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Age, Gender with Nutritional Status of Renal Failure Patients Undergoing Hemodialysis

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Abstract

Background: Chronic kidney failure is a condition in which structural and functional damage to the kidneys occurs that lasts for 3 months or more. This disease is persistent and cannot be cured, so it requires long-term treatment, such as kidney transplantation, peritoneal dialysis, hemodialysis, and ongoing outpatient therapy. A problem that is often experienced by hemodialysis patients is the nutritional condition of patients with chronic kidney failure, which is influenced by age and gender factors.

Purpose: To analyze the relationship between age and sex with nutritional status in chronic kidney failure patients undergoing hemodialysis.

Methods: Quantitative method with an analytical observational design and a cross-sectional approach. The study sample consisted of 69 patients with chronic kidney failure. Data analysis was carried out using the Spearman's rho statistical test.

Results: Based on the characteristics of male gender respondents as many as 39 respondents (56.5%), with intermediate adult age 41-60 years as many as 38 respondents (55.1%).

Conclusion: The results of the study showed that the table of sig values (p -value) = 0.592 and 0.099 or >0.05 showed that there was no significant relationship between age and sex and nutritional status of kidney failure patients undergoing hemodialysis

Keywords: Age; Chronic Kidney Failure Patients; Gender; Nutritional Status

INTRODUCTION

Chronic kidney failure is a condition in which there is both structural and functional damage to the kidneys that lasts for 3 months or more. If there is a sudden or acute impairment of kidney function and does not last more than three months, then this condition is classified as acute kidney disorder (Lubis, Tarigan, Nasution, Ramadani, & Vegas, 2022). Based on data from the World Health Organization (WHO), the prevalence of

chronic kidney failure worldwide reaches 10% of the population, with the number of patients receiving hemodialysis (HD) estimated to reach 1.5 million people globally. Cases of chronic kidney failure are expected to increase by about 8% each year. Meanwhile, chronic kidney disease is the 20th leading cause of death in the world (Yogyantini & Wahyunani, 2023).

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Based on a report from the Indonesia Renal Registry in 2017, there are 30,831 people with kidney failure in the entire Indonesian population. The prevalence of chronic kidney failure in Indonesia according to the results of Basic Health Research reached 2% in 2013 and increased to 3.8% in 2018 (Ministry of Health of the Republic of Indonesia, 2018). The rate of chronic kidney failure in the Special Region of Yogyakarta (DIY) is in 12th position with a percentage of 4.3%, which is still considered high compared to the average rate in Indonesia (3.8%). Chronic kidney disease can gradually progress to more severe where the kidneys can no longer function properly which can lead to the appearance of complications. Various complications that often arise due to chronic kidney failure include heart disease, bone and mineral disorders, anemia, and malnutrition (Ariani, 2016). In chronic kidney failure, hemodialysis is a kidney replacement therapy that is often chosen even though it does not cure the disease (Siagian, 2018).

Hemodialysis affects the nutritional status of patients, as the dialysis process causes the loss of nutrients into dialysis and accelerates the process of catabolism, which can lead to malnutrition (Budi, Setyawan, & Sekarputri, 2024). In patients with chronic kidney failure, the initial and main symptoms that appear are malnutrition caused by uremic processes that cause the main symptoms in the form of anorexia and nausea. Although patients

have undergone hemodialysis with a restrictive diet, malnutrition remains a significant problem for chronic kidney failure patients which can lead to malnutrition conditions in patients (Satti, Mistika, & Imelda, 2021).

The results of a short interview conducted by the researcher on patients undergoing hemodialysis at PKU Muhammadiyah Hospital Yogyakarta, found that several patients with low BMI were found. Weight loss in hemodialysis patients occurs due to the nausea and vomiting experienced by the patient, which can affect their nutritional status. Patients also revealed that during hemodialysis, their weight sometimes increased and sometimes decreased, even decreased up to 10 kg, and the changes that occurred in the nutritional status of the patients were not caused by edema.

