

Correlation of Drug-Related Problems and Quality of Life in Chronic Kidney Disease (CKD) Patients Undergoing Hemodialysis

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ABSTRACT

The complexity of treatment with the disease in patients with chronic kidney disease (CKD) can increase the incidence of Drug Related Problems (DRPs). Analysis of DRPs is very useful to reduce the duration of illness, death, and treatment costs. The condition of patients who require hemodialysis therapy can cause changes such as physical, psychological, lifestyle and social that have an impact on the quality of life. This study aims to determine correlation between DRPs and the quality of life of CKD patients undergoing hemodialysis at Dr. Pirngadi Hospital, Medan, Indonesia.

This study uses an observational method with a retrospective and prospective cross sectional research design on 72 patients who met the inclusion criteria in February-March 2024. DRPs were analyzed applying Cipolle and quality of life was obtained using the EQ-5D-5L questionnaire. The data was analyzed using the Spearman Rho test in the SPSS program.

The results showed that there were DRPs in 64 patients with the categories of needing additional drugs (3.38%), unnecessary therapy (15.54%), drug interactions (35.13%) and ineffective drugs (45.95%). Quality of life with categories of good (36.1%), adequate (41.7%), and poor (22.2%). The patient's average quality of life score was 0.657. There was a correlation between the number of DRPs and the patient's quality of life ($r=-0.802$) with a significance value of $p=0.032$ ($p<0.05$), which shows that the higher the incidence rate of DRPs, the lower the patient's quality of life. Based on the results of the study, it was concluded that there was a significant relationship between the number of DRPs events and the quality-of-life value of CKD patients undergoing hemodialysis.

Keywords: Chronic Kidney Disease; Hemodialysis; DRPs; Quality of Life

Introduction

Chronic kidney disease (CKD) is one of the major causes of death in the world various age groups (Putri et al., 2020). Chronic kidney failure is a condition where there is chronic decline in kidney function (Makmur et al., 2022). According to the World Health Organization (WHO) the incidence of CKD in the world reaches 10 percent of the population, with patients hemodialysis reaches 1.5 million people in the world. The incidence of CKD increases every year and ranks 20th in mortality in the world (Juwita et al., 2022). The Global Burden of Disease (GBD) reports an increase in CKD in the list. Mortality was ranked 13th in 2016 and in 2017 it was ranked 12th, the figure global deaths at all ages caused by chronic kidney failure increased by 41.55 percent between 1990-2017 (Kovesdy, 2022). Based on the Basic Health Research report (RISKESDAS) in 2018, the prevalence of CKD in Indonesia reached 0.38% of the entire Indonesian population. In North Sumatera, the prevalence of CKD reached 0.33% (Ministry of Health of the Republic of Indonesia, 2018). Based on the 2018 Indonesian Renal Registry (IRR) report, North Sumatera is one of the provinces with data on CKD patients undergoing hemodialysis quite high at 4,076 new patients (IRR, 2018).

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Hemodialysis is a method where blood is removed from the body for circulation through an external machine called a dialyzer before returning to the body (Aryzki et al., 2019). The goal of therapy in CKD patients is not to cure but to slow it down disease progression, treatment for CKD needs to be adjusted and avoidance of drug doses because the glomerular filtration rate has decreased (Sari et al., 2023). The complexity of treatment with comorbidities in patients with CKD can be increasing the potential for drug-related problems (DRPs) (Diputra et al., 2020). Drug-related problems (DRPs) is an analysis that examines drug therapy that has a real impact or potential that can influence the results of a person's health therapy (Juwita et al., 2022).

Several studies have been conducted regarding DRPs in failed patients chronic kidney disease in various parts of the world, one of which was research conducted in Nigeria which identified the incidence of DRPs namely, there were 234 incidents in the election problem category drugs, as well as drug interactions (Adibe et al., 2017). Other research in African countries in patients with chronic renal failure there is an incidence of DRPs with patient drug interaction category 20%, drug dose too low by 18%, and the presence of additional drug therapy was 31% (Garedow et al., 2019). Research that the same thing was also done in Indonesia where DRPs were found in patients CKD at RSUP Dr. M. Djamil Padang in 2021, there were DRPs in 20 patients. The occurrence of DRPs was also found in Sumatera Utara where there are 11 patients with CKD at the central general hospital H. Adam Malik Medan and there were 12 cases of DRPs (Utami, 2017).

