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Research Article

Factors Affecting the Quality of Life of Patients with Chronic Renal Failure Undergoing Hemodialysis at RSUD Sekarwangi Sukabumi District

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Abstract

Aims: Chronic renal failure is an increasingly prevalent global health issue, with hemodialysis as the most common treatment method. Factors affecting patients' quality of life include age, gender, education, occupation, and treatment duration. This study aimed to identify and examine these factors.

Methods: This cross-sectional study involved 80 hemodialysis patients at RSUD Sekarwangi Kabupaten Sukabumi, using total sampling and questionnaires for data collection. Logistic regression was used for data analysis, and the study received ethical approval.

Results: The Chi-square test results indicate that age, gender, education, occupation, duration of chronic kidney failure, and length of hemodialysis significantly influence the quality of life in chronic kidney failure patients ($p < 0.005$). Logistic regression analysis identified education as the dominant factor impacting quality of life (OR = 39.316).

Conclusion: The study reveals that age, gender, education, occupation, duration of chronic renal failure, and length of hemodialysis treatment significantly impact the quality of life of patients with chronic renal failure.

Keywords:

Age, Duration of CKD, Duration of Hemodialysis, Education, Gender, Occupation, Quality of Life,

INTRODUCTION

Kidney failure is a global health problem that is increasing year by year as sufferers range from young to old (1). Based on data from the World Health Organization (WHO), in 2021 there were more than 843.6 million, and it is estimated that the number of deaths due to chronic renal failure will increase to 41.5% by 2040. This high number indicates that chronic renal failure ranks 12th among all causes of death (2).

Chronic Kidney Disease is progressive and irreversible and is 3 months or longer. (3).

One of the treatments for chronic renal failure is hemodialysis. (4).

Hemodialysis therapy is an action to replace damaged kidney function. Hemodialysis management is carried out routinely 1 to 3 times a week, each meeting can take about 4-5 hours (5). Patients undergoing hemodialysis for a long period of time often experience symptoms of uremia and fluid overload, which can lead to hypertension and pulmonary edema (6).

In addition, hemodialysis will not only affect the patient physically but also mentally (3). The physical effects are shortness of breath,

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anorexia, itchy skin, general weakness, muscle cramps, and generalized edema. This impact makes the patient experience interference in daily life activities. While the psychological impact found is experiencing a decreased quality of life, due to a lack of willpower and has begun to surrender to the state of his illness (7).

Quality of life is Quality of life in patients with chronic renal failure will experience a decreased quality of life, due to a lack of willpower that has begun to surrender to the state of the disease (7). There are various factors that can affect the quality of life of patients with Chronic Kidney Failure (CKD) undergoing hemodialysis. Some factors, such as age, gender, education, occupation, duration of CKD, duration of hemodialysis (8).

Factors that affect quality of life are length of hemodialysis. The length of undergoing hemodialysis is the time needed to adapt to each patient's different lengths, the longer the patient undergoes hemodialysis the better the patient's adaptation because the patient has received more health education or information needed from health workers. the length of hemodialysis makes patients understand the importance of adherence to the hemodialysis process so that patients can benefit from hemodialysis therapy (1).

Length of illness is another factor that affects quality of life. Length of illness is the time span between the patient's first diagnosis and the current time expressed in years (9). Length of time with CKD will affect the decline in kidney function (10). One of the factors affecting the quality of life of people with CKD is age. In general, quality of life decreases with increasing age. Younger patients with GHGK will have a better quality of life because they are usually in better physical condition than older patients. (11).

Work is another factor that affects quality of life. Generally, patients with CKD who have undergone hemodialysis will experience various complaints that cause difficulty in working. Employment can affect the quality

of life of patients with chronic renal failure. The patient's dependence on hemodialysis machines for life, resulting in role changes, loss of work and income which is a stressor that can cause depression, in addition to family support can affect patient satisfaction in living daily life. (12).

Education as one of the patient characteristics that may be associated with the quality of life of chronic renal failure patients. Higher education will have broader knowledge, which also allows patients to control the entire diet and adhere to the treatment program. (13). Another factor that affects the quality of life of patients with CKD is gender. Carr (2003) states that gender is one of the determinants of quality of life that is specific to the individual, gender differences will affect the physiological and psychological functions of the individual so that it will have an impact on the quality of life of the individual (14). Age is another factor that affects the quality of life of patients with CKD. Age is a limit or level of life size that affects a person's physical condition. Unproductive age is age under 15 years and age over 65 years, while productive age is age 15 years to age 65 years (15). The purpose of this study was to determine the factors that influence quality of life in patients with corneal renal failure at RSUD Sekarwangi, Sukabumi Regency.

METHODS

Study Design

This research is a correlational study employing a cross-sectional approach, aimed at identifying relationships between demographic, clinical, and quality of life factors among patients with chronic renal failure undergoing hemodialysis.

Sample

The study population included all patients undergoing hemodialysis at Sekarwangi Hospital, Sukabumi Regency, from April to December 2024. Using a total sampling technique, the study obtained a sample of

80 patients, ensuring comprehensive representation of the patient population at this facility.

Instrument

Data were collected using structured questionnaires designed to gather demographic details (age, gender, education, occupation) and clinical information (duration of chronic kidney failure and length of hemodialysis treatment). The questionnaires also included a validated quality of life measurement tool specifically for patients with chronic renal failure, enabling consistent assessment of quality of life indicators relevant to the study's objectives.

Data Collection

Data collection was carried out through direct administration of questionnaires, either through face-to-face interviews or by providing the questionnaires to the patients to complete. This approach helped to ensure completeness and accuracy, as trained staff were available to assist patients as needed and clarify any questions about the questionnaire items.

Data Analysis

Data analysis was conducted using three main approaches:

Univariate Analysis: Frequency distribution tables were generated to summarize the distribution of demographic and clinical characteristics across the sample.

Bivariate Analysis: Simple linear regression analysis was used to examine the relationship between each independent variable (e.g., age, gender, education) and the quality of life outcome, providing insights into individual factor correlations.

Multivariate Analysis: Logistic regression analysis was performed to assess the combined effect of multiple factors on patients' quality of life and to identify the dominant predictors.

Ethical Consideration

The study was approved by the Ethics Committee at STIKES Sukabumi, with approval number 000820/KEP STIKES SUKABUMI/2024. Informed consent was obtained from each participant prior to their inclusion in the study, ensuring that participants were fully aware of the study's purpose, procedures, and confidentiality measures. Data were handled in compliance with ethical standards, with strict measures taken to maintain patient confidentiality and use the data solely for research purposes.

RESULTS

Univariate Analysis

Table 1. Univariate Analysis

Variabel	n	%
Age (Years)		
< 45	44	55,0
> 45	36	45,0
Gender		
Female	35	43,8
Male	45	56,2
Education		
Higher	47	58,8
Low	33	41,2
Employment		
Work	45	56,2
Not Working	35	43,8

Duration of Chronic Renal Failure (Years)		
< 5	39	48,8
> 5	41	51,2
Duration of Hemodialysis (Months)		
<24	43	53,8
>24	37	46,2
Quality of Life		
Good	36	45,0
Poor	44	55,0

Table 1 above explains that most respondents were < 45 years old as many as 44 or (55.0%), male as many as 45 or (56.2%), highly educated as many as 47 or (58.8%), working as many as 45 or (56.2%), suffering from GGK> 5 years as many as 41 or (51.2%) and undergoing hemodialysis for < 24 months as many as 43 or (53.8%). Most had a poor quality of life as many as 44 or (55.0%).

Analisis Bivariate Analysis

Table 2. Bivariate Analysis of Respondents' Characteristic Factors on the Quality of Life of Chronic Renal Failure Patients

No	Respondent Characteristics	Quality Of Life				Total		P-value
		Good		Bad		n	%	
		n	%	n	%			
1	Age (Years)							
	< 45	30	68,2	14	31,8	44	100	0,000
	> 45	6	16,7	30	83,3	36	100	
	Total	36	45,0	44	55,0	80	100	
2	Gender							
	Female	25	71,4	10	28,6	35	100	0,000
	Male	11	24,1	34	75,6	45	100	
	Total	36	45,0	44	55,0	80	100	
3	Education							
	Higher	34	72,3	13	27,7	47	100	0,000
	Low	2	6,1	31	93,3	33	100	
	Total	36	45,0	44	55,0	80	100	
4	Employment							
	Work	33	73,3	12	26,7	45	100	0,000
	Not Working	3	8,6	32	91,4	35	100	
	Total	36	45,0	44	55,0	80	100	
5	Duration of Chronic Renal Failure (Years)							
	< 5	28	71,8	11	28,2	39	100	0,014
	> 5	8	19,5	32	80,5	41	100	
	Total	36	45,0	44	55,0	80	100	
6	Duration of Hemodialysis (Months)							
	<24	25	58,1	18	41,9	43	100	0,000
	>24	11	29,7	26	70,3	37	100	
	Total	36	45,0	44	55,0	80	100	

Table 2 above shows the results of the Chi Square statistical test obtained p-value <0.005, meaning that there is an effect of age, gender, education, occupation, length of chronic kidney failure and length of hemodialysis significantly on the quality of life of patients with chronic kidney failure.

Multivariate Analysis

Table 3. Multivariate Analysis of Respondents' Characteristic Factors on the Quality of Life of Chronic Renal Failure Patients

Model	B	P-Value	OR	R Square
(Constant)	-26,335	0,001		
Age	3,024	0,024	20,571	
Gender	3,520	0,014	33,779	
Education	3,672	0,013	39,316	
Employment	3,160	0,049	23,562	0,890
Duration of Chronic Renal Failure	2,376	0,037	10,760	
Duration of Hemodialysis (Months)	2,816	0,042	16,716	

Table 3 explains the most dominant factors between age, gender, education, occupation, length of chronic kidney failure and length of hemodialysis are significant to the quality of life of chronic kidney failure patients undergoing hemodialysis. The modeling results obtained R Square = 0.328 (Nagelkerke R Square) means that age, gender, education, occupation, length of chronic renal failure and length of hemodialysis contribute to influencing the quality of life of chronic renal failure patients undergoing hemodialysis by 89.0% and the remaining 11.0% is influenced by other factors not studied. The results showed a probability value of age of 20.571, gender of 33.779, education of 39.316, occupation of 23.562, duration of chronic renal failure of 10.760 and duration of hemodialysis of 16.716. So it can be concluded that the dominant factor in the quality of life of patients with chronic renal failure is education.

DISCUSSION

The Influence of Age on the Quality of Life of Patients with CKD

Based on the results of this study, there is an influence of age on the quality of life of patients with CKD who undergo HD. Age is

the time span calculated from the time a person is born until a certain point in time. Biologically, age reflects the stages of development and aging experienced by the human body. Age is also often used as one of the important indicators in various health studies because it is related to various disease risk factors, physical, psychological and social abilities of a person. In this study, most respondents were <45 years old. Respondents aged less than 45 years old are a younger group compared to the majority of the population undergoing hemodialysis. In general, this age group faces greater challenges in terms of quality of life, especially as they are in a phase of life that is expected to be more productive. This younger age portrait of respondents suggests that they may experience more emotional and psychological distress due to their serious health condition. They may feel limited in social activities, work and have greater concerns for their future compared to older patients. This is because at a young age, individuals tend to have higher hopes and aspirations, and when faced with a chronic illness such as kidney failure, the impact on quality of life can be more significant (16).

Hemodialysis patients younger than 45 years old face various stressors related to

fluid and food intake restrictions and decreased social life. These restrictions pose significant challenges for them. Age less than 45 years affects the quality of life of chronic kidney failure (CKD) patients undergoing hemodialysis. Younger patients often have higher life expectancies, and serious health conditions such as CKD can cause greater psychological stress in this age group. Younger patients may also feel more disturbed by the physical and social limitations caused by the disease and hemodialysis treatment compared to older patients. They tend to be more aware of the loss of their quality of life, which can include a decreased ability to work, participate in social activities, and achieve important life goals. All of these contribute to the overall decline in quality of life among young GKK patients undergoing hemodialysis (17,18).

According to the researchers' assumption, younger patients often experience greater emotional and psychological distress compared to older patients. They may feel more stressed by changing roles in the family, physical activity restrictions, and uncertainty about the future. Patients under the age of 45 may also face more difficulties in adjusting to the drastically changed lifestyle due to hemodialysis, which can negatively affect their quality of life. They may feel like they are missing out on many aspects of normal life that they should be living at a young age, leading to a significant decrease in quality of life.

Influence of Gender on the Quality of Life of Patients with CKD

There is an effect of gender on quality of life in CKD patients undergoing hemodialysis.

CKD patients undergoing HD. Gender is a biological attribute that distinguishes between males and females, based on physical characteristics such as chromosomes, reproductive organs, and hormones. In addition, gender also relates to the social and cultural roles associated with being male or female. The study

respondents were predominantly male. Male patients with chronic kidney failure (CKD) undergoing hemodialysis (HD) often face fatigue, decreased energy, and physical discomfort, such as muscle cramps and pain at the blood access site. The routine HD process can limit their social and work life, cause stress, and affect their mental health (19).

Male patients undergoing hemodialysis (HD) often have a lower quality of life compared to female patients. Male patients tend to experience more physical disabilities such as fatigue, muscle pain, sexual dysfunction and depression, which negatively impact their overall quality of life, including physical functioning and mental health. Male patients may be more affected by the physical changes associated with chronic kidney disease (CKD) and HD treatment (20).

The quality of life of male patients undergoing hemodialysis (HD) is poorer due to several biopsychosocial reasons that affect their overall well-being. Male patients often experience significant changes in their daily lives, including fluid and food intake restrictions, physical limitations, and disruption of social and family life. These conditions often lead to psychological and emotional stress, such as depression and anxiety, which worsen their quality of life. In addition, male patients may feel burdened with economic responsibilities as the head of the family, which can increase emotional distress and fear of death. These factors suggest that the physical, mental and emotional changes brought about by HD may negatively impact the quality of life of male patients (21).

According to the researchers' assumption, male patients with chronic kidney disease undergoing hemodialysis tend to have poorer quality of life than women due to greater psychological and emotional burdens, such as stress from economic responsibilities and difficulty adapting to lifestyle changes. In addition, men may seek less emotional support, which may

exacerbate feelings of isolation and depression, thus negatively impacting quality of life.

Effect of Education on Quality of Life

Based on the results of the study, there is an effect of education on the quality of life of patients with chronic renal failure who undergo hemodialysis.

This study also shows that most patients are highly educated. Education covers the entire process of an individual's life from birth to death, besides that education also aims to realize a change in the behavior of the process from not knowing to knowing, from not understanding to understanding, and from being unable to become capable (22). With a high level of education in patients with chronic renal failure, it can increase the level of knowledge and care for the health problems experienced, patients will be easier to provide information about one of the efforts for therapy and rehabilitation programs for chronic kidney disease patients undergoing hemodialysis. This is in line with the research of Sarastika et al. (2019) which states that educational factors have an impact on the quality of life of GGK patients undergoing hemodialysis, with patients whose quality of life improves with higher levels of education (23).

Patients with higher education levels are more likely to have a better quality of life than those with lower education levels because they can find and obtain information about their disease. A higher level of education may mean better access to information and understanding of chronic renal failure disease, treatment, and necessary care, as well as being able to make better decisions regarding treatment and managing symptoms and complications associated with chronic renal failure. Highly educated chronic renal failure patients have better quality of life in the physical and functional domains, especially in terms of physical function, energy/fatigue, social function, and role function limitations due to emotional problems (24).

Effect of Work on Quality of Life

Based on the results of the study, there is an effect of work on the quality of life in patients with GGK who undergo hemodialysis.

This study also showed that most patients were still working. Respondents who are still working are civil servants, self-employed people who still have their own businesses at home, and private employees. Patients who have jobs are more independent and can fulfill their own needs, which makes them feel confident and secure. Patients who are employed also have daily routine activities such as going to work or gathering with coworkers that keep them busy and socially active, thus improving their quality of life (25).

Mousa et al., (2018) stated that patients who choose to continue working have a very important impact, where working can be a great social support and having a working status will contribute to higher quality and confidence. However, patients who are still working have a more stable financial condition. Furthermore, someone who is still working can also maintain social conditions and maintain their productivity. This condition will certainly have a positive impact on the quality of life of chronic renal failure patients. Although sometimes one of the impacts of chronic renal failure disease is that patients have to reduce their work due to physical limitations, fatigue, decreased energy makes the patient's productivity decrease, but patients who work on average have a better quality of life (26).

Influence of Length of CKD on Quality of Life

Based on the results of the study, there is an effect of length of HD on the patient's quality of life. Hemodialysis is a process that requires major adjustments in patients' lives, including changes in physical activity, social limitations, and a general decrease in quality of life. The results of this study showed that most patients underwent HD <

2 years, patients undergoing HD for less than 2 years can worsen quality of life because patients usually have not reached a level of acceptance of their illness, which often leads to feelings of helplessness, dependence on others, and decreased self-esteem. This adversely affects the physical, psychological domains, such as the appearance of symptoms of fatigue, muscle cramps, poor appetite, and insomnia. Low adaptation, as well as these symptoms, lead to greater psychological discomfort, reducing the patient's quality of life (27).

Patients undergoing hemodialysis for less than two years often face a decline in quality of life. In the early stages of therapy, patients experience various physical symptoms such as fatigue, muscle cramps, loss of appetite, and more intense sleep disturbances as the body has not fully adapted to the treatment process. In addition, psychological burdens such as anxiety, depression, and feelings of helplessness also increase due to the drastic changes in their lives, including dependence on the dialysis machine and loss of freedom to carry out usual activities (28).

A hemodialysis stay of less than 2 years can worsen patients' quality of life because during the initial period, patients often experience fatigue, muscle cramps, insomnia, and other sleep disorders, which affect their physical and emotional conditions. Insomnia is a common problem experienced by hemodialysis patients, with a high prevalence ranging from 40% to 85%. This condition leads to chronic fatigue, decreased concentration, anxiety, and depression, thus significantly impacting quality of life. In addition, patients who have just started hemodialysis tend to experience greater psychological distress as they are still adjusting to major lifestyle changes, such as dependence on a dialysis machine and restrictions on daily activities. This can also disrupt their social relationships and lead to emotional instability and decreased self-esteem. On the other hand, the slow adjustment to the

treatment routine, coupled with physical limitations and symptoms, further deteriorates the quality of life of patients in the early stages of therapy (29).

According to the researchers, undergoing hemodialysis for less than two years can worsen the patient's quality of life because the body has not fully adapted, triggering physical side effects such as fatigue and hypotension. Hemodialysis also causes fluid and electrolyte balance disturbances, potentially leading to complications such as infections. Psychologically, patients often experience stress, depression and anxiety due to machine dependency and a strict dialysis schedule, which limits social activities. Sleep disturbances and changes in self-image also exacerbate the condition, so medical and emotional support is essential.

Effect of Length of Hemodialysis on Chronic Renal Failure Quality of Life

Based on the results of the study, there is an influence of the length of time undergoing GKG on the quality of life of patients with GKG undergoing HD. This study also showed that most patients had experienced more than 5 years of CKD. In patients with chronic renal failure (CKD) for more than five years, the clinical parameters showed that the average serum creatinine and blood urea levels tended to increase as the disease stage increased. This increase in creatinine and urea levels reflects the decreased ability of the kidneys to filter waste and toxins from the blood, which is a major sign of kidney disease progression. In addition, hemoglobin levels usually decrease, as damaged kidneys no longer produce enough erythropoietin, a hormone that stimulates red blood cell production. The anemia that results from this decrease in hemoglobin can worsen the overall health condition, increase fatigue, and decrease the physical endurance of the patient (30)

Patients who have Chronic Renal Failure (CKD) for more than five years tend to experience a significant decline in quality of life. This is due to prolonged physical,

psychological and social complications, such as fatigue, depression and dependence on medical care. In addition, continued deterioration in health may result in limitations in daily activities, contributing to poor quality of life (31).

Patients suffering from chronic kidney failure (CKD) for more than 5 years are likely to experience a significant decline in quality of life. This long-lasting disease causes a prolonged decline in physical function, mental health, and increases emotional burden. Over time, patients often face more complications and limitations in daily activities, as well as decreased ability to work and participate in social activities. Long-standing GJK is also associated with increased dependence on medical care and support from family, which can exacerbate psychological stress and reduce overall quality of life. (32).

More than 5 years of chronic kidney failure (CKD) can significantly worsen patients' quality of life. Patients who have had CKD for a long time often face a decline in various aspects of quality of life, including physical, psychological, social, and environmental. Over time, the disease can lead to more complications, increased symptom severity, and limitations in daily activities, all of which negatively impact overall well-being. Furthermore, patients who have had GJK for a long time tend to face more barriers in getting effective treatment, which worsens their condition and decreases their overall quality of life (33).

According to the researchers' assumptions, patients with GJK who have been suffering for more than 5 years tend to experience a significant decline in their quality of life. Physically, they face complications such as weakness, fatigue and impaired mobility. Psychologically, the length of time suffering from GJK increases the risk of stress, anxiety and depression. In addition, activity limitations, absence from work, and high treatment costs can worsen social and economic well-being, so their overall

quality of life declines more dramatically compared to newly diagnosed patients.

The most dominant factor on Chronic Renal Failure Quality of Life

Based on the results of the study, it was found that the most dominant variable on the quality of life of chronic renal failure patients is education.

Wahl, Astrid, Rusteun, Hanested (2004) found that quality of life will increase along with the higher level of education obtained by individuals. Education is needed to obtain information, such as things that support health and improve quality of life. Hemodialysis patients with higher education will certainly understand better what to do as patients with chronic kidney failure so that they can maintain a good quality of life. the results of the study showed a high significance comparison of highly educated patients increasing in functional limitations related to emotional problems over time compared to patients with low education and found a better quality of life for highly educated patients in the physical and functional domains, especially in physical function, social function role function related to emotional problems (34).

CONCLUSION

There is a simultaneous influence of age, gender, education, occupation, duration of chronic renal failure and duration of hemodialysis significantly on the quality of life of chronic renal failure patients undergoing hemodialysis. Education is the most dominant variable affecting quality of life with an OR value = 39.316, meaning that respondents with higher education will have a chance of having a good quality of life of 39.316 times higher than patients with low education.

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