maintain the patient's survival but cannot restore kidney function to normal. (Bulut, 2017) added that the side effects of hemodialysis patients include physical weakness, decreased cognitive abilities, and decreased role in the family. Apart from that, hemodialysis can also trigger a stress response in patients undergoing it (Syahrizal et al., 2020).

According to (Chairunnisa, et al., 2017) Dependence on hemodialysis machines is a stressor that can cause depression in hemodialysis patients with a prevalence of 15-69%. Depressive conditions can affect physical and sleep quality. Sleep disorders in chronic kidney failure patients undergoing hemodialysis therapy result in poor sleep quality and negative physical and mental impacts and can lead to a decline in the patient's appearance such as cognitive and memory dysfunction, irritability, decreased alertness and concentration.

Based on the results of a preliminary study conducted on April 11, 2023, hemodialysis data was obtained from Slamet Riyadi Hospital, Surakarta, there were 57 patients undergoing routine hemodialysis therapy at this hospital. From the results of interviews with 11 patients, it was found that 4 patients experienced stress, 5 patients experienced sleep disorders, and 2 patients experienced stress and sleep disorders. From the above background, it is important to carry out research regarding the relationship between the duration of hemodialysis and the stress level and sleep quality of chronic kidney failure patients in the Tk.III Slamet Riyadi Hospital, Surakarta.

## 2. Method

This research uses a quantitative research design with a descriptive analytical design and a cross-sectional approach. This research was conducted in the hemodialysis room at Tk.III Slamet Riyadi Hospital, Surakarta in June 2023. The population in this study was chronic kidney failure patients undergoing hemodialysis at Tk.III Slamet Riyadi Hospital, Surakarta. The sampling technique in this research used total sampling with a sample size of 57 respondents. Data collection methods used the Depression Anxiety Stress Scale (DASS-42) and Pittsburgh Sleep Quality Index (PSQI) questionnaires. The statistical test used is the gamma test.

## 3. Results And Discussion

Based on the following table, it can be seen that the results of the descriptive analysis test obtained the characteristics of respondents from several dimensions including age, gender, and duration of hemodialysis (Table 1). In the bivariate test results to determine the relationship between the duration of hemodialysis and stress levels using the Gamma Test, a p-value of 0.009 was obtained with a correlation coefficient of 0.431 (Table 2). The results of the bivariate test to determine the relationship between the duration of hemodialysis and the patient's sleep quality using the Gamma Test obtained a p-value of 0.006 with a correlation coefficient of 0.410 (Table 3).

Table 1.

Characteristics of Respondents Based on Age, Gender, and Duration of Hemodialysis (n=57)

No	Age	Frequency	Percentage (%)
1	17-25	1	1,8
2	26-35	3	5,3
3	36-45	8	14,0
4	46-55	28	49,1
5	56-65	14	24,6
6	>65	3	5,3
Total		57	100
Gender			
1	Man	29	50,9
2	Woman	28	49,1
Total		57	100
Duration of Hemodialysis			
1	<12 months	19	33,3
2	12 -23 months	6	10,5
3	23 -36 months	9	15,8
4	> 36 months	23	40,4
Total		57	100

Source: Primary Data

Table 2.

The Relationship Between the Duration of Hemodialysis and Stress Levels

Relationship	Correlation coefficient (r)	Value p
Length of hemodialysis - Stress level	0,431	0,009

Source: Primary Data

Table 3.

Relationship Between Duration of Hemodialysis and Sleep Quality

Relationship	Correlation coefficient (r)	Value p
Length of hemodialysis - Sleep quality	0,410	0,006

Source: Primary Data

## Discussion

### Characteristics of Respondents (Age, Gender, and Duration of Hemodialysis)

Based on the research results, it is known that the majority of respondents were aged 46-55 years, namely 28 respondents (49.1%). This is in line with research from (Tokala et al., 2015) which stated that the majority of respondents were in the 46-55 year age range, 11 people (32.4%). According to (Smeltzer & Bare, 2015), over the age of 40 years, there will be a progressive decrease in the glomerular filtration rate until the age of 70 years, amounting to approximately 50% of normal. If we look at the increasing age of respondents, the quality of life will decrease. Age is also closely related to disease prognosis and life expectancy. Those over 55 years of age have a greater risk of developing various health complications which result in decreased kidney function compared to those under 40 years of age.

Based on the results of research that has been carried out, it shows that the frequency of respondents based on gender, out of a total of 57 respondents (100%), the majority were male, 29 respondents (50.9%). This research is in line with research conducted by (Chairunnisa et al., 2017) which shows the gender of 42 respondents, the majority of respondents were male, 22 respondents (52.4). According to (Khairiadi, 2016), gender is associated with a high risk of hypertension, diabetes, smoking, exposure to toxic substances, alcohol and a lifestyle that men pay less attention to. Research by (McKercher et al., 2013) proves that chronic kidney failure is often caused by diabetes mellitus and hypertension, where both diseases are the impact of an unhealthy lifestyle or lifestyle.

