

## The quality of life of hemodialysis patients in Yogyakarta, Indonesia

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### ABSTRACT

The assessment of quality of life serves as a critical evaluation of the effectiveness of the administered hemodialysis treatment. The measurement of quality of life can be conducted using the Kidney Disease Quality of Life Short Form (KDQoL-SF™) questionnaire. This research aims to gather information concerning hemodialysis patients' quality of life due to chronic kidney failure at the dr. S. Hardjolukito Regional Military Hospital in Yogyakarta. The research employed a cross-sectional design. The respondents consisted of 65 outpatients selected through purposive sampling. The inclusion criteria were patients in the end-stage of hemodialysis, having undergone hemodialysis for at least 3 months, aged 18 years or older, willing to participate in the study, and capable of honestly and voluntarily completing the questionnaire. Subjects experiencing disturbances in consciousness, communication impairments, and those designated as emergency patients (Cito) were excluded. The Independent T-test, Mann-Whitney test, Chi-Square test and Fischer test were conducted to define the predictors of quality of life. Most of the hemodialysis patients was male (50.8%) with average of age was 54.66 years old. The findings revealed that 64.6% of the respondents experienced moderate/poor quality of life, while 35.4% exhibited good quality of life. Statistical analysis established a significant relationship between age and period of hemodialysis and quality of life based ( $p < 0.05$ ). Hemoglobin levels, number of prescribed medications, gender, education, occupation and income demonstrated no significant relationship with the quality of life. Among the respondents' characteristics, age and duration of hemodialysis were associated with the quality of life.

**Keywords:** hemodialysis, KDQoL-SF™, quality of life, Yogyakarta

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## INTRODUCTION

Chronic kidney failure claims the lives of 850,000 individuals annually, ranking as the 12th leading cause of death worldwide (Ariyanti & Imam, 2021). In Indonesia, there is an increase of the prevalence of chronic kidney failure in 2013 (0.2%), to 2018 (0.38%) (Rohmaniah & Sunarno, 2022). The Special Region of Yogyakarta holds the 12th position with a high prevalence of chronic kidney failure at 4.3% (Hayati et al., 2021). The total number of new patients undergoing hemodialysis in Indonesia witnessed a twofold increase by the end of December 2018 compared to the year 2017, reaching a total of 66,433 individuals, resulting in a rise in the overall number of active patients to 132,142 during the same period (Anonymous, 2018). Notably, dr. S. Hardjolutito Regional Military Hospital Yogyakarta experienced a 17.7% increase in chronic kidney failure patients undergoing hemodialysis between 2017 and 2021. Research findings indicate that individuals with kidney failure undergoing hemodialysis suffer from various effects and conditions that adversely impact their physical, psychological, social, and environmental well-being (Rahman et al., 2013).

The Kidney Disease Quality of Life (KDQoL) and Short Form Transplant Module (SF<sup>TM</sup>) are two instruments utilized to assess the quality of life in patients with kidney disease. KDQoL incorporates a combination of the Short Form-36 (SF-36) and additional questions specifically developed for kidney disease patients. Similarly, SFTM also employs SF-36 to measure general health status but is supplemented with specific questions. The KDQoL-SF<sup>TM</sup> version 1.3 differs from version 1.2 by the inclusion of a section on sexual activity (Hays et al., 1995).

This study aims to define patients' quality of life with hemodialysis due to chronic kidney failure at dr. S. Hardjolutito Regional Military Hospital in Yogyakarta using the KDQoL-SF<sup>TM</sup> questionnaire.

## MATERIALS AND METHOD

### Materials

This study used the *Kidney Disease Quality of Life Short-Form* (KDQoL-SF<sup>TM</sup>) as the instrument. This questionnaire employs a Likert scale to assess the health status of the subjects. The instrument comprises 36 questions concerning general health and 43 questions pertaining specifically to kidney-related conditions.

### Methods

This study employed a cross-sectional design. Data collection was conducted at dr. S. Hardjolutito Regional Military Hospital from April to September 2022. The subjects included all out patients with chronic kidney disease undergoing hemodialysis at the Hemodialysis Installation. The inclusion criteria were patients in the end-stage of hemodialysis, having undergone hemodialysis for at least 3 months, aged 18 years or older, willing to participate in the study, and capable of honestly and voluntarily completing the questionnaire. Subjects experiencing disturbances in consciousness, communication impairments, and those designated as emergency patients (Cito) were excluded from the study.

