

FACTORS RELATED TO COMPLIANCE DIET FOR CHRONIC KIDNEY FAILURE PATIENTS UNDERGOING HEMODIALYSIS AT PATI ISLAMIC HOSPITAL

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Abstract

Chronic kidney failure (CKD) is a condition characterized by progressive and irreversible decline in kidney function. One of the main therapies for CKD patients is hemodialysis, which requires adherence to a special diet to prevent complications and maintain quality of life. This study aims to analyze the relationship between age, gender, education level, length of hemodialysis, knowledge level, and family support with dietary compliance in CKD patients undergoing hemodialysis at RSI Pati. This study used a quantitative method with a cross-sectional design with a total sampling technique, involving 50 respondents who met the inclusion criteria. The instrument used was a questionnaire on respondent characteristics, knowledge, family support, and dietary compliance. Data analysis was carried out univariately and bivariate using the Chi-Square test. The results showed that the variable that had a significant relationship with dietary compliance was the level of knowledge ($p = 0.011$). Meanwhile, age ($p = 0.386$), gender ($p = 0.248$), education level ($p = 0.071$), duration of hemodialysis ($p = 0.137$), and family support ($p = 0.498$) did not show a significant relationship. Dietary compliance in patients with chronic kidney disease (CKD) undergoing hemodialysis is largely influenced by their level of knowledge. It is recommended that healthcare professionals develop structured and ongoing educational programs, tailored to patient needs, to improve dietary compliance.

Keywords: *Chronic Kidney Failure, Hemodialysis, Diet Compliance, Knowledge, Family Support*

INTRODUCTION

Background Chronic Kidney Failure (CKF) is a condition of structural damage or impaired kidney function that lasts for more than three months and can impact an individual's health by causing the accumulation of metabolic waste products in the body. CKF is progressive and irreversible, meaning the damage to the kidneys cannot return to normal. (Rustendi, Murtiningsih, and Inayah, 2022). This condition has a systemic impact on an individual's health status and often causes serious complications if not treated properly. The prevalence of CKF continues to increase globally and nationally. Data from the United States Renal Data System shows that the prevalence of CKF in the United States increases by 20-25% annually. In Indonesia itself, based on the Basic Health Research (Riskesdas) (2023), the prevalence of CKF increased from 2% to 3.8% in 2024. Twelve provinces recorded the highest number of CKF cases, namely the Special Region of Yogyakarta and Central Java, which have a prevalence of 0.3%, higher than the average prevalence in Indonesia, which is 0.2%. The number of CKD sufferers in Central Java has reached 13,886 (Central Java Health Office, 2023). CKD patients who have entered the end-stage renal disease are characterized by a Glomerular Filtration Rate (GFR) of less than 15 mL/min/1.73m² (PERNEFRI, 2018). At this stage, patients require renal replacement therapy (RRT) to maintain survival. Forms of renal replacement therapy include hemodialysis, kidney transplantation, and peritoneal dialysis. However, kidney transplantation in Indonesia is still rarely performed due to many obstacles that must be faced, such as the limited number of compatible organ donors, surgical techniques, and also post-operative care. The peritoneal dialysis method utilizes the peritoneal membrane, a thin layer in the abdominal cavity as a natural filter to remove metabolic waste substances and maintain electrolyte balance in the body (Nurani and Mariyanti, 2019). Therefore, most CKD patients in Indonesia undergo hemodialysis therapy as the main option. Hemodialysis is the process of cleansing the blood of metabolic waste

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products, excess fluid, and electrolytes using a dialyzer that takes over the functions of the kidneys. Patients with kidney failure undergo regular therapy, generally two to three times a week (Rustendi, Murtiningsih, and Inayah, 2022).

This procedure requires a high level of commitment from patients, as it involves not only a regular therapy schedule but also lifestyle changes, including adherence to medication, fluid intake, and a strict and specific diet. When someone begins hemodialysis therapy, they must change all aspects of their life, including eating habits, social mobility, and daily activities (Sariaslan and Kavurmaci, 2020). The burden of these changes is significant. Patients must regularly visit the hemodialysis unit, maintain fluid balance, adhere to nutritional guidelines, and take medications regularly. Furthermore, patients often experience side effects such as fatigue, sleep disturbances, gastrointestinal disorders (such as nausea, vomiting, and decreased appetite), and a decreased quality of life due to physical and economic limitations (Fitriani et al., 2020). This condition is exacerbated by other complications such as anemia, hypertension, secondary hyperparathyroidism, and heart disease (Juwita and Kartika, 2019).

