

# Biopsychosocial Factors Affecting the Quality of Life of Hemodialysis Patients

Merry Tiyas Anggraini<sup>1</sup>, Gunadi<sup>2</sup>

<sup>1</sup>Department of Family Medicine, Faculty of Medicine, Universitas Muhammadiyah Semarang

<sup>2</sup>Department of Public Health, Faculty of Medicine, Universitas Muhammadiyah Semarang

## ABSTRACT

**Background:** Hemodialysis is performed to support the life of Chronic Kidney Disease patients. However, it affects the patient's quality of life in some cases. Clinical factors get enough attention in daily medical practice, while patients' psychological and social aspects are often ignored. This study aims to analyze the biopsychosocial factors affecting hemodialysis patients' quality of life at Roemani Hospital Semarang.

**Method:** This is descriptive-analytic research with a cross-sectional approach. Samples were hemodialysis patients at Roemani Hospital, Semarang, with a total number of samples was 80 people. The data taken are primary data derived from questionnaire interviews and results of laboratory investigations. Data analysis used the chi-square test and the Spearman test.

**Results:** Statistical test results obtained for the variable gender  $p = 0.358$ , education  $p = 0.462$ , employment  $p = 0.239$ , comorbid diseases  $p = 0.347$ , length of time undergoing hemodialysis  $p = 0.024$ , psychological function  $p = 0.280$ , family supports  $p = 0.526$ , age  $r = 0.001$  and  $p = -0.992$ , hemoglobin  $r = 0.129$  and  $p = 0.254$ , urea  $r = -0.089$  and  $p = 0.432$ , creatinine  $r = 0.022$  and  $p = 0.844$ . Based on these results, there was no relationship between age, gender, educational level, employment, comorbid disease, psychological functioning, family supports, hemoglobin, urea, and creatinine levels, and there was a significant relationship between the length of time undergoing hemodialysis and the quality of life of hemodialysis patients at Roemani Hospital Semarang.

## Correspondence

merry.tyas@unimus.ac.id

## Article History

Received 4 March 2023

Revised 7 April 2023

Accepted 10 April 2023

Available Online 5 July 2023

## Keywords

Quality of Life  
Chronic Kidney Disease  
Hemodialysis  
Biopsychosocial factors

## DOI

10.14710/jpki.18.2.64-72

## INTRODUCTION

Chronic Kidney Disease (CKD) has become a global health challenge.<sup>1</sup> Increasing morbidity and mortality is a significant constraint on the provision of health services.<sup>2</sup> CKD is an economic problem in healthcare systems worldwide, especially in developing countries. Currently, the prevalence of CKD has increased significantly. Estimates of the number of patients range from 11% - 13% globally.<sup>3</sup> In Indonesia, the prevalence and incidence of CKD in the last five years have increased rapidly, especially in the Central Java region.<sup>4</sup>

CKD is a gradual disorder of kidney function that causes irreversible kidney damage. The primary comorbid disease that causes kidney damage are hypertension, diabetes mellitus, and glomerulonephritis. Patients at an advanced stage should receive renal replacement therapy. Hemodialysis is the most frequently performed today.<sup>5</sup>

Hemodialysis is performed to support the patient's life but sometimes harms the patient's quality of life (QoL) because it causes changes in habits and daily life, including long-term drug consumption, restriction of water intake, time to work, physical limitations and

nutrition, disruption of social and family life and reliance on maintenance schedules. CKD patients experience decreased sex lives, spiritual distress, and existential conflicts, exacerbating physical and emotional symptoms. These conditions can result in impaired physical, mental, and emotional well-being and worsen the QoL.<sup>5</sup>

Long-term hemodialysis patients face various problems, such as finances, difficulties maintaining a job, depression, and fear of death. These problems will change the QoL of CKD patients.<sup>6</sup> In daily medical practice, patient's psychological and emotional aspects are often ignored.<sup>3</sup> These psychological conditions can affect psychological functioning in CKD patients. Assessment of QoL is an important indicator to assess the effectiveness of hemodialysis measures given, so the equity of QoL is also an important goal in the treatment of end-stage chronic kidney failure.<sup>6</sup> Based on data, the number of CKD patients at Roemani Hospital Semarang is increasing yearly, and few publications analyze the relationship between biopsychosocial factors and QoL. This study analyzes biopsychosocial factors affecting hemodialysis patients' quality of life at Roemani Hospital Semarang.