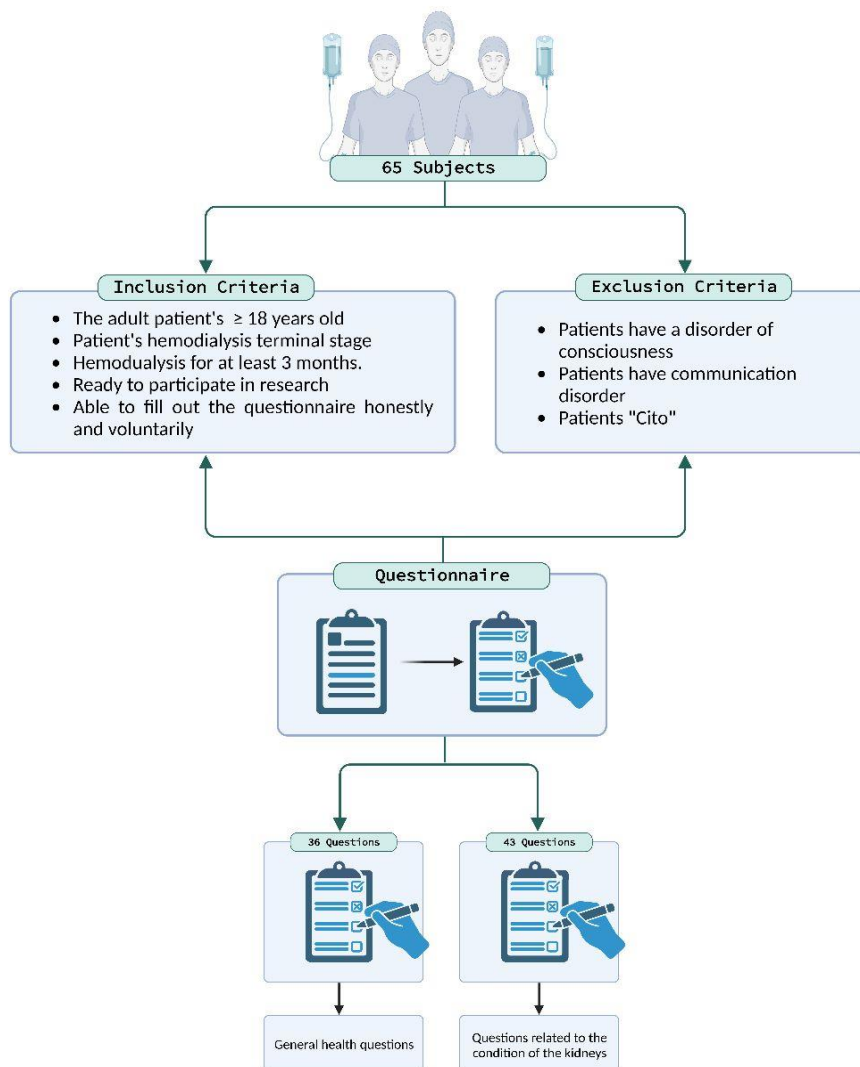
The quality of life instrument is the *Kidney Disease Quality of Life Short-Form* (KDQoL-SF<sup>TM</sup>) as depicted in Figure 1.

### Data Analysis

This questionnaire employs a Likert scale to assess the health status of subjects in this study. The instrument comprises 36 questions concerning general health and 43 questions pertaining specifically to kidney-related conditions. General health encompasses role functioning, pain, overall health, emotional well-being, emotional role, social functioning, and fatigue. Function scores range from 0 to 100, where a score of 100 indicates good quality of life. Other items in the questionnaire address the patients' overall health and their feelings regarding their health. Additional patient background information includes gender, ethnicity, education, income, length of hospitalization, and the number of medications received (Joshi et al., 2010; Rokhman et al., 2023). The scoring of the KDQoL SF<sup>TM</sup>

questionnaire follows the procedures outlined in previous research (Hays et al., 1994). The quality of life variables in this study was categorized as follows: good quality of life (76-100), moderate quality of life (60-75), and poor quality of life (<60) (Theofilou, 2013).

To define the predictors of patients' quality of life, the Independent T-test, Mann-Whitney test, Chi-Square test and Fischer test were conducted based on the type of data and the normal distribution.