Table 1.1 Research Authenticity

No	Researcher (Year) Research Title	Sample Design	Variables	Research result	Similarities and Differences with Research
1.	Naryati & Nugrahandari (2021) "Factors Associated with Diet Compliance in Chronic Kidney Failure Patients Undergoing Hemodialysis Therapy"	The study used a purposive sampling design with a sample size of 50 chronic kidney failure patients undergoing hemodialysis for at least 6 months.	Knowledge, Motivation, Family support for dietary compliance	<ol style="list-style-type: none"> 81.6% of patients with good knowledge, showed high dietary compliance. 68% of patients with high motivation showed better dietary compliance. 68.4% of patients with good family support showed higher dietary compliance. 	Equality: <ul style="list-style-type: none"> - The similarity in the method is quantitative cross-sectional. - Focus on the same variables, namely compliance and CKD patients. Difference: <ul style="list-style-type: none"> - This study only focuses on knowledge, motivation, and family support. - Research location.
2.	Wicaksono, Hastuti, and Pujiastuti (2023) "Experiences of Chronic Kidney Failure Patients Undergoing Hemodialysis Therapy at a Private Hospital in Yogyakarta"	The study was conducted using a qualitative phenomenological method with 5 GJK participants undergoing hemodialysis.	The variables are independent and dependent because the research is qualitative.	Six themes were identified: physical discomfort, negative emotions, adaptation efforts, activity limitations, family and healthcare support, and spirituality. These themes are crucial and determine the success of therapy.	Equality: <ul style="list-style-type: none"> - Focus on CKD patients undergoing hemodialysis and the success of hemodialysis. Difference: <ul style="list-style-type: none"> - The research methods are different. - The aim of the research is to explore subjective and emotional experiences.
3.	Sitorus (2021) "The Relationship Between Knowledge Level and Diet Compliance in Chronic Kidney Disease Patients Undergoing"	The study was conducted quantitatively with a cross-sectional approach on 19 CKD patients undergoing hemodialysis.	Level of knowledge (independent variable), and dietary compliance (dependent variable)	The results showed no significant relationship between knowledge level and dietary adherence (p-value = 0.147). Therefore, many factors other than knowledge level can	Equality: <ul style="list-style-type: none"> - The same population and sample, namely CKD patients undergoing hemodialysis.

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	Hemodialysis at Dr. RM. Pratomo Bagansiapiapi Regional Hospital"			significantly influence dietary adherence in CKD patients.	- There are similarities in the dependent variables
					Difference: The independent variable only discusses the level of knowledge.
4.	Nadi, Kurniawati, & Maryanti (2018) "Social Support and Motivation Are Related to Compliance with Fluid Intake Restrictions in Chronic Kidney Disease Patients"	The study was conducted cross-sectionally with 19 CKD patients at Dr. MM Dunda Limboto Regional Hospital and was conducted using consecutive sampling technique.	Social support and motivation (independent variables), and compliance with fluid intake restrictions (dependent variable).	The findings from this study showed a significant relationship between social support and motivation (p=0.000; r=0.788) and adherence to fluid restrictions. Compliance was higher when social support and motivation were high.	Equation: - Using the same method, namely quantitative cross-sectional. - Population and sample equations Difference: - The dependent variable is only about limiting fluid intake.
5.	Susilawati, Latief & Khomarudin (2018) "Self-Efficacy and Social Support of Hemodialysis Patients in Improving Fluid Restriction Compliance"	Correlative descriptive quantitative with 76 samples through questionnaires and 6 people through direct interviews.	Self-efficacy and social support (independent variables), and fluid restriction compliance (dependent variable)	This study found a significant relationship between self-efficacy and social support and fluid restriction compliance in hemodialysis patients. This finding indicates that the higher the self-efficacy and social support, the higher the patient's compliance with fluid restriction.	Equality: - The same focus is on CKD patients undergoing hemodialysis. - The equation of the dependent variable, namely compliance with medical recommendations. Difference: - Different independent variables, namely self-efficacy and social support. - The difference in method, because this method uses a mixed method.

LITERATURE REVIEW

A. Theoretical Basis of Chronic Kidney Failure (CKF)

1) Understanding Chronic Kidney Failure (CKF)

Chronic Kidney Failure (CKF) is a pathological condition characterized by a gradual decline in kidney function until the kidneys are no longer able to perform their physiological functions optimally. These functions include the filtration of metabolic waste and electrolytes, regulation of body fluid balance, and stabilization of important electrolyte levels such as sodium and potassium in the blood, including urine production (National Kidney Foundation, 2016). This disease is progressive and irreversible, and slowly progresses to total kidney failure. According to Wilson, in clinical practice, kidney failure is divided into two types: acute kidney failure and chronic kidney failure. By definition, Mansjoer defines CKF as a clinical syndrome resulting from a decline in kidney function that is chronic, continuous, and progressive, and irreversible (Nurani and Mariyanti, 2019). In addition, according to the K/DOQI from the National Kidney Foundation (2016), CKD is classified based on the

presence of structural or functional damage to the kidneys and/or a decrease in the Glomerular Filtration Rate (GFR) to less than 60 mL/minute/1.73 m² for a period of more than three months.

2) Etiology and Pathophysiology of Chronic Kidney Failure

The two main factors that cause chronic kidney disease (CKD) are diabetes mellitus and hypertension, which collectively account for approximately two-thirds of all cases (National Kidney Foundation, 2016). Diabetes occurs when blood glucose levels are chronically high, causing damage to various organs, including the kidneys, heart, blood vessels, nervous system, and eyes. Meanwhile, hypertension, or high blood pressure, is a condition in which blood pressure against the artery walls increases. If not properly controlled, hypertension can trigger heart attacks, strokes, and accelerate the progression of CKD. Conversely, chronic kidney disease itself can also be a triggering factor for hypertension. According to data from the 2020 Indonesian Renal Registry (IRR), the primary cause of kidney failure in patients undergoing hemodialysis remains consistent with previous years, with hypertension increasing to 35%. This is followed by diabetic nephropathy at 29%, primary glomerulopathy at around 8%, and various unknown diseases at 16% (Ministry of Health, 2023).

