



## Stress Level and Hemodialysis Duration of Patients with Chronic Kidney Failure Undergoing Hemodialysis

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### ABSTRACT

Kidney failure is a chronic and irreversible impaired kidney function. End-stage kidney disease requires therapy, namely hemodialysis using a dialysis machine, in which the process takes a long time. Such a duration of therapy can lead to anxiety and stress to the patient. The study aims to determine the relationship between stress level and hemodialysis duration among patients with chronic kidney failure who underwent hemodialysis at Toto Kabila Regional Public Hospital. This research employed a cross-sectional method involving patients suffering from kidney failure and undergoing hemodialysis as the population. Further, the sample consisted of 29 respondents with a total sampling technique. The results showed that one respondent (3.4%) experienced normal stress, eight respondents (27.6%) had mild stress, 15 respondents (51.7%) got moderate stress, and five respondents (17.2%) experienced severe stress. In addition, two respondents underwent hemodialysis therapy for <6 months, and 27 respondents (93.1%) were under the therapy for >6 months. All in all, stress level relates to hemodialysis therapy of patients with chronic kidney failure who undergo hemodialysis in the aforementioned hospital. The p-value was  $0.021 < 0.05$ , indicating that  $H_0$  is accepted. It is suggested that people think positively and composedly during circumstances to live a better life.

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### ABSTRAK

#### Kata kunci:

Tingkat Stres  
Lama Hemodialisis  
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Gagal Ginjal adalah gangguan fungsi ginjal yang bersifat kronis, dan tidak dapat pulih kembali (irreversible). Penyakit ginjal stadium akhir membutuhkan suatu terapi, yaitu terapi hemodialisis dengan menggunakan mesin dialisis. Dimana proses hemodialisis membutuhkan waktu yang lama, dan hal tersebut bisa menimbulkan kesemasan maupun stress pada pasien. Tujuan penelitian mengetahui hubungan tingkat stress dengan lama hemodialisis pada pasien gagal ginjal kronik yang menjalani hemo dialisis di RSUD Toto Kabila. Desain penelitian ini menggunakan metode Cross Sectional. Populasinya adalah pasien gagal ginjal yang menjalani hemodialisis. Sampel dalam penelitian ini sebanyak 29 responden dengan teknik pengambilan sampel Total Sampling. Hasil penelitian didapat tingkat stress normal 1 (3,4%), stress ringan 8 (27,6%), stress sedang 15 (51,7%), stress berat 5 (17,2%) dan lama hemodialisis <6 bulan 2 (6,9%) dan >6 bulan 27 (93,1%). Terdapat hubungan tingkat stress dengan lama hemodialisis pada pasien gagal ginjal kronik yang menjalani hemodialisis di RSUD Toto Kabila yang diperoleh p-value =  $0,021 < 0,05$ , sehingga  $H_0$  diterima. Disarankan kepada masyarakat agar tetap selalu berpikir yang positif dan tenang pada keadaan maupun situasi yang dialami, karena bisa membuat kita lebih baik lagi menjalani kehidupan.

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## INTRODUCTION

Kidney failure is a chronic and irreversible impaired kidney function. The body is no longer able to maintain metabolism, fluid balance, and electrolytes, causing uremia symptoms in the form of urea retention and other nitrogenous wastes in the blood—consequently, end-stage kidney disease occurs (Ningsih 2018). Kidney failure cause a decline in kidney functions, so that urine can no longer be produced and excreted, along with the occurrence of fluid imbalance. This can make one's body swell, experience shortness of breath, toxic accumulation, uncontrolled blood pressure, leading to anemia that aggravates the heart function, making the bone growth impaired (Rahayu 2018). End-stage kidney disease thus requires kidney transplant and hemodialysis; however, the most common therapy is hemodialysis (Danamik, 2020).

