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ANALYSIS OF POTASSIUM INTAKE, DIET COMPLIANCE AND NUTRITIONAL STATUS OF CHRONIC KIDNEY FAILURE PATIENTS WITH HEMODIALYSIS AT JASA KARTINI HOSPITAL, TASIKMALAYA CITY

Analisis Asupan Kalium, Kepatuhan Diet dan Status Gizi Pasien Gagal Ginjal Kronis dengan Hemodialisa di RS Jasa Kartini Kota Tasikmalaya

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ABSTRACT

Chronic kidney failure is a gradual and irreversible kidney dysfunction characterized by a permanent decrease in kidney function. The study aims to analyze potassium intake, dietary compliance and nutritional status of chronic kidney failure patients with hemodialysis at Jasa Kartini Hospital, Tasikmalaya City. The type of study is an analytical survey with a cross-sectional study approach, namely the variables of potassium intake, dietary compliance and nutritional status were studied simultaneously which was conducted from April to May 2024. Potassium intake data were obtained by interview using a 2 x 24 hour food recall form and a food photo book. Dietary compliance data were obtained by interview using a dietary compliance questionnaire. Nutritional status data were obtained using the SGA formular. The results of the study showed that most of the potassium intake in patients was in the good category as many as 39 people (59%). Most respondents were compliant with the diet as many as 40 people (61%). The conclusion is that most chronic kidney failure patients with hemodialysis have good potassium intake, many are compliant with the diet and nutritional status is at risk of malnutrition.

Keyword : *chronic kidney failure; dietary compliance; nutritional status; potassium intake*

ABSTRAK

Gagal ginjal kronis merupakan gangguan fungsi ginjal yang terjadi secara bertahap dan bersifat *irreversible* dan ditandai dengan adanya penurunan fungsi pada ginjal yang bersifat menetap, dan akhirnya harus menjalankan pengobatan melalui terapi hemodialisa. Penelitian bertujuan untuk menganalisis asupan kalium, kepatuhan diet dan status gizi pasien gagal ginjal kronis dengan hemodialisa di RS Jasa Kartini Kota Tasikmalaya Jawa Barat. Jenis penelitian adalah survei analitik dengan pendekatan *cross-sectional study* yaitu variabel asupan kalium, kepatuhan diet dan status gizi diteliti secara bersamaan yang dilakukan bulan April hingga Mei 2024. Data asupan kalium diperoleh dengan cara wawancara menggunakan formulir *food recall* 2 x 24 jam dan buku foto makanan. Data kepatuhan diet diperoleh dengan cara wawancara menggunakan kuesioner kepatuhan diet. Data status gizi diperoleh dengan menggunakan formular SGA. Hasil penelitian bahwa sebagian besar asupan kalium pada pasien yaitu dalam kategori baik sebanyak 39 orang (59%). Sebagian besar responden patuh terhadap diet sebanyak 40 orang (61%) dan yang tidak patuh terhadap diet sebanyak 26 orang (39%). Kesimpulan adalah sebagian besar pasien gagal ginjal kronis dengan hemodialisa memiliki asupan kalium yang baik, kepatuhan diet banyak yang patuh dan status gizi berisiko

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malnutrisi.

Kata Kunci : asupan kalium, gagal ginjal kronis, kepatuhan diet, status gizi

INTRODUCTION

Chronic kidney failure (CKD) is a progressive impairment of kidney function that cannot be restored or is irreversible (Rahman et al., 2021). Chronic kidney failure is characterized by a persistent decline in kidney function, which eventually requires treatment through renal replacement therapy such as kidney transplantation or hemodialysis (Simorangkir et al., 2021). Hemodialysis uses a special filter through which blood flows. This filter helps remove excess fluid, waste, and toxic substances from the blood. This procedure helps regulate normal blood pressure by maintaining fluid and electrolyte balance. Through this mechanism, toxin levels decrease and symptoms of uremia are reduced (Mehmood et al., 2019).

According to the World Health Organization (WHO) (2015), the global prevalence of chronic kidney failure is 10% of the total population, while the number of individuals undergoing hemodialysis reaches 1.5 million worldwide. In Indonesia, there are 2,850 people (19.33%) with chronic kidney failure undergoing hemodialysis, with the highest prevalence found in West Java Province, amounting to 651 people (19.34%). In Tasikmalaya City, the prevalence of chronic kidney failure is 0.2% (Riskesdas, 2018). Based on 2024 medical record data from Jasa Kartini Hospital in Tasikmalaya City, there were 150 patients with chronic kidney failure undergoing hemodialysis.

