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by Dr, Merry

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BIOPSYCHOSOCIAL FACTORS AFFECTING THE QUALITY OF LIFE OF HEMODIALYSIS PATIENTS

ABSTRACT

Background: Hemodialysis is performed to support the life of Chronic Kidney Disease patients, but sometimes it has a negative impact on the patient's quality of life. In daily medical practice clinical factors get attention while the psychological and social aspects of patients are often ignored, so the authors want to analyze the biopsychosocial factors that affect the quality of life hemodialysis patients at Roemani hospital Semarang.

Methods: This research is descriptive-analytic research with cross-sectional approach. Samples were hemodialysis patients at Roemani Hospital, Semarang with a total sampling of 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.

Result: 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.

Conclusions: This research resulted that there were 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.

Keywords: quality of life, Chronic Kidney Disease, hemodialysis, biopsychosocial factors

FAKTOR BIOPSIKOSOSIAL YANG MEMPENGARUHI KUALITAS HIDUP PASIEN HEMODIALISIS

ABSTRAK

Latar belakang: Hemodialisis dilakukan untuk mendukung kehidupan pasien penyakit ginjal kronik, namun kadang berdampak negatif terhadap kualitas hidup pasien. Pada praktik medis sehari-hari faktor klnis yang mendapatkan perhatian sedangkan aspek psikologis dan social dari pasien sering kali diabaikan, maka penulis ingin menganalisis pengaruh faktor biopsikososial terhadap kualitas hidup pasien hemodialisis di RS Roemani Semarang.

Metodologi: Penelitian ini merupakan penelitian deskriptif analitik dengan pendekatan *cross sectional*, teknik *sampling* menggunakan *total sampling*. Sampel adalah pasien hemodialisis di RS Roemani Semarang dengan jumlah 80 orang. Data primer berasal dari kuisioner dan hasil pemeriksaan penunjang laboratorium. Data penelitian ini dianalisis dengan uji *chi square* dan uji korelasi Spearman.

Hasil : Hasil uji statistik didapatkan hasil untuk varaibel jenis kelamin nilai p=0,358, pendidikan nilai p=0,462, pekerjaan nilai p=0,239, penyakit komorbid nilai p=0,347, lama menjalani hemodialysis nilai p= 0,024, fungsi psikologis nilai p=0,280, dukungan keluarga nilai p=0,526, umur nilai r = 0.001 dan p = – 0.992, kadar hemoglobin nilai r = 0.129 dan p = 0.254, kadar ureum nilai r = -0.089 dan p = 0.432, kadar kreatinin nilai r = 0.022 dan p = 0.844.

Kesimpulan : Hasil penelitian didapatkan tidak ada hubungan antara umur, jenis kelamin, tingkat pendidikan, pekerjaan, penyakit komorbid, fungsi psikologis, dukungan keluarga, kadar haemoglobin, ureum dan kreatinin serta didapatkan adanya hubungan yang signifikan antara lama menjalani hemodialisis dengan kualitas hidup pasien Hemodialisis di RS Roemani Semarang.

Keywords: kualitas hidup, penyakit ginjal kronik, hemodialisis, faktor biopsikososial

INTRODUCTION

CKD (Chronic kidney disease) has become a global health challenge.[1] Increasing morbidity and mortality is a major constraint on the provision of health services.[2] CKD is a economic problem on healthcare systems throughout the world, especially in developing countries. Currently, the prevalence of CKD has increased significantly. Estimates of the number of patients range 11% - 13% globally. [3] In Indonesia, the prevalence and incidence of CKD in the last five years have increased rapidly especially in the Central Java region.[4]

CKD is a gradual disorder of kidney function that causes irreversible kidney damage. The main comorbid disease that causes of 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. [5]

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 also experience decreased sex lives, spiritual distress, and existential conflicts, which in turn exacerbate physical and emotional symptoms. These conditions can result in impaired physical, mental, and emotional well-being and worsen the QoL.[5]

Long-term hemodialysis patients are also faced with various problems such as finances, and difficulties in maintaining a job, depression and fear of death. This will changing QoL of CKD patients.[6] In daily medical practice, the psychological aspects and emotional of patients are often ignored.[3] 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 alquity of QoL is also an important goal in the treatment of end-stage chronic kidney failure. [6] From that background, the authors are interested in researching the biopsychosocial factors that affect the quality of life of hemodialysis patients at Roemani Hospital, Semarang.

METHODS

This study is an analytic descriptive study with a cross-sectional approach, was conducted in December 2022 at Roemani Hospital Semarang. 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: are hemodialysis patients at Roemani Hospital in Semarang, 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, namely identity, age, gender, education level, employment, length of time hemodialysis, and comorbid diseases. The instrument used to measure the QoL is the Short Form 36 (SF-36) questionnaire. The questionnaire to measure family support uses perceived social support from family (PSS-Fa), while to measure psychological function, the Psychological well-being scale questionnaire is used. Data on hemoglobin, urea, and creatinine levels were obtained by direct measurement.

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 the issuance of 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.

RESULT

Table 1. Frequency distribution of hemodialysis patients at Roemani Hospital Semarang

Variable	Frequency	Percentage (%)
Age		
< 40 years	10	12,5
40-55 years	41	51,2
≥ 55 years	29	36,3
Gender		
Male	50	62,5
Female	30	37,5
Employment		
Yes	40	50
No	40	50
Educational level		
	3	3,8
Elementary school	9	11,3
Junior High School	12	15
Senior High School	35	43,8
D3	3	3,8
S1	16	20
S2	2	2,5
Length of time hemodialysis		
< 24 months	35	43,7
≥ 24 months	45	56,3
Comorbid diseases		
Yes	61	76,25
No	19	23,75
Family Support		
Low	0	0
Moderate	15	18,8
Good	65	81,3
Psychological Well Being		
Low	0	0
Moderate	18	22,5
High	62	77,5
Quality of Life		
Poor	0	0
Moderate	45	56,25
Good	33	41,25
Very good	2	2,5
Excellent	0	0
Total	80	100

The research resulted that most of the respondents are aged 40-55 years old, namely 41 respondents (51.2%). Most of them are male, namely 50 respondents (62.5%). Most of the respondents who had educational level status of senior high school were 35 respondents (43.8%). Respondents who worked and did not work were 40 respondents (50.0%) respectively. Most of the respondents underwent hemodialysis > 24 months, 45 respondents (56.3%). Most of the respondents had a comorbid diseases, namely 61 respondents (76.25%). There were 65 respondents (81.3%) of respondents who received good family support. Most

of the respondents had high psychological well-being namely as many as 62 respondents (77.5%), and most of the respondents had a moderate QoL, namely as many as 45 respondents (56.25%).

Table 2. Frequency Distribution of Comorbid Diseases in hemodialysis patients at Roemani Hospital Semarang

Comorbid Diseases	Frequency	Percentage (%)
Hypertension		
Yes	54	67,5
No	26	32,5
Diabates Mellitus		
Yes	18	22,5
No	62	77,5
Nephrolithiasis		
Yes	2	2,5
No	78	97,5
Total	**80**	**100**

The research resulted that the majority of respondents had a comorbid disease hypertension, namely 54 respondents (67.5%).

Table 3. Haemoglobin, Ureum, and Creatinine level in patients undergoing hemodialysis at Roemani Hospital Semarang

Variable	Minimum-Maximum	Mean	Standard Deviation
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

The research resulted that the hemoglobin level of the respondents 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 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		Very Good				
	n	%	n	%	n	%	N	%	
Gender									0.358
Male	29	58	19	38	2	4	50	100	
Female	15	50	15	50	0	0	30	100	
Employment									0.239
Yes	22	57,9	14	36,8	2	5,3	38	100	
No	22	52.4	20	47,6	0	0	42	100	
Educational Level									0.462
No	1	33,3	2	66,7	0	0	3	100	
Elementary School	7	77.8	2	22,2	0	0	9	100	
High School (Junior and senior high school)	27	57,4	18	38,3	2	4,3	47	100	
Bachelor degree (D3, S1,S2)	9	42,8	12	57,2	0	0	21	100	

Length of time hemodialysis									0,024
< 24 months	25	71,4	10	28,6	0	0	35	100	
≥ 24 months	19	42.2	24	53,3	2	4,5	45	100	
Family support									0.526
Moderate	10	66,7	5	33,3	0	0	15	100	
Good	34	52.3	29	44,6	2	3,1	65	100	
Psychological Well Being									0.280
Moderate	8	53,3	6	40	1	6,7	15	100	
Good	38	58.5	26	40	1	1,5	65	100	
Comorbid disease									0.347
Yes	36	59	24	39,3	1	1,7	61	100	
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 as many as 2 (4%) male respondents who had a very good QoL, while there were no female respondents who had a very good 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.

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 a very good QoL, while no respondents who did not work had a very good 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 as many as 27 (57.4%) respondents who had a high school education level had a moderate QoL, and 18 (38.3%) had a good QoL. and 2 (4.3%) have a very good 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 time hemodialysis and the QoL, it was found that there were as many as 2 (4.5%) respondents who underwent hemodialysis ≥ 24 months and had a very good QoL, while there were no respondents who underwent hemodialysis <24 months had very good 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 time hemodialysis 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 there were as many as 2 (3.1%) respondents who had good family support, and had a very good QoL, while there were no respondents who had moderate family support, had a very good 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 well-being and QoL, it was found that there were 38 (58.5%) respondents who had good psychological well-being, had a moderate QoL, and 26 (40%) respondents had a good QoL and 1 (1.5%) have a very good 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 as many as 36 (59%) respondents who had comorbid diseases had a moderate QoL, 24 (39.3%) respondents who had comorbid diseases had good QoL and 1 (1.7%) of respondents have a very good QoL. The statistical test results obtained p value = 0.347 (p> 0.05) so it can be concluded that there is no relationship between comorbid diseases and the quality of life of hemodialysis patients at Roemani Hospital, Semarang.

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

Statistical test resulted that there was 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).

DISCUSSION

This research resulted that no relationship between age and QoL. This result in line with Candra's research resulted that there is no relationship between age and QoL. The QoL of respondents <60 years is better than respondents who are aged ≥ 60 years. Nevertheless, QoL according to age theory is one of the factors that determines a person's physical quality. Someone who has a younger age tends to have a better QoL prediction. Age is in line with health and physical function and social function but does not have an impact on mental function using a questionnaire KDQOL-SF 36. [7]

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, this 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.[8]

The results of this study indicate that there is no relationship between work and QoL. This is in line with research written by Yuanita that there is no relationship between work and QoL. In this study, respondents who were still working generally worked as traders, teachers, and odd jobs. Respondents who were still working generally had good conditions when doing hemodialysis, not often, even respondents who were still working went alone when doing hemodialysis, but patients who were not working when undergoing hemodialysis, generally used to have a job, but the respondents when they first did hemodialysis felt worried about their health condition, this resulted in the respondents finding it difficult to maintain their job at that time.[8]

The results of this study showed that there is no relationship between educational levels with the QoL. This is in line with previous research which states that education level does not significantly affect the the QoL. QoL is generally subjective, so it cannot be determined by the level 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. At the time of conducting the research, the respondents generally just resigned themselves to the day after day they were going through without thinking about how to improve their quality of life. [9] By previous studies stated that patients with lower levels of education have a tendency to behave and have unhealthy lifestyles compared to clients with higher education because the educational level affects a person's level of awareness of health. [10]

The most comorbid disease in hemodialysis patients is hypertension. The most common comorbidities after hypertension are Diabetes Mellitus and cardiovascular disease. 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, the presence of comorbid diseases can affect aspects of a person's life, one of which is QoL. However, the results of this study are in line with previous studies where there was no relationship between the presence of comorbid diseases and the QoL of hemodialysis patients. This can be caused by patients who previously had chronic diseases as comorbidities and taking drugs for a long time can cause kidney damage to get worse. [11]

This study result indicated that there is a relationship between the length of time hemodialysis and QoL. This is in line 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 can accept dependence on hemodialysis machines can have an adequate or even very good QoL. Respondent's quality of life who have recently undergone hemodialysis may decrease, this is because respondents are not ready to accept and adapt to various changes that occur both in their bodies and in their lives. This problem will interfere with various aspects, namely social, psychological, and physical aspects. Because actually, the quality of life is an individual's perception of his condition in life. [12]

Each patient undergoing hemodialysis requires a different time to adapt. In this study, the results showed that patients who had a good QoL were more likely to be respondents who had undergone hemodialysis for ≥ 24 months. Even in respondents who had undergone hemodialysis ≥ 24 months, some respondents had a very good QoL, namely 2 people. Respondents who underwent hemodialysis ≥ 24 months had reached an advanced level of adaptation, at this stage, the respondents were getting used to the limitations of doing something and the various complications that resulted.[13]

Family members are an inseparable part of the family environment. The family is considered a place where family members need help and assistance when needed. 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. So that with this it will make patients feel happy and not easily discouraged. [14]

This reasearch resulted, the most of the family support received by CKD patients in the hemodialysis unit at Roemani Hospital, Semarang, had good support. This is because the family provides full support to hemodialysis patients. Family support is the best preventive intervention strategy in helping family members.[15] Support can be provided by the closest people, such as spouses or family members, close friends, and someone who has a harmonious relationship with the individual.[16]

Family support is very important 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.[17]

It was found that most of the respondents had high psychological well-being, this was because the research respondents had good family support. Family support is an important factor that can affect psychological well-being in CKD hemodialysis patients.[10] 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.[8] 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. [9]

Anemia occurs in 80-90% of patients with CKD. The main factor that often causes anemia in hemodialysis patients is erythropoietin deficiency. Large blood loss factors, such as repeated phlebotomies for laboratory tests and blood retention on the dialyzer are also causes of anemia in CKD patients. 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, can cause fatigue, reduced cognitive abilities, and impaired immunity.[18]

This research resulted there was no relationship between hemoglobin levels and the QoL of hemodialysis patients at Roemani Hospital, Semarang. This result could have occurred because the amount of data was not comparable where there were only 2 respondents who had normal hemoglobin levels while most of the other respondents had below-normal hemoglobin levels. This is in line with Nurchyati's research in a study conducted on 95 respondents to assess the relationship between hemoglobin levels and QoL and it was found that hemoglobin levels were not related to the QoL.[19] 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.[20]

High levels of urea 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. Increased levels of urea 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 greatly reduced.[21] This research resulted that there was 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 not comparable where there is only 1 respondent who has normal urea levels while most of the other respondents have urea levels that are high above the normal value.

Creatinine levels are the end product of muscle protein metabolism. Excess creatinine does not cause systemic effects in multisystem. The creatinine level can be used as an indicator of glomerular filtration rate which is then used as an indicator of kidney function. The results of previous studies stated that creatinine levels were not a determinant that affected the QoL of hemodialysis patients.[22] 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 not comparable where all respondents have high creatinine levels above normal values. This result in line with previous study which identified a relationship between clinical factors and the QoL score of hemodialysis patients using the KDQoL-SF36 instrument.[23]

CONCLUSION

The results showed that there was no relationship between age, gender, education, employment, comorbid diseases, psychological well-being, family support, hemoglobin, urea, and creatinine levels and there was a significant relationship between the length of time hemodialysis and the quality of life of hemodialysis patients at the Roemani hospital Semarang.

CONFLICT OF INTEREST

The authors have no conflict of interest.

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