Factors Associated with the Nutritional Status of Chronic Kidney Disease Patients at Depati Hamzah Hospital

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Abstract

Introduction: Chronic Kidney Disease (CKD) sering menyebabkan gangguan status gizi akibat penurunan fungsi ginjal dan efek samping hemodialisis seperti anoreksia dan keluhan gastrointestinal. Berbagai faktor, termasuk usia, jenis kelamin, pendidikan, pekerjaan, dan lama hemodialisis diduga berperan dalam perubahan status gizi pasien.

Objective: Impaired nutritional status is a side effect of long-term hemodialysis, as it can cause physiological disturbances, including gastrointestinal problems, that can lead to malnutrition. Several risk factors, such as age, gender, education, occupation, and duration of hemodialysis, are thought to contribute to this nutritional status. This study aims to determine the factors associated with the nutritional status of Chronic Kidney Disease (CKD) patients at Depati Hamzah Pangkalpinang Regional General Hospital in 2025

Method: The research method used is quantitative with a cross-sectional approach. The number of samples is 105 patients selected using quota sampling techniques. Data obtained through questionnaires and medical records, then analyzed univariately and bivariately using the Chi-square test with a confidence level of 95% ($\alpha = 0.05$).

Result: The results of the study showed that there was a significant relationship between age ($p = 0.006$) having a POR value of 3.307, gender ($p = 0.011$) having a POR value of 3.025, education ($p = 0.005$) having a POR value of 3.446, occupation ($p = 0.016$) having a POR value of 2.896, and duration of hemodialysis ($p = 0.001$) having a POR value of 3.951 with nutritional status

Conclusion: The suggestion from this study is the need for early detection and management of related risk factors, such as regular nutritional status checks, controlling food intake, consulting with nutritionists, and health controls to monitor kidney conditions and detect complications early.

Keywords: chronic kidney disease, hemodialysis, nutritional status

Introduction

Chronic kidney disease (CKD) is a potentially fatal condition that can significantly reduce a patient's quality of life, leading to disability and death. Chronic kidney disease (CKD) is characterized by the permanent loss of kidney function, resulting in the body's inability to maintain metabolic, fluid, and electrolyte balance, leading to uremia or azotemia (Pertiwi, 2022). According to World Health Organization (WHO) data, in 2019, chronic kidney disease (CKD) affected 15% of the global population and resulted in 1.2 million deaths. In 2020, there were 254,028 deaths caused by chronic kidney disease (CKD). In 2021, the number of deaths surpassed 843.6 million, and it is projected that the number of deaths caused by chronic kidney disease (CKD) will increase to 41.5% by 2040. These rising statistics indicate that chronic kidney disease (CKD) is the twelfth leading cause of death (WHO, 2021).

According to the Pan American Health Organization (PAHO), chronic kidney disease (CKD) ranked the 8th leading cause of death in the Americas and the 10th leading cause of lost life years in 2021, with 254,028 deaths across the Americas, with 131,008 deaths among men and 123,020 among women (PAHO, 2021). According to the 2013 Basic Health Research (Riskesdas), the incidence of chronic kidney disease (CKD) increased by 11,689 cases. However, in 2018, there was a significant increase, reaching 713,786 cases. West Java, East Java, and Central Java are the main locations where chronic kidney disease (CKD) cases are highest in Indonesia (Riskesdas, 2018). In 2019, Indonesia recorded a mortality rate due to chronic kidney disease (CKD) of 2.35%, equivalent to 1.4 million people, which later increased to 1.2%, or 8.7 million people. The total number of deaths due to chronic kidney disease (CKD) is projected to reach 42,000 by 2023 (Ministry of Health, 2023).

According to data from the Bangka Belitung Islands Provincial Health Office, the prevalence of chronic kidney disease (CKD) was 5,534 cases from 2021 to 2023. In 2021, the prevalence of chronic kidney disease (CKD) was 1,683 cases, with 232 people undergoing hemodialysis. In 2022, the prevalence of chronic kidney disease (CKD) was 1,822 cases, with 267 people undergoing hemodialysis. In 2023, the number of chronic kidney failure patients increased to 2,029 cases, with 356 undergoing hemodialysis (Bangka Belitung Provincial Health Office, 2023).