(Pranandari & Supadmi, 2015) stated that men are at risk of developing CKD disease compared to women, because women have more estrogen hormones than men. The function of the estrogen hormone is to inhibit the formation of certain cytotoxins which can inhibit osteoclasts from absorbing bone excessively so that calcium levels are balanced. Calcium has a protective effect by preventing the absorption of oxalate which can form kidney stones as one of the causes of chronic kidney failure.

Based on the results of research that has been conducted, the frequency of respondents is based on the length of hemodialysis, out of a total of 57 respondents (100%), most of whom had hemodialysis time >36 months, 23 respondents (40.4%). This is in accordance with research conducted by (Duana, & Prima, 2022) that the majority of hemodialysis duration was >36 months, as many as 10 respondents (22.2%). These results are in line with research from (Mailani et al., 2015) that the majority of respondents in their study had undergone hemodialysis for more than one year. (Wulandari & Fatimah, 2016) also revealed that 28 people (43.6%) not functioning properly and various health problems due to the kidney damage he experienced.

#### **The relationship between the duration of hemodialysis and stress levels**

Based on the research results, it shows that the analysis of the relationship between the duration of hemodialysis and stress levels uses the gamma correlation statistical test. The results of the statistical test showed that the p value was 0.009. This means the p value <0.05. So, it can be concluded that there is a relationship between the duration of hemodialysis and stress levels. The correlation value between variables is 0.431, which is in the sufficient category. The longer a patient undergoes hemodialysis, the stress level increases. This is in line with research conducted by (Handayani, 2020) which obtained analysis results of p value = 0.000 < 0.05, which means there is a relationship between the length of undergoing hemodialysis therapy and the level of stress in the hemodialysis room at Madiun City Regional Hospital with a moderate correlation value of 0.422.

As a result of hemodialysis therapy, patients experience anxiety, stress and depression. Stress in chronic kidney failure patients can be caused by patients undergoing hemodialysis throughout their lives, plus facing complications from chronic kidney failure, such as cardiovascular system disorders, anemia, hypertension, fertility disorders for both men and women, integumentary and skeletal system disorders and other problems. chronic kidney failure which has an impact on increasing anxiety experienced by patients (Fitri et al., 2018).

#### **Relationship between duration of hemodialysis and sleep quality**

Based on the research results, it shows that the analysis of the relationship between the duration of hemodialysis and sleep quality is by using the gamma correlation statistical test. The results of the statistical test showed that the p value was 0.006. This means the p value <0.05. So, it can be concluded that there is a relationship between the duration of hemodialysis and sleep quality. The correlation value between variables is 0.410, which is in the sufficient category. This is in line with research conducted by (Lilipory, 2019) which obtained analysis results of p value = 0.003 < 0.05 which can be concluded that there is a relationship between sleep quality and the length of time undergoing hemodialysis at RSUD Dr. M. Haulussy Ambon.

The dependence of chronic kidney failure patients on undergoing hemodialysis throughout their lives will have physical, psychosocial and economic impacts on the individual. Anxiety about the health problems they experience can affect the patient's sleep quality (Potter, A & Perry, 2015). According to (Sari, 2016), the length of time undergoing hemodialysis can cause sleep pattern disturbances in patients with chronic kidney failure. This occurs due to progressive symptoms and diseases undergoing therapy as well as complications caused by long-term hemodialysis therapy or other sleep disorders such as increased parathyroid hormone, renal osteodystrophy, breathing problems during sleep and excessive daytime sleepiness.

(Abdullah et al., 2021), revealed that several diseases related to neurological and cardiovascular disease will appear in patients who undergo hemodialysis for a long time. The emergence of other

diseases that can cause symptoms, such as bone pain, pruritus, coughing, etc., this can disrupt the patient's sleep process, thereby reducing the patient's sleep quality

## Conclusion

Based on the research results, it can be concluded that there is a relationship between the duration of hemodialysis and the stress level and sleep quality of patients undergoing hemodialysis at Tk.III Slamet Riyadi Hospital, Surakarta with p-values of 0.009 and 0.006. These results can be a basis and reference for health workers in choosing the right intervention when carrying out treatment on patients undergoing hemodialysis in order to improve sleep quality and reduce the level of stress experienced by patients while undergoing treatment and for future researchers to develop variables related to risk factors Infections in hemodialysis patients, especially hemodialysis patients who have Cimino permanently installed, can cause prolonged hospital stay because this can affect stress and the quality of the patient's sleep.

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