3) Pathophysiology

The following is an explanation regarding the pathophysiology of chronic kidney failure based on the etiology of the cause of CKD:

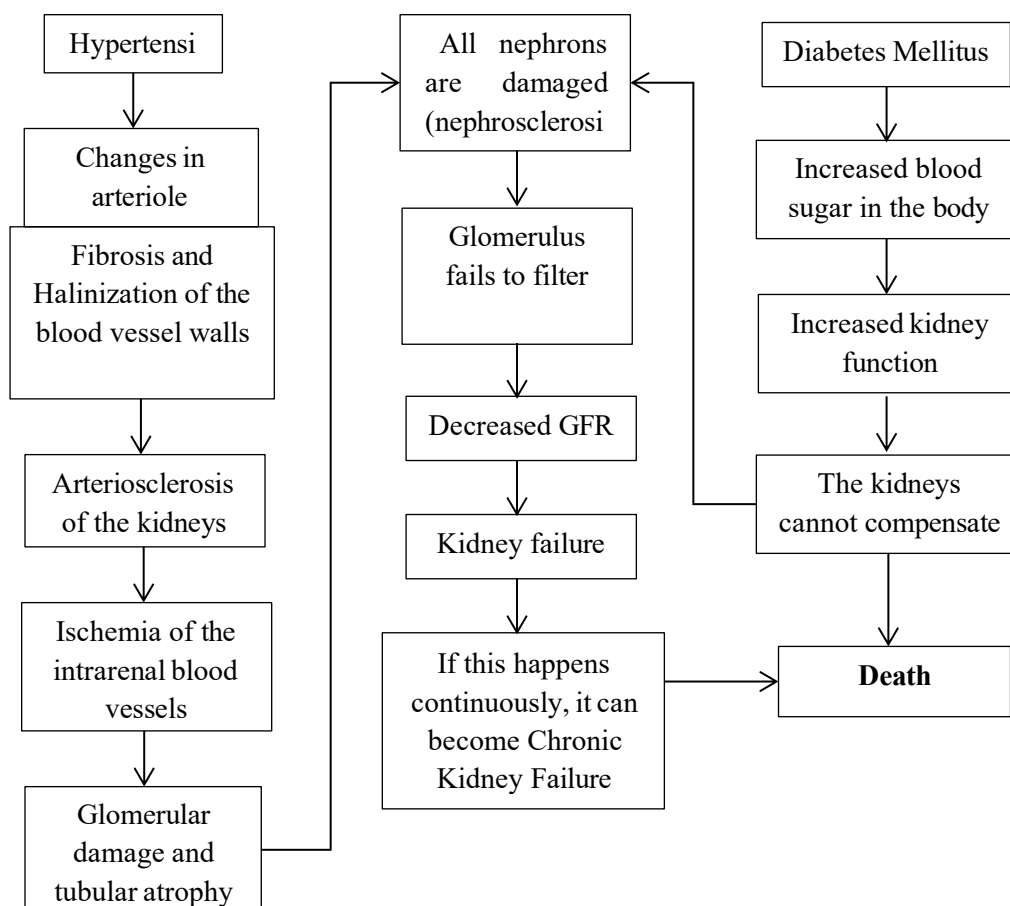


Figure 2.1 Pathway (NKF, 2016)

4) Hypertension

Hypertension and chronic kidney failure have a reciprocal relationship, where both can exacerbate each other (Gultom and Sudaryo, 2023). Long-term hypertension can cause structural changes in small blood vessels (arterioles) in various organs, including the kidneys. These changes include thickening and hardening (fibrosis and hyalinization) of blood vessel walls. In the kidneys, this condition can lead to arteriosclerosis, which then leads to nephrosclerosis due to decreased blood flow due to narrowing of the lumen of intrarenal blood vessels. This blockage triggers glomerular damage and tubular atrophy, ultimately leading to complete destruction of the nephrons and chronic kidney failure. Conversely, chronic kidney failure can also cause hypertension. It is estimated that approximately 90% of hypertension cases in CKD patients are related to excess fluid volume and the renin-angiotensin system (Masi and Kundre, 2018).

5) Diabetes mellitus

According to data from the Indonesian Renal Registry (2020), diabetes mellitus is a leading cause of chronic kidney failure and a significant factor in the death of patients with this condition. When blood sugar levels are uncontrolled over a long period, it can trigger diabetic nephropathy, which is a leading cause of kidney failure. The kidneys contain numerous small blood vessels that are susceptible to damage from hyperglycemia. This damage disrupts the kidneys' blood filtration process. As the kidneys work harder, protein, particularly albumin, can leak into the urine (albuminuria) (Saputra et al., 2023). Over time, this condition leads to a decline in the kidneys' filtering function. As kidney function deteriorates, the body is no longer able to optimally eliminate waste, marking the progression to kidney failure. If left untreated, this condition can accelerate the progression of kidney failure to the final stage, potentially leading to death.

6) Other causes

Besides diabetes and hypertension, several other medical conditions can affect kidney function, including glomerulonephritis, a group of diseases that cause inflammation and damage to the glomeruli, the filtering units of the kidneys (Rachmadi, 2010). This disorder is the third most common cause of kidney disease. Genetic disorders such as polycystic kidney disease can also cause kidney damage. This disease is characterized by the development of large cysts in the kidneys and damage surrounding tissue. Furthermore, congenital malformations that occur during fetal development, such as narrowing of the urinary tract, can disrupt urine flow and cause urine to back up into the kidneys (reflux), which can then trigger infection and damage kidney tissue. Autoimmune diseases such as lupus can also affect the kidneys due to immune system disorders. Furthermore, urinary tract obstructions due to kidney stones, tumors, or an enlarged prostate gland in men, as well as recurrent urinary tract infections, are also factors that can cause impaired kidney function (National Kidney Foundation, 2016).