According to data from Depati Hamzah Pangkalpinang Regional Hospital (RSUD), the number of chronic kidney disease (CKD) patients has fluctuated over the past four years. In 2021, the number of chronic kidney disease (CKD) patients was 188. In 2022, the number decreased to 158. In 2023, the number of chronic kidney disease (CKD) patients decreased to 146. In 2024, the number of chronic kidney disease (CKD) patients increased to 185 (Depati Hamzah Regional Hospital Medical Records Data, 2024).

Chronic kidney disease (CKD) is a global health problem. Patients with chronic kidney disease (CKD) typically require renal replacement therapy, which is crucial for their health. Three common renal replacement methods include hemodialysis, peritoneal dialysis, and kidney transplantation (Anggraini & Fadila, 2023). Nutritional therapy is crucial for the survival of individuals with chronic kidney disease (CKD), as it aims to maintain the patient's nutritional status through dietary adjustments and adequate fluid restriction. Individuals with chronic kidney disease are susceptible to fluid overload. Current management techniques are largely conservative, focusing on delaying the initiation of dialysis and alleviating symptoms and manifestations associated with comorbidities associated with chronic kidney disease (CKD) (Putri et al., 2024). Individuals diagnosed with chronic kidney disease (CKD) experience a variety of clinical problems, including pruritus, hematuria or proteinuria, myoclonus, edema manifested as swelling in the ankles and hands, chest pain due to pericardial effusion,

respiratory complications or dyspnea, sleep disturbances and insomnia, and erectile dysfunction in men. Patients with kidney failure undergoing hemodialysis often experience anxiety, which can lead to many health problems, including physiological disturbances that can affect their nutritional status (Mustafa & Abdurrachim, 2024).

Patients with kidney failure often exhibit indicators of decreased nutritional status. Decreased nutritional indicators can be caused by kidney failure or related conditions, or by dialysis, which causes symptoms such as edema, dyspnea, and respiratory failure. A diet program is provided to individuals with chronic kidney failure, designed to maintain nutritional status, thereby optimizing quality of life and therapy, while preventing uremic syndrome and the progression of kidney disease (Pane & Muflihatin, 2021).

Impaired nutritional status is a significant side effect of hemodialysis, as it can cause physiological disturbances, including gastrointestinal problems: nausea, vomiting, abdominal discomfort, diarrhea, and anorexia. Persistent digestive problems will impact a patient's nutritional status and can lead to life-threatening conditions, resulting in malnutrition. Malnutrition in CKD patients is characterized by calorie and protein deficiencies, leading to significant loss of muscle mass. It is crucial to monitor energy intake in patients with chronic kidney disease (Zulfikar, Koerniawati & Perdana, 2023).

According to Ekaputri & Khasanah (2022), this study shows that many factors influence nutritional status, including gastrointestinal disorders such as nausea and anorexia, inflammation, underlying diseases, comorbidities with other chronic conditions, and the impact of dialysis procedures. Furthermore, inadequate nutritional intake arises from excessive dietary restrictions, delayed gastric emptying, diarrhea, other medical comorbidities, recurrent illnesses and hospitalizations, medications that cause dyspepsia, inadequate dialysis, depression, and altered taste perception.

According to Sembiring & Hanifah (2020), this study showed that of 54 chronic kidney disease (CKD) patients undergoing hemodialysis at Arifin Achmad Regional Hospital in Riau Province, 15% showed good nutritional status, 46% showed moderate malnutrition, and 39% showed severe malnutrition. The study findings revealed that 74% of patients experienced a decline in nutritional status after three months. This is consistent with research by Ekaputri & Khasanah (2022), who examined the nutritional status of chronic kidney disease patients undergoing hemodialysis at the Indonesian Christian University Hospital in Jakarta. Of the 50 patients, 18 (36%) showed good nutritional status, while 32 (64%) showed poor nutritional status.

According to Mustafa & Abdurrachim (2024), they found that age, gender, education, and occupation were associated with decreased nutritional status in chronic kidney disease (CKD) patients. This finding aligns with research by Satti, Mistika, & Imelda (2021), which found a relationship between age, gender, and duration of hemodialysis, which contribute to decreased nutritional status in chronic kidney disease (CKD) patients.

In a study by Sembiring & Hanifah (2020), the duration of hemodialysis significantly impacted the nutritional status of chronic kidney disease (CKD) patients. In this case, the duration of hemodialysis involves a catabolic process that leads to a depletion of essential nutrients (amino acids, vitamins, proteins, and glucose). Longer duration of hemodialysis therapy exacerbates this catabolic process; if this is not balanced with nutritional intervention, there is a risk of decreased nutritional status, resulting in malnutrition.