**Figure 1. Data Collection using the Kidney Disease Quality of Life Short-Form (KDQoL-SF™)**  
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## RESULT AND DISCUSSION

We recruited 63 hemodialysis patients. The characteristics of the subjects in this study are presented in Table 1.

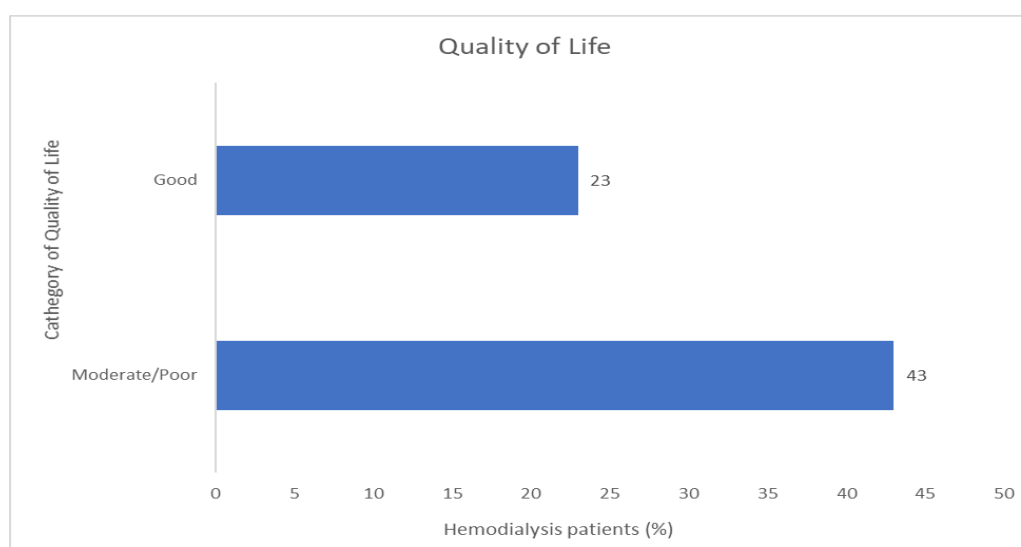
Most patients are male and their average of age is 54.66 years old. The average hemoglobin level of the respondents is  $8.21 \pm 1.18$  g/dL and the average number of prescribed medications for the respondents is  $5.15 \pm 1.41$  types of medication. The respondents are dominantly within the age group of 45-59 years, which aligns with the data from Riskesdas 2018, where 30% of hemodialysis patients were found in this age range (Anonymous, 2018). The longer the respondents undergo hemodialysis,

the more time they need to adapt to the changes experienced, such as symptoms, complications, and lifelong treatments (Gil Cunqueiro et al., 2003).

**Table 1. Characteristics of subjects in this study**

Respondents' Characteristics	N	%	$\bar{X} \pm SD$
Age (years old)	65	-	54.66 ± 11.21
Duration of Hemodialysis (months)	65	-	326.98 ± 253.64
Hemoglobin Level (g/dL)	65	-	8.21 ± 1.18
Number of Prescribed Medications (types of medication)	65	-	5.15 ± 1.41
<b>Sex</b>			
Male	33	50.8	-
Female	32	49.2	-
<b>Educational Background</b>			
No formal education/Incomplete	3	4.6	-
Completed primary education (SD)	8	12.3	-
Completed junior high school (SMP)	11	16.9	-
Completed senior high school (SMA)	28	43.1	-
Tertiary education (College/University)	15	23.1	-
<b>Employment Status</b>			
Unemployed	44	67.7	-
Employed	21	32.3	-
<b>Monthly Income (IDR)</b>			
< 6,000,000 per month	63	96.9	-
≥ 6,000,000 per month	2	3.1	-

The subjects' quality of life can be observed in [Figure 2](#).



**Figure 2. Quality of life of hemodialysis patients with chronic kidney failure at dr. S. Hardjolukito regional Military Hospital, Yogyakarta**

Among the subjects, 64.6% experienced moderate/poor quality of life, while 35.4% exhibited good quality of life. These results can be attributed to several factors experienced by the respondents, both upon diagnosis of the disease and during the course of hemodialysis. This finding aligns with previous research indicating that the majority of hemodialysis patients have poor quality of life (Al Salmi et al., 2021; Van Loon et al., 2017).