Cases of malnutrition detected at the beginning of hemodialysis in patients with chronic kidney failure reached 40%. Weight loss in patients with chronic kidney failure begins to appear after 3 months of undergoing hemodialysis and significant weight loss after 1 year of undergoing hemodialysis (Ratnasari, 2020). Poor nutritional status can result in malaise and fatigue, poor rehabilitation, inhibited wound healing, increased sensitivity to infections, increased hospitalization rates, and increased morbidity and mortality. Therefore, it is necessary to treat the nutritional status of pre-dialysis patients to prevent nitrogen accumulation, maintain optimal nutritional status to avoid malnutrition, slow the progression of kidney function deterioration, and reduce the symptoms of uremia and metabolic disorders (Hayati, Widiyati, & Nofartika, 2021).

RESEARCH METHODS

This study is an analytical observational research with a cross sectional *research design*. The research sample consisted of 69 patients with chronic kidney failure with a *purposive sampling* method with inclusion criteria: respondents aged >20 years, ≤12 months long, able to communicate well, patients are cooperative, willing to be research respondents and have signed informed consent, recorded in the data of hemodialysis patients at PKU Muhammadiyah Hospital Yogyakarta. The exclusion criteria are that the patient refuses to be a respondent, the patient does not fill out the questionnaire completely. The research instrument was in the form of a DMS questionnaire to determine the nutritional status and characteristics of respondents for age and gender. The statistical test used is the Spearman's rho test.

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RESEARCH RESULTS**Table 1. Distribution Data on Respondent Characteristics (N=69)**

Variables	Results
Age (n/%)	
Age (Mean±SD)(Range)(Month)	
18-40	4/5.8
41-60	38/55.1
>60	27/39.1
Gender (n/%)	
Man	39/56.5
Woman	30/43.5
Nutritional Status	
Good	4/5.8
Keep	37/53.6
Heavy	28/40.6

Table 1. shows characteristics of respondents with a aged 41-60 (middle adult) with a total of 38 respondents (55.1%). The characteristics of the majority of respondents based on gender are male with a total of 39 respondents (56.5%). Based on Table 1, it shows that most of the respondents have moderate nutritional status with 37 respondents (53.6%).

Table. 2 T-test Results

Variabel	Correlations		
	Nutritional Status of Patients (coefficient±Sig.)	Patient Age (coefficient±Sig.)	Gender (coefficient±Sig.)
Nutritional Status of Patients	1.000±-	0.066±0.592	0.200±0.099
Patient Age	0.066±0.592	1.000±-	0.005±0.967
Gender	0.200±0.099	0.005±0.967	1.000±-

In the table of sig values (*p-value*) = 0.592 and 0.099 or >0.05, it shows that there is no significant relationship between age and sex and nutritional

status of kidney failure patients undergoing hemodialysis.

DISCUSSION

The majority of the age of this study was middle adulthood (41-60). These results explain that age is a risk factor for chronic kidney failure. As a person ages, his kidney function also decreases, it is stated

that every ten years after a person enters the age of 40 there will be a decrease of approximately 10% in the number of functional nephrons due to nephrosclerosis and glomerulosclerosis, due to

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nephrosclerosis and glomerulosclerosis will cause elderly patients to experience chronic kidney failure and must be treated with hemodialysis for a long time. This happens because kidney function declines with age, which correlates with decreased glomerular secretion rate and poorer tubule function (Mutmainah & Wahyuni, 2024). As we age, the ability of the kidneys to respond to changes in fluids and electrolytes will also decrease. In addition, as you age, the ability of the kidneys to respond to changes in fluids and electrolytes will also decrease (Rahmah, 2021).

The majority gender in this study was male with a total of 36 people (56.5%). This result is supported by those who also get more results for male patients than women with a percentage of 57%. The results of the research conducted by and also obtained the results of the number of male patients are more than women. Clinically, men have a 2 times greater risk of developing chronic kidney failure than women. This is possible because more men have habits that can affect health such as smoking, drinking coffee, alcohol and supplementary drinks that can trigger systemic diseases that can cause a decrease in kidney function with long-term hemodialysis. Indonesian Renal Registry IRR (2018) (Salawati, 2016; Insani, Ayu, & Anggraini 2019)

Men are more prone to chronic kidney failure than women. The content of urine compounds (natural compounds that contain calcium, such as oxalate or phosphate, and other compounds, such as the amino acid cysteine), hormonal influences, the physical condition of the patient, and their activity routine affect this. Elsewhere, the male urinary tract is smaller, which increases the risk of developing kidney stones. Another influential factor is the lifestyle followed by men who smoke. Male smokers are more prone to chronic kidney disorders because cigarettes put pressure on the kidneys, which requires the kidneys to work harder (Al Kamaliah, Cahaya, & Rahmah, 2021).

In this study, the number of respondents who experienced moderate nutritional status was more, namely 37 people (53.6%). Current nutritional status can be affected by various factors, such as age, gender, and education level. Based on age, respondents who belonged to the elderly age group

(>60 years) showed abnormal nutritional status, with this percentage higher than other age categories. Aging is indeed related to malnutrition even in healthy individuals. Decreased free radical accumulation, decreased immunity, and chronic inflammation that appear during the aging process are factors that contribute to malnutrition in elderly patients (Oluseyi & Enajite, 2016).

In men, malnutrition is more common because there is a high risk of impaired kidney function, this is due to the structure and anatomy of the long urinary tract and also the long flow of urine, so there is a risk of garbage or metabolic residue sticking to the urinary tract. The anatomy of the male urinary tract is much longer than that of women. This allows the risk of deposition of substances contained in urine is greater than that of women (Oluseyi & Enajite, 2016)

Hemodialysis that is carried out regularly is reported to provide benefits to maintain nutritional status and has been linked to improved appetite, increased calorie and protein intake, gradual increase in dry weight, muscle mass, and serum albumin adequation produced from hemodialysis also plays a role in maintaining the nutritional status of hemodialysis patients. Even though the patient has been receiving hemodialysis for a long time, if the hemodialysis process is carried out properly, the risk of malnutrition will be reduced through the mechanism of avoiding the patient from exposure to uremic toxins and cytokines that play a role in the appearance of anorexia, vomiting, and inflammatory symptoms (Bramania, Ruggajo, Bramania, Mahmoud, & Furia, 2021).

The success factor of good nutritional status is by complying with hemodialysis therapy, sThe longer hemodialysis therapy has been undertaken, the higher the catabolism process will occur. If this is not balanced with a balanced intake, it increases the occurrence of malnutrition (Besang, Budhiresna, & Suryandhita, 2023).

The results of this research are in line with previous research, that there is no relationship between time and nutritional status in the hemodialysis room of Purwokerto Islamic Hospital. The value of the pear son chi square was 0.221 ($p>0.05$) which showed that there was no relationship between the length of HD and

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nutritional status. It was stated that there was no correlation between the period of hemodialysis and the nutritional status of the patient. This difference is likely due to a number of things, including the different populations of the studies and the different levels of adherence when undergoing therapy from the study subjects. The difference in nutritional status of patients at the time of first recording hemodialysis can also affect the difference in results obtained (Ratnasari, 2020).

Patients undergoing hemodialysis experience a decrease in appetite so that their eating frequency is irregular (Budi et al., 2024). In addition, the obstacles faced by respondents in fulfilling nutrition include digestive disorders and changes in appetite (Lolowang, Lumi, & Rattoe, 2021). One of the factors of poor nutrition is lack of appetite, which has implications for low food consumption where patients actually need energy intake, especially enough protein to overcome nutritional deficiencies due to the hemodialysis process (Chen, Luo, Chen, Zhang, Yin, Xiao, Xu, Liu, & Su, 2024). With the effective use of hemodialysis, the patient's dietary intake can be improved although it usually requires some adjustment or restriction on protein, sodium, potassium and fluid intake (Yogyantini & Wahyunani, 2023). If the patient's nutritional status is good, then his appetite is also good (Siagian, 2018).

CONCLUSION

Patients with Chronic Kidney Failure at PKU Hospital Muhammadiyah Yogyakarta based on the age of the most respondents in the middle adult category or aged 41-60 years with a total of 38 respondents (55.1%). The respondents were more male with a total of 39 respondents (56.5%), respondents with the last high school education as many as 36 respondents (37.7%).

The nutritional status of patients with Chronic Kidney Failure at PKU Muhammadiyah Hospital mostly had a moderate nutritional status with a total of 37 respondents (53.6%). There was no significant relationship between age and sex with nutritional status in patients with chronic kidney failure at PKU Muhammadiyah Hospital Yogyakarta, this was evidenced by the Sig (2-tailed) values of 0, 0.592 and 0.099 or >0.05.

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