Based on a survey conducted by researchers on December 26, 2024, at Depati Hamzah Regional Hospital, Pangkalpinang, through brief interviews with 10 CKD patients undergoing hemodialysis, all 10 patients were found to have decreased nutritional status. This was caused

by several factors, including patient age, gender, education related to the patient's knowledge of the disease, the patient's occupation, which often involves heavy activity, and the duration of hemodialysis, which causes physiological disturbances in the patient.

Objective

This study aims to determine the factors associated with the nutritional status of CKD patients at Depati Hamzah Pangkalpinang Regional General Hospital in 2025.

Method

This study employed a quantitative design with a cross-sectional approach to examine the relationship between patient characteristics and the nutritional status of individuals with CKD undergoing hemodialysis. The study population consisted of all CKD patients receiving hemodialysis at Depati Hamzah Regional Hospital Pangkalpinang in 2025. A total of 105 respondents were included using a quota sampling technique based on the availability of patients who met the research criteria. Eligible participants were adults aged 18 years or older, had undergone hemodialysis for at least three months, and provided written informed consent. Patients who were critically ill, unconscious, or had severe communication impairments were excluded from the study.

Data collection was carried out through direct interviews using a structured questionnaire to obtain information on age, gender, education level, occupation, and duration of hemodialysis. Nutritional status and supporting clinical data were retrieved from medical records following the hospital's standardized nutritional assessment procedures for hemodialysis patients. All collected data were verified to ensure accuracy and completeness.

Data analysis consisted of univariate analysis to describe the distribution of each variable and bivariate analysis using the Chi-square test to determine the association between independent variables and nutritional status. A p-value of less than 0.05 was considered statistically significant at a 95% confidence level, and the strength of associations was measured using the Prevalence Odds Ratio (POR) with corresponding confidence intervals. This study was conducted after obtaining ethical approval from the institutional Research Ethics Committee, and the approval number will be included once officially issued.

Result

Table 1 : The Relationship between Age and Nutritional Status of CKD Patients

| Variables | Nutritional Status | | | | | | P | POR (95%CI) |
| | Poor | | Good | | Total | | | |
	n	%	n	%	n	%		
Age								
Elderly	29	61.7	18	38.3	47	100	0,006	3307 (1,480-7,390)
Adults	19	32.8	39	67.2	58	100		
Sex								
Male	33	57.9	24	42.1	57	100	0.011	3025 (1,352-6,770)
Female	15	31.2	33	68.8	48	100		
Education								
Low	35	58.3	25	42.7	60	100	0.005	3.446 (1.512-7.856)
High	13	28.9	32	71.1	45	100		
Occupation								
Nonformal	34	56.7	26	43.3	60	100	0.016	2.896 (1.286-6.521)
Formal	14	31.1	31	69.9	45	100		
Hemodialysis Duration								
≥ 5 years	31	63.3	18	36.7	49	100	0.001	3.951 (1.751-8.913)
< 5 years	17	30.4	39	69.6	56	100		

Based on the results presented in the table, the analysis shows a clear pattern regarding factors associated with the nutritional status of CKD patients at Depati Hamzah Regional Hospital, Pangkalpinang. Elderly patients were found to have a higher proportion of poor nutritional status (61.7%) compared to adults, who more frequently demonstrated good nutritional status (67.2%). This relationship was statistically significant, as indicated by a p-value of 0.006, with a POR of 3.307 (95% CI: 1.480–7.390), meaning elderly patients were more than three times more likely to experience poor nutritional status than adults.

Gender also showed a significant association with nutritional status. Poor nutritional status was more common among male patients (57.9%), while female patients tended to have better nutritional outcomes (68.8%). The p-value of 0.011 and POR of 3.025 (95% CI: 1.352–6.770) indicate that male patients were approximately three times more at risk of poor nutritional status compared to female patients.

Educational background further contributed to differences in nutritional status. Patients with lower educational levels had a higher prevalence of poor nutritional status (58.3%), whereas those with higher education were more likely to have good nutritional status (71.1%). This relationship was statistically significant, with a p-value of 0.005 and POR of 3.446 (95% CI: 1.512–7.856), suggesting that low-educated patients were more than three times more likely to experience poor nutritional status.