Parameters for assessing the respondents' quality of life are based on 19 domains grouped into three categories: kidney disease domain, physical health domain, and mental health domain. The mean quality of life score for the respondents in this study is  $70.96 \pm 10.92$ , with the highest score found in the mental health domain ( $78.14 \pm 8.95$ ), which is higher than both the kidney disease domain ( $72.78 \pm 20.01$ ) and the physical health domain ( $58.83 \pm 17.47$ ) (Table 2). The physical health domain has lower scores compared to the mental health domain. The lower scores in the physical health domain suggest that over time, respondents can adapt psychologically to the limitations of their health conditions (Adiningrum et al., 2021; Risky, 2019).

**Table 2. Quality of life domains of hemodialysis patients with chronic kidney failure at dr. S. Hardjolukito regional Military Hospital, Yogyakarta**

Domain	$\bar{X} \pm SD$
Kidney Disease	
Symptoms/Issues	$85.63 \pm 11.95$
Effects of Kidney Disease	$85.38 \pm 14.98$
Burden of Kidney Disease	$50.86 \pm 19.29$
Employment Status	$43.07 \pm 17.40$
Cognitive Function	$89.84 \pm 20.75$
Quality of Social Interactions	$96.72 \pm 9.14$
Sexual Function	$46.75 \pm 53.44$
Quality of Sleep	$61.73 \pm 22.07$
Social Support	$95.89 \pm 10.22$
Quality of Dialysis Staff Services	$64.61 \pm 14.92$
Patient Satisfaction	$80 \pm 16.97$
Physical Health	
Physical Function	$61.54 \pm 27.08$
Physical Role	$34.61 \pm 26.40$
Perception of Pain	$76.31 \pm 29.13$
General Health	$62.84 \pm 16.86$
Mental Health	
Emotional Well-being	$87.63 \pm 18.02$
Emotional Role	$83.07 \pm 30.68$
Social Function	$70.96 \pm 10.92$
Energy/Fatigue	$67.61 \pm 19.16$
<b>Quality of Life Scores</b>	$70.96 \pm 10.92$

Good quality of life is observed in individuals who can carry out their functions and roles in daily life appropriately and in line with their developmental level (Sabaan & Perwitasari, 2016). The SF-36 has been used worldwide to assess quality of life. In China, the SF-36 has been employed in several studies to assess the quality of life in the general population and specific chronic diseases. A study evaluating the quality of life in the general population conducted in Shanghai, China concluded that the SF-36 is acceptable and applicable for evaluating the quality of life in the general population. Chronic diseases significantly disrupt all dimensions of the SF-36, leading to a decrease in the quality

of life among individuals with chronic conditions (Wang et al., 2008). The assessment of quality of life in the general population has also been conducted in India (Sinha et al., 2013) and Iran (Montazeri et al., 2005) where the SF-36 was found suitable for measuring the quality of life in populations and could be used as a basis for comparison with specific populations. Furthermore, the SF-36 has been utilized to evaluate the quality of life in the general population in Indonesia, with the highest physical domain at 91.21 (SD = 12.09) and the lowest general health status at 71.69 (SD = 12.18), indicating that societal characteristics can influence the quality of life in the normal population (Sabaan & Perwitasari, 2016).

**Table 3. Predictors of quality of life of hemodialysis patients (age and hemoglobin)**

Variable	Mean $\pm$ SD		t	p	95% CI
	Moderate/Poor (n=42)	Good (n=23)			
Age (year)	57.76 $\pm$ 11.26	49.00 $\pm$ 8.79	3.227	0.002	3.336 - 14.188
Hemoglobin Level (g/dL)	8.15 $\pm$ 1.02	8.322 $\pm$ 1.44	-0.513	0.611	-0.8640 - 0.5158

t = T-test; p = significance/probability; CI = Confidence Interval

As Table 3 indicates, the average age of respondents in the group with moderate/poor quality of life is 57.76  $\pm$  11.26 years, is higher than the average age of respondents in the group with good quality of life, which is 49.00  $\pm$  8.79 years. This is statistically significant (p<0.05), indicating a difference between age and quality of life, significantly. Our study findings differ from a previous study (Risky, 2019) which found no association between age and quality of life. Age has a significant and negative correlation, meaning that the quality of life of respondents decreases as their age increases (Barzegar et al., 2017). Advanced age can lead to deteriorating organ functions, making the body susceptible to diseases and complications. For instance, kidney function tends to decline with increasing age, affecting physical activity due to impaired organ function. On the other hand, respondents in their productive age can perform activities well, feel motivated for recovery, and have high life expectancy (Istanti, 2014).