## **METHOD**

This descriptive-analytic study was conducted in December 2022 at Roemani Hospital Semarang with a cross-sectional approach. The population in this study were all hemodialysis patients at Roemani Hospital, Semarang. Samples were taken using a total sampling technique of 80 patients who fit the inclusion and exclusion criteria. Inclusion criteria: hemodialysis patients at Roemani Hospital in Semarang are willing to be research respondents. Exclusion criteria: incomplete questionnaire filling, patients with impaired awareness and communication, and patients who do not live with their families.

The instrument used in this study was a questionnaire about the demographic characteristics of the respondents, such as identity, age, gender, education level, employment, length of hemodialysis period, and comorbid diseases. The Short Form 36 (SF-36) questionnaire measures the QoL. The questionnaire to measure family support uses perceived social support from family (PSS-Fa), while the Psychological well-being scale questionnaire measures psychological function. Data on hemoglobin, urea, and creatinine levels were obtained by direct measurement in the Roemani Hospital Semarang laboratory.

Kidney Disease Quality of Life Short Form 36 questionnaire (KDQOL-SF 36TM) was used to measure QoL in CKD patients undergoing hemodialysis. The KDQOL-SF 36 questionnaire developed by Research a Development (RAND) in the Indonesian version was assessed for validity. The KDQOL-SF 36 questionnaire contained 36 questions with sub-variables in them. These sub-variables are about physical function, physical limitations, body aches, general health, vitality, social functioning, limitations, and emotional and mental health. Questions in the KDQOL-SF 36 questionnaire relate to CKD and the resulting impact of CKD. The interpretation of the scale used in the KDQOL-SF 36 questionnaire uses a scale with a value range of 0 -100 for each listed. Score interpretation: poor = 0-24, moderate = 25-60, good = 61-83, very good = 84-99, excellent = 100.

The Perceived Social Support from Family (PSS-Fa) questionnaire was used in this study to measure the family support for chronic kidney disease patients at Roemani Hospital Semarang. This questionnaire consists of 20 statements and uses a Likert scale. The assessment of each answer on this questionnaire is divided into scores of yes=3, no =2, and don't know=1 for the favorable question, yes =2, no =3, and don't know =1 for the

unfavorable question. Score interpretation: low = 20-33, moderate = 34-47, good = 48-60.

The Psychological Well-Being Scale (PWBS) questionnaire was used in this study to measure the psychological function of patients with chronic kidney disease at Roemani Hospital Semarang. This questionnaire consists of 36 statements and uses a Likert scale. The assessment of each answer on this questionnaire is divided into strongly agree=4, agree=3, disagree=2, strongly disagree=1 for favorable questions, strongly agree=1, agree=2, disagree=3, strongly disagree=4 for unfavorable questions. Score interpretation: Low = 36-72, Moderate = 73-108, High = 109-144.

Data analysis was performed on variables suspected of having a relationship, namely age, gender, employment, length of time undergoing hemodialysis, comorbid diseases, psychological functioning, family support, hemoglobin levels, urea, and creatinine levels (independent variable) to QoL (dependent variable). Bivariate analysis used a chi-square test for gender, education level, employment, length of time hemodialysis, comorbid diseases, family support, and psychological functioning. As for the age, hemoglobin, urea, and creatinine level, a correlation test was carried out. This research has received an ethically proper decision by issuing a letter by the Health Research Ethics Commission (KEPK) Faculty of Medicine Universitas Muhammadiyah Semarang No. 113/EC/KEPK-FK/UNIMUS/2022 according to the 7 ethical standards of WHO 2011.

## **RESULTS AND DISCUSSION**

Table 1 showed that most respondents are 40-55 years old, namely 41 respondents (51.2%). Most of them are male (62.5%). Most of the respondents with the educational level status of senior high school were 35 (43.8%). Respondents who worked and did not work were 40 respondents (50.0%) respectively. Most respondents underwent hemodialysis > 24 months (56.3%). Most respondents had a comorbid disease (76.25%). There were 81.3% of respondents who received good family support. Most respondents had a high psychological function (77.5%), and most had a moderate QoL (56.25%).

Table 2 showed that most respondents had hypertension as the comorbid with 54 respondents (67.5%). Table 3 showed that the respondents' hemoglobin levels ranged from 5.20 to 13.20, with a mean of 9.45. Respondent's urea levels ranged from 31 to 253, with a mean of 109.95. Respondent's creatinine levels ranged from 2.40 to 24.60, with a mean of 6.68.