The condition of patients who require dialysis therapy (hemodialysis) can resulting in changes, such as physical, psychological, or lifestyle changes, and social changes that impact the patient's quality of life (Rustendi et al., 2022). Quality of life is an important indicator for assessing health status and the effectiveness of a treatment action as well as the survival of CKD sufferers undergoing hemodialysis (Ibrahim, 2022). WHO defines quality of life as a person's perception of his or her position in life, involving culture, values, where he lives, interests, hopes, life goals, and the standards he wants to achieve individual (Nurgusmy et al., 2022). Quality of life is a subjective perceptual person's physical, psychological, social, and environmental conditions in daily life. Quality of life is an important indicator to evaluate a treatment action for patients (Aryzki et al., 2019). Quality of life a patient is a subjective thing; where to know how a person's quality of life can be measured or assessed from various conditions. Assessment of quality of life in patients is carried out by monitoring status functional and statements related to the patient's condition (Anggraini and Fadila, 2022).

Chronic Kidney Disease has significant side effects on quality health-related of life (HRQoL). HRQoL is a multidimensional concept that assesses a person's views (perceptions) of health so that it becomes a useful indicator to see severity of the disease. This HRQoL assessment helps in identify the need to design new policies or improved, strategic planning, allocating resources health effectively, as well as planning appropriate strategies. Apart from that guide and assist in improving the monitoring of the results of the intervention public health (Cardoso et al., 2016). Chronic kidney disease requiring hemodialysis can greatly affect an individual physically or mentally, where the individual will undergoing hemodialysis for the rest of his life carried out 2-3 times a week and requires 2-5 hours of therapy each time can cause bored and stress due to fear of loss work, thinking about costs, and physical changes. This condition is very affect the patient's quality of life. It is necessary to assess the quality of life related to health (HRQoL) to be able to see an overview of adisease and the therapy received by the patient is related to quality of life (Firmansyah et al., 2022).

An example of an instrument that can measure quality of life is a questionnaire European Quality of Life Five Dimension Five Levels (EQ-5D-5L). Questionnaire European Quality of Life Five Dimension Five Levels (EQ-5D-5L) consists of five dimensions include patient mobility, self-care, usual activities, pain/discomfort, and anxiety/depression. Five dimensions each categorized into five levels known as 5L (1= no problem, 2= slight problems, 3= moderate problems, 4= severe problems, and 5= unable). The EQ-5D descriptive system is followed by a self-assessment overall health status on a visual analog scale (EQ VAS), ranges from 0 to 100, where 0 = the worst possible health of the patient and 100 = the best health the patient can imagine (Purba et al., 2019). The patient's quality of life score is grouped into 3 categories, namely category good (score ≥ 0.8), fair category (score 0.6-0.8), and poor category (score < 0.6) (Nasution et al., 2018).

In response to the above problems, the present study was conducted to determine correlation between DRPs and the quality of life of CKD patients undergoing hemodialysis at Dr. Pirngadi Hospital, Medan, Indonesia.

Materials and Methode

Study Design

This study uses an observational method with a retrospective and prospective cross sectional research design in patients who met the inclusion criteria in February-March 2024. This research was approved by Health Research Ethics Committee Faculty of Nursing, University of Sumatera Utara Number 3022/I/SP/2024. All patients who participated in the research it signs and delivers consent as proof of willingness to become a respondent.

Subject

The subjects in this study were 72 CKD patients undergoing hemodialysis. Criteria inclusion of patients who become respondents included: patients diagnosed with stage V CKD who had undergo hemodialysis for at least 3 months, patients undergoing hemodialysis 2 and 3 times a week, men and women aged ≥ 18 years, and patients who are willing and able to complete the questionnaire. Exclusion criteria patients include: CKD patients who do not undergo hemodialysis routinely, patients diagnosed with stage V CKD who are not undergoing hemodialysis for more than 3 months, patients who are not willing to fill out the questionnaire, and patients who experience impaired consciousness and die.

Instrument

The Patient characteristics were assessed using a self-designed questionnaire. DRPs were analyzed applying Cipolle, and Quality of life is measured using Questionnaire European Quality of Life Five Dimension Five Levels (EQ-5D-5L) consists of five dimensions include patient mobility, self-care, usual activities, pain/discomfort, and anxiety/depression. Five dimensions each categorized into five levels known as 5L (1= no problem, 2= slight problems, 3= moderate problems, 4= severe problems, and 5= unable). The EQ-5D descriptive system is followed by a self-assessment overall health status on a visual analog scale (EQ VAS), ranges from 0 to 100, where 0 = the worst possible health of the patient and 100 = the best health the patient can imagine (Purba et al., 2019). The patient's quality of life score is grouped into 3 categories, namely category good (score ≥ 0.8), fair category (score 0.6-0.8), and poor category (score < 0.6) (Nasution et al., 2018).

Data Analysis

Data were analyzed using Spearman Rho correlation analysis to determine the correlation between the incidence of Drug Related Problems (DRPs) and the quality of life of CKD patients undergoing hemodialysis at Dr. Pirngadi hospital, Medan, Indonesia.

Result and Discussion

Patient Characteristic

This research was conducted to analyze Drug Related Problems (DRPs) and quality of life in CKD patients at Dr. Pirngadi hospital, Medan, Indonesia. The research was conducted in the hemodialysis installation room at hospital Dr. Pirngadi in 72 patients undergoing hemodialysis and meeting the inclusion criteria. Characteristics of CKD patients undergoing hemodialysis based on gender, age, education, and duration of hemodialysis can be seen in Table 1.

Table 1. Patient characteristics during the study

Gender		Age		Education		Duration Hemodialysis	
Variable	Number (%)	Variable	Number (%)	Variable	Number (%)	Variable	Number (%)
Male	50 (69.44)	< 45	24 (33.33)	Primary School	2 (2.78)	<1	24 (33.33)
Female	22 (30.56)	45-65	45 (62.50)	Senior High School	59 (81.94)	1-5	30 (41.67)
		> 65	3 (4.17)	University	11 (15.28)	>5	18 (25.00)
Total	72 (100.00)	Total	72 (100.00)	Total	72 (100.00)	Total	72 (100.00)

As shown in Table 1, The majority of CKD patients undergoing hemodialysis are of any gender there were 50 mens (69.4%), with an age range of 45-65 years as many as 45 patients (62.50%), with an education level at senior high school level as many as 59 patients (81.94%), and the duration of hemodialysis was predominantly in the range of 1 to 5 years for 30 patients (41.67%).

The patient's age, level of education, occupation, and length of illness were all very different. Numerous complex elements were linked to these diseases. A comprehensive study established that the features of individuals with CKD as well as the morbidity and mortality of the disease are influenced by socioeconomic factors, such as income or employment level, education level, health insurance, and access to healthcare facilities (Morton et al. 2016).

Based on 2018 Basic Health Research (Riskesmas) data, the prevalence of CKD sufferers is higher in men at 0.42% while in women it is 0.35%. Physically, the higher proportion of men is caused by poor lifestyle habits such as smoking, consuming coffee, alcohol, and energy drinks. This can result in oxidative stress which can cause damage to the glomerulus and tubular cells. Regarding the specific mechanism of kidney function that is influenced by smoking, the mechanism that occurs is that smoking can cause chronic endothelial dysfunction, oxidative stress, and glomerular hardening. Research shows that nicotine inhalation can cause mesangial cell proliferation, and this mechanism can cause a decrease and deterioration in kidney function (Fu et al., 2022). In relation to instant foods and drinks containing sweeteners that are widely available, especially for drinks, if consumed excessively the effects of consuming these drinks are hypertension, diabetes, and kidney problems. The effects of consuming high doses of energy drinks continuously can cause kidney problems as indicated by an increase in serum creatinine, increased excretion of albumin, and abnormal histological features with thickening of the renal medulla (Diputra et al., 2020). Therefore, a higher proportion of chronic kidney failure occurs in men than in women (Juwita et al., 2022).

The results of the study showed that the prevalence of chronic kidney failure sufferers undergoing hemodialysis was higher in the age group between 45 and 65 years. These results are in line with the results found by (Diputra et al., 2020) that the majority of chronic kidney failure patients were in the age range 45-65 years as many as 45 people (52%), aged under 45 years as many as 15 people (18%) and aged over 65 years 15 people (18%). IRR data (2018), shows that the highest proportion of CKD patients undergoing HD is in the 45 to 55-year age range at 30%, the second highest is in the 56-65-year age range, namely 22%, and at ages over 65 years the percentage is 18%. This is due to a decrease in kidney function that occurs at the age of 30 years and over, and at the age of 60 years, there are physiological changes in the body that can no longer regenerate which affects kidney function (Juwita et al., 2022).

Based on education level, in this study, it was dominated by high school education level. In the theory obtained, it is not explained that there is a connection between the incidence of CKD and the level of education. However, researchers assume that the level of education can influence a person in seeking better treatment for their recovery. Education is an important factor that determines a patient's knowledge. The higher the level of education, the easier it will be for him to receive and absorb information so that this can increase his understanding regarding the disease and treatment he is experiencing (Prasetyo et al., 2018).

Based on the research results obtained, the majority of patients have been on hemodialysis for less than five years, this is in line with research conducted by (Aryzki et al., 2019) stating that the maximum duration of hemodialysis is in the range of 1-5 years as many as 126 people (60.86%). The longer

someone undergoes hemodialysis, the more compliant they are because they have received the benefits and it has become necessary.

Drugs Related Problems

Drug Related Problems are an event or condition involving drug therapy actual (real) or potential that can interfere with the results of the therapy desired (Juwita et al., 2022). The incidence of DRPs in patients with CKD undergoing hemodialysis can be seen in Table 2.

Table 2. The incidence of DRPs in patients with CKD undergoing hemodialysis

Category of DRPs	Number of Events	Percentage (%)
Needs additional drug therapy	5	3.38
Unnecessary drug therapy	23	15.54
Ineffective drug therapy	68	45.94
Drug interactions	52	35.14
Total	148	100,00

Based on the research results presented in Table 2, showed that there were 148 incidents of Drug Related Problems (DRPs) that occurred in patients with CKD patients undergoing hemodialysis at Dr. Pirngadi hospital, Medan, Indonesia. The average number of DRP events per patient was 2.312 ± 1.258 events. The incidence of DRPs includes as many categories of needs additional drug therapy 5 cases (3.38%), unnecessary drug therapy 23 cases (15.54%), ineffective drug therapy 68 cases (45.95%), and drug interactions 52 cases (35.13%). The results of this study are consistent with research (Diputra et al., 2020) that there were 57 drug-related incidents Problems (DRPs) in CKD patients undergoing hemodialysis at hospital 45 Kuningan in category needs additional drug therapy was 5 cases (5.9%), unnecessary drug therapy 17 cases (20%), inappropriate medication for the patient in 18 cases (21.2%), and drug interactions in 17 cases (20%). Research (Juwita et al., 2022) found 20 incidents of DRPs with category needs additional drug therapy was 7 cases (35%), the dose too low was 1 case (5%), and dose too high in 12 cases (60%).

Drug related problems is one condition that can result in morbidity and death in patients not getting optimal therapeutic benefits as expected patients (Kurniawan, 2020). Drug related problems found in this research include category needs additional drug therapy, unnecessary drug therapy, ineffective drug therapy, and drug interactions. DRPs with the category of needs additional therapy, namely patients who have clinical indications requiring medication therapy but not receiving appropriate therapy. This incident was seen in medical records, laboratory results, and prescriptions patient treatment, indications that arise that are not given therapy are hyperkalemia (high potassium levels) and hypertension (high blood pressure) but the patient did not get the medicine. This research is in line with research (Juwita et al., 2022) there were 7 cases (35%) of DRPs in the category of need additional drug therapy for CKD patients at Dr. M. Djamil hospital, Padang. Indications without therapy can be occurs in patients who require additional therapy to treat or prevent disease progression in patients (Diputra et al., 2020).

Unnecessary drug therapy occurs when a patient receives therapy unnecessary treatment, for which clinical indications did not exist at that time (Diputra et al., 2020). The results of unnecessary drug therapy are seen from medical records, laboratory results, and patient medication prescriptions. Unnecessary drug therapy occurs in patients with CKD absolute deficiency anemia is given erythropoiesis-stimulating agent (ESA) therapy, administration of calcium polystyrene drugs with the patient's potassium level being normal, and therapy without other indications is the patient with normal blood pressure were given amlodipine therapy. According to Indonesian Nephrology Association (PERNEFRI), the algorithm ESA therapy in CKD patients undergoing hemodialysis with absolute deficiency anemia administration of ESA therapy should be postponed first, then given iron therapy, whether oral, parenteral intravenous (iron sucrose or iron dextran) and evaluated after one week of therapy (PERNEFRI, 2011).

The next category of DRPs is ineffective drug therapy. Ineffective drug therapy is a drug or therapy that the patient does not receive achieve the desired response so that other therapies are needed (Cipolle et al., 2012). Therapy doesn't effective measures found included a decrease in hemoglobin (Hb) after given

therapy, the patient's Hb did not increase even though he had been treated, furthermore, the patient's blood pressure did not decrease after being given therapy appropriate. Analysis of DRPs in the category of ineffective drug therapy based on medical records of patients, laboratory results, and patient drug prescriptions. Judging from drug prescriptions CKD patients are given Epodion Erythropoietin Alfa 3,000UI, therapy Renogen injection 3,000UI/ml and Hemapo injection. Erythropoietin (EPO) is a hormone glycoproteins produced in the kidneys to increase blood cell production. EPO therapy according to Kidney Disease Improving Global Outcome (KDIGO) in 2012, carried out when the hemoglobin (Hb) value was <10.0 g/dL and not used for maintenance when Hb is above 11.5 g/dL in adult patients. Patients with severe anemia due to CKD $< Hb 9.0$ g/dL and patients undergoing routine hemodialysis requires long-term ESA therapy to prevent anemia-related symptoms, minimize the need for anemia, and improve the quality of life of patients (Shahab and Saifullah Khan, 2020).

Based on recommendations from KDIGO (2012) EPO therapy is not recommended to increase hemoglobin concentration >13 g/dL. EPO therapy in patients CKD who undergoing hemodialysis at hospital Dr. Pirngadi used are Epodion alfa 3,000UI, Renogen injection 3.000UI/ml and Hemapo injection is given when the Hb concentration value is <10.0 g/dL, therapy is maintained when the Hb value is 10-12 g/dL, then ESA therapy stopped when the Hb value is >13 g/dL. There are several underlying factors of the efficacy of ESA therapy, namely the dose required to achieve the dose target hemoglobin concentration and hematocrit values, which can be summarized in pharmacokinetics and pharmacodynamics of a person's ESA, then the factors that influence is the route of administration of ESA therapy (Shahab and Saifullah Khan, 2020). Based on laboratory results in patients it was found that there were several patients who did not experience an increase in hemoglobin concentration and there was a decrease in hemoglobin values after therapy. Hemoglobin is a protein in red blood cells whose job is to carry oxygen throughout the body, when the amount of hemoglobin falls then red blood cells do not function properly and are damaged so this can cause levels of hematocrit to decrease. Kidney disease that has been going on for a long time and is severe can cause anemia. This is due to reduced numbers of the hormone that forms red blood cells (erythropoietin) produced in the kidneys (Ayu et al., 2021). Hemoglobin that is not increased or low is caused by CKD experienced by the patient.

In theory, patients undergoing hemodialysis often experience intradialysis hypertension. Intradialysis hypertension is an increase systolic blood pressure ≥ 10 mmHg starting from pre-hemodialysis until post hemodialysis and felt ≥ 4 in a hemodialysis session consecutive. One of the factors causing intradialysis hypertension is the presence of increase in Intradialytic Weight Gain (IDWG), increase in IDWG can influences many intradialysis complications experienced by patients with the highest frequency is intradialysis hypertension (Dewi et al., 2022). There are several patients whose blood pressure does not decrease even though they have been given therapy contributing factors in patients treated with hemodialysis include volume overload, arterial stiffness, increased sympathetic nervous system activity and renin-angiotensin aldosterone system, endothelial dysfunction, and agent use erythropoietin stimulant. Patients treated with hemodialysis experience chronic sympathetic overactivity, an increased maladaptive response to conditions arterial overload and stiffness. Activity of the renin angiotensin aldosterone system excess is seen from increased plasma renin and aldosterone activity plasma from before and after hemodialysis. Imbalance of vasodilators and endothelium-derived vasoconstrictors also contribute to hypertension, especially the reduced availability of nitric oxide that occurs, an imbalance. This may be exacerbated by the use of erythropoietin-stimulating agents causes vasoconstriction and increases blood viscosity (Bansal et al., 2023).

Another category of DRPS in this study is drug interactions. A drug interaction is an event where the activity of a drug influenced or changed by other drugs used simultaneously (Diputra et al., 2020). Drug interactions based on severity grouped into three levels, namely minor are interactions that occur still low and not dangerous, then moderate interaction, namely interaction that occur that can increase the side effects of the drug, and interactions major is a drug interaction that is potentially dangerous resulting in interactions major monitoring and intervention must be carried out (Mantang et al., 2023). Based on the research results, it was found that the severity level was minor there is a drug interaction, namely a proton pump inhibitor drug interaction (Omeprazole) with the benzodiazepine drug (Alprazolam) where omeprazole may increase the effects of alprazolam (Medscape, 2024). Furthermore at moderate severity

levels there are drug interactions in the beta blocker selective (bisoprolol) with calcium channel blockers (amlodipine), then interacts with the angiotensin receptor blockers (Candesartan and Valsartan) and there are interactions Bisoprolol is an antacid drug (calcium carbonate) and calcium channel blocker (amlodipine) is antacid. Use of the drug Bisoprolol with angiotensin receptor class blockers can both lower blood pressure and increase effects on the other hand, its use must be monitored (Medscape, 2024). Giving antacid drugs with antihypertensive drugs can cause interactions, where antacids can interfere with oral absorption of drugs (Mantang et al., 2023). Drug interactions of major severity occur with drugs diltiazem with calcium channel blockers (amlodipine), the interaction that occurs is that diltiazem can increase the effect of amlodipine by affecting the CYP3A4 enzyme in the liver/intestine (Medscape, 2024). Interaction angiotensin receptor blocker drugs (Telmisartan, Valsartan) with the ACE inhibitor (Captopril), use of both can cause hyperkalemia and kidney disorders after being given this therapy (Sari et al., 2023). In interactions with major severity, use must be monitored because it is potentially dangerous.

Quality of Life

Categories of quality of life for patients CKD undergoing hemodialysis at hospital Dr. Pirngadi Medan is presented in Table 3.

Table 3. Categories of quality of life for patients CKD undergoing hemodialysis

Category Quality of Life	Number (N=72)	Percentage (%)
Good	26	36.11
Fair	30	41.67
Poor	16	22.22

Based on the research results, it was found that the patient's quality of life of CKD undergoing hemodialysis at hospital Dr. Pirngadi, Medan with 72 respondents, the majority were dominated by the adequate quality of life category as many as 30 patients (41.7%), followed by the good quality of life category with 26 patients (36.1%), and in the poor quality of life category there were 16 patients (22.2%). The average quality of life index score of patients undergoing chronic renal failure hemodialysis is 0.657. There were 16 patients with poor quality of life, where this can be seen from interviews and questionnaires of patients experiencing difficulties in walking/moving, difficulty in self-care, difficulty in carrying out usual activities, experiencing pain/pain and patients experiencing depression and anxiety. Relating to quality of life therapy hemodialysis undergoing chronic renal failure patients can affect this quality of life is also affected, including if complications occur. From the research carried out, it can be seen that the average condition of patients at this time undergoing hemodialysis, health is not in perfect condition or even sufficient low.

Correlation Drug Related Problems and Quality of Life

The number of occurrences of DRPs is correlated with the quality of life of CKD patients undergoing hemodialysis. The correlation between the number of DRPs and the patient's quality of life can be seen in Table 4.

Table 4. The correlation between the number of DRPs and the patient's quality of life of CKD Patients undergoing hemodialysis

Number of DRPs	Number of Patients	Average of QoL	Spearman Rho Test	
			Correlation coefficient (<i>r-value</i>)	Sign. (<i>p-value</i>)
1	19	0.729 ± 0.111	r= -0.802	p= 0.032
2	22	0.777 ± 0.142		
3	14	0.641 ± 0.199		

4	3	0.687 ± 0.216
5	5	0.215 ± 0.113
6	1	0.160 ± 0.000

The results of statistical tests using the Spearman Rho correlation test show a correlation value for the number of DRPs incidents and quality of life values ($r=-0.802$). This shows that the number of DRP events and the patient's quality of life value have a strong correlation. A negative correlation indicates that the higher the number of DRP events, the lower the patient's quality of life value, and otherwise, a positive correlation value indicates that the lower the number of DRP events, the higher the patient's quality of life value. The significance value of $p<0.05$ ($p=0.032$) shows that there is a significant correlation between the number of DRPs events and the quality of life value of CKD patients undergoing hemodialysis.

The incidence of DRPS has a correlation with the patient's quality of life. The results of the study showed that the higher the number of DRP events, the lower the value of the patient's quality of life. This research is in line with research (Peri et al., 2022) which found there is a significant relationship between the number of Drug Related Problems with the quality of life of CKD patients with a value of $p=0.002$ and r value = -0.329 which indicates a higher number of DRPs incidence by the patient means the patient's quality of life is getting lower. Drugs Related Problems are events in therapy management that can result in not achieving optimal therapy received by patients (Mantang et al., 2023). Achieving an optimal therapy a person receives can affect the quality of life. The results of this research show that there are many incidents of Drug Related Problems (DRPs). occurs affecting the quality of life of patients undergoing chronic renal failure hemodialysis at hospital Dr. Pirngadi, Medan, Indonesia.

The average quality of life index score of patients undergoing chronic renal failure hemodialysis is 0.657. There were 16 patients with poor quality of life, where this can be seen from interviews and questionnaires of patients experiencing difficulties in walking/moving, difficulty in self-care, difficulty in carrying out usual activities, experiencing pain/pain and patients experiencing depression and anxiety. Relating to quality of life therapy hemodialysis undergoing chronic renal failure patients can affect this quality of life is also affected, including if complications occur. From the research carried out, it can be seen that the average condition of patients at this time undergoing hemodialysis, health is not in perfect condition or even sufficiently low. This research is in line with (Sinaga, 2023) which found an average quality of life index of 0.645 in CKD patients undergoing hemodialysis..

Conclusion

Based on the result the concluded that there were 148 incidents of drug related problems that occurred in chronic kidney failure patients undergoing hemodialysis at hospital Dr. Pirngadi Medan, Indonesia with the category of needing additional medication was 5 incidents (3.38%), unnecessary therapy was 23 incidents (15.54%), therapy was ineffective 68 incidents (45.95%), and drug interactions were 52 incidents (35.13%). There is a relationship between the number of Drug Related Problems and the quality of life of chronic kidney failure patients undergoing hemodialysis at hospital Dr. Pirngadi, Medan, Indonesia, with a significance value of $p=0.032$ ($p<0.05$).

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