The average hemoglobin level of respondents in the group with moderate/poor quality of life is 8.15  $\pm$  1.02 g/dL, which is lower than the average hemoglobin level of respondents in the group with good quality of life, which is 8.32  $\pm$  1.44 g/dL. However, the difference is not statistically significant (p>0.05). A decrease in hemoglobin levels is often associated with poor quality of life in chronic kidney disease patients undergoing hemodialysis. However, the relationship between quality of life and changes in hemoglobin levels does not always mean that an increase in hemoglobin levels can improve the quality of life and anemia in chronic kidney disease patients (Lefebvre et al., 2006). Anemia is one of the common complications in patients with chronic kidney failure. The previous research mentioned that hemodialysis patients experienced mild anemia in 45% of cases, moderate anemia in 25%, and severe anemia in 8% (Senduk et al., 2016). Anemia can also impact the quality of life of hemodialysis patients; therefore, proper management of anemia can improve the quality-of-life scores of hemodialysis patients (Gong et al., 2022).

Table 4 shows that the percentage of male respondents with moderate/poor quality of life is 69.7%, which is not significantly different from the percentage of female respondents at 59.4%. The odds ratio (OR) value is 1.57, indicating that male respondents are 1.57 times more likely to have moderate/poor quality of life compared to female respondents. However, this difference is not statistically significant (95% CI; 0.56-4.38), meaning that there is no significant difference between gender and quality of life. Our study results align with previous research (Anggraeni, 2016; Risky, 2019) indicating that gender is not associated with quality of life. In general, any disease can affect anyone, but certain diseases may have different effects on males and females due to differences in employment status, lifestyle, genetic conditions, and physiology (Budiarto & Anggraeni, 2002). Males are considered for predictor of

*The quality of life... (Siswandi et al.,)*



chronic kidney disease, because of lifestyle factors such as smoking and alcohol consumption, which play a significant role in the development of chronic kidney disease (Astrini, 2013). Researchers assume that both males and females have the same desire for recovery and to feel comfortable with their condition. They have their own ways to adapt to changes and cope with some problems, like symptoms, complications, and lifelong treatment. The methods they employ become the most significant factors in determining their quality of life.

**Table 4. Predictors of quality of life in hemodialysis patients (gender, education level, employment status and income)**

Variabel	Quality of Life		Total	95% Confidence Interval	OR
	Moderate/Poor	Good			
<b>Sex</b>					
Male	23 (69.7%)	10 (30.3%)	33	0.56-4.38	1.57
Female	19 (59.4%)	13 (40.6%)	32		
<b>Education Level</b>					
Low	13 (59.1%)	9 (40.9%)	22	0.24-2.01	0.69
High	29 (67.4%)	14 (32.6%)	43		
<b>Employment Status</b>					
Unemployed	31 (72.1%)	12 (27.9%)	43	0.88-7.52	2.58
Employed	11 (50.0%)	11 (50.0%)	22		
<b>Income (IDR)/month</b>					
< 6,000,000	41 (65.1%)	22 (34.9%)	63	0.11-31.25	1.86
≥ 6,000,000	1 (50.0%)	1 (50.0%)	2		

$X^2 = \text{Chi-Square}$  ;  $p = \text{Significance/Probability}$  ; OR = *Odds Ratio*

The percentage of respondents with low education level and moderate/poor quality of life is 59.1%, which is almost twice as high as the percentage of respondents with high education level, which is 67.4%. The odds ratio (OR) value is 0.69, indicating that respondents with low education level are 0.69 times less likely to have moderate/poor quality of life compared to respondents with high education level. However, this difference is not statistically significant (95% CI, 0.24-2.01), meaning that there is no significant difference between education level and quality of life. Our results are consistent with previous research (Anggraeni, 2016; Bosniawan, 2018; Risky, 2019), indicating that education is not associated with quality of life. Education level plays an important role in determining the health status and quality of life of chronic kidney disease patients undergoing hemodialysis, as individuals with higher education are considered to be more knowledgeable, more receptive to information recommended by healthcare professionals for their treatment efforts, and more aware of their medical issues. The quality of life improves with higher education levels (Fadlilah, 2019). The researchers assume that both respondents with high and low education levels are capable of taking care of their health and are receptive to input from medical professionals and their families. They have their own ways of seeking information about their condition and treatment.