**Table 1.** Characteristics of hemodialysis patients at Roemani Hospital Semarang

Characteristic	n	%
<b>Age</b>		
< 40 years	10	12.5
40-55 years	41	51.2
> 55 years	29	36.3
<b>Gender</b>		
Male	50	62.5
Female	30	37.5
<b>Employment</b>		
Yes	40	50.0
No	40	50.0
<b>Educational level</b>		
No school	3	3.8
Elementary school	9	11.3
Junior High School	12	15.0
Senior High School	35	43.8
College	21	26.3
<b>Length of time hemodialysis</b>		
< 24 months	35	43.7
≥ 24 months	45	56.3
<b>Comorbid diseases</b>		
Yes	61	76.25
No	19	23.75
<b>Family Support</b>		
Low	0	0
Moderate	15	18.8
Good	65	81.3
<b>Psychological Function</b>		
Low	0	0
Moderate	18	22.5
High	62	77.5
<b>Quality of Life</b>		
Moderate	45	56.25
Good	33	41.25
Very good	2	2.5
Excellent	0	0
<b>Total</b>	<b>80</b>	<b>100</b>

**Table 2.** Frequency distribution of comorbid diseases in hemodialysis patients at Roemani Hospital Semarang

Comorbid Diseases	f	%
Hypertension	54	67.5
Diabetes Mellitus	18	22.5
Nephrolithiasis	2	2.5

**Table 3.** Haemoglobin, ureum, and creatinine level in patients undergoing hemodialysis at Roemani Hospital Semarang

Variable	Minimum-Maximum	Mean	SD
Hemoglobin	5.20-13.20	9.45	1.749
Ureum	31-253	109.95	47.291
Creatinine	2.40-24.60	6.68	3.736

**Table 4.** Chi-square test result between gender, occupation, education, length of time hemodialysis, family support, psychological function, and comorbid diseases with QoL of hemodialysis patients at Roemani Hospital Semarang

Variable	Quality of Life						Total		p-value
	Moderate		Good		Excellent		n	%	
	n	%	n	%	n	%			
<b>Gender</b>									
Male	29	58	19	38	2	4	50	100	0.358
Female	15	50	15	50	0	0	30	100	
<b>Employment</b>									
Yes	22	57.9	14	36.8	2	5.3	38	100	0.239
No	22	52.4	20	47.6	0	0	42	100	
<b>Educational level</b>									
No education	1	33.3	2	66.7	0	0	3	100	0.462
Elementary school	7	77.8	2	22.2	0	0	9	100	
High school	27	57.4	18	38.3	2	4.3	47	100	
College	9	42.8	12	57.2	0	0	21	100	
<b>Length of time hemodialysis</b>									
< 24 months	25	71.4	10	28.6	0	0	35	100	0.024
≥ 24 months	19	42.2	24	53.3	2	4.5	45	100	
<b>Family support</b>									
Moderate	10	66.7	5	33.3	0	0	15	100	0.526
Good	34	52.3	29	44.6	2	3.1	65	100	
<b>Psychological function</b>									
Moderate	8	53.3	6	40	1	6.7	15	100	0.280
Good	38	58.5	26	40	1	1.5	65	100	
<b>Comorbid disease</b>									
Yes	36	59	24	39.3	1	1.7	61	100	0.347
No	8	42.1	10	52.6	1	5.3	19	100	

From the results of the analysis between gender and QoL, it was found that there were 2 (4%) male respondents who had an excellent QoL, while there were no female respondents who had an excellent QoL. The statistical test results obtained p-value= 0.358 ( $p > 0.05$ ), so it can be concluded that there is no relationship between gender and the QoL of CKD hemodialysis patients at Roemani Hospital, Semarang. (Table 4)

From the results of the analysis between employment and QoL, it was found that there were as many as 2 (5.3%) respondents who worked had an excellent QoL, while no respondents who did not work had an excellent QoL. Statistical test results obtained p-value = 0.239 ( $p > 0.05$ ), so it can be concluded that there is no relationship between work and the quality of life of CKD patients undergoing hemodialysis at Roemani Hospital Semarang.

From the results of the analysis of the relationship between the level of education and the QoL, it was found

that there were 27 (57.4%) respondents who had a high school education level with moderate QoL, 18 (38.3%) with good QoL, and 2 respondents (4.3%) with an excellent QoL. The statistical test results obtained p value = 0.462 ( $p > 0.05$ ), so it can be concluded that there is no relationship between education level and quality of life of CKD patients undergoing hemodialysis at Roemani Hospital, Semarang.

