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Original Article

The Relationship Between Nutritional Status and The Quality of Life of Chronic Kidney Disease Patients Undergoing Hemodialysis

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ABSTRACT

Patients undergoing hemodialysis for a period of more than 3 years tend to experience malnutrition due to inadequate food intake, diseases of the digestive tract, eating restrictions, drugs that cause impaired nutrient absorption, inadequate dialysis, and comorbidities. This study aimed to determine the relationship between nutritional status and the quality of life of chronic kidney disease patients undergoing hemodialysis in Palu. This study used a cross-sectional design to determine the correlation or relationship between 2 variables. Data were analyzed using the Pearson correlation test. The sampling formula determined the number of samples to test the hypothesis on the average of two populations with 108 respondents. This study was carried out in 2 hemodialysis units in Palu. The samples involved in this study were selected by simple random sampling. The results of this study show that most respondents are in the age range of > 55 years, with 41 people (48.1%); are female, with 56 people (51.9%); have a high school education, with 46 people (42.6%); are working, with 81 people (75%) while the remainings are retirees and housewives; and have hypertension as their comorbid disease, with 56 people (51.9%). There is a relationship between nutritional status and overall quality of life, based on the SGA p-value of 0.016 (p-value < 0.05) and based on the MIS p-value of 0.004 (p-value < 0.05), with the strength of the relationship being weak. The conclusion is there is a relationship between nutritional status and the quality of life of CKD patients undergoing hemodialysis. It is hoped that nurses can pay more attention to the nutritional status of CKD patients undergoing hemodialysis.

Keywords: *Nutritional Status, Quality of Life, CKD Patients, Hemodialysis*

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INTRODUCTION

Hemodialysis (HD) is the main therapy performed on patients with chronic kidney disease (CKD) to replace damaged kidney function. Stage 5 CKD patients undergoing hemodialysis are at risk of experiencing abnormalities in nutritional and metabolic status, including protein-energy wasting (PEW), obesity, nutritional deficiencies, electrolyte disorders, and accumulation of metabolic waste[1]. The National Kidney Foundation Disease Outcomes Quality Initiative (KDOQI) has issued a guideline for assessing and managing nutrition for CKD patients, especially those undergoing

hemodialysis therapy [2] and this guideline was updated in 2021.

Patients undergoing hemodialysis for a period of more than 3 years tend to experience malnutrition due to inadequate food intake, diseases of the digestive tract, eating restrictions, drugs that cause impaired nutrient absorption, inadequate dialysis, and comorbidities [3]. [4]state that the longer the HD time affects the patient's body composition—and decreases their nutritional status and food profile. The nutritional status of hemodialysis patients is measured using Subjective global assessment (SGA) and Dialysis Malnutrition score (DMS) [2].

The quality of life of hemodialysis patients tends to decrease at each stage of CKD as they experience pain and a decline in bone function, fitness, and social function[5]. The quality of life of hemodialysis patients is important to measure because it provides an overview of how CKD affects the patient's long-term life [6,7] . The questionnaire on HD patient quality of life measures physical function, mental status, and social interaction abilities [8]. Management of hemodialysis patients requires multidisciplinary involvement to provide holistic care, reduce mortality, and reduce costs. In Canada, Taiwan, the United States, and the United Kingdom—this multidiscipliner management of hemodialysis patients is commonly done but, in developing and low-income countries, this is rarely done, especially in Indonesia [9]. Health workers carry out their respective duties. Based on the background, this study aimed to determine the relationship between nutritional status and the quality of life of chronic kidney disease patients undergoing hemodialysis.

METHOD

This study used a cross-sectional design to assess the correlation or relationship between nutritional status and the quality of life of chronic kidney disease patients undergoing hemodialysis (hemodialysis patients). The populations in this study were chronic kidney disease patients undergoing hemodialysis in 2 hemodialysis units in Palu, namely RSUD Undata (Undata Regional Hospital) and RSUD Anutapura (Anutapura Regional Hospital). Respondents who participated in this study were 108 people. This study was carried out from June 24, 2023 to August 1, 2023. Data were collected by enumerators by asking respondents directly. The independent variable in this study was nutritional status of CKD patients undergoing hemodialysis measured using the SGA and MIS methods and the dependent variable was the quality of life of CKD patients undergoing hemodialysis.

Data were collected by filling in the questionnaire directly. In addition, data on respondents' characteristics were collected in the form of age, gender, occupation, education level, comorbid diseases, duration of undergoing hemodialysis, nutritional status measured using the SGA and MIS methods.

Data were analyzed univariately to collect demographic data and bivariately using the Pearson correlation test to determine the relationship between nutritional status and the quality of life of chronic kidney disease patients undergoing hemodialysis. This study has passed the ethical test from the Ethics Committee of Poltekkes Kemenkes Palu with number 0058/KEPK-KPK/III/2023.

RESULTS

The results of this study are described with demographic data. The results of this study show that the youngest age range of the respondents is 27 years old and the oldest age range of the respondents is 73 years old. However, most respondents are in the age range of >47 years old, with 80 people (62%). Next, the results of this study show that there are slightly more female respondents than male respondents, with 56 people (51.9%). Most respondents have a high school education, with 46 people (42.6%). Also, there are more working respondents than non-working respondents, with 81 people (75%). All respondents undergo hemodialysis 2 times a week, which means they undergo hemodialysis 10 hours per week. Yet, most respondents experience inadequate HD adequacy, with 66 people (61.1%).

Table 1. Demographic data of CKD patients undergoing hemodialysis

Characteristics	N	Percentage (%)	± SD	Quality of life	
				Good	Not enough
Age (years)					
26-35 years old	9	8.3	0.50	25 (44.6)	31 (55.4)
26-45 years old	19	17.6	0.50	29 (55.8)	23 (44.2)
46-55 years old	39	36.1	0.50		
≥55 years old	41	48.1	0.50		
p-value	0.06				0.336
Gender					
Female	56	51.9	0.50		
Male	52	48.1	0.50		
Level of education					
Elementary School	12	11.1	1.4		
Junior High School	9	8.3	1.4		
Senior High School	46	42.6	1.4		
D3	4	3.7	1.4		
S1	32	29.6	1.4		
S2	5	4.6	1.4		
Work					
Work	81	75	0.43		
Doesn't work	27	25	0.43		
Comorbid Diseases					
DM	41	38	0.64		
Hypertension	56	51.9	0.64		
Other	11	10.2	0.64		
Duration of Hemodialysis					
New < 191 times	54	50	0.50	26(48.1)	28(51.9)
Old >191 times	54	50	0.50	28(51.9)	26(48.1)
p-value				0.700	
SGA value					
Good nutrition	51	47.2	0.50		
Malnutrition	57	52.8	0.50		
p-value	0.074				
MIS value					
Not Malnourished	57	52.8	0.50		
Malnutrition	51	47.2	0.50		
p-value	0.200				
Hemodialysis Adequacy (Kt/V)					
Adequate	42	38.9	0.490		
Inadequate	66	61.1			
p-value	0.01				
Quality of Life KDQOL-SF36					
Health problems	71.53		17.43		
Effects of kidney disease	67.20		20.43		
Burden of kidney disease	32.64		26.37		
Physical health	35.96		7.72		
Mental health	45.47		9.86		
p-value	0.183				

Table 2. The Relationship between Nutritional Status and the Quality of Life of CKD patients undergoing hemodialysis

KDQOL-SF36 domains Based on SGA Measurements	p-value	R	The strength of the relationship
S-12 Physical	0.019	0.225	Weak relationship
S-12 Mental	0.11	0.154	Weak relationship
Overall quality of life	0.016	0.231	Weak relationship
Based on MIS measurements			
S-12 Physical	0.0005	0.409	Adequate relationship
S-12 Mental	0.067	0.177	Weak relationship
Overall quality of life	0.004	0.276	Weak relationship

Source: Primary data, 2023

Table 2 describes the relationship between nutritional status and the quality of life of CKD patients undergoing hemodialysis. Nutritional status is associated with 3 quality of life variables, namely physical health, mental health, and overall quality of life. From the three results of the correlation test using SGA, MIS, and hemodialysis adequacy with quality of life, it was found that there is a relationship between nutritional status and physical health and overall quality of life. However, there is no relationship between nutritional status and mental health. Likewise, there is no relationship between HD adequacy and mental health.

DISCUSSION

The results of this study show that the youngest age range of the respondents is 27 years old and the oldest age range of the respondents is 73 years old. However, most respondents are in the age range of >47 years old, with 80 people (62%). Next, the results of this study show that there are slightly more female respondents than male respondents, with 56 people (51.9%). Most respondents have a high school education, with 46 people (42.6%). Also, there are more working respondents than non-working respondents, with 81 people (75%). All respondents undergo hemodialysis 2 times a week, which means they undergo hemodialysis 10 hours per week. Yet, most respondents experience inadequate HD adequacy, with 66 people (61.1%). This demographic data is different from 2 previous studies (10,11) where they found that most respondents were male respondents who were working. In the 2 previous studies, it was also found that most respondents had comorbid diseases, namely DM and hypertension, with more respondents having diabetes mellitus as comorbid disease, with 41 people (38%) compared to hypertension, with 56 people (51.9%) while the remainings had other diseases. The results on comorbid diseases in this study and the 2 previous studies (10,11) are also different, as this study show that the most common comorbidity is hypertension, whereas the 2 previous studies found that the most common comorbidity was diabetes mellitus. All of the demographic factors mentioned have a positive effect or influence on CKD patients undergoing hemodialysis to maintain a good quality of life (12,13).

Research on nutritional status using SGA and MIS provides two different results. Assessment using the SGA method show that most respondents experience malnutrition, with 57 people (52.8%), however, assessment using the MIS method show that most respondents have good nutritional status, or in other words, 57 people (52.8%) do not experience malnutrition.