The average dietary intake among chronic kidney failure patients is low. This is caused by disrupted eating patterns, nausea, and vomiting, which result in undesired weight loss. A normal potassium intake is essential for chronic kidney failure patients undergoing hemodialysis. Insufficient potassium intake can have harmful effects on the body. When potassium levels fall below 3.5 mEq/L, hypokalemia may occur, causing a decrease in heart rate. Conversely, increased potassium levels above 5 mEq/L may lead to hyperkalemia, which can cause cardiac arrhythmias, and even higher concentrations may result in cardiac arrest or ventricular fibrillation (Sari et al., *year not stated*).

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Dietary management for chronic kidney failure patients undergoing hemodialysis is necessary to restrict the consumption of high-potassium foods such as vegetables and fruits. As a result, patients' fiber intake is lower compared to healthy individuals. The vegetables with the highest potassium content include papaya leaves (926 mg/100 g), *genjer* (905 mg/100 g), *katuk* leaves (478 mg/100 g), spinach (456 mg/100 g), and mustard greens (436 mg/100 g). The fruits with the highest potassium content are durian (601 mg/100 g), young coconut (564 mg/100 g), and *pisang raja* (522 mg/100 g) (Ministry of Health, 2020). Limiting the consumption of high-potassium foods in chronic kidney failure patients undergoing hemodialysis is crucial for controlling potassium excretion because impaired kidney function may lead to hyperkalemia (Annisa, 2016).

Dietary compliance refers to the attitude of chronic kidney failure patients undergoing hemodialysis toward their willingness to follow a diet and adhere to recommended eating patterns as advised by nutritionists based on established guidelines (Astuti, 2021). Such dietary compliance affects the balance of creatinine and urea levels in the blood. An important factor in achieving dietary compliance among patients is social support, which includes emotional support from family, relatives, and healthcare workers (Kurniawati et al., 2017). Research conducted by Sherly et al. (2021) states that patients with high potassium levels are affected by excessive consumption of foods high in potassium. Meanwhile, according to Rahayu (2019), factors contributing to poor dietary compliance among chronic kidney failure patients undergoing hemodialysis include lack of knowledge about the diet, its objectives, and its benefits.

A nutritional status that worsens can increase the risk of malnutrition. Approximately 40% of malnutrition cases often occur in chronic kidney failure patients undergoing hemodialysis (Satti et al., 2021). Malnutrition is a condition of inadequate nutrition caused by an imbalance between dietary intake and nutritional needs (N. L. Euphora and Samira, 2023). The nutritional status of chronic kidney failure patients can be affected by symptoms such as nausea, vomiting, anorexia, and decreased appetite, which place patients at risk of developing malnutrition (Setiawan and Purbianto, 2023). The purpose of this study is to analyze

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potassium intake, dietary compliance, and nutritional status of chronic kidney failure patients undergoing hemodialysis at Jasa Kartini Hospital, Tasikmalaya City, West Java.

METHODS

Design, Location, and Time

This type of research is an analytical survey with a cross-sectional study approach, in which the variables of potassium intake, dietary compliance, and nutritional status were examined simultaneously. The study was conducted at Jasa Kartini Hospital, Tasikmalaya City, West Java. The research took place from April to May 2024.

Sample

The sampling technique used was consecutive sampling, which is a method of selecting samples by choosing participants who meet the research criteria until the required sample size is reached (Nurbaeti, 2015). The sample size was determined using the Slovin formula. A total of 66 samples that met the criteria were obtained. The inclusion criteria consisted of patients who were willing to become respondents, aged ≥17 years, diagnosed with chronic kidney failure, routinely undergoing hemodialysis at least 2–3 times per week, and able to communicate well.

Data Collection

Respondent characteristic data included name, sex, age, education level, employment status, and duration of undergoing hemodialysis. Potassium intake data were obtained through interviews using a 2 × 24-hour food recall form and a food photo book. Dietary compliance data were collected through interviews using a dietary compliance questionnaire. Nutritional status data were obtained using the Subjective Global Assessment (SGA) form. SGA is a screening method used to determine the nutritional status of chronic kidney failure patients undergoing hemodialysis (Adrianto et al., 2021).