From the results of the analysis of the relationship between the length of hemodialysis time and the QoL, it was found that there were 2 (4.5%) respondents who underwent hemodialysis  $\geq 24$  months and had an excellent QoL. At the same time, no respondents who underwent hemodialysis  $< 24$  months had excellent QoL. The statistical test results obtained p-value = 0.024 ( $p < 0.05$ ), so it can be concluded that there is a significant relationship between the length of the hemodialysis period and the QoL of hemodialysis patients at Roemani Hospital, Semarang.

From the results of the analysis between family support and QoL, it was found that 2 (3.1%) respondents had good family support and excellent QoL. On the other hand, no respondents had moderate family support and an excellent QoL. The statistical test results obtained p-value = 0.526 ( $p > 0.05$ ), so it can be concluded that there is no relationship between family support and the quality of life of hemodialysis patients at Roemani Hospital, Semarang.

From the results of the analysis between psychological function and QoL, it was found that there were 38 (58.5%) respondents who had good psychological well-being and a moderate QoL. 26 (40%) respondents had a good QoL and 1 (1.5%) have an excellent QoL. The statistical test results obtained a p-value = 0.280 ( $p > 0.05$ ), so it can be concluded that there is no relationship between psychological well-being and the quality of life of hemodialysis patients at Roemani Hospital, Semarang.

From the results of the analysis between comorbid diseases and QoL, it was found that there were 36 (59%) respondents with comorbid had a moderate QoL, 24 (39.3%) respondents who had comorbid diseases had a good QoL and 1 (1.7%) of respondents have an excellent QoL. The statistical test results obtained p-value = 0.347 ( $p > 0.05$ ), so it can be inferred that there is no relationship between comorbid diseases and the quality of life of hemodialysis patients at Roemani Hospital, Semarang. (Table 5)

**Table 5.** Spearman test results between age, hemoglobin, urea, and creatinine levels with the QoL of hemodialysis patients at Roemani Hospital Semarang.

Variable	r-value	p-value
Age	0.001	0.992
Hemoglobin	0.129	0.254
Urea	- 0.089	0.432
Creatinine	0.022	0.844

The statistical test showed no relationship between age and QoL for CKD patients (r-value = 0.001 and p-value = 0.992). There is no relationship between hemoglobin levels and the QoL of CKD patients (r-value = 0.129 and p-value = 0.254). There is no relationship between urea levels and the QoL of CKD patients (r-value = - 0.089 and p-value = 0.432). There is no relationship between creatinine levels and the QoL of CKD patients (r-value = 0.022 and p-value = 0.844).

This research resulted in no relationship between age and QoL. This result, in line with Candra's research, showed no association between age and QoL. The QoL of respondents <60 years is better than respondents who are aged  $\geq 60$  years. Nevertheless, according to age theory,

QoL is one factor that determines a person's physical quality. Someone who has a younger age tends to have a better QoL prediction. Age aligns with health, physical, and social function but does not impact mental function using a questionnaire KDQOL-SF 36.<sup>7</sup>

The results of this study showed that there is no relationship between gender and QoL. Most of the respondents in this study were male. The results of this study are consistent with research conducted by Yuanita that there is no relationship between gender and QoL. Several studies state that the QoL of a female is lower than that of a male. QoL difference can happen because females are not good at dealing with stress which can lead to depression. In addition, gender issues are still a scourge of reduced opportunities for females in various fields of life.<sup>8</sup> Naturally, every disease can affect both men and women, but in some disease conditions, there is a higher frequency of males than females. In some disease conditions, there is a higher frequency of males than females, such as chronic kidney disease. Men are known to have socio-emotional differences. Women have better self-regulation in behavior than men, especially in paying attention to health and maintaining a healthy lifestyle. In addition, women are known to be more compliant than men in undergoing treatment processes because they are more able to take care of and regulate themselves.<sup>9</sup>

Humans naturally need to meet the necessities of life to survive. CKD patients experience difficulties living with their condition. Besides sharing all physical weaknesses, they understand that in their situation, it is pretty challenging to fulfill their needs holistically without inconveniencing other people. For those with a responsibility as the head of the family, it becomes a burden to meet their needs. Their illness caused them to lose their formal job while undergoing hemodialysis, and some had difficulty returning to work. In contrast, informal employment usually has a business as they struggle with CKD for those with the ability and capital to work as entrepreneurs. This situation makes them experience negative emotions such as depression and anxiety. They are helpless because their illness makes them no longer able to be productive people for themselves and their families. The burden of CKD sufferers on their lives is immense.<sup>10</sup> The results of this study indicate that there is no relationship between employment and QoL. The result is in line with research written by Yuanita that there is no relationship between employment and QoL. In this study, the working respondents generally worked as traders, teachers, and odd jobs. The active respondents naturally had good conditions when doing hemodialysis. With not too frequent a hemodialysis schedule, they can even go alone. However, patients who were not working when undergoing

hemodialysis generally used to have a job but felt worried about their health condition when they first had hemodialysis. Their worry resulted in the respondents finding it difficult to maintain their position then.<sup>8</sup>

The results of this study showed that there is no relationship between educational levels with the QoL. The development aligns with previous research, which states that education level does not significantly affect the QoL. QoL is generally subjective, so it cannot be determined by the story of a person's educational level. Respondents with low or high education tend to have their way of finding out about their disease and its treatment. In general, respondents will only focus on their recovery. When conducting the research, the respondents generally resigned themselves to the day after day they were going through without thinking about improving their quality of life.<sup>11</sup> Previous studies stated that patients with lower levels of education tend to behave and have unhealthy lifestyles compared to clients with higher education because the educational level affects a person's level of health awareness.<sup>12</sup>

The most comorbid disease in hemodialysis patients is hypertension. The most common comorbidities after hypertension are Diabetes Mellitus and cardiovascular disease. Modernization causes sedentary behavior in society, such as reduced physical activity. Uncontrolled food intake can also cause chronic kidney disease, such as consuming salt-high foods, which leads to hypertension.<sup>13</sup> Comorbid diseases can appear as the etiology of CKD and are still present during the hemodialysis process. Patients with at least three comorbidities have a more rapid progression of CKD. Therefore, comorbid diseases can affect aspects of a person's life, including QoL. However, this study's results align with previous studies where there was no relationship between the presence of comorbid diseases and the QoL of hemodialysis patients. The situation can be caused by patients who previously had chronic diseases as comorbidities and taking drugs for a long time which leads to the worsened kidney.<sup>11</sup>

This study result indicated a relationship between the length of hemodialysis time and QoL. This study result aligns with the theory that the longer the respondent undergoes hemodialysis, the more he accepts and adapts. The longer time for hemodialysis, the more the patient will experience the benefits of undergoing hemodialysis. Respondents who take dependence on hemodialysis machines can have an adequate or even excellent QoL. No exact theory explains when a patient is considered a new patient or an old patient based on the length of hemodialysis. Hemodialysis can prolong the life expectancy of patients due to several functions. Patients with chronic kidney disease must undergo hemodialysis

therapy, which takes place about three or two times a week. The longer the patient undergoes hemodialysis, the better the survival rate. The study proved that the longer the patient undergoes hemodialysis, the smaller the risk of death in patients.<sup>9</sup> Respondent's quality of life who recently underwent hemodialysis may decrease. The decreased number is because respondents need more time to accept and adapt to changes in their bodies and lives. This problem will interfere with different aspects, such as social, psychological, and physical aspects. Indeed, the quality of life is an individual's perception of his condition.<sup>14</sup>

Patients with CKD who have been diagnosed by a doctor and experience this terminal disease still show their healthy behavior by following all the processes of treatment, including routine hemodialysis, dieting, taking medication according to the doctor's advice, and maintaining their lifestyle.<sup>10</sup> Each patient undergoing hemodialysis requires a different time to adapt. This study showed that patients with good QoL were more likely to be respondents who had undergone hemodialysis for  $\geq 24$  months. Even in respondents who had undergone  $\geq 24$  months of hemodialysis, 2 had an excellent QoL. Respondents who experienced  $\geq 24$  months of hemodialysis had reached an advanced level of adaptation. At this stage, the respondents were getting used to the limitations of doing something and its various complications.<sup>15</sup>

Family members are an inseparable part of the family environment. The family is considered a place where family members need help and assistance. Support can be given by the family, such as helping to find information related to the process of hemodialysis therapy. Families can also communicate with each other regarding complaints experienced by patients and can provide entertainment, enthusiasm, and motivation for patients undergoing hemodialysis therapy. Family support will make patients feel happy and not easily discouraged.<sup>16</sup>

This research resulted in most of the family support received by CKD patients in the hemodialysis unit at Roemani Hospital, Semarang, having good support. This is because the family provides full support to hemodialysis patients. Family support is the best preventive intervention strategy for helping family members.<sup>17</sup> Support can be provided by the closest people, such as spouses or family members, close friends, and someone with a harmonious relationship with the individual.<sup>18</sup> Family support is vital for patients with chronic diseases, especially in hemodialysis patients' therapy, because family support greatly influences behavior, and this behavior produces the desired health outcomes. The family is believed to be able to provide positive things so that it can increase the perception of

control and self-mastery and reduce the anxiety of hemodialysis patients.<sup>19</sup>

It was found that most of the respondents had a high psychological function. This was because the research respondents had good family support. Family support is an essential factor that can affect psychological well-being in CKD hemodialysis patients.<sup>10</sup> Hemodialysis patients will undergo hemodialysis therapy for the rest of their life will experience various psychological problems such as difficulty accepting their condition, feeling a burden to other people, stress, anxiety, depression, boredom, and boredom.<sup>8</sup> Support from the closest people, namely the family, can overcome these psychological problems and, of course, will improve the psychological well-being of hemodialysis patients.<sup>9</sup>

Anemia occurs in 80-90% of patients with CKD. The main factor that often causes anemia in hemodialysis patients is erythropoietin deficiency. Significant blood loss factors, such as repeated phlebotomies for laboratory tests and blood retention on the dialyzer, are also causes of anemia in CKD patients.<sup>20</sup> In addition, anemia in CKD patients is caused by a lack of intake of iron-containing foods. Anemia that occurs in hemodialysis patients can cause a decrease in QoL and increased mortality. Anemia can reduce exercise capacity due to lack of oxygen carried to body tissues and cause fatigue, reduced cognitive abilities, and impaired immunity.<sup>21</sup> Efforts to prevent and overcome anemia are carried out by providing adequate iron intake to increase hemoglobin formation. Efforts can be made to improve the intake of iron-source foods with a balanced nutritious diet, which consists of a variety of foods, especially animal food sources that are rich in iron (heme iron) in sufficient quantities, according to the RDA. In addition, it is also necessary to increase plant food sources that are rich in iron (non-heme iron), although their absorption is lower than that of animals. Foods rich in animal sources of iron include liver, fish, meat, and poultry, while vegetable sources include dark green vegetables and legumes.<sup>22</sup>

This research showed no relationship between hemoglobin levels and the QoL of hemodialysis patients at Roemani Hospital, Semarang. This result could have occurred because the data needed to be comparable, where there were only 2 respondents who had normal hemoglobin levels. In contrast, most of the other respondents had below-normal hemoglobin levels. This aligns with Nurchayati's research in a study conducted on 95 respondents to assess the relationship between hemoglobin levels and QoL. It was found that hemoglobin levels were not related to the QoL.<sup>23</sup> These results were in

line with the study of Ayoub et al., who conducted a study on the relationship between hemoglobin levels and QoL using the SF-36 questionnaire on 130 respondents, and the results obtained were hemoglobin levels not related to the total score of the SF-36 questionnaire.<sup>24</sup>

High urea levels in CKD patients cause various organ disorders, such as anorexia and nausea in digestion, metabolic acidosis in the blood, cardiac arrhythmias, skin damage, and decreased consciousness. Increasing urea levels will increase the symptoms and complications of CKD.<sup>25</sup> Increased urea levels are the same as the accumulation of toxins in the blood, which reduce physical abilities, increase dependence on others, reduce self-confidence, and affect the socio-psychological dimension. With this condition, patients feel their QoL is significantly reduced.<sup>26</sup>

This research showed no relationship between urea levels and the QoL of hemodialysis patients at Roemani Hospital, Semarang. This result could occur because the amount of data is different, where there is only 1 respondent who has normal urea levels. In contrast, most other respondents have high urea levels above the standard. Several factors, such as food intake, can cause elevated urea. Protein sources such as eggs, meat, and beans, including processed products such as tempeh and tofu, can trigger an increase in urea in the blood. Patients with chronic kidney disease must consider their diet to minimize uremia's severity.<sup>9</sup>

Creatinine levels are the end product of muscle protein metabolism. Excess creatinine does not cause systemic effects in multisystem. The creatinine level can indicate the glomerular filtration rate, which is then used to indicate kidney function.<sup>9</sup> Regulating protein intake is the most important thing to pay attention to. The higher the protein consumption, the heavier the work of the kidneys in excreting metabolic waste, so that there will be an increase in protein intake will be an increase in urea and creatinine levels. The results of previous studies stated that creatinine levels were not a determinant that affected the QoL of hemodialysis patients.<sup>9</sup> The results of this study also showed that there was no relationship between creatinine levels and the QoL of hemodialysis patients at Roemani Hospital, Semarang. This result could occur because the amount of data is different, where all respondents have high creatinine levels above average values. This result aligns with a previous study that identified a relationship between clinical factors and the QoL score of hemodialysis patients using the KDQoL-SF36 instrument.<sup>27</sup> Many factors can one of them is the diet intake consumed.

## CONCLUSION

The results showed a significant relationship between the length of hemodialysis time and the quality of life of hemodialysis patients at the Roemani Hospital Semarang. CKD patients strive to meet their needs holistically with all the limitations of physical and psychological conditions by trying to carry out the routine treatment process recommended by health workers. Lifestyle modification of CKD patients is needed to prevent the worsening of CKD and life-threatening complications and improve quality of life. Self-care education and behavioral changes constituted two essential components of CKD treatment. Developing viable strategies for encouraging participants to maintain self-care skills was significant. Therefore, healthcare professionals should play a role in encouraging CKD patients to engage in more healthy lifestyles not only to manage the coexisting diseases effectively but also to delay the progress of the diseases by providing specialized care and support.

## ACKNOWLEDGMENTS

The authors have no conflict of interest.

## CONFLICTS OF INTEREST

This research was supported by Research and Community Service Institution, Universitas Muhammadiyah Semarang, according to the research contract number 0247/UNIMUS.L/PT/PJ.INT/2022.

## REFERENCES

1. National Institute for Health and Care Excellence. Chronic kidney disease: assessment and management NICE guideline. 2021;(November):1–74. Available from: [www.nice.org.uk/guidance/ng203](http://www.nice.org.uk/guidance/ng203)
2. Rossing P. Risk Factors, Symptoms, Biomarkers, and Stages of Chronic Kidney Disease. *Chronic Kidney Dis Type 2 Diabetes*. National Library of Medicine. 2021;8–12.
3. Mosleh H, Alenezi M, Al Johani S, Alsani A, Fairaq G, Bedaiwi R. Prevalence and Factors of Anxiety and Depression in Chronic Kidney Disease Patients Undergoing Hemodialysis: A Cross-sectional Single-Center Study in Saudi Arabia. *Cureus*. 2020;12(1):1–11.
4. Kemenkes RI. Hasil Riset Kesehatan Dasar Tahun 2018. Kementrian Kesehat RI. 2018;53(9):1689–99.
5. Jesus NM, Souza GF de, Mendes-Rodrigues C, Almeida Neto OP de, Rodrigues DDM, Cunha CM. Quality of life of individuals with chronic kidney disease on dialysis. *J Bras Nefrol*. 2019;41(3):364–74.
6. Fadlilah S. Faktor-Faktor yang Berhubungan dengan Kualitas Hidup Pasien Hemodialisis. *J Kesehat*. 2019;10(2):284.
7. Puspitasari CE, Andayani TM, Irijanto F. Penilaian Kualitas Hidup Pasien Hemodialisis Rutin dengan Anemia di Yogyakarta. *Journal Manag Pharm Pract*. 2019;9(3):182.
8. Yuanita P. Hubungan Karakteristik Individu dengan Kualitas Hidup Pasien Hemodialisis. *Bul Kesehat Publ Ilm Bid Kesehat*. 2018;2(1):80–91.
9. Malfica MJ, Rosita L, Yuantari R. Hubungan Ureum dan Kreatinin Serum dengan Lamanya Terapi Hemodialisis pada Pasien Penyakit Ginjal Kronis ( PGK ) di RS PKU Bantul. *Berkala Ilmiah Kedokteran dan Kesehatan Masyarakat*. 2023;1(1):8–18.
10. Kurniawaty Y, Lestarina NNW, Kristama BY. Behavior of Patients with Chronic Kidney Disease. *J Keperawatan*. 2020;11(2):188–99.
11. Suparti S. Perbedaan Kualitas Hidup Pasien Gagal Ginjal Kronik Ditinjau dari Tingkat Pendidikan, Frekuensi dan Lama Hemodialisis Di RSUD Goeteng Taroenadibrata Purbalingga. *Medisains*. 2016;14(2):50–8.
12. Muliani R, Fauziah LA. Komorbiditas Dan Lama Menjalani Hemodialisis Dengan Kualitas Hidup Pada Klien Yang Menjalani Hemodialisi. *Window of Health*. 2022;5(2):533–44.
13. Baroleh JM, Ratag TB, G FLF, Langi. Faktor-Faktor Yang Berhubungan Dengan Penyakit Ginjal Kronis Pada Pasien Di Instalasi Rawat Jalan RSU Pancaran Kasih Manado. *Kesmas*. 2019;8(7):8.
14. Wahyuni P, Miro S, Kurniawan E. Hubungan Lama Menjalani Hemodialisis dengan Kualitas Hidup Pasien Penyakit Ginjal Kronik dengan Diabetes Melitus di RSUD Dr. M Djamil Padang. *J Kesehat Andalas*. 2018;7(4):480.
15. Purwati H, Wahyuni S. Hubungan Antara Lama Menjalani Hemodialisis dengan Kualitas Hidup Pasien Gagal Ginjal Kronik di RS Gatoel Mojokerto. *Jurnal Keperawatan*. 2016;5(2):57–65.
16. Paath CJG, Masi G, Onibala F. Study Cross Sectional : Dukungan Keluarga Dengan Kepatuhan Hemodialisa Pada Pasien Gagal Ginjal Kronis. *J Keperawatan*. 2020;8(1):106.
17. Ndore S, Sulasmini S, Hariyanto T. Dukungan Keluarga Berhubungan Dengan Kepuasan Interaksi Sosial Pada Lansia. *Care J Ilm Ilmu Kesehat*. 2017;5(2):256.
18. Siburian HP, Pakpahan JES. Dukungan Keluarga Dengan Tingkat Penerimaan Diri Saat Pasien Terapi Hemodialisa Di RSUD Dr. Pirngadi Medan. *Jurnal*