7) Pathway

This pathway diagram depicting the relationship between hypertension, diabetes mellitus, and the development of chronic kidney disease (CKD) shows how both conditions can lead to progressive kidney damage. Hypertension causes structural changes in the renal blood vessels, while diabetes mellitus causes damage to the glomeruli, ultimately contributing to the decline in kidney function and the development of chronic kidney disease (CKD).

8) Chronic Kidney Failure Stages

The Kidney Disease Outcomes Quality Initiative (K/DOQI) (National Kidney Foundation, 2016) classifies chronic kidney disease into five stages. This classification is based on the degree of kidney damage and the glomerular filtration rate (GFR), the primary indicator of kidney function. This classification table provides a clear overview of each stage, ranging from mild kidney damage to end-stage renal failure.

Table 2.2 Stages of Chronic Kidney Failure (NKF, 2016)

Stage	Description	Glomerular Filtration Rate (GFR) (mL/min/1.73m ²)
1	Kidney damage (e.g., protein in the urine) with normal GFR	90 or more of the above
2	Kidney damage with mild decrease in GFR	60 – 89

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3a	Moderate decrease in GFR	45 – 59
3b	Moderate decrease in GFR	30 – 44
4	Severe decrease in GFR	15 – 29
5	Kidney failure	Less than 15

Theoretical Framework

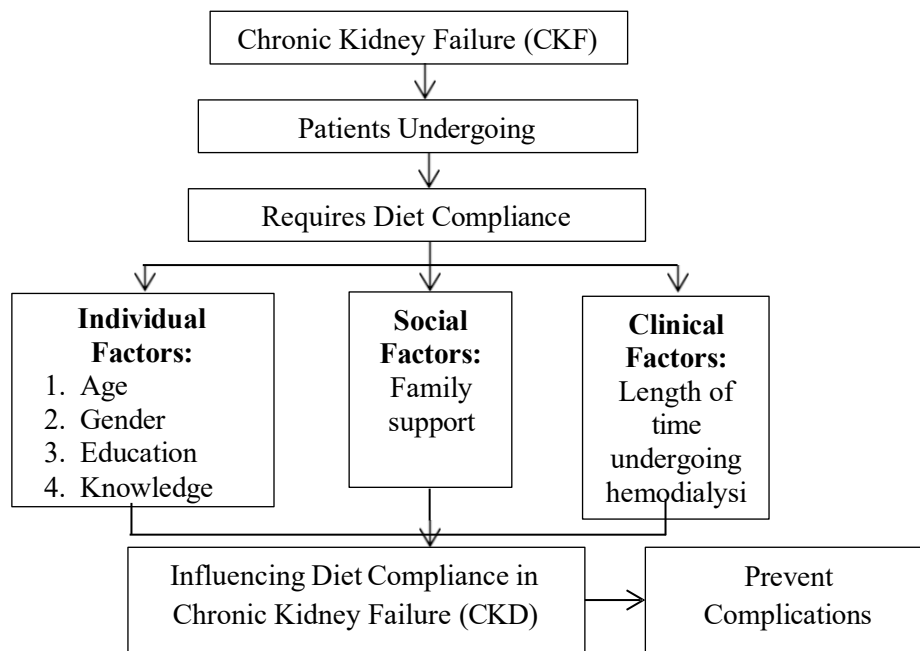


Figure 2.2Theoretical Framework(Kara, Caglar and Kilic, 2007),(Mailani and Bakri, 2020)

Conceptual Framework

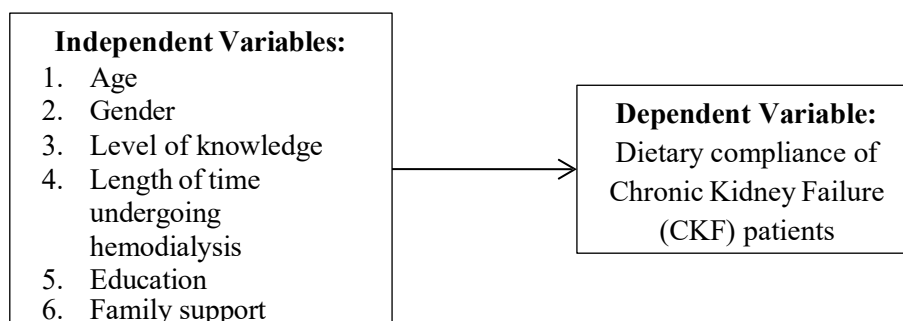


Figure 2.3Conceptual Framework

Information:

□ : Variables studied → : Directions studied (influence)

9) Hypothesis

Alternative Hypothesis

- a. H1: There is a relationship between age and dietary compliance in CKD patients undergoing hemodialysis.
- b. H2: There is a relationship between gender and dietary compliance in CKD patients undergoing hemodialysis.
- c. H3: There is a relationship between the level of knowledge and dietary compliance in CKD patients undergoing hemodialysis.
- d. H4: There is a relationship between the length of hemodialysis and dietary compliance in CKD patients undergoing hemodialysis.
- e. H5: There is a relationship between education level and dietary compliance in CKD patients undergoing hemodialysis.
- f. H6: There is a relationship between family support and dietary compliance in CKD patients undergoing hemodialysis.

10) Null Hypothesis (H0)

There was no significant relationship between individual factors (age, gender, level of knowledge, length of hemodialysis, education, and family support) and adherence to diet in Chronic Kidney Failure (CKF) patients undergoing hemodialysis at RSI Pati.

METHOD

A. Type of Research

This study uses a quantitative approach that refers to the positivistic paradigm. The quantitative approach is considered a scientific method because it meets the principles of concrete, empirical, objective, structured, rational, and systematic science (Sugiyono, 2013). The purpose of this approach is to test previously formulated hypotheses through research on specific populations and samples, using research instruments to collect data, and analyzing the data statistically. The type of research used is descriptive correlation research, which aims to describe and reveal the relationship between independent variables (age, gender, knowledge, duration of hemodialysis, education, and family support) with the dependent variable (dietary compliance of CKD patients undergoing hemodialysis).

B. Research Design

The research design used, in line with descriptive correlation research, is a cross-sectional approach. This design aims to describe and test the relationship between independent variables (age, gender, knowledge, duration of hemodialysis, education, and family support) and the dependent variable (dietary compliance of CKD patients undergoing hemodialysis). Data were collected at a single point in time to analyze correlations between variables without manipulating them.

C. Research Variables

This study consists of two types of variables: independent variables and dependent variables. Independent variables are variables that influence or cause changes in/information of the dependent variable (Sugiyono, 2013). In this study, the independent variables include: age, gender, patient knowledge about diet and hemodialysis, length of time the patient has been on hemodialysis, education level, and family support. Meanwhile, the dependent variable is a variable that is influenced by or results from the independent variable (Sugiyono, 2013), namely the level of dietary compliance of chronic kidney failure (CKF) patients undergoing hemodialysis.

D. Time and Place of Research

This research was conducted at the Pati Islamic Hospital, located at Jl. Raya Pati-Tayu Km. 18, Waturoyo, Margoyoso, Pati Regency. The research was conducted in June 2025. Determining the location and timing of this research is important to ensure that the data collected is relevant and reliable.

E. Research Population

A population is a collection of objects or subjects that have certain characteristics and traits that have been determined by the researcher, so that they can be used as study material to then draw conclusions (Sugiyono, 2013). The population in this study was all chronic kidney failure (CKF) patients undergoing hemodialysis at RSI Pati, which amounted to 50 people. This population includes patients with various characteristics of age, gender, education level, length of hemodialysis, level of knowledge, and support from different families.

F. Samples and Sampling Techniques

According to Sugiyono (2013), sampling procedures in research can be carried out using two approaches: probability sampling and non-probability sampling. Probability sampling provides an equal opportunity for each member of the population to be selected as a sample, while non-probability sampling does not provide an equal opportunity. In this study, the researcher used a saturated sampling technique (total sampling), which is included in non-probability sampling. Saturated sampling is a sampling technique in which all members of the population are used as samples, usually used when the population is relatively small (less than 30–50 people). Based on this procedure, the researcher does not conduct a specific sample selection because all members of the population are used as research respondents.

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G. Operational Definition

An operational definition is a description of each variable in a study, with the aim of ensuring that these variables can be measured concretely using specific instruments. This study includes seven variables: age (X1), gender (X2), education (X3), knowledge (X4), duration of hemodialysis (X5), family support (X6), and dietary compliance of chronic kidney disease (CKD) patients undergoing HD (Y). This operational definition aims to facilitate readers in interpreting the research's meaning and ensure that measurements are carried out accurately.

Table 3.1 Operational Definitions

No	Variables	Operational Definition	Measuring Tools/Methods	Measurement Results	Measuring Scale
Independent Instrument					
1.	Age (X1)	Age undergoing hemodialysis is calculated based on year of birth.	Questionnaire	1. > 65 years 2. ≤ 65 years	Ordinal
2.	Gender (X2)	The patient's biological identity as male and female	Questionnaire	1. Man 2. Woman	Nominal
3.	Education (X3)	The level of formal education that the respondent has completed	Questionnaire	1. PT (high) 2. High school (medium) 3. Elementary-Middle School (low)	Nominal
4.	Knowledge (X4)	Level of patient understanding regarding diet for CKD and hemodialysis	Questionnaire	1. Good, if the score obtained is ≥ median (6.0) 2. Less, if the score obtained is < median (6.0)	Ordinal
5.	Long time undergoing HD (X5)	The number of years from the start of hemodialysis until the time the study was conducted	Questionnaire	1. ≤ 4 years 2. > 4 years	Ordinal
6.	Family support (X6)	Any form that comes from outside the individual (family) that influences patient compliance	Questionnaire	1. Good, if the score obtained is ≥ median (34.0) 2. Less, if the score obtained is < median (34.0)	Ordinal
Dependent Instrument					
7.	Dietary compliance of CKD patients undergoing HD (Y)	Respondent compliance in following the dialysis program, including fluid restrictions, nutrition, medication, and hemodialysis session visits in accordance with the advice of health workers.	Modified ESRD-AQ questionnaire	1. Comply, if the score obtained is ≥ 800 2. Disobedient, if the score obtained is <800	Ordinal

H. Research Instruments

A research instrument is a tool used by researchers to evaluate phenomena, both natural and social. In this study, researchers used a structured questionnaire developed based on theory and previous studies. The questionnaire

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consists of several sections: Respondent Demographics: Collecting basic information such as age, gender, highest education level, and duration of hemodialysis, to determine the distribution of respondent characteristics.