The World Health Organization (WHO) data revealed that people suffering from kidney failure in 2013 increased by 50% from the previous year. The prevalence of kidney failure worldwide is more than 500 million people; 1.5 million of them requires hemodialysis therapy (Bayhakki and Hasneli, 2017). According to Basic Health Research 2018 (known as Risesdas in Indonesia), the prevalence of kidney failure following the diagnosis of Indonesian doctors was 3.8% compared to 2013 with 1.8%. Meanwhile, the incidence rate of such a disease based on age ranging from 65-74 years old was 0.823 % (Ministry of Health, 2018). In 2018, the prevalence of kidney failure in Gorontalo Province accounted for 4.3%. Specifically, the prevalence of patients with kidney failure who were under hemodialysis at Toto Kabila Hospital in 2019 was 90 inpatients and 1220 outpatients.

Hemodialysis is a kidney function replacement therapy assisted by a dialysis machine. This therapy aims to replace kidney functions in removing waste and toxins and regulating blood plasma volume with a machine. Hemodialysis should be performed regularly and periodically, i.e., 1-3 times a week that is considered quite effective to maintain the patient's body homeostasis (Danamik, 2020). Hemodialysis takes a long time, causing the patient and the family to get stressed (anxiety). The frequency of hemodialysis is among the factors that influences the family members' anxiety as they are responsible for taking care of the patient, especially during the therapy. Besides, it can also raise psychological (anxiety) and physical stress that will disrupt neurological systems, such as weakness, fatigue, anxiety, tremor, decreased concentration, and disorientation (Manurung, 2018).

After conducting a preliminary interview, four out of five respondents who had just done hemodialysis felt anxious and stressed in undergoing the therapy. The other one did not feel the same way since s/he had been undergoing hemodialysis for a long time. Such anxiety and stress resulted from doing life-long hemodialysis therapy, disturbing daily works and activities, and spending too much money.

## METHOD

The present study was conducted at Toto Kabila Regional Public Hospital from 11 to 16 January 2021. It relied on a

cross-sectional design with patients suffering from chronic kidney failure involved as the population. Further, 29 respondents were selected as the sample using the total sampling technique. The instrument used to collect the data was DASS 42 questionnaire.

## RESULTS

### Respondents' Characteristics

**Table 1**  
**Respondents' characteristics based on age, sex, Comorbidity, Stress Level, and Hemodialysis Duration (N=29)**

Characteristics Respondent	Frequency	
	N	%
<b>Age</b>		
31-43 years old	8	27.6
44-55 years old	12	41.4
56-67 years old	9	31.0
<b>Sex</b>		
Male	19	65.5
Female	10	34.5
<b>Comorbidity</b>		
Diabetes Mellitus	6	20.7
Hypertension	21	72.4
Nephrolithiasis	2	6.9
Diabetes Mellitus	6	20.7
<b>Stress Level</b>		
Normal	1	3.4
Mild	8	27.6
Moderate	15	51.7
Severe	5	17.2
<b>Hemodialysis Duration</b>		
Less than 6 months	2	6.9
More than 6 months	27	93.1

The table 1 shows that 12 respondents (41.4%) are 44-55 years old, nine respondents (31.0%) are 56-67 years old, and eight respondents (27.6%) are 31-43 years old. Department of Health of the Republic of Indonesia (2009) revealed that the age of 31-43 years was adult, 44-55 years was young old, and 56-67 was elderly. The distribution of respondents' sex that 19 respondents (65.5%) are males and ten respondents (34.5%) are female

21 respondents (72.4%) suffer from hypertension, six respondents (20.7%) experience diabetes mellitus, and two respondents (6.9%) have nephrolithiasis as the comorbidity.

The above table informs that 15 respondents (51.7%) have moderate stress, eight respondents (27.6%) get mild stress, five respondents (17.2%) are severely stressed, and one respondent (3.4%) experience normal stress.

Table 1 illustrates that 27 respondents (93.1%) undergo hemodialysis therapy for more than six months and two respondents (6.9%) undergo the therapy for less than six months.

The results of the bivariate analysis are to explore the relationship between stress level and hemodialysis duration as the variables. Given below are the results of this research.

**Table 2**  
**Analysis of the Relationship between Stress Level and Hemodialysis Duration of Patients with Chronic Kidney Failure Undergoing Hemodialysis (N=29)**

Stress Level	Hemodialysis Duration				Total		p-value
	< 6 Months		> 6 Months		N	%	
	N	%	N	%			
Normal Stress	0	0	1	3.4	1	3.4	0.021
Mild Stress	0	0	8	27.6	8	27.6	
Moderate Stress	0	0	15	51.7	15	17.2	
Severe Stress	2	6.9	3	10.3	5	17.2	

## DISCUSSION

### *Respondents' Characteristics*

Drawing upon table 4.1, the majority of respondents (12 people or 41.4%) are 44-55 years old, followed by the age of 56-67 years with nine respondents (31.0%). A decline in kidney function on a small scale is normal for human beings as they get older. Age serves as the factor contributing to chronic kidney failure; the older one gets, the less the kidney works properly. After a person is 40 years old and over, s/he will go through a progressive decrease in Glomerular Filtration Rate to approximately 50% of its normal rate (Sidharta, 2008). In the same tune, Dewi (2015) mentions that the oldest age of respondents ranged from 41-60 years with 32 people (53.3%).

Respondents' characteristics based on sex show that most respondents (19 people or 65.5%) were males and ten respondents (34.5%) were females. Theories have claimed that males primarily experience kidney stone formation because their urinary tract is lengthier than females. Males also have bad habits that are detrimental to their health, such as smoking, consuming coffee and alcohol that trigger systemic diseases leading to a decline in kidney function (Btunner&Suddarth, 2008). This also in line with a study by Rukmaliza (2013) finding out that patients with chronic kidney failure who underwent hemodialysis were mostly males (40 people or 63.5%), compared to females (23 people or 36.5%).

In terms of comorbidity, this research discovered that 20 patients (72.4%) with kidney failure generally experienced hypertension. Hypertension is defined as blood pressure above 140/90 mmHg. It causes chronic/terminal kidney failure through a process that involves the loss of a large number of functional nephrons that are progressive and irreversible. It is believed that the chronic increase in pressure and strain on the arterioles and glomeruli can lead to sclerosis in the glomerular blood vessels (glomerulosclerosis). The decreased number of nephrons will create an adaptive process, i.e., increased bloodstream, GFR, and urine excretion within the existing nephrons. Changes in kidney function over a long time can result in further damage to the existing nephrons. The formed sclerotic lesions increase in number that can generate glomerular obliteration. Glomerular obliteration will cause further declines in kidney function and slow development, and ended up as terminal kidney failure (Guyton dan Hall, 2007). A study conducted by Sari, et al. (2014) also showed that the hospital chart of patients with chronic kidney failure at Haji Medan Public Hospital from 2012 to 2013 was mostly hypertension (28.3%).

### *Stress Level of Patients with Kidney Failure at Toto Kabila Hospital*

The results indicated that 15 respondents (51.7%) had moderate stress on the ground that they had been doing hemodialysis for a long time, feeling uncomfortable and afraid of something, and getting bothered with their health problems. Bustan (2008) argues that stress arises when a person tries to adapt to a situation or event. There are two factors making stressful situation; related to the person and his/her experience.

This study also revealed that eight respondents (27.6%) undergoing hemodialysis therapy experienced mild stress as they had started to adapt to dialysis and found it easier to manage their physical limitations. Despite this, they sometimes faced some problems, particularly if their coping mechanism was imperfect in responding to stressors, yet it did not last long. Priyoto (2014) claims that mild stress is a stressor one encounters regularly and only lasts for a few minutes or hours. Mild stress can also make them think and try toughly to deal with life challenges.