Data Analysis

The data analysis used was univariate analysis, which was applied to examine potassium intake, dietary compliance, and nutritional status of chronic kidney failure patients undergoing hemodialysis.

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RESULTS AND DISCUSSION

Respondent Characteristics

Table 1. Respondent Characteristics

Characteristics	Number	
	N	%
Sex / Gender		
Male	33	50
Female	33	50
Total	66	100
Age		
Early Adulthood (18–44 years)	19	29
Early Elderly (45–65 years).	37	56
Late Elderly > 65 years old	10	15
Total	66	100
Education		
Elementary School Graduate	17	26
Junior High School Graduate	12	18
Senior High School Graduate	18	27
Higher Education / University	19	29
Total	66	100
Occupation		
Civil Servant / Military / Police	7	10
Private Employee	2	3
Entrepreneur	9	14
Retired	4	6
Farmer / Laborer	5	8
Unemployed / Not working	39	59
Total	66	100
Duration of Hemodialysis		
< 2 years	28	42
2 – 5 years	17	26
> 5 years	21	32
Total	66	100

Based on the respondent characteristics in Table 1, the majority of respondents were female, totaling 33 individuals (50%), with the most common age group being 45–65 years, comprising 37 individuals (56%). The highest level of education was higher education, with 19 individuals (29%). The dominant employment status was not working, accounting for 39 individuals (59%). The most common duration of hemodialysis was less than 2 years, with 28 individuals (42%).

Based on the study results, chronic kidney disease patients undergoing hemodialysis who were respondents consisted of an equal number, with 33 individuals (50%). Males are more prone to chronic kidney disease due to insufficient fluid intake, hormonal influences, physical condition, activity intensity, and the narrower male urinary tract, which makes kidney stones more likely to become obstructed (Febriani, 2022). Females have specific physiological conditions, such as pregnancy, which increase the risk of developing chronic kidney disease (Astuti, 2021).

The data collection results showed that among respondents undergoing hemodialysis, the highest proportion by age was in the early elderly group (45–65 years), totaling 37 individuals (56%). Based on interviews with respondents at the

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Hemodialysis Installation of Jasa Kartini Hospital, most respondents in this age group developed chronic kidney disease requiring hemodialysis due to comorbidities such as hypertension. The degenerative aging process leads to anatomical, physiological, and biochemical changes, thereby reducing kidney function and performance. In early elderly individuals, the glomerular filtration rate gradually declines by up to 50% of the normal value, resulting in decreased tubular kidney function responsible for reabsorption and urine concentration, impaired bladder emptying that can increase the risk of infection and obstruction, and reduced fluid intake, which is one of the factors contributing to kidney damage (Puspasari and Nggobe, W, 2018). Consistent with Harahap's study (2018), as age increases and chronic conditions such as hypertension are present, kidney damage tends to be more severe and irreversible.

Based on the study results, the respondents with the highest level of education were those with higher education, totaling 19 individuals (29%). Interviews with the respondents revealed that those with a higher education background had better understanding of what is recommended and not recommended, particularly regarding foods high in potassium. According to Astuti (2021), the higher a person's level of education, the more likely they are to have greater awareness of self-care. With higher education, individuals are able to seek information to manage their own diet.

The data collection results showed that the highest employment category was not working, totaling 39 individuals (59%). Interviews revealed that respondents who were not working did so because their physical condition no longer allowed them to engage in productive activities. According to Desitasari et al. (2021), chronic kidney disease patients undergoing hemodialysis are often not working due to the loss of ability to perform work and instead focus on undergoing hemodialysis treatment.

Based on the interview results, most respondents had been undergoing hemodialysis for less than 2 years, totaling 28 individuals (42%). According to Puspasari and Nggobe, W. (2018), patients who are newly diagnosed with chronic kidney disease and undergoing hemodialysis tend to have lower understanding, whereas long-term patients have higher understanding. However, patients who have been on

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hemodialysis for a longer period tend to perceive it as a disruption to their daily lives.

Table 2. Frequency Distribution of Potassium Intake, Dietary Adherence, and Nutritional Status

Food Intake	Number	
	N	%
Potassium Intake		
Low	5	8
Adequate / Good	39	59
High / Excessive	22	33
Total	66	100
Dietary Adherence		
Non-adherent	26	39
Adherent	40	61
Total	66	100
Nutritional Status		
Not at Risk	8	12,1
At Risk of Malnutrition	58	87,9
Total	66	100

Potassium Intake

Based on the study, potassium intake was assessed through interviews with respondents using the 2×24-hour food recall method. The 2×24-hour recall results of potassium intake were compared with the potassium requirement, which is 8–17 mg/day. The study found that the majority of chronic kidney disease patients undergoing hemodialysis had potassium intake in the adequate category, totaling 39 individuals (59%).

