

Original Article

Overview of Nutritional Status of Patients with Chronic Kidney Disease Who 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 quasy experiment design to determine the the 2-mean difference test.. The sample formula determined the number of samples to test the hypothesis on the average of two populations with 100 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 KDQOL SF-36 is used to measure quality of life, whereas the malnutrition inflammation score is employed in the questionnaire used to assess nutritional status. The results of this study show that most respondents are in the age range of > 55 years, with 60 people (60%); are female, with 48 people (48%). 48% have a poor quality of life, and 52% have a good quality of life. The p-value for MIS is 0.001, so it can be concluded that at 5% alpha, there is a significant difference between the malnutrition inflammation score before and after education, while there is no significant difference for quality of life and kt/v values. There is an influence of health education on patient nutrition, there is no influence of health education using the KADOic application on quality of life and kt/v.

Keywords : nutritional status; quality of life; CKD patients; hemodialysis.

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INTRODUCTION

Patients with chronic kidney disease (CKD) undergo renal replacement therapy in the form of hemodialysis to reduce symptoms and complaints felt due to the accumulation of toxic substances such as urea and creatinine. 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

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.^{2,3} The longer the Hemodialysis time affects the patient's body composition and decreases their nutritional status and food profile.⁴ The nutritional status of hemodialysis patients is measured using the malnutrition inflammation score for patients undergoing hemodialysis.⁵ The nutritional status values in patients undergoing hemodialysis are not much different between those with good and poor nutritional status based on measurements using *subjective global assesment* (SGA) dan *Malnutrition inflammation score* (MIS).³ tends to decrease at each stage of CKD as they experience pain and a decline in bone function, fitness, and social function.⁶ There is a relationship between 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.^{7,8} The questionnaire on Hemodialysis patient quality of life measures physical function, mental status, and social interaction abilities.⁹ Management of hemodialysis patients requires multidisciplinary involvement to provide holistic care, reduce mortality, and reduce costs. Way to improve self-management is through educational activities and patients actively manage themselves through the process of learning about their health, recognizing and managing the body's responses and having compliance with the treatment plan that has been prepared together with health workers and an Android application has been created.¹⁰ In developed countries this multidisciplinary management of hemodialysis patients is commonly done but, in developing and low-income countries, this is rarely done, especially in Indonesia.¹¹ Based on the background, this study aims to determine the relationship between nutritional status and the quality of life of chronic kidney disease patients undergoing hemodialysis after being given education through the KADOic application. diberi edukasi melalui aplikasi KADOic.

METHODS

This study used a quasi-experimental design to identify the effect of education using applications on quality of life and nutritional status. The populations in this study were chronic kidney disease patients undergoing hemodialysis in 2 hemodialysis units in Palu, namely RSUD Undata and RSUD Anutapura. Respondents who participated in this study were 100 people. This study was carried out from June 2024 to August 2024. 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 MIS methods and the dependent variable was the quality of life of CKD patients undergoing hemodialysis.

Before the two-mean difference test was conducted, all data had undergone a Normality test and a Homogeneity test. Data were analyzed using univariate and bivariate analysis using a 2-mean difference test to determine the effect of education using the KADOic application on the nutritional status and quality of life of CKD

patients undergoing hemodialysis. This study has 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. describes that most respondents are aged >50 years, female, quality of life is not much different between before and after education. For the value of quality of life before and after there is an increase especially in physical health items, the burden of kidney disease seems to be slightly different, while for health problems it tends to decrease, the effects of kidney disease, and mental health tend to decrease. Determination of nutritional status according to MIS is determined based on a score of 6. A score of <6 is called poor nutritional status, a score of >6 has good nutritional status, while a score of 6 is determined based on clinical conditions. Before the 2-mean difference test is carried out, the data normality test is first carried out. Because the data obtained was not normally distributed, a non-parametric test was carried out. Based on the skewness value, both data, both MIS pre and post and QOL pre and post, are obtained so that the difference test used is the 2-mean difference test using the Wilcoxon test.

Table 1. Demographic data of CKD patients undergoing hemodialysis

Characteristics	n	Percentage (%)	± SD
Age (years)			
<40 years	12	12	0.995
40-49 years	21	21	
50-59 years	36	36	
≥ 60 years	31	31	
Gender			
Female	60	60	0.499
Male	48	48	
Quality of life			
Poor	48	48	0.502
Good	52	52	
QOL SF36 Pre	Mean		
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

Characteristics	n	Percentage (%)	± SD
QOL SF36 Post			
Health problems	66.50		22.86
Effects of kidney disease	64.29		19.37
Burden of kidney disease	36.38		24.94
Physical health	37.23		8.02
Mental health	43.03		8.61
MIS pre			
Normal	11		11
Mild	44		44
Moderate	15		15
Severe	30		30
MIS post			
Normal	43		43
Mild	19		19
Moderate	21		21
Severe	17		17

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

Variables	N	Mean Rank	P value
MIS pre	100	17.85	0,001
MIS post	100	25.73	
QOL pre	100	48.20	0,198
QOLpost	100	48.73	
Kt/V pre	100	53.67	0.466
Kt/V post	100	47.20	

Table 2 Based on the table above, the p-value for MIS is 0.001, so it can be concluded that at 5% alpha, there is a significant difference between the malnutrition inflammation score before and after education, while there is no significant difference for quality of life and kt/v values.