The percentage of respondents who are unemployed and have moderate/poor quality of life is 72.1%, which is higher than the percentage of employed respondents, which is 50.0%. The odds ratio

(OR) value is 2.58, indicating that unemployed respondents are 2.58 times more likely to have moderate/poor quality of life compared to employed respondents. However, this difference is not statistically significant (95% CI, 0.88-7.52), meaning that there is no significant difference between employment status and quality of life. Our study results are consistent with previous research, indicating that employment status is not associated with quality of life (Risky, 2019). In the study by previous study, individuals who are employed have stronger social bonds and support. Having a job can help individuals cope with life difficulties and reduce life stress (Primastuti, 2017). The economic status of employed respondents is more stable, which positively impacts their quality of life. The researchers assume that each individual has a different quality of life, and thus, employment status is not always related to quality of life, as many factors can influence respondents' quality of life. Although employment can provide higher income and social status, unemployed respondents can have a good quality of life if they are in good health and have adequate social support.

The percentage of respondents with an income of less than 74 million IDR per year has a moderate/poor quality of life is 65.1%, which is 40 times higher than the percentage of respondents with an income of 74 million IDR or more per year, which is 50.0%. The odds ratio (OR) value is 1.86, indicating that respondents with an income of less than 74 million IDR per year are 1.864 times more likely to have a moderate/poor quality of life compared to respondents with an income of 74 million IDR or more per year. However, the result is not statistically significant ( $p > 0.05$ ), meaning that there is no significant difference between income and quality of life. The previous studies mentioned contradictive results that the income had significant association with quality of life (Rustandi et al., 2018; Simorangkir et al., 2021).

**Table 5. Predictors of the quality of life in HD patients (Duration of hemodialysis and number of prescribed medications)**

Variable	Mean		U	p
	Moderate/Poor QOL (n=42)	Good QOL (n=23)		
<b>Duration of hemodialysis (months)</b>	36.55	26.52	334.000	0.041
<b>Number of Prescribed Medications (types of medication)</b>	35.27	28.85	387.500	0.178

U = Mann-Whitney; p = significance/probability; QOL = *Quality of Life*

As Table 5 indicates, the average duration of hemodialysis for respondents in the moderate/poor quality of life group is 36.55 months, which is higher than the average duration of hemodialysis for respondents in the good quality of life group, which is 26.52 months. There is a significant difference in the average duration of hemodialysis between the group of patients with moderate/poor quality of life and the group with good quality of life. This finding is consistent with previous research (Barbosa et al., 2017; Naseef et al., 2023), that indicates the duration of hemodialysis is associated with quality of life.

The average number of prescribed medications for respondents in the moderate/poor quality of life group is 35.27 types of drugs, which is higher than the average number of prescribed medications for respondents in the good quality of life group, which is 28.85 types of drugs. However, there is no significant difference between the number of prescribed medications and quality of life. The number of medications prescribed is associated with the presence of comorbidities or coexisting diseases experienced by the respondents. This finding is different from a previous study (Simorangkir et al., 2021), which found a relationship between the number of prescribed medications and quality of life.

The use of medications in patients with chronic kidney disease undergoing hemodialysis is associated with the respondents' comorbidities and additional symptoms in some cases (Seki, 2020).



Respondents with multimorbidity tend to have a negative perception of their health, due to the increasing number of prescribed medications (Pratiwi et al., 2019). The researchers assume that respondents view the prescribed medications as a means to help them overcome their illness, so the quantity of medications given does not affect their quality of life. Moreover, they already understand that if their condition is not treated, it could worsen over time.

The limitation of this study is related to the small sample size. This small sample size may impact the statistical power to detect predictors of quality of life in hemodialysis patients. Further research should use a larger sample size and include other factors that can influence the quality of life of patients.

## CONCLUSION

The quality of life of hemodialysis patients at dr. S. Hardjolukito regional Military Hospital is mostly moderate/poor (64.6%). In this study, the factors of age and duration of hemodialysis were identified as predictors of quality of life.

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