- Keperawatan Flora. 2021;14(1)94–103.
19. Dame AM, Rayasari F, Besral, Irawati D, Kurniasih DN. Faktor yang Berhubungan dengan Tingkat Kecemasan Pasien Penyakit Ginjal Kronik yang Menjalani Hemodialisis. *Jurnal Keperawatan*. 2022;14(3):831–844.
  20. Garini A. Kadar Hemoglobin Pada Pasien Gagal Ginjal Kronik Yang Menjalani Hemodialisis. *JPP Jurnal Kesehat Poltekkes Palembang*. 2019;13(2):111–6.
  21. Senduk CR, Palar S, Rotty LWA. Hubungan anemia dengan kualitas hidup pasien penyakit ginjal kronik yang sedang menjalani hemodialisis reguler. *e-CliniC*. 2016;4(1).
  22. Kemenkes RI. Pedoman Pencegahan dan Penanggulangan Anemia Pada Remaja Putri dan Wanita Usia Subur. Jakarta: Kemenkes RI; 2018.
  23. Rantepadang A. Hubungan Kadar Hemoglobin dan Lama Hemodialisa terhadap Kualitas Hidup Pasien Gagal Ginjal Kronik yang Menjalani Hemodialisa. *Klabat Journal of Nursing*. 2022;4(1):36-41.
  24. Ayoub A, Nelson K, Wood P, Hijjazi KH. The relationship between laboratory values and quality of life of dialysis patients in the United Arab Emirates. *Ren Soc Australas J*. 2014;10(1):12–20.
  25. Sari SP, Rasyidah AZ, Maulani. Hubungan Lama Hemodialisis dengan Kualitas Hidup Pasien Penyakit Ginjal Kronik di Ruang Hemodialisa Rumah Sakit Bhayangkara Kota Jambi. *Jurnal Ilmiah Ners*. 2022;3(2):54-62.
  26. Kurniawan AW, Koesrini J. Hubungan Kadar Ureum, Hemoglobin dan Lama Hemodialisa dengan Kualitas Hidup Penderita PGK. *J Ners dan Kebidanan*. 2019;6(3):292–9.
  27. Adiningrum N, Andayani TM, Kristina SA. Analisis Faktor Klinik terhadap Kualitas Hidup Pasien Hemodialisis di RSUD dr. Loekmono Hadi Kudus. *J Farm Dan Ilmu Kefarmasian Indones*. 2021;8(1):29.