The difference between these two questionnaires is that they both measure the nutritional status of hemodialysis patients who often experience protein energy wasting (PEW) which is caused by loss of protein and body mass accompanied by a decrease in functional capacity (14). Assessment using the SGA method is a nutritional assessment recommended by the NKF KDOQI which uses physical examination and history as the basis. This assessment is easy to do (14,15). Apart from that, assessment using the MIS method have also been developed which are cheaper and easier to carry out. Because the MIS method

uses 7 SGA components plus 3 new components, namely BMI, serum albumin, and TIBC. These two assessments are equally good for assessing PEW in hemodialysis patients because they both describe the state of energy and protein deficiency in CKD patients (16), although to describe the actual situation, the MIS method is more able to prevent malnutrition because there is the addition of 3 new component values of BMI, serum albumin, and transferrin (17). To conclude, both methods can be used equally well (18,19).

Nutritional status is associated with 3 quality of life variables, namely physical health, mental health, and overall quality of life. From the three results of the correlation test using SGA, MIS, and hemodialysis adequacy with quality of life, it was found that there is a relationship between nutritional status and physical health and overall quality of life. However, there is no relationship between nutritional status and mental health. Likewise, there is no relationship between HD adequacy and mental health. This study is in line with a previous study (20) stating that there is no relationship between hemodialysis adequacy and quality of life. So, it can be concluded that there is no significant relationship between inadequate HD adequacy and poor quality of life, especially in mental status, but for physical health and overall quality of life, there is a relationship. From a deeper examination of the assessment items, it can be seen that respondents have the lowest scores on burden due to kidney disease and physical health. Meanwhile, mental health is still better. This is in line with a previous study (10) stating that physical health scores were lower than mental health indicating the patient's adaptability to their physical health. As physical health declines, the quality of life will also decline.

This is in contrast to mental health status. The longer a patient undergoes hemodialysis, their mental health will improve. This may be because the patient can manage themselves well and adapt to their illness, so their mental health improves (21). Patients will adapt to their illness, get sufficient support from their environment, especially support from the family and fellow patients. The longer a patient undergoes hemodialysis, it is the physical aspect of their quality of life that will decrease, not the mental aspect. Good mental health is thought to be related to a person's personality which is basically good (22). Furthermore (22) state that the negative emotions felt by CKD patients appear to be due to the effect or influence of high creatinine values which are a biomarker for negative emotions. A person with a positive personality may one day feel bored with long-term hemodialysis treatment, so support from a multidisciplinary team and intervention done to improve mental health is needed to keep the mental health of hemodialysis patients maintained or positive.

The quality of life of hemodialysis patients is influenced by the stage of CKD, age, gender, DM, and cardiovascular disease (23). Anemia and the use of blood pressure lowering drugs will cause a decrease in quality of life (13). Apart from that, the type of kidney replacement therapy also affects the quality of life where the best quality of life is felt by patients who have undergone kidney transplantation, stages 3-5 CKD patients who have not undergone hemodialysis, and finally patients who have undergone hemodialysis (23). Patients who have a good quality of life tend to be more compliant with treatment, and have better physical health (24). In turn, they will have better self-management and will be willing to accept intervention or education provided by health workers (25).

The overall quality of life of stages 3-5 CKD patients who have undergone hemodialysis will decrease or be less good, and mental health will be lower than physical health. This condition is influenced by low socioeconomic status due to the expensive cost of hemodialysis, reduced opportunities for patients to earn a living because part of their time is spent going to the hemodialysis unit for 10 hours per week, and the presence of comorbidities (26), physical limitations, sexual problems, and dietary and nutritional restrictions (27).

Actions that can be taken to overcome this include support from the government, psychologists, or psychiatrists to provide reinforcement so the patient's mental health is maintained. The absence of a relationship between mental health and the quality of life of CKD patients undergoing hemodialysis in developing countries may be due to the greater impact of the burden of disease on physical problems, so health workers often ignore mental problems and do not focus too much on the patient's mental health as they focus more on the patient's physical health (26). Apart from being often ignored by health workers, the

patient's family also tends to ignore the patient's mental health. CKD patients undergoing hemodialysis need strong support from their family (27,28), the family needs to play an active role in the treatment. All of the above supports the patient's independence to be able to carry out independent self-management (29).

Hemodialysis adequacy is a general condition felt by the patient when they feel well, feel comfortable, and feel no signs of uremia—this will prolong the patient's life. Pernefri Indonesia recommends the Kt/V(30) value or urea clearance ratio and hemodialysis time measured on the machine. For hemodialysis carried out 4-5 hours with a frequency of 2 times a week, the kt/V target achieved is >1.8.

CONCLUSION

There is a relationship between nutritional status measured using SGA and MIS on the total quality of life of CKD patients. The strength of the relationship is weak. It can be concluded that patients who have good nutritional status will have a good quality of life. Suggestions are given for health workers to be more intensive in providing education related to nutrition and taking regular measurements. This is because according to the majority of respondents and nurses working in hemodialysis units, health workers in this case nutrition officers, rarely measure patients' nutritional status and provide health education. According to nutrition officers, they only provide counseling on nutritional status once and rarely remeasure it because this disease is classified as a chronic disease where patients undergo repeated treatments, so they think there is no need to provide repeated counseling.

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CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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