The present work also found five respondents experiencing severe stress (17.2%). Such a condition is due to the anxiety of the patients regarding their chronic kidney failure; the disease is incurable and causes several physical and mental complications. Stress due to stressors experienced by the individuals is a threat that leads to anxiety. According to Donsu (2017), severe stress is excessive pressure experienced for a long period, i.e., weeks, months, and even years. The pressure may involve financial problems, family separation, chronic diseases and physical changes, as well as social psychology issues.

Severe stress symptoms include difficulty performing daily tasks, social relationship issues, sleep problems, decline in concentration, fear for no reason, overwhelming tiredness, inability to perform simple tasks, and overwhelming fear.

The results of the present study found one respondent experiencing normal stress (3.4%); the patient has accepted the situation and started to think positive. This situation resonates with Rachmadi's theory (2014), claiming that normal stress is a natural response. Positive stress or eustress is defined as a condition that causes no harm to individuals; this type of stress instead produces the feeling of excitement and tranquility. Eustress is a response to positive, healthy, and constructive situations. The results of this research are in line with the one seen in Oktaviana et al. (2019), where they reported that 12 respondents (17.1%) experienced normal stress as the patients had accepted their conditions

### ***Hemodialysis Duration at Toto Regional Public Hospital, Kabila***

According to the research results, 27 respondents were undergoing 6-month hemodialysis (93.1%). The long-term treatment was impactful for patients without symptoms and other problems. Rustina (2012) asserts that long-term treatment is a problem to patients, considering the cost and pain during the injection. Although it is not severe, the side effect of the drug still leads to patients' discomfort. It is challenging to encourage the patients not to stop this type of treatment. Long-term treatment requires the tenacity and perseverance of the patients.

This notion is in compliance with the one proposed by Brunner and Suddart (2008). They argue that patients undergoing more than six months of hemodialysis can adapt to their condition, thus lowering their stress level as the patients have reached the stage of acceptance. In the same tune, Sari (2017), in her study, reports that patients who undergo hemodialysis for more than 24 months have better life quality and better adaptability.

In this present study, two patients (6.9%) undergoing hemodialysis for less than six months experienced anxiety in the first treatment. The patients fear the syringe, blood in dialysis catheters, and the dialysate units' alarm noises. On top of that, the patients pondered the time they need to get fully recovered. Situmorang (2007) claims that anxiety is common in patients undergoing hemodialysis. This situation is caused by several aspects, such as problems with vascular access, duration of hemodialysis procedures, and the effects felt during hemodialysis (when the needle is inserted into the vein, muscle cramps, hypotension, headache, nausea, vomiting, and headaches).

Similarly, Warhamna and Husna (2016) claim that patients with chronic kidney failure, who undergo hemodialysis treatment for less than six months, have lower emotional responses and poor physical condition

The Relationship between Stress Level and Hemodialysis Duration among Patients with Chronic Kidney Failure Who Undergo Hemodialysis Treatment at Regional Public Hospital Toto Kabila

Statistical test using Spearman's rank with SPSS obtained the  $p$ -value = 0.021 or less than ( $\alpha = 0.05$ ), indicating that the results met the prerequisites of the Spearman's rank tests. The  $H_0$  was refuted, hence confirming the relationship between stress level and hemodialysis duration in chronic kidney failure patients undergoing hemodialysis at Toto Kabila Hospital.

Further, the research revealed that 15 respondents (51.7%) undergoing hemodialysis for more than six months have moderate stress because they find it hard to stay calm, rest, and always get angry and panic. According to Stuart Gail (2016), the long duration of treatment performed every week distracts the patients' daily activity, and, thereby, the patients were overwhelmed with the accumulation of the tasks they should accomplish. The patients are ultimately prone to stress. Stress is a state of emotional strain experienced by all people. This condition can affect one's activities, emotions, diets, sleep patterns, concentrations, and even self-harms.

The results of the present work resonate with the one seen in Rahayu et al. (2018), which reported that 28 patients (48.3%) undergoing hemodialysis often experienced moderate stress.

This research found eight respondents (27.6%) undergoing hemodialysis for more than six months experienced mild stress. According to their responses, these

patients often felt anger and panic, and they found it difficult to stabilize their mood. The majority of the patients have started to get used to changes in their condition, despite complications caused by chronic kidney failure that sometimes lead to several health problems. Bustan (2008) opines that poor coping mechanisms are detrimental to stressors' responses, thus causing stress. Stress occurs if a person tries to adapt to a situation regarding themselves or their experiences.

A study by Rahayu et al. (2019) reveals that 11 patients (32.3%) were able to adapt to themselves and manage their physical limitations, despite uneasy feelings that may cause stress.

The results revealed that five respondents (16.7%) experienced severe stress; two among them (6.9%) had undergone hemodialysis for less than six months. This condition is caused by the physical and psychological trauma of the patients. On top of that, the patients still found it difficult to accept the situation due to their incurable chronic kidney failure and the fact that the patients must undergo life-long therapy (which distracts them as they might lose jobs caused by their conditions). Oftentimes the patients experienced death anxiety.

Three respondents (10.3%) experienced severe stress; they had undergone hemodialysis for more than six months. The duration of the treatment is determined by factors, e.g., sex (most of the patients are women) and responses in the questionnaires (most of the patients admitted that they oftentimes felt anxious, found it difficult to calm themselves and perform daily activities, became temperamental and panicked, and unable to control their emotions).

This notion resonates with the theory by Stuart Gail (2016), which states that changes in health conditions are among the trigger of stress. Patients often have financial problems as they lose their jobs and feel anxious, and fear death. Stress due to stressors experienced by the individuals is a threat that leads to anxiety. Shifting roles are also another change experienced by hemodialysis patients and their families. The patients, who now have limited capacity to perform tasks (e.g., social activities), sometimes think that they become a burden for their families. Such a perspective, in turn, leads to frustration and conflict (and feeling of guilty to the families).

This research reported that one respondent (3.4%) undergoing hemodialysis for more than six months had normal stress; this is based on the responses of the patients. Supports from families and friends are also the factor that helps the patients stay positive and mentally healthy. In the same way, Nurchayati (2010) states that positive thinking, including financial, social, and environmental supports, can help maintain the psychological condition of patients with chronic kidney failure, resulting in better life quality. Ardila and Dewi (2014) further support this idea. This research found that 24 patients (30.4%) experienced normal stress based on their responses in the questionnaires and the fact that they have accustomed to their health conditions.

### **LIMITATION OF THE STUDY**

The quality of research data has to be seen in light of some limitations. The data collection technique used a questionnaire regarding stress and hemodialysis duration. Such a technique is more likely to be subjective, so that the honesty of respondents determines the data accuracy. The questions are structured, enabling the respondents to answer them accordingly. Answer inaccuracy is also due to respondents' lack of understanding regarding the interview

questions. Hence, the researchers frequently repeat questioning.

## CONCLUSION AND RECOMMENDATIONS

### Conclusion

Based on the research on patients with chronic kidney failure undergoing hemodialysis at regional public hospital Toto Kabila, it is concluded that:

1. As many as 15 respondents (51.7%), eight respondents (27.6%), five respondents (17.2%), and one respondent (3.4%) experience moderate, mild, severe, and normal stress, respectively.
2. Regarding the treatment duration, 27 respondents (93.1%) undergo hemodialysis for more than six months, and two respondents (6.9%) do the therapy for less than six months.
3. Statistical test using Spearman's rank with SPSS obtained the p-value = 0.021 or less than ( $\alpha = 0.05$ ), meaning that  $H_0$  was rejected. Hence, there is a relationship between stress level and hemodialysis duration in chronic kidney failure patients who undergo hemodialysis at Toto Kabila Hospital.

### Recommendations

This research formulates several recommendations. Firstly, for future researchers, the present work is expected to be beneficial for future researchers who aspire to contribute to the studies on the relationship between stress levels and hemodialysis duration. Secondly, for society, the present work suggests people always think positively about their health conditions. Positive thinking helps perform all activities in our life

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