According to the interviews using the 2×24-hour food recall form, some respondents still consumed foods high in potassium. Generally, respondents did not experience negative reactions when consuming high-potassium foods. Most respondents consumed high-potassium food sources such as 1 cup of green beans (250 mg/100 g), 1 cup of water spinach (250 mg/100 g), 1 small papaya (221 mg/100 g), 9 duku fruits (149 mg/80 g), 1 banana (522 mg/50 g), 2 sweet oranges (472 mg/100 g), 1 medium potato (396 mg/100 g), 1 medium piece of cassava (394 mg/120 g), and 1 medium sweet potato (565 mg/135 g).

Potassium plays an important role in maintaining fluid and electrolyte balance, as well as in acid-base balance (Sherly et al., 2021). For chronic kidney disease patients undergoing hemodialysis, the recommended intake according to Pernefri is 9–17 mg/kg/day (Pernefri, 2011). If chronic kidney disease patients consume foods high in potassium, it can lead to hyperkalemia. Hyperkalemia can cause weakness in the heart and pulse, and in severe cases, it may result in fatal cardiac arrest (Annisa, 2016). This condition can be managed by limiting the intake of high-potassium foods such as bananas, oranges, potatoes, leafy green vegetables, and so on (Bellasari, 2020). Conversely, hypokalemia in patients can

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cause weakness, fatigue, loss of appetite, and can affect nutritional status (Sherly et al., 2021).

Dietary Adherence

Based on the study results, it was found that most of the hemodialysis patients completed a questionnaire consisting of 18 statements with the response options: "Very Often," "Often," "Rarely," and "Never."

Table 3. Statements on Dietary Adherence

No	Statements
1	I do not consume various sweet potato-based products
2	I consume tempeh
3	I monitor my intake of legumes/nuts
4	I finish my rice in one meal as a recommended carbohydrate source
5	I consume spinach
6	I consume mango
7	I consume papaya
8	I consume cassava
9	I monitor my intake of high-fat foods
10	I do not monitor my intake of high-sodium foods
11	I consume sweet oranges
12	I eat according to the hemodialysis diet program suitable for my body weight
13	I consume water spinach
14	I consume apples
15	I limit the intake of white mustard greens
16	I consume melon
17	I consume various potato-based products
18	I consume chicken liver

Source: Astuti (2021)

Respondents were categorized as non-adherent to the diet if their score was below the median, and as adherent if their score was equal to or above the median. The median of the total score was 49. Data collection results showed that the majority of respondents were adherent to the diet, totaling 40 individuals (61%), while 26 individuals (39%) were non-adherent. Interviews with respondents revealed that most were already following the recommended diet. Some respondents were also afraid to consume foods that were not recommended. Many respondents expressed a desire to recover by making efforts and avoiding inappropriate foods, including those high in potassium.

The results from the negative dietary adherence questionnaire statement regarding spinach consumption showed that 45 respondents did not consume spinach. This is because spinach contains a high level of potassium, 456 mg, which can have adverse effects on chronic kidney disease patients undergoing hemodialysis. Meanwhile, the results from the positive dietary adherence statement regarding respondents always finishing rice as a recommended food showed that 19 respondents did so. This was supported by the 2×24-hour recall interviews, which indicated that respondents always consumed carbohydrates, namely rice, in one

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meal. In line with the study by Agustini, K. Y. (2022), it was shown that the average chronic kidney disease patient undergoing hemodialysis adhered to the recommended diet. This occurs because patients already understand which types of foods are recommended and which are not.

Adherence to the recommended diet is a behavior that can be observed and measured. Adherence is a term used to describe compliance with planned goals. The level of adherence reflects the attitude demonstrated by chronic kidney disease patients undergoing hemodialysis, which must be followed and maintained. Patient adherence should also be encouraged by family members to dedicate time to undergo the necessary treatment, including following the prescribed diet (Astuti, 2021).

Nutritional Status

Based on Table 2, the majority of respondents were at risk of malnutrition, totaling 58 individuals (87.9%), while 8 respondents (12.1%) were not at risk of malnutrition. The Subjective Global Assessment (SGA) is one of the screening methods used to detect nutritional status specifically in chronic kidney disease patients undergoing hemodialysis. In the SGA system, anamnesis and physical examination of the individual are performed. This system includes 11 questions. The total score for each SGA is then calculated and classified into three categories: score A (good nutritional status), score B (moderate malnutrition), and score C (severe malnutrition). A patient receives score A if, in answering the 11 questions, most of their responses fall into category A. A patient receives score B if most responses fall into category B, and score C if most responses fall into category C (Adrianto et al., 2021).

The SGA technique is more comprehensive than anthropometric measurements because it uses a structured clinical approach consisting of anamnesis and physical examination. The SGA screening has the best sensitivity in detecting the risk of malnutrition (Natasha Louise Euphora and Samira, 2023). The final result of the nutritional status assessment according to the SGA scoring is A (not at risk of malnutrition) or B and C (at risk of malnutrition).

The majority of respondents were at risk of malnutrition. Patients experiencing malnutrition typically exhibit characteristics such as weight loss, visible thinness,

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decreased appetite, and loss of fat and muscle mass. According to Iorember (2018), malnutrition in chronic kidney disease patients undergoing hemodialysis occurs due to uremic syndrome and changes in the gastrointestinal system, such as anorexia, nausea, vomiting, and diarrhea. Anorexia often occurs and may be caused by changes in orexigenic hormones (appetite stimulants) and anorexigenic hormones (appetite suppressants).

CONCLUSION

Based on the study results, it can be concluded that the majority of chronic kidney disease patients undergoing hemodialysis have adequate potassium intake, most are adherent to the diet, and their nutritional status is at risk of malnutrition.

BIBLIOGRAPHY

Adrianto, Y. *et al.* (2021) "Hubungan Subjective Global Assessment (SGA) dengan Asupan Energi, Protein, Kekuatan Genggam Tangan, dan Indeks Massa Tubuh pada Pasien Penyakit Ginjal Kronis (PGK) dengan Continuous Ambulatory Peritoneal Dialysis (CAPD)," *Jurnal Penyakit Dalam Indonesia*, 8(4), hal. 195. https://doi.org/10.7454/jpdi.v8i4.628.

Agustini, K, Y, A. (2022) "Gambaran Kepatuhan Diet pada Pasien Gagal Ginjal Kronik (GGK) dengan Hemodialisa Di Rumah Sakit Umum Negara," *Bali Health Published Journal* [Preprint]. https://doi.org/10.47859/bhpj.v6i1.329.

Annisa, H. (2016) "Hubungan Kepatuhan Diet dan Asupan Kalium dengan Kadar Kalium pada pasien Gagal Ginjal Kronik yang Menjalani Hemodialisa Rawat Jalan di RSUD Kabupaten Sukoharjo," *Universitas Muhamadiyah Surakarta*, 4(1), hal. 1–23.

Astuti, T. (2021) "Hubungan Tingkat Pengetahuan dan Dukungan Keluarga dengan Kepatuhan Diet pada Pasien Gagal Ginjal Kronis yang Menjalani Hemodialisa di Rs Puri Husada Yogyakarta," *Industry and Higher Education* [Preprint].

Bellasari, D. (2020) "Hubungan Lama Menjalani Hemodialisis dengan Kualitas Hidup Pasien Gagal Ginjal Kronik di RSUD Kota Madiun.," *Nature Microbiology*, 3(1), hal. 641.

Desitasari *et al.* (2021) "Hubungan Tingkat Pengetahuan, Sikap dan Dukungan Keluarga terhadap Pasien Gagal Ginjal Kronik yang Menjalani Hemodialisa," *Jurnal Kesehatan Masyarakat*, 2(1), hal. 1–8.

Euphora, N. L dan Samira, J. (2023) "Hubungan Lama Menjalani Hemodialisis dengan Status Gizi pada Pasien Gagal Ginjal Kronik,"

DOI 10.20884/1.jgipas.2025.9.2.15790

Fakultas Kedokteran, Universitas Trisakti, 4(1), hal. 96–107.

Febriani, H. (2022) "Hubungan Lama Menjalin Hemodialisis dengan Self Care di Rumah Sakit Islam Sultan Agung Semarang," hal. 6.

Harahap, S. (2018) "Faktor-Faktor Risiko Kejadian Gagal Ginjal Kronik (Ggk) Di Ruang Hemodialisa (Hd) Rsup H. Adam Malik Medan," *Jurnal Online Keperawatan Indonesia*, hal. 92–109.

Iorember, F.M. (2018) "Malnutrition in Chronic Kidney Disease," *Frontiers in Pediatrics*, 6, hal. 161. https://doi.org/10.1007/978-981-15-2365-6_3.

Kurniawati, A. *et al.* (2017) "Hubungan Antara Tingkat Pengetahuan dengan Kepatuhan Diet Pasien Hemodialisa di RSUD Wonosari Kabupaten Gunungkidul," *Universitas Alma Ata Yogyakarta* [Preprint].

Kemenkes RI. (2020). Tabel Komposisi Pangan Indonesia. In *Tabel Komposisi Pangan Indonesia*.

Mehmood, Y. *et al.* (2019) "Hemodialysis; Acute Intradialytic Complications Found on Maintenance Hemodialysis in Patients at A Public Hospital Lahore," *The Professional Medical Journal*, 26(1), hal. 45–50. https://doi.org/10.29309/TPMJ/2019.26.01.2511.

Nurbaeti, S. (2015). Gambaran Kejadian Postpartum Blues pada Ibu Nifas Berdasarkan Karakteristik di Rumah Sakit Umum Tingkat IV Sariningsih Kota Bandung. *Scientific Journal of Reflection: Economic, Accounting, Management and Business*.

Pernefri (2011) "Konsensus pada Penyakit Ginjal Kronik."

Puspasari, S. dan Nggobe, W, I. (2018) "Hubungan Kepatuhan Menjalani Terapi Hemodialisa dengan Kualitas Hidup Pasien Di Unit Hemodialisa RSUD Cibabat-Cimahi," *Holistik Jurnal Kesehatan*, 12(3), hal. 154–159.

Rahayu, C, S. (2019) "Pengaruh Kepatuhan Diet pada Pasien Gagal Ginjal Kronis di Unit Hemodialisa Rumah Sakit Sumber Waras Cicielia," *Akademi Keperawatan Sumber Waras Jakarta*, 11(1). https://doi.org/10.37012/jik.v11i1.63.

Rahman, T.S. *et al.* (2021) "Nursing Care to Meet Fluid and Electrolyte Needs of Chronic Kidney Disease Patient," *Jendela Nursing Journal*, 5(1), hal. 48–63. https://doi.org/10.31983/jnj.v5i1.6954.

Riskesdas (2018) *Laporan Nasional Riskesdas 2018*.

Sari, R. *et al.* (2017) "Hubungan Asupan Energi, Protein, Vitamin B6, Natrium dan Kalium Terhadap Status Gizi pada Pasien Gagal Ginjal Kronik dengan Hemodialisis," *Jurnal Akademika Baiturrahim Jambi*, 6(2), hal. 34–43.

Satti, Y.C. *et al.* (2021) "Faktor-Faktor yang Mempengaruhi Status Gizi Pasien Hemodialisa di Rumah Sakit Stella Maris Makassar," *Jurnal Keperawatan Florence Nightingale*, 4(1), hal. 1–8.

DOI 10.20884/1.jgipas.2025.9.2.15790

https://doi.org/10.52774/jkfn.v4i1.54
.

Setiawan, I. dan Purbianto, P. (2023) "Effect of Hemodialysis on Nutritional Status in Chronic Renal Failure Patients," *Journal of Noncommunicable Diseases Prevention and Control*, 1(1), hal. 13–19.

Sherly *et al.* (2021) "Asupan Energi, Protein, Kalium dan Cairan dengan Status Gizi (SGA) Pasien GGK yang Menjalani Hemodialisa," *Ghidza: Jurnal Gizi dan Kesehatan*, 5(2), hal. 211–220. https://doi.org/10.22487/ghidza.v5i2.200.

Simorangkir, R. *et al.* (2021) "Faktor-Faktor yang Berhubungan dengan Kualitas Hidup Pasien Penyakit Ginjal Kronis yang Menjalani Hemodialisis Renni," *Jurnal Farmasi Dan Ilmu Kefarmasian Indonesia*, 8(1), hal. 83. https://doi.org/10.20473/jfiki.v8i12021.83-90.

WHO (2015) *World Health Statistics*.

DOI 10.20884/1.jgipas.2025.9.2.15790