Occupational status also showed a similar pattern. Poor nutritional status was more prevalent among patients working in non-formal occupations (56.7%), while those with formal employment more frequently had good nutritional status (68.9%). The p-value of 0.016 and POR of 2.896 (95% CI: 1.286–6.521) indicate that individuals in non-formal occupations were almost three times more likely to have poor nutritional status than those in formal jobs.

Lastly, the duration of hemodialysis was strongly associated with nutritional status. Patients undergoing long-term hemodialysis (≥5 years) had a higher rate of poor nutritional status (63.3%), while those with shorter hemodialysis duration (<5 years) more often showed good nutritional status (69.6%). This variable demonstrated the strongest statistical association, with a p-value of 0.001 and POR of 3.951 (95% CI: 1.751–8.913), indicating that long-term hemodialysis patients were nearly four times more likely to experience poor nutritional status compared to newer patients.

Discussion

Based on statistical testing using the chi-square test, this study obtained a p-value of 0.006 < α (0.05), indicating a relationship between age and nutritional status in CKD patients in 2025. This is in line with research conducted by Dwiastuti & Lestari (2024) with 75 respondents regarding factors related to the nutritional status of chronic kidney failure patients at Moewardi Regional Hospital, Surakarta, in 2024. They concluded that there was a relationship between age and nutritional status in kidney failure patients with a p-value of 0.008. With increasing age, there is a decline in physiological functions such as decreased appetite, metabolic disorders, and decreased digestive function and nutrient absorption, which contribute to malnutrition. This is also supported by research conducted by Rahmawati & Sari (2023) with 83 respondents regarding the relationship between age and duration of hemodialysis and the nutritional status of chronic kidney failure patients at Prof. Dr. Moewardi Regional Hospital, Surakarta. Margono Soekarjo's 2023 study concluded that there is a relationship between age and the nutritional status of chronic kidney disease patients

with a p-value of 0.006. Older patients tend to experience decreased nutritional intake, metabolic disorders, and physiological changes that disrupt nutritional balance.

Based on the aforementioned research, the researchers concluded that age is related to the nutritional status of CKD patients, with advanced age being a major risk factor for malnutrition in CKD patients. If not managed appropriately, it can worsen disease progression, reduce immunity, and increase morbidity and mortality. Therefore, an appropriate nutritional approach based on age is a crucial aspect of the comprehensive management of CKD patients.

Based on statistical tests with chi square test in this study obtained a value of $p = 0.011 < \alpha$ (0.05), this indicates that there is a relationship between gender and nutritional status of CKD patients in 2025. This is in line with research conducted by Sari & Susanti (2023) with 112 respondents, regarding factors related to nutritional status of chronic kidney failure patients at Dr. Soetomo Hospital Surabaya in 2023 which concluded that there is a relationship between gender and nutritional status of kidney failure patients with a value of $p = 0.007$. Male patients experienced a decline in nutritional status more than females. This can be caused by differences in body composition, metabolic needs, and behavioral tendencies in maintaining diet., also supported by research conducted by Yuliani (2022) with 64 respondents, regarding factors that influence nutritional status in CKD patients at Bandung Regional General Hospital in 2022 which concluded that there is a relationship between gender and nutritional status of CKD patients with a value of $p = 0.009$. While male patients tend to experience a greater decline in nutritional status than female patients, this relationship is often influenced by other factors such as nutritional intake and adherence to the CKD diet.

Based on the aforementioned research, researchers believe that gender is related to the nutritional status of CKD patients because men are more susceptible to nutritional decline due to higher nutrient needs and a tendency to lose muscle mass more rapidly when energy deficits occur. However, women are also at risk of malnutrition due to hormonal factors and stricter dietary restrictions. Therefore, while there are differences based on gender, nutritional decline can occur in both sexes and is influenced by multifactorial factors.

Based on statistical tests with chi square test in this study obtained a value of $p = 0.005 < \alpha$ (0.05), this indicates that there is a relationship between education and nutritional status of CKD patients in 2025. This is in line with research conducted by Mulyani & Fauziyah (2022) with 92 respondents, regarding the relationship between knowledge and education level with nutritional status of hemodialysis patients at Dr. Hasan Sadikin General Hospital Bandung in 2022 which concluded that there is a relationship between education and nutritional status of kidney failure patients with a value of $p = 0.003$. Patients with low levels of education tend to have less understanding of diet and management of chronic kidney disease, so they are at greater risk of malnutrition, also supported by research conducted by Putri & Ramadhani (2024) with 103 respondents, regarding factors related to nutritional status in CKD patients at the Medan City Hemodialysis Clinic in 2024 which concluded that there is a relationship between education and nutritional status in CKD patients with a value of $p = 0.006$. Education plays a crucial role in determining the nutritional status of CKD patients. Lower levels of education are correlated with an increased risk of nutritional decline due to poor nutritional literacy and adherence to a diet low in protein, sodium, and potassium.

Based on the aforementioned research, researchers believe that education is linked to the nutritional status of CKD patients. Low levels of education often result in poor nutritional knowledge, which contributes to poor nutritional status. Therefore, appropriate and

continuous nutrition education needs to be provided intensively, especially to patients with low educational backgrounds.

Based on statistical tests with chi square test in this study obtained p value = 0.016 < α (0.05), this indicates that there is a relationship between work and a decrease in the nutritional status of CKD sufferers in 2025. This is in line with research conducted by Nugroho & Andriyani (2023) with 57 respondents, regarding the relationship between work status and the nutritional status of hemodialysis patients at Surabaya General Hospital in 2023 which concluded that there is a relationship between work status and the nutritional status of hemodialysis patients with a p value = 0.009. Patients with non-permanent jobs or low incomes tend to have limitations in meeting nutritional needs specifically for kidney disease, so they are more at risk of malnutrition compared to patients who have permanent jobs and stable incomes, also supported by research conducted by Wardhani & Ramadhani (2023) with 87 respondents, regarding factors related to nutritional status in CKD patients at Dr. Soetomo General Hospital. A 2023 study by A. Dadi Tjokrodipo in Bandar Lampung concluded that there is a relationship between employment and nutritional status in CKD patients with a p-value of 0.008. Employment influences economic capacity, access to nutritious food, and adherence to recommended diets. Employment instability is a risk factor for declining nutritional status in CKD patients undergoing long-term therapy such as hemodialysis.

Based on the aforementioned research, the researchers concluded that employment is related to the nutritional status of CKD patients because patients with precarious employment or those working in the informal sector tend to experience limitations in meeting adequate nutritional needs, which can lead to decreased nutritional status. Therefore, employment aspects need to be considered in planning nutritional interventions and managing CKD patients.

Based on statistical tests with chi square test in this study obtained p value = 0.001 < α (0.05), this shows there is a relationship between the duration of hemodialysis and the decline in nutritional status of CKD patients in 2025. This is in line with research conducted by Utami & Lestari (2022) with 61 respondents, regarding the relationship between the duration of hemodialysis and the nutritional status of CKD patients at the HD Clinic in Sleman Regency in 2022 which concluded that there is a relationship between the duration of hemodialysis and the nutritional status of CKD patients with a p value = 0.002. The longer the patient undergoes hemodialysis, the greater the risk of experiencing malnutrition due to protein loss, metabolic disorders, and chronic decreased appetite, also supported by research conducted by Permata & Andriyani (2024) with 68 respondents, regarding factors related to nutritional status in hemodialysis patients at Semarang City Hospital in 2024 which concluded that there is a relationship between the duration of hemodialysis and nutritional status in CKD patients with a p value = 0.000. The duration of hemodialysis is a factor that influences nutritional status in patients with chronic kidney disease. As dialysis duration increases, the body experiences accumulated metabolic stress and loses essential nutrients that cannot always be replaced through food intake.

Based on the aforementioned research, researchers believe that the duration of hemodialysis is related to the nutritional status of CKD patients. The association between the duration of hemodialysis and decreased nutritional status suggests that long-term therapy may be a risk factor for malnutrition. Therefore, the duration of dialysis needs to be a primary consideration in the nutritional management of CKD patients.

Conclusion

The findings indicate that age, gender, education, occupation, and the duration of hemodialysis each show a significant relationship with the nutritional status of Chronic Kidney Disease (CKD) patients at Depati Hamzah Regional Hospital, Pangkalpinang, in 2025. Among these factors, the duration of hemodialysis emerges as the most dominant predictor, with a POR of 3.951, suggesting that patients undergoing long-term hemodialysis are at a substantially higher risk of experiencing poor nutritional status compared to other groups.

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