Knowledge of Hemodialysis (HD): Measures respondents' understanding of hemodialysis therapy with 10 dichotomous statements (yes/no), where the maximum score is 10. Knowledge categories: high (≥ 8), moderate (7-5), and low (< 4).

Family Support: Measures respondents' perceptions of family support in hemodialysis therapy and diet. Consisting of 7 statements with a 5-point Likert scale. The maximum score is 35, with categories: good (35-24), moderate (23-13), and poor (<12). Compliance-Related Exposure: Measures the level of patient compliance with hemodialysis therapy and lifestyle management using a modification of The End-Stage Renal Disease Adherence Questionnaire (ESRD-AQ). Consisting of 6 items with scoring that categorizes compliance into adherent (score ≥ 800) and non-adherent (<800) out of a total score of 1200.

Table 3.2 Compliance Questionnaire Scores (Kim, 2010)

Items in question	Score/value
a) Frequency of HD session absences in a month	1 = 200
b) Frequency of HD time acceleration that occurs in a month	2 = 150 3 = 100
c) Accelerated HD time duration in a month	4 = 50
d) Frequency of not taking medication in a month	5 = 0
e) Frequency of fluid restriction (self-mentoring)	
f) Frequency of dietary restrictions (self-mentoring)	

I. Validity and Reliability Test

Validity Test: This test measures the ability of a measuring instrument to reflect the phenomenon being measured. Content validity indicates the extent to which the items in the instrument reflect the overall measure. In this study, the instrument was adapted from Ahmad Helmi's (2020) research and tested using the Pearson Product Moment technique. The results showed that the calculated r value for all items was greater than the table r (0.361), thus it was declared valid.

Table 3.3 Instrument Validity Test

Questionnaire	Number of Items	Calculated r value	r table (N=30)	Conclusion
Knowledge	10	0.632	0.361	Valid
Family support	7	0.632	0.361	Valid
Diet compliance	6	0.632	0.361	Valid

Reliability Test: This test measures the consistency of measurement results. An instrument is considered reliable if it produces consistent results in repeated measurements. Reliability testing is conducted using the Cronbach's Alpha method, where an α value ≥ 0.7 indicates reliability. All questionnaires in previous studies had values above 0.7, thus being considered reliable.

Table 3.4 Instrument Reliability Test

Questionnaire	Number of Items	Cronbach's Alpha	Conclusion
Knowledge	10	0.984	High reliability
Family support	7	0.969	High reliability
Diet compliance	6	0.780	Reliable enough

J. Data Processing Techniques

Data processing is the process of obtaining a summary of data using specific techniques, which are divided into statistical (quantitative) and non-statistical (qualitative) techniques. This study used quantitative data obtained from questionnaires of CKD patients undergoing hemodialysis, and processed using the following steps:

- 1) Editing: Checking and correcting questionnaires to ensure completeness and clarity of data. This process is carried out in the field so that any unclear data can be confirmed with respondents.
- 2) Coding: Converting qualitative data into numerical data to simplify data input into a computer system. Each item is assigned a code to prevent duplication.
- 3) Entry: Entering collected data into a computer table or database. This process requires precision to avoid input errors.
- 4) Verification: Double-checking entered data to ensure there are no errors or duplications. Verification is performed manually and using statistical software validation features.
- 5) Output: Produces statistical output such as frequency distribution tables and statistical test results. Data is analyzed using the Spearman Rank correlation test to determine the relationship between the independent and dependent variables.

K. Data Analysis

Data analysis was conducted after data collection, using univariate and bivariate analysis: Univariate Analysis: Describes each variable, including patient dietary compliance and independent variables. Data were calculated for frequency and percentage, presented in a table.

Bivariate Analysis: Using the Chi-Square test to determine the relationship between independent and dependent variables. This test examines the hypothesis of a significant relationship between factors such as age and education and dietary adherence.

The Chi Square formula used is:

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e}$$

Information:

χ^2 = Chi Square count

f_o = Observed frequency

f_e = Expected frequency

According to Sabri and Hastono (2010), the conditions for using the Chi Square test are:

- a. Data must be categorical in scale.
- b. If in the 2x2 table there is an expected value < 5 , then the Fisher Exact Test is used.
- c. If the 2x2 table does not contain an E value < 5 , then Continuity Correction is used.
- d. If the table is larger than 2x2, then Pearson Chi Square is used.

L. Research Course

Preparation Stage: Includes problem identification, title determination, consultation with supervisor, permit processing, preliminary study, literature study, and instrument creation and testing.

Implementation Stage: Arranging research permits, providing informed consent, introducing the research to respondents, and distributing questionnaires for 6 days.

Data Collection and Processing Stage: Editing, entering, and analyzing data using SPSS.

Research Results Consultation: Consult the findings with the supervisor before the final exam.

Research Results Examination: Presenting research results in a thesis defense.

M. Research Ethics

Important aspects of research ethics include:

1. Informed Consent Sheet: Provide the consent sheet to respondents after explaining the purpose of the research.
2. Anonymity: Maintaining the confidentiality of respondents' identities.
3. Data Confidentiality: Maintaining the information provided by respondents so that it is not disseminated individually.

N. Research Schedule

The research schedule table includes activities from title submission to revision and collection of final results.

RESULTS AND DISCUSSION

A. General Description of Research Location

This research was conducted at the Islamic Hospital (RSI) Pati, located on Jalan Raya Pati-Tayu Km. 18, Kampunganyar, Waturoyo, Margoyoso District, Pati Regency. RSI Pati is a private healthcare facility managed by the YKM NU Pati Foundation and was established in 1994. To date, RSI Pati is still operating and is one of the main referral centers for healthcare services in the Pati area and its surroundings. Various medical services are provided at RSI Pati, including outpatient services, inpatient care, emergency room (ER), laboratory, specialist polyclinic, and other supporting units such as hemodialysis services. The hemodialysis unit at RSI Pati is equipped with eight machines and beds, managed by seven certified nurses. At the time of this research, there were 50 patients registered as active participants in the hemodialysis program.

B. Research Results

Univariate Analysis

a. Respondent Characteristics

The age of the respondents indicated that the majority were under 60 years old, with 34 people (68%) in this group, while 16 people (32%) were aged 60 years and above. This age division uses the 60-year threshold, which is often used in health research to distinguish between productive age groups and the elderly. These results indicate that chronic kidney failure patients undergoing hemodialysis at RSI Pati are mostly from the productive age group, namely between 18 and 59 years old.

Table 4.1 Frequency Distribution of Respondents Based on Age

Age	Frequency	Percentage (%)
< 60 years	34	68%
≥ 60 years	16	32%
Total	50	100%

Source: Primary Data, 2025

b. Gender

The gender distribution of respondents showed a balance between men and women, with 25 people in each group (50%). This reflects the fact that chronic kidney disease can affect both sexes equally. Although many studies indicate that men are more susceptible to CKD, these results indicate a balanced proportion between the two sexes in this study.

Table 4.2 Frequency Distribution of Respondents Based on Gender

Gender	Frequency	Percentage (%)
Man	25	50%
Woman	25	50%
Total	50	100%

Source: Primary Data, 2025

c. Education

Based on education level, the majority of respondents had a secondary education (high school), namely 30 respondents (60%). Respondents with lower education (middle school and elementary school) numbered 17 (34%), while only 3 (6%) had a higher education (high school). These findings indicate that the majority of patients have sufficient education, which may influence their understanding of medical information.

Table 4.3 Frequency Distribution of Respondents Based on Education

Level of education	Frequency	Percentage (%)
Height (PT)	3	6%
Middle (High School)	30	60%
Low (Junior High & Elementary School)	17	34%
Total	50	100%

Source: Primary Data, 2025

d. Length of Hemodialysis Treatment

The study results showed that most respondents had undergone hemodialysis therapy for ≤ 4 years, namely 38 people (76%). The remaining 12 people (24%) had undergone therapy for more than 4 years. The length of hemodialysis therapy can affect patient adaptation to the procedure and dietary restrictions.

Table 4.4 Frequency Distribution of Respondents Based on Length of Hemodialysis

Duration of HD	Frequency	Percentage (%)
≤ 4 years	38	76%
> 4 years	12	24%
Total	50	100%

Source: Primary Data, 2025

e. Knowledge

Most respondents (26 respondents) had a moderate level of knowledge regarding hemodialysis therapy. Sixteen (32%) had a high level of knowledge, while eight (16%) had a low level of knowledge. Good knowledge is crucial for preventing complications that may arise from improper dietary management.

Table 4.5 Frequency Distribution of Respondents Based on Knowledge of HD Therapy

Level of Knowledge	Score Range	Frequency	Percentage (%)
Tall	10 – 8	16	32%
Currently	7 – 5	26	52%
Low	< 5	8	16%
Total		50	100%

Source: Primary Data, 2025

f. Family Support

Family support for hemodialysis patients also showed positive results, with 41 (82%) reporting high levels of family support. This indicates that the majority of patients receive attention and involvement from their families, which can help them adhere to dietary and therapy recommendations.

Table 4.6 Frequency Distribution of Respondents Based on Family Support

Support Level	Score Range	Frequency	Percentage (%)
Tall	35 – 24	41	82%
Currently	23 – 13	7	14%
Low	< 12	2	4%
Total		50	100%

Source: Primary Data, 2025

g. Diet Compliance

In terms of dietary compliance, the study results showed that 30 people (60%) were in the high compliance category. Only 20 people (40%) were in the moderate compliance category, and no respondents were in the low compliance category. This high level of compliance indicates that patients at RSI Pati are able to follow the dietary recommendations provided by healthcare professionals.

Table 4.7 Frequency Distribution of Respondents Based on Diet Compliance

Diet Compliance Level	Score Range	Frequency	Percentage (%)
Tall	1200 – 801	30	60%
Currently	800 – 401	20	40%
Low	< 400	0	0%
Total		50	100%

Source: Primary Data, 2025

Bivariate Analysis

a. Relationship between Age and Diet Compliance

The analysis results showed no significant association between age and dietary adherence, with a p-value of 0.386. However, the age group ≥ 60 years showed a tendency for higher adherence compared to the age group < 60 years. This tendency may be due to greater experience and health awareness in older patients.

Table 4.8 Analysis of the Relationship between Age and Diet Compliance in CKD Patients

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Undergoing Hemodialysis at RSI Pati in 2025 (n = 50)							
Age	Compliance				Total		<i>p-value</i>
	Obedient		Not obey		f	%	
	f	%	f	%	f	%	
< 60 years	19	55.9	15	44.1	34	100	0.386
≥ 60 years	11	68.8	5	31.3	16	100	
Total	30	60	20	40	50	100	

Source: Primary Data, 2025

b. Relationship between Gender and Diet Compliance

There was no significant association between gender and dietary adherence, with a p-value of 0.248. However, female respondents showed higher adherence rates than male respondents. This may be due to psychosocial factors, as women tend to be more attentive to medical instructions.

Table 4.9 Analysis of the Relationship between Gender and Diet Compliance of CKD Patients Undergoing Hemodialysis at RSI Pati in 2025 (n = 50)

Gender	Compliance				Total		p-value
	Obedient		Not obey		f	%	
	f	%	f	%			
Man	13	52	12	48	25	100	0.248
Woman	17	68	8	32	25	100	
Total	30	60	20	40	50	100	

Source: Primary Data, 2025

c. Relationship between Education and Diet Compliance

The analysis showed no significant relationship between education level and dietary adherence, with a p-value of 0.071. Although respondents with low education demonstrated the highest levels of adherence, these results suggest that other factors may be more dominant in influencing dietary adherence.

Table 4.10 Analysis of the Relationship between Education and Diet Compliance in CKD Patients Undergoing Hemodialysis at RSI Pati in 2025 (n = 50)

Level of education	Compliance				Total		p-value
	Obedient		Not obey		f	%	
	f	%	f	%			
Tall	0	0	3	100	3	100	0.071
Currently	18	60	12	40	30	100	
Low	12	70.6	5	29.4	17	100	
Total	30	60	20	40	50	100	

Source: Primary Data, 2025

d. Relationship between Length of HD and Diet Compliance

The results showed no significant relationship between the duration of hemodialysis and dietary adherence, with a p-value of 0.137. Respondents undergoing hemodialysis for ≤4 years tended to be more compliant than those undergoing more than 4 years, although this difference was not statistically significant.

Table 4.11 Analysis of the relationship between length of HD treatment and patient diet compliance Patients with GGK Undergoing Hemodialysis at RSI Pati in 2025 (n = 50)

Duration of HD	Compliance				Total		p-value
	Obedient		Not obey		f	%	
	f	%	f	%			
≤ 4 years	25	65.8	13	34.2	38	100	0.137
> 4 years	5	41.7	7	58.3	12	100	
Total	30	60	20	40	50	100	

e. Relationship between Knowledge and Diet Compliance

There was a significant relationship between knowledge level and dietary adherence, with a p-value of 0.011. Patients with low knowledge showed the highest adherence levels, which may be due to other factors influencing their adherence behavior.

Table 4.12 Analysis of the Relationship between Knowledge and Diet Compliance of CKD Patients Undergoing Hemodialysis at RSI Pati in 2025 (n = 50)

Level of Knowledge	Compliance				Total		p-value
	Obedient		Not obey		f	%	
	f	%	f	%			
Tall	5	31.3	11	68.8	16	100	0.011
Currently	18	69.2	8	30.8	26	100	
Low	7	87.5	1	12.5	8	100	

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Total	30	60	20	40	50	100
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Source: Primary Data, 2025

f. Relationship between Family Support and Diet Compliance

The analysis showed no significant relationship between family support and dietary adherence, with a p-value of 0.498. Although patients with low support demonstrated the highest adherence, this suggests that other factors, such as individual motivation, may be more influential.

Table 4.13 Analysis of the Relationship between Family Support and Diet Compliance of CKD Patients Undergoing Hemodialysis at RSI Pati in 2025 (n = 50)

Level of Family Support	Compliance				Total		p-value
	Obedient		Not obey		f	%	
	f	%	f	%			
Tall	24	58.5	17	41.5	41	100	0.498
Currently	4	57.1	3	42.9	7	100	
Low	2	100	0	0	2	100	
Total	30	60	20	40	50	100	

Source: Primary Data, 2025

DISCUSSION

This study showed that the characteristics of the respondents varied, with the majority being of productive age and having secondary education. High family support and good dietary adherence suggest that health interventions can be effective in RSI Pati. However, the relationship between these variables highlights complexities that need to be considered to improve dietary adherence in patients with chronic kidney disease (CKD) undergoing hemodialysis.

CONCLUSION

Based on the results of research conducted on the relationship between age, gender, education, duration of hemodialysis, level of knowledge, and family support on dietary compliance in chronic kidney failure patients at RSI Pati, it can be concluded that there is no significant relationship between age, gender, education, and duration of hemodialysis with the level of dietary compliance. However, there is a significant relationship between the level of knowledge and dietary compliance, where patients with low levels of knowledge show a higher level of compliance compared to patients with high levels of knowledge. This finding is contrary to general expectations, so further research is needed to understand other factors that may play a role.

SUGGESTION

For healthcare professionals, it is recommended that educational approaches regarding hemodialysis patient diets be interactive and ongoing, taking into account the patient's understanding and individual health conditions. Regular evaluation of dietary adherence is also crucial. Patients and their families are advised to actively seek information about the diet of patients with chronic kidney disease and support the implementation of the diet recommended by healthcare professionals, both at home and during hospitalization.

RECOMMENDATIONS FOR FURTHER RESEARCH

Future researchers are advised to involve a larger number of respondents and more diverse research locations to generalize the results. Furthermore, other variables such as economic status, psychological conditions, personal motivation, and adherence to hemodialysis schedules should be considered as factors that may influence dietary adherence. A longitudinal research design is also recommended to monitor changes in dietary adherence behavior over the long term.

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