DISCUSSION

From the results of the univariate analysis, it can be seen that most respondents were aged >50 years with an average age of 53.58 years, not much different from previous studies.^{12,13} Although it cannot be denied that currently many patients undergoing hemodialysis are younger, it is proven that the youngest respondent was 27 years old. Indonesia is a developing country where according to Awuah¹³ CKD patients often occur in developing countries and have a low quality of life due to socio-economic factors.

There have been 2 years of research related to the quality of life in CKD patients in the hemodialysis unit of Undata and Anutapura Regional Hospitals where the assessment of quality of life was measured using the QOL SF-36. These 2 studies showed that the quality of life was not much different.³ Quality of life assessment using QOL-SF36 is measured by 5 indicators, namely health problems, effects of kidney disease, burden of kidney disease, physical health and mental health.¹⁴ This assessment is based on changes that occur in patients due to chronic diseases they suffer from, Treatment, lesions, and disabilities. The quality of life of patients undergoing hemodialysis is also a way of assessment carried out by health workers to assess the effectiveness of the quality of services provided in the hemodialysis unit.¹⁵ Pre and post assessments that spanned approximately one year showed that the assessment of quality of life was not much different, as well as the kt/v value to determine Hemodialysis adequacy. The most influential thing on the patient's quality of life is due to physical and psychological problems.¹⁶ Hemodialysis patients have difficulty performing daily activities such as running, lifting heavy weights and doing heavy exercise. Hemodialysis patients tend to experience fatigue which limits their activities.

Respondents in this study were CKD patients who had undergone hemodialysis in the hemodialysis unit for 10 hours per week, where patients visited the hemodialysis unit to undergo hemodialysis therapy twice a week. As is known, hemodialysis is a procedure to maintain stable kidney function by removing excess fluid and removing metabolic waste.¹⁷ Patients undergoing renal replacement therapy in the form of hemodialysis experience complex problems that affect many aspects of their lives, including physical, psychological and social problems. One of the parameters used to measure the well-being of CKD patients undergoing hemodialysis is quality of life Kasonde¹⁸ as measured using the SF-36 instrument. Socio-economic, psychological, biological and health care are some of the factors that affect quality of life. Patients undergoing hemodialysis have poor quality of life, become a burden on health care worldwide for health care systems worldwide and have a negative impact on their health and have poor coping with themselves.^{19,20} In accordance with what happened in this study, the quality of life

of Hemodialysis patients was only at the middle average value and the value was not much different between those with good and poor quality of life.

There are many complaints felt by patients when undergoing hemodialysis, including feelings of shortness of breath, fatigue, drained energy, decreased appetite, physical changes such as itching, nausea and vomiting, as well as other complaints that are felt continuously Nunes²¹ so that patients tend to limit their activities. These complaints will decrease if hemodialysis is performed.^{19,22} Patients will feel comfortable for a while after hemodialysis and will improve again before the next Hemodialysis schedule.^{23,24} Not to mention the complications that can occur at any time during Hemodialysis procedures, such as sudden increases in blood pressure, Evans and Yarnof^{25,26} state seizures during hemodialysis all of this is felt to be related to the glomerular filtration rate value.²⁷

Some factors that affect quality of life include employment status. Patients who do not work have a lower quality of life than patients who do work.¹⁸ Likewise, with increasing age, the quality of life decreases. In accordance with this study, where most respondents are >50 years old, their quality of life also decreases. Some tools that can be used for patient nutritional status include using SF-36. In addition, quality of life is also greatly influenced by the patient's nutritional status.²⁸ CKD is one of the factors causing morbidity and mortality. Malnutrition is associated with worsening of the disease, nutritional management of dialysis patients is a therapeutic strategy. Nutritional assessment is a basic and important process in the nutritional management of these patients. To assess the nutritional status of dialysis patients by various means, including anthropometric measurements, biochemical parameters, performance evaluation, and comprehensive evaluation of diet or other methods such as Subjective global assessment,²⁸ Several instruments used to assess nutritional status are available. This study used the malnutrition inflammatory scale (MIS). MIS has 4 sections including nutritional history, physical health status, especially in patients who have comorbidities such as chronic diseases such as DM, Hypertension.^{1,29,30} Hemodialysis patients often experience protein energy deficiency.³¹ The indicators assessed in hemodialysis

patients as biomarkers to determine good quality of life and nutritional status are Hb values because an increase in Hb is related to an increase in energy, stamina and the ability to carry out activities,³¹ protein energy malnutrition, comorbidity. MIS is closely related to nutritional indicators.³² Nutritional status assessment using MIS and quality of life instruments that can help health professionals make informed decisions about disease management.³³

Good nutritional intake can reduce the risk of malnutrition-inflammation complex syndrome (MICS), where MICS is associated with cardiovascular disorders, prolongs the length of stay, and increases the risk of mortality in end-stage CKD patients. Protein is an important nutritional component in patients with routine hemodialysis. Hemodialysis patients are advised to follow the recommended protein intake of 1.2 grams per kilogram of body weight per day to achieve better nutritional status.

All of this is a never-ending circle in hemodialysis patients. Malnutrition, poor quality of life, physical and psychological stress so that support from family members and people around the patient is very much needed while they are undergoing therapy.^{34,35} 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 Black³⁶ states 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 an educational effect using the KADOic application on patient nutritional status but not on quality of life and hemodialysis adequacy. 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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