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Psychosocial factors affecting the adherence of chronic kidney disease patients to undergo a hemodialysis program: a cross-sectional study

Rondhianto Rondhianto[1]*, Murtaqib Murtaqib[1], and Nila Nabila Yonda[1]

[1] Faculty of Nursing, Universitas Jember, Jember, Indonesia

*Correspondence: Rondhianto Rondhianto. Address: Faculty of Nursing, Universitas Jember, Jember, Indonesia. Email: rondhianto@unej.ac.id

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ABSTRACT

Introduction: : Chronic kidney disease (CKD) patients are often not adherent to undergoing hemodialysis programs. Psychosocial factors, such as knowledge, motivation, coping skills, support from the family and health workers, and depression are the main factors that influence hemodialysis program adherence, which has an impact on successful treatment. This study aims to analyze the effect of psychosocial factors on hemodialysis program adherence.

Methods: The study was cross-sectional, with a sample size of 90 respondents, obtained through simple random sampling. The study's dependent variable was hemodialysis program adherence and the independent variables were knowledge, motivation, coping, depression, perceived family support and health worker support. Data were collected using a questionnaire and analyzed using multiple linear regression.

Results: Most respondents adhered to the hemodialysis program (90%). The level of knowledge, motivation, coping, family support, and health worker support was in the good category (93.3%; 100%; 91.1%; 90%; 88.9%, respectively), and did not experience depression (90%). The independent variables (knowledge, motivation, coping, family support, health worker support) simultaneously significantly affected the dependent variable, namely adherence to the hemodialysis program by 94.5% (R2 = 0.945; F = 236.613; p = 0.001). Partially, the factors of knowledge, motivation, coping, family support, health workers support, and depression also had a significant effect on hemodialysis program adherence (t = 2.234, t = 5.344, t = 3.473, t = -4.190, t = 6.457, t = 4.887, t = 4.190, respectively; p = 0.001).

Conclusions: The study results showed that psychosocial factors (knowledge, motivation, coping, family support, health worker support, and depression) simultaneously or partially influenced the adherence of CKD patients to undergo a hemodialysis program, with the most dominant factor affecting adherence to hemodialysis as perceived family support. Nurses must pay attention to the psychosocial factors of CKD patients in hemodialysis services to increase their adherence to the hemodialysis program and improve the outcomes.

Keywords: Adherence, Hemodialysis, Psychosocial

Introduction

Chronic kidney disease (CKD) is an enormous global health problem, with the number of sufferers reaching 850 million people by 2022, or 10% of the world population, an increase compared to 2017, when there were only 697.5 million people. Indonesia is one of the countries in the Oceania and South East Asia-ISN region with an estimated prevalence of 10.44% (International Society of Nephrology, 2023). Based on the Indonesian Basic Health Research (RISKESDAS), in 2018, 713,783 CKD cases were reported, and East Java was ranked second nationally with 113,045 cases (Ministry of Health Republic of Indonesia, 2019). In the condition of kidney failure, which is the fifth stage or end stage of CKD, patients need kidney replacement therapy, namely transplant or dialysis (hemodialysis or peritoneal

dialysis). However, many CKD patients still do not get the proper treatment, namely hemodialysis programs, especially in lower-middle-income countries such as Indonesia (International Society of Nephrology, 2023). Only 19.33% received hemodialysis treatment in Indonesia; for the province of East Java, it was higher, namely 23.14% (Ministry of Health Republic of Indonesia, 2019). However, the percentage shows that hemodialysis services in East Java province are higher than the national percentage. However, there are still 76.86% of CKD patients who have not received hemodialysis services. Limited access to hemodialysis causes enhanced mortality in CKD patients. The mortality rate was higher in lower-middle-income countries than the global mortality rate (2.6% vs. 2.4%). The mortality rate among CKD patients in Indonesia was 2.47%, which shows that the mortality rate is higher than the global mortality rate (International Society of Nephrology, 2023). The Secretary of the Directorate General of Disease Prevention and Control, Ministry of Health of the Republic of Indonesia said that the death rate in 2019 was 2.35% (1.4 million people), increasing to 3.5% (8.7 million people) in 2023 (Quality Division of PKMK FK UGM, 2024)

A hemodialysis program's success in achieving positive health outcomes in CKD patients is due to their adherence. Low adherence to undergoing a hemodialysis program causes failure to achieve the goals of the hemodialysis program, thus increasing morbidity and mortality (International Society of Nephrology, 2023). Several previous studies showed that adherence of CKD patients undergoing a hemodialysis program is still low, that is only 49.6 – 55.96% (Naalweh et al., 2017; Mukakarangwa et al., 2020; Alzahrani and Al-Khattabi, 2021; Jemali, Munyua and Atoni, 2023). Previous studies in Indonesia also showed the same results, with only 44.2 – 60% of CKD patients undergoing a hemodialysis program (Alisa and Wulandari, 2019; Agu and Tambunan, 2024). Previous studies showed that psychosocial factors were the most dominant influencing CKD patients' adherence to hemodialysis (Cardol et al., 2022; Wen et al., 2023; Yasin et al., 2024). Good knowledge enhances CKD patients' adherence to undergoing a hemodialysis program (Alisa and Wulandari, 2019; Cardol et al., 2022; Mirzaei-Alavijeh et al., 2023; Xu et al., 2023; Yasin et al., 2024). Motivation can influence the behavior of CKD patients. Higher motivation in undergoing a hemodialysis program then will increase adherence to hemodialysis program (Ok and Kutlu, 2021; Cardol et al., 2022; Mirzaei-Alavijeh et al., 2023; Agu and Tambunan, 2024). Besides that, positive coping can also improve hemodialysis adherence (Niihata et al., 2017; Hwang et al., 2018; Ulusoy and Kal, 2020; Melastuti et al., 2022). Symptoms of depression experienced by CKD patients can also worsen adherence to undergoing hemodialysis programs (Pretto et al., 2020; Cardol et al., 2022; Nielsen et al., 2023). Another factor that contributes to adherence to a hemodialysis program is social support. Previous studies stated that high family support can enhancement adherence to hemodialysis in CKD (Al Husna, Yetti and Sukmarini, 2019; Alisa and Wulandari, 2019; Mundakir et al., 2019; Mukakarangwa et al., 2020; Alhamad et al., 2023; Gebrie et al., 2023). Furthermore, previous studies mentioned that support from health workers could also increase adherence of CKD patients undergoing hemodialysis. Higher support from health workers will increase the adherence of CKD patients to undergo hemodialysis programs (Mukakarangwa et al., 2020; Alzahrani and Al-Khattabi, 2021; Sapkota et al., 2022; Gebrie et al., 2023).

However, several other previous studies have shown different results with research results stating that knowledge is unrelated to attitude when undergoing hemodialysis (Xu et al., 2023) and improved adherence in CKD patients (Alikari et al., 2019; Dsouza et al., 2023). Motivation does not always relate to treatment adherence with previous studies having mentioned that motivation is unrelated to the coping of CKD patients undergoing hemodialysis (Melastuti et al., 2022; Zher and Bahari, 2022). Moreover, neither does coping has a positive relationship with adherence to hemodialysis and positive attitude to hemodialysis did not have a significant relationship with hemodialysis adherence (Sheikh et al., 2022; Alhamad et al., 2023). Experience of depression by CKD does not influence their adherence to hemodialysis (Fotaraki et al., 2022; Zher and Bahari, 2022; Jemali, Munyua and Atoni, 2023). Previous studies also showed that social support does not always relate to adherence of CKD patients undergoing hemodialysis. High family support is not always correlated with positive adherence (Al atawi and Alaamri, 2021; Sultan, Fouad and Zaki, 2022). Likewise, support from health workers is not always correlated positively with adherence to CKD patients undergoing hemodialysis (Alhamad et al., 2023). Based on the results of several previous studies, it shows that there was inconsistency in the influence of psychosocial factors, namely knowledge, motivation, coping, depression, family support and support from health workers on the adherence of CKD patients undergoing hemodialysis. Therefore, the study aims to analyze the influence of

psychosocial factors on adherence of CKD patients undergoing hemodialysis.

Materials and Methods

Design

The study was a cross-sectional design and conducted at the Hemodialysis Unit of Dr. Soebandi Hospital, Jember, from June to July 2023 to analyze the influence of psychosocial factors on the adherence of CKD patients to a hemodialysis program. The study variable is CKD patients' adherence to a hemodialysis program as the dependent variable. The independent variables are psychosocial factors, which affect adherence of CKD patients to undergo a hemodialysis program, consisting of knowledge (Alisa and Wulandari, 2019; Cardol et al., 2022; Mirzaei-Alavijeh et al., 2023; Xu et al., 2023; Yasin et al., 2024); motivation (Ok and Kutlu, 2021; Cardol et al., 2022; Mirzaei-Alavijeh et al., 2023; Agu and Tambunan, 2024); coping (Niihata et al., 2017; Hwang et al., 2018; Ulusoy and Kal, 2020; Melastuti et al., 2022); depression (Pretto et al., 2020; Cardol et al., 2022; Nielsen et al., 2023); family support (Al Husna, Yetti and Sukmarini, 2019; Alisa and Wulandari, 2019; Mundakir et al., 2019; Mukakarangwa et al., 2020; Alhamad et al., 2023; Gebrie et al., 2023); and health worker support (Mukakarangwa et al., 2020; Alzahrani and Al-Khattabi, 2021; Sapkota et al., 2022; Gebrie et al., 2023).

Sample and sampling techniques

The sample size was 90 respondents, calculated with G*Power 3.1 (α= 0.05; β= 0.8; f^2 = 0.15) and taken randomly using simple random sampling. The inclusion criteria were: (1) aged 18 – 65 years; (2) already undergoing hemodialysis ≥ 6 months; (3) compos mentis status (normal consciousness, fully aware, able to answer all questions about the surrounding conditions, with a Glasgow Coma Scale score ≥14); (4) being able to communicate. Meanwhile, the exclusion criteria included: (1) patients undergoing hospitalization; (2) unwilling to become respondents; (3) having severe conditions or multiple morbidities.

Instruments

Data were collected using a questionnaire. CKD patients' adherence to a hemodialysis program was measured using the adherence to undergo hemodialysis questionnaire adapted from The Greek Simplified Medication Adherence Questionnaire for Hemodialysis Patients (Alikari et al., 2017). The questionnaire was translated into Indonesian and was then back-translated by the researcher. The result of the validity test showed that all items were valid (r = 0.512 – 0.888 > r table = 0.361 (n = 30) and reliable (Cronbach's alpha = 0.872). This questionnaire consists of eight (8) items, namely medication adherence (4 items), presence session hemodialysis (2 items), diet and fluid management adherence (2 items), with a Guttman scale (yes/no) and Likert (0 – 2). Hemodialysis program adherence was categorized into non-adherence (<4) and adherence (≥4).

Knowledge about CKD and its management was measured with the awareness of chronic kidney disease (CKD) patients with the hemodialysis questionnaire (Utami and Dwi Susanti, 2022). This questionnaire consists of 12 items, namely awareness of the disease (5 items), CKD-related diet and exercise knowledge (3 items), examination results comprehension (2 items), understanding of medical resources (2 items) with a Likert scale (1 – 5), with a value of "not knowing at all" = 1; " know a little" = 2: "so that you know" = 3; "knows almost everything" = 4; "know very well" = 5. Results of the validity and reliability test showed that the tool is valid and reliable (r = 0.590 – 0.831 > r table = 0.361 (n=30), Cronbach's alpha = 0.865). Knowledge was categorized into poor (< 25), moderate (25 – 47), and good (≥48).

CKD patients' motivation to undergo a hemodialysis program was measured with the Motivation Questionnaire (Syamsiah, 2011). This questionnaire consists of 10 items, namely condition push act behavior (4 items), behavior in demand driven by circumstances (3 items), and goals from act behavior (3 items), with a Likert scale (1 - 5), with a value of "never" = 1; "rarely" = 2; "sometimes" = 3; "often" = 4, "always" = 5. Results of the validity and reliability test showed that the tool is valid and reliable (r = 0.390 – 0.912 > r table = 0.361 (n=30), Cronbach's alpha = 0.859). Motivation to undergo a hemodialysis program was categorized into low (≤34) and high (>34).

Coping of CKD patients undergoing hemodialysis programs was measured with the Coping Scale (Hamby et al., 2015). This questionnaire consists of 13 items, namely evaluation of problems (5 items) and behavior overcome issues (8 items) with a Likert scale (1 – 4), with a value of "untrue about me" = 1; "a bit true about me" = 2; "somewhat true about me" = 3; "mostly true about me" = 4. Results of the validity and reliability test showed that the tool is valid and reliable (r = 0.419 - 0.813 > r table = 0.361 (n = 30), Cronbach's alpha = 0.903). Coping with hemodialysis programs was

categorized into poor (< 27), moderate (27 – 39), and good (> 39).

Depression in CKD patients undergoing hemodialysis programs was measured with the Hospital Anxiety and Depression Scale: Indonesian Version (Tiksnadi et al., 2023). This questionnaire consists of seven (7) items, with a Likert scale (0 = not at all to 3 = very often). Results of the validity and reliability test showed that the tool is valid and reliable (r = 0.590 – 0.774 > r table = 0.361 (n=30), Cronbach's alpha = 0.796). Depression was categorized into not depressed (< 8), mild (8 – 10), moderate (11 – 15), and severe (> 15).

Perceived family support to undergo a hemodialysis program was measured with the Family Support Questionnaire (Syamsiah, 2011). This questionnaire consists of seven (7) items, namely support and presence session hemodialysis (1 item), motivation (1 item), diet, fluid and medication management (2 items), support informational (1 item), and support emotional (2 items), with a Likert scale, with a value of "never" = 1; "rarely" = 2; "sometimes" = 4, and "always" = 5. Results of the validity and reliability test showed that the tool is valid and reliable (r = 0.661 – 0.912 > r table = 0.361 (n=30), Cronbach's alpha = 0.888). Perceived family support in the hemodialysis program was categorized into low (≤28) and high (>28).

Perceived health worker support to undergo a hemodialysis program was measured with the Health Worker Support Questionnaire (Syamsiah, 2011). This questionnaire consists of seven (7) items, namely service quality (1 item), interaction quality (1 item), performance (1 item), communication (1 item), activity counseling (1 item), motivation (1 item), health monitoring (1 item) with a Likert Scale, with a value of "never" = 1; "rarely" = 2; "sometimes" = 4, and "always" = 5. Results of the validity and reliability test showed that the tool is valid and reliable (r = 0.588 - 0.803 > r table = 0.361 (n = 30), Cronbach's alpha = 0.859). Perceived health workers' support in the hemodialysis program was categorized into low (≤28) and high (>28).

Data collection

At the data collection stage, the researcher determines candidate respondents based on criteria inclusion and exclusion study. The researcher explains to the candidate respondents a description of the general study, aims, benefits, research procedures, and data confidentiality, and there is no coercion for the following involved in the study. The researcher gives an informed consent form to the candidate respondents as a form of agreement. Assuming the candidate respondent agrees to participate in the study, the researcher asks the candidate respondent to sign the consent form as a study respondent. The data were collected once through an interview directly with the respondents (the researcher read each question in the questionnaire to the respondents). Respondents underwent the hemodialysis process, and patients stated that they were allowed to go home to home by a doctor. There was no bias in data collection; respondents were in compos mentis and not uremic conditions (normal blood urea nitrogen level: 5 to 20 mg/dl or 1.8 to 7.1 mmol/L). Respondents did not fill in the questionnaire by themselves; however, the researcher read every question to the respondents, then noted down and filled in every answer given by respondents in the questionnaire. Duration time of data collection for each respondent was ± 30 – 45 minutes.

Data analysis

The researcher analyzed the data using descriptive statistics and inferential statistics. The researcher conducted descriptive statistics to describe the respondents' sociodemographic data and study variables, categorized as frequency distributions. The researcher also performed inferential statistics with multiple linear regression tests to analyze the effect of independent variables on the dependent variable (numeric data). Thus, the researcher used categorical data for descriptive analysis, and numerical data (total score of each respondent) for statistical analysis. In addition, the researcher also conducted a chi-square test to explore differences in adherence to undergoing hemodialysis programs based on independent factors that had been categorized (categorical data) to enrich the discussion. The researcher carried out classic assumption tests, multicollinearity, heteroscedasticity, autocorrelation and normality as multiple linear regression test requirements. After testing the classic assumptions test, the researcher continued with the multiple linear regression test (α= 0.05).

Ethical consideration

The study was conducted by upholding human rights and applying ethical principles. The researcher provided direct explanations to prospective respondents about the general description, objectives, benefits, risks, right to withdraw, and rewards and compensation given to respondents. If prospective respondents agreed to participate in the research, respondents could sign the consent form. There was no coercion on respondents to participate in the study. This study has obtained ethical eligibility from the Health Research Ethics Commission

Table 1. Respondents' characteristics, psychosocial factors and adherence of CKD patients to undergo a hemodialysis program at RSD Dr. Soebandi Jember in the period June – July 2023 (n = 90)

Variables	Mean±SD (Min-Max) or Frequency (n)	%
Demographic characteristics		
Age (years)	46.82±12.976 (18 – 65)	
18 – 25	5	5.56
26 – 35	13	14.44
36 – 45	20	22.22
46 – 55	26	28.89
56 – 65	26	28.89
Gender		
Woman	57	63.33
Man	33	36.67
Education level		
No school	6	6.67
Elementary school	30	33.33
Junior high school	13	14.44
High school seniors	27	30
Diploma	2	2.22
Bachelor or higher	12	13.33
Hemodialysis history (month)	39.53±15.672 (6 – 120)	
6 – 24	30	33.33
25 – 72	50	55.56
73 – 120	10	11.11
Psychosocial factors		
Knowledge	55.92±3.339 (46 – 60)	
Poor	0	0
Moderate	6	6.67
Good	84	93.33
Motivation	46.44±3.295 (36 – 50)	
Low	0	0
High	90	100
Coping	46.14±3.683 (34 – 52)	
Poor	0	0
Moderate	8	8.89
Good	82	91.11
Depression	2.10±3.006 (0 – 12)	
Not depressed	81	90
Mild	5	5.56
Moderate	4	4.44
Severe	0	0
Perceived family support	32.52±2.437 (25 – 35)	
Low	9	10
High	81	90
Perceived health worker support	32.31±2.439 (24 – 35)	
Low	10	11.11
High	80	88.89
Hemodialysis program adherence	6.76±1.546 (2 – 8)	
Non-adherence	9	10
Adherence	81	90

(KEPK) of the Faculty of Nursing, Universitas Jember, with certificate number 246/UN25.1.14/KEPK/2023.

Results

Respondents' characteristics

Table 1 shows the average age of respondents was 46.82 years, with most respondents being in the categories of early elderly (46 – 55 years) and elderly (56 – 65 years) (28.89%), women (63.33%), primary education level, namely elementary school (33.33%), and had undergone a hemodialysis program for 25 – 72 months (55.56%). The research results also showed that most respondents had hemodialysis program adherence in the high category (90%). Psychosocial variables show that most respondents had good knowledge about hemodialysis (93.33%), good coping (91.11%), did not experience depression (90%), had perceived family support and perceived health worker support in the high category (90%; 88.89 %), and all respondents had high motivation to undergo a hemodialysis program (100%) (Table 1).

Differences in CKD patients' adherence to a hemodialysis program based on psychosocial factors (knowledge, motivation, coping, depression, perceived family support, and perceived health worker support)

The results of cross-tabulation and chi-square tests show significant differences in adherence of CKD patients to hemodialysis programs based on knowledge, motivation, coping, depression, family support and perceived health worker support (p = 0.001) (Table 2). The study results also showed that 3.33% of CKD patients had good knowledge but did not adhere to hemodialysis programs. Based on motivation, it was

Table 2. Results of cross-tabulation between adherence of CKD patients to undergo hemodialysis program with psychosocial factors at RSD Dr. Soebandi Jember in the period June – July 2023 (n= 90)

Psychosocial factors	Hemodialysis program adherence		Chi-Square Test	
	Non-adherence (n%)	Adherence n (%)	Pearson Chi-Square value	p
Knowledge				
Poor	0 (0)	0 (0)		
Moderate	6 (6.67)	0 (0)	66.667	0.001
Good	3 (3.33)	81 (90)		
Motivation				
Low	0 (0)	0 (0)	80.000	0.001
High	9 (10)	81 (90)		
Coping				
Poor	0 (0)	0 (0)	44.883	0.001
Moderate	8 (8.89)	0 (0)		
Good	1 (1.11)	81 (90)		
Depression				
Not depressed	0 (0)	81 (90)	90.000	0.001
Mild	5 (5.56)	0 (0)		
Moderate	4 (4.44)	0 (0)		
Severe	0 (0)	0 (0)		
Perceived family support				
Low	9 (10)	0 (0)	90.000	0.001
High	0 (0)	81(90)		
Perceived health worker support				
Low	9 (10)	1 (1.11)	80.000	0.001
High	0 (0)	80 (88.89)		

seen that, although 10% of CKD patients had high motivation, they did not adhere to undergo hemodialysis programs. Based on the depression variable, it showed that CKD patients who were not depressed showed adherence to undergoing hemodialysis programs (90%). Furthermore, CKD patients who had low perceived family support and health worker support showed non-adherence to undergoing hemodialysis programs (10%; 10%).

Multiple linear regression test results

The results of the classical assumption test show that all variables in this study have met the classical assumption test, namely that the data for each variable have a normal distribution (p > = 0.05), and there is no multicollinearity between independent variables (tolerance value > 0.10; VIF < 10). The autocorrelation test results showed that there was no autocorrelation (Value DW statistics = 1.940 > DW table = 1.8041 (n=90; Independent variables = 6), dL = 1.518, DW= 1.8041). There is no autocorrelation because the value of dU < DW < 4 – dU is 1.8014 < 1.940 < 2.1986. Apart from that, the data also do not show symptoms of heteroscedasticity (p > α= 0.05) (Table 3).

The results of the Fisher's test show that the estimated regression model is a fit model that is suitable for use to explain the influence of independent variables simultaneously on the dependent variable (F value = 236.631; p = 0.001 < α= 0.05) (Table 4). It means knowledge, motivation, coping, depression, perceived family support, and perceived health worker support simultaneously influence variable adherence of CKD patients to undergo a hemodialysis program. The adjusted R-square value is 0.941. It means the independent variables (knowledge, motivation, coping, depression, perceived family support, and perceived health worker support) influenced the dependent variable (adherence of CKD patients to a hemodialysis program), which amounted to 94.1%. In contrast, other variables outside the model explain the rest, 5.9 % (1 – 0.941). Successively, variable knowledge contributed to 8.3%, motivation contributed to 15.2%, coping contributed to 9.6%, depression contributed to 17.2%, perceived family support contributed to 26.7%, and perceived health worker support contributed to 13.9% on adherence of CKD patients undergoing hemodialysis program. The most dominant variable influencing CKD patients' adherence to hemodialysis programs is perceived family support (26%; t = 6.457; p = 0.001), whereas the least dominant variable is knowledge

Table 3. Results of classic assumption test

Variables	Normality	Multicollinearity		Autocorrelation	Heteroscedasticity
		Tolerance	VIF	Durbin-Watson	
Knowledge	0.225	0.104	9.651	1,940	0.066
Motivation	0.191	0.182	5.505	dL = 1.5181	0.129
Coping	0.234	0.155	6.453	dU = 1.8014	0.231
Depression	0.358	0.104	9.611		0.234
Perceived family support	0.222	0.156	6.390		0.059
Perceived health worker support	0.167	0.328	3.045		0.202

Table 4. Results of multiple regression rest

Variables	Fisher's Test		R^2	Adjusted R^2	Unstandardized Coefficients		t	p
	F	p			B	SE		
(Constant)	236.613	0.001	0.945	0.941	-22.886	2.062	-11.097	0.001
Knowledge					0.083	0.037	2.234	0.028
Motivation					0.152	0.028	5.344	0.001
Coping					0.096	0.028	3.473	0.001
Depression					-0.172	0.041	-4.190	0.001
Perceived family support					0.267	0.041	6.457	0.001
Perceived health worker support					0.139	0.029	4.887	0.001

(8.3%; t= 2.234; p = 0.001). All the independent variables positively influenced adherence of CKD patients undergoing hemodialysis programs, except depression, which has a negative influence. Higher knowledge, motivation, coping, perceived family support, and perceived health worker support will increase adherence of CKD patients undergoing hemodialysis programs. Meanwhile, if depression is higher, the adherence of CKD patients undergoing hemodialysis programs will decrease.

Discussions

The results show that most respondents aged 46 – 65 years, with an average of 46.82 years, were female, had a low education level, and had a history of undergoing a hemodialysis program of 25 – 72 months. Most respondents adhered to undergo a hemodialysis program, with most respondents having good knowledgeabout CKD disease and its management, good coping, no experience of depression, high perceived family support and perceived health worker support, and all respondents had high motivationin undergoing a hemodialysis program (Table 1 and Table 2). The study follows previous studies showing that the average age of CKD patients is 45.78 (Zher and Bahari, 2022), with most CKD patients aged over 45 – 65 years (Xu et al., 2023). Previous studies stated that the older the CKD patient, the lower the adherence to a hemodialysis program (Zher and Bahari, 2022). Younger CKD patients have a good knowledge, attitudes, and practice of hemodialysis (Xu et al., 2023). However, other studies have stated that poor coping is related to younger age, which impacts lower adherence (Hwang et al., 2018; Ulusoy and Kal, 2020). The study result aligns with previous study, which stated that female CKD patients (Zher and Bahari, 2022) have better hemodialysis adherence than men (Hwang et al., 2018; Sheikh et al., 2022; Alhamad et al., 2023). The study results align with the previous study, which stated that most CKD patients have a low level of education (Mirzaei-Alavijeh et al., 2023). Low education level causes low adherence in CKD patients undergoing hemodialysis (Hwang et al., 2018; Nielsen et al., 2023). Higher education patients adhere more to hemodialysis (Alhamad et al., 2023; Mirzaei-Alavijeh et al., 2023; Xu et al., 2023). The study aligns with a previous study that stated that most CKD patients have a hemodialysis duration of less than six years, with an average of 5.4 years (Niihata et al., 2017). DCKD patients with a long history of hemodialysis are associated with low adherence (Zher and Bahari, 2022; Alhamad et al., 2023). Patients with a more extended history of hemodialysis had lower hemodialysis practices than those with a shorter history of hemodialysis (Xu et al., 2023).

The Influence of Knowledge on Adherence of CKD Patients to Undergo a Hemodialysis Program

Results show that knowledge significantly affected CKD patients' adherence to hemodialysis programs (Table 4), with most respondents having good knowledge (Table 1). The results align with previous studies stating that knowledge determines adherence to hemodialysis programs. The better their knowledge, the adherence to hemodialysis will be (Alisa and Wulandari, 2019; Cardol et al., 2022; Mirzaei-Alavijeh et al., 2023; Xu et al., 2023; Yasin et al., 2024). Adequate hemodialysis knowledge can be the capital for determining behavior (Sousa et al., 2023; Xu et al., 2023), clarifying appropriate behavior related to hemodialysis so can they increase adherence (Mirzaei-Alavijeh et al., 2023; Mailani et al., 2024). Knowledge about hemodialysis (benefits, therapy schedule, and the impact of non-adherence, etc.) can enhance patient adherence to hemodialysis program (Alisa and Wulandari, 2019; Cardol et al., 2022; Yasin et al., 2024) to improve hemodialysis outcomes (Støme r et al., 2020). Knowledge had a significant influence, but knowledge has a minor impact on adherence to undergoing a hemodialysis program compared to other variables. It can also be seen that there were still three respondents with high knowledge but who had non-adherence to the hemodialysis program (Table 2). Sociodemographic analysis showed that the three respondents were elderly (> 56 years) with a duration of hemodialysis of more than 73 months and low perceived health worker

support. Previous studies showed that age and treatment duration negatively correlate with hemodialysis adherence. The older patients with a longer duration of hemodialysis had low adherence. Older age is connected with difficulty accessing health information (Hwang et al., 2018; Mirzaei-Alavijeh et al., 2023). More specifically, even though respondents' overall level of knowledge is high, the knowledge component analysis shows that understanding and awareness of medical resources is of low value. Therefore, it is essential to pay attention to efforts to comprehensively increase patient knowledge by increasing understanding of the results of laboratory tests that have been carried out and their impact on health, as well as increasing CKD patients' knowledge of medical resources, such as access to information and education from health workers so that they can increase positive perceptions of health workers thereby increasing compliance and better outcomes. Health literacy can increase positive perception, adherence, and quality of life (Alzahrani and Al-Khattabi, 2021; Mailani et al., 2024).

The Influence of Motivation on Adherence of CKD Patients to Undergo a Hemodialysis Program

The results show that motivation significantly affected CKD patients' adherence to hemodialysis programs (Table 4), with all respondents having high motivation (Table 1). The study follows previous studies, which stated that motivation can influence the behavior of CKD patients so that it can determine adherence to a hemodialysis program (Ok and Kutlu, 2021; Cardol et al., 2022; Mirzaei-Alavijeh et al., 2023; Agu and Tambunan, 2024). Motivation is the strongest predictor of hemodialysis adherence (Mirzaei-Alavijeh et al., 2023). Enhancement motivation for undergoing treatment facilitates behavior change through positive and supportive treatment (Ok and Kutlu, 2021; Cardol et al., 2022) to achieve positive clinical outcomes (Mukakarangwa et al., 2020). Study results show that, although all respondents have high motivation, nine (9) still did not adhere to a hemodialysis program (Table 2). Sociodemographic analysis showed that non-adherence respondents were CKD patients who were older and male. A previous study stated younger CKD patients have better adherence than older (Sheikh et al., 2022). Besides that, women adhere more than men (Hwang et al., 2018; Alzahrani and Al-Khattabi, 2021; Alhamad et al., 2023). More specifically, although the overall motivation of all respondents is in the high category, based on the components, it was found, however, that some components still need to be improved, namely the goal behavior component. Therefore, more intensive efforts are required from health workers to educate CKD patients about the benefits of hemodialysis for their health. Health workers should continuously improve the quality of service for CKD patients undergoing hemodialysis therapy to increase patient motivation in undergoing hemodialysis (Agu and Tambunan, 2024). Besides that, the nurse's caring behavior must continually improve to increase patient motivation in undergoing hemodialysis therapy. Enhancement motivation can become positive energy and increase adherence to hemodialysis (Cardol et al., 2022) and outcomes (Naalweh et al., 2017; Mukakarangwa et al., 2020).

The Influence of Coping on Adherence of CKD Patients to Undergo a Hemodialysis Program

The results show that coping has significantly affected CKD patients' adherence to hemodialysis programs (Table 4), with most respondents having high coping (Table 1). This study's results align with previous studies stating that coping affects hemodialysis adherence (Niihata et al., 2017; Hwang et al., 2018; Ulusoy and Kal, 2020; Melastuti et al., 2022). Positive coping increases perceived behavioral control, reduces negative stressors, and enhances disease self-management (Niihata et al., 2017; Sheikh et al., 2022). Good coping can reduce symptom depression connection with burden management disease, increase obedience to treatment that impacts positive outcomes, and improve the quality of life of CKD patients (Ulusoy and Kal, 2020). The study result shows that one respondent still has positive coping but does not adhere to the hemodialysis program (Table 2). Sociodemographic analysis shows that respondents have a hemodialysis duration of more than 73 months, namely 120 months. Patients with a history of longer duration of the hemodialysis program and poor clinical results can cause non-adherence (Mirzaei-Alavijeh et al., 2023). The use of emotion-focused coping is associated with a reduced risk of depressive disorders. However, longer duration of hemodialysis had a negative correlation with emotion-focused coping strategies (Ulusoy and Kal, 2020). The study shows all the respondents' coping is in the moderate-good category, and none is in the poor category. However, coping components need to be improved, especially problem-solving behavior. Therefore, it is necessary to develop an appropriate strategy to enhance the proper behavior of CKD patients to overcome problems related to

hemodialysis (Hwang et al., 2018; Ulusoy and Kal, 2020), reducing mortality and increasing quality of life (Niihata et al., 2017). One of the efforts made is education and counseling to improve disease management motivation (Ok and Kutlu, 2021) or involving the family in disease management so that the burden of disease management can be distributed to other family members, ultimately increasing adherence to undergo a hemodialysis program (Sousa et al., 2023).

The Influence of Depression on Adherence of CKD Patients to Undergo a Hemodialysis Program

The results show that depression significantly affected CKD patients' adherence to hemodialysis programs (Table 4), with most respondents having no depression and respondents who experience depression having non-adherence to undergoing hemodialysis program (Table 1; Table 2). Respondents who experienced severe depression also experienced increased non-compliance (Table 4). This study's results align with previous studies that stated that depression experienced by CKD patients could also worsen adherence to hemodialysis (Pretto et al., 2020; Cardol et al., 2022; Nielsen et al., 2023). An increase in the burden associated with managing a disease that cannot be managed well can cause depression, which can reduce hemodialysis adherence (Nielsen et al., 2023). The results of the further analysis show that CKD patients who experience depression are younger CKD patients of the male gender, thus increasing non-adherence (Hwang et al., 2018). Younger age is linked with poor coping and increasing non-adherence (Ulusoy and Kal, 2020). It may be related to their role as heads of families obliged to earn a living for their families. Failure to play the role can worsen coping, resulting in non-adherence. Previous study explains that poor coping is related to low resilience and high cognitive distortions, giving rise to depression (González-Flores et al., 2021). Emotional well-being and psychological stress that can be managed well can increase CKD patient' adherence to controlling their disease. Symptoms of depression experienced by CKD patients, as well as the lack of social support, cause non-adherence to undergo hemodialysis (Pretto et al., 2020; Cardol et al., 2022) and decrease quality of life (Ulusoy and Kal, 2020).

The Influence of Family Support on Adherence of CKD Patients to Undergo a Hemodialysis Program

The results show that family support significantly affected CKD patients' adherence to undergoing hemodialysis programs. Perceived family support is the most dominant factor influencing CKD patients' adherence to undergoing hemodialysis program (Table 4). The result aligns with previous studies, which stated that family support had a positive influence on the adherence of CKD patients in hemodialysis (Al Husna, Yetti and Sukmarini, 2019; Alisa and Wulandari, 2019; Mundakir et al., 2019; Mukakarangwa et al., 2020; Alhamad et al., 2023; Gebrie et al., 2023). Families who participate in disease management, fulfilling the physical, emotional and social needs of CKD patients undergoing hemodialysis, can increase perceived family support (Gebrie et al., 2023), so it can increase adherence to hemodialysis (Sousa et al., 2023). Most respondents perceived family support to be in the high category (Table 1). However, nine (9) respondents still perceived family support in the low category (Table 2). More specifically, the components of family support that are still low are the components of support for managing diet, fluids and medicines, and informational support.

Moreover, support for attendance at hemodialysis sessions, motivation and emotional support is high. Efforts to increase health literacy in families must be improved so that families can understand the problem and how to manage it well. In the end, the family can appraise the issues faced by the patient and provide accurate information. Apart from that, families can also be actively involved in managing disease, especially in managing diet, fluids and medication needed by the patient. A previous study stated that good family support is essential for helping CKD patients overcome problems connected with the disease (Mukakarangwa et al., 2020), especially from a spouse, can reduce low interdialytic weight gain in hemodialysis patients (Mundakir et al., 2019). Family involvement in disease management can balance the disease management burden among family members, thereby increasing adherence to hemodialysis (Kerr et al., 2024). Therefore, family-focused interventions for CKD patients with an interdisciplinary approach combining psychosocial support can increase family involvement through providing emotional support in overcoming problems that arise in connection with disease management as well as providing instrumental support (Alhamad et al., 2023), so can increase adherence (Sousa et al., 2023), and improve the quality of life of CKD patients (Isdiarti and Ardian, 2020).

The Influence of Health Worker Support on Adherence of CKD Patients to Undergo a Hemodialysis Program

The results show that health worker support significantly affected the adherence of CKD patients in hemodialysis programs (Table 4). The study results align with previous studies, which stated that social support from health workers could increase adherence to hemodialysis programs (Mukakarangwa et al., 2020; Alzahrani and Al-Khattabi, 2021; Sapkota et al., 2022; Gebrie et al., 2023). Most respondents perceived health worker support to be in a high category (Table 1). However, nine (9) respondents stated that support of health workers was still low, which impacted hemodialysis adherence (Table 2). The item analysis results show that components are still low in health worker support, including communication, counseling/education, and health monitoring. A previous study stated that health workers are responsible for assessing and managing individual symptoms of CKD patients based on existing needs and resources (Mehrotra et al., 2023). Health workers must be aware of and consider the factors that can be facilitators and barriers in providing effective hemodialysis therapy for better health outcomes (Mukakarangwa et al., 2020). Health workers should create tailored and customized health information plans to inform patients of the critical components they need to manage chronic kidney disease (Mailani et al., 2024). As much as possible, health workers provide interventions tailored to CKD patients' sociodemographic and psychological factors to increase their understanding of the disease and how to manage it (Alhamad et al., 2023). A supportive social environment, where family and health workers constantly interact with patients, can increase CKD patients' adherence. Good relationships with dialysis center staff and the fact that they receive good care, which makes them comfortable when they come for routine care, can increase adherence to the hemodialysis program (Gebrie et al., 2023). Discussions with patients about their adherence with a focus on managing the patient-health worker relationship need to be carried out by assessing the patient's experience of symptoms so they can participate in finding solutions to overcome existing problems (Nielsen et al., 2023). Health worker support through motivation and counseling can increase adherence to undergo hemodialysis with dialysis (Sapkota et al., 2022). Development of a multidisciplinary team with family involvement to better meet the physical, emotional and social needs of patients while undergoing hemodialysis to increase patient adherence is needed (Gebrie et al., 2023; Sousa et al., 2023; Yasin et al., 2024)

The strength of this study is that it is one of the few studies that analyze how psychosocial factors influence CKD patient compliance to undergo hemodialysis using a multiple regression model. This study method allows researchers to simultaneously investigate the influence of independent variables on the dependent variable. In addition, the method used can also partially analyze the influence of each independent variable on the dependent variable. The use of this method can confirm the inconsistency of the results of previous studies, namely, on the one hand, stating that psychosocial factors influence CKD patient compliance to undergo hemodialysis. However, it states that there is no influence. The results of this study confirm that psychosocial factors, such as knowledge, motivation, coping, depression, family support and health worker support have a significant influence on CKD patient compliance to undergo hemodialysis both simultaneously and partially. The variable that has the most considerable influence on compliance to undergo hemodialysis is perceived family support, while the factor that has the smallest influence is knowledge. However, this study has several limitations. This study was conducted with a small sample size and only in Jember. Variations in CKD patient compliance to undergo hemodialysis programs between regions in Indonesia may occur. Further studies using large sample sizes and multi-centers are needed. In our study, we did not exclude other comorbidities such as diabetes, cardiovascular disease, and other comorbidities that are usually present in CKD patients.

Conclusion

The study results show that the psychosocial factors of CKD patients, namely knowledge, motivation, coping, depression, perceived family support, and perceived support from health workers, had a significant effect on their adherence to the hemodialysis program. The most dominant variable influencing hemodialysis compliance is perceived family support. To improve services for CKD patients undergoing hemodialysis, nurses should pay attention to psychosocial factors, especially perceived family support. Family involvement in managing CKD disease can increase CKD patient compliance in undergoing hemodialysis programs to improve the quality of hemodialysis services.

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Conflicts of Interest

The authors declare that they have no competing interests.

References

Agu, K. D. and Tambunan, E. H. (2024) 'The relationship between motivation and adherence in patients with chronic kidney disease in undergoing hemodialysis therapy in the hospital', *Nutrix Journal*, 8(1), pp. 131–139. doi: 10.37771/nj.v8i1.1095.

Alhamad, M. A. *et al.* (2023) 'Factors affecting adherence to hemodialysis therapy among patients with end-stage renal disease attending In-Center Hemodialysis in Al-Ahsa Region, Saudi Arabia', *Cureus*, 15(10), pp. 1–11. doi: 10.7759/cureus.46701.

Alikari, V. *et al.* (2017) 'A modified version of the Greek Simplified Medication Adherence Questionnaire for hemodialysis patients', *Health Psychology Research*, 5(1), pp. 1–7. doi: 10.4081/hpr.2017.6647.

Alikari, V. *et al.* (2019) 'The impact of education on knowledge, adherence and quality of life among patients on haemodialysis', *Quality of Life Research*, 28(1), pp. 73–83. doi: 10.1007/s11136-018-1989-y.

Alisa, F. and Wulandari, C. (2019) 'Factors associated with compliance in chronic kidney disease (CKD) patients undergoing hemodialysis at RSIP Dr. M. Djamil Padang', *Jurnal Kesehatan Mercusuar*, 2(2), pp. 58–71. doi: 10.36984/jkm.v2i2.63.

Alzahrani, A. M. A. and Al-Khattabi, G. H. (2021) 'Factors influencing adherence to hemodialysis sessions among patients with end-stage renal disease in Makkah City', *Saudi Journal of Kidney Diseases and Transplantation*, 32(3), pp. 763–773. doi: 10.4103/1319-2442.336772.

Al atawi, A. A. and Alaamri, M. M. (2021) 'The relationship between perceived social support and adherence to treatment regimens among patients undergoing hemodialysis: A scoping review', *Evidence-Based Nursing Research*, 4(1), pp. 1–17. doi: 10.47104/ebnrojs3.v4i1.231.

Cardol, C. K. *et al.* (2022) 'Psychosocial barriers and facilitators for adherence to a healthy lifestyle among patients with chronic kidney disease: A focus group study', *BMC Nephrology*, 23(1), pp. 1–16. doi: 10.1186/s12882-022-02837-0.

Dsouza, B. *et al.* (2023) 'Effect of educational intervention on knowledge and level of adherence among hemodialysis patients: A randomized controlled trial', *Global Health, Epidemiology and Genomics*, 2023(4295613), pp. 1–9. doi: 10.1155/2023/4295613.

Fotaraki, Z.-M. *et al.* (2022) 'Depression, adherence, and functionality in patients undergoing hemodialysis', *Cureus*, 14(2), pp. 1–12. doi: 10.7759/cureus.21872.

Gebrie, M. H. *et al.* (2023) 'Patients' experience of undergoing maintenance hemodialysis: An interview study from Ethiopia', *PLoS ONE*, 18(5), p. e0284422. doi: 10.1371/journal.pone.0284422.

González-Flores, C. J. *et al.* (2021) 'Resilience: A protective factor from depression and anxiety in mexican dialysis patients', *International Journal of Environmental Research and Public Health*, 18(22), pp. 1–12. doi: 10.3390/ijerph182211957.

Hamby, S., Grych, J. H. and Banyard, V. (2015) *Coping Scale, TN: Life Paths Research Program*. doi: 10.13140/RG.2.1.3094.0001.

Al Husna, C. H., Yetti, K. and Sukmarini, L. (2019) 'Determinant of fluid adherence among hemodialysis patients in Malang, Indonesia', *Enfermeria Clinica*, 29(S2), pp. 117–122. doi: 10.1016/j.enfcli.2019.04.018.

Hwang, H. C. *et al.* (2018) 'Influence of major coping strategies on treatment non-adherence and severity of comorbid conditions in hemodialysis patients', *Journal of Korean Medical Science*, 33(20), pp. 1–11. doi: 10.3346/jkms.2018.33.e148.

International Society of Nephrology (2023) *ISN-Global Kidney Health Atlas 2023, ISN: Internacional Society of Nephrology*. Brussels.

Isdiarti, R. and Ardian, I. (2020) 'Correlation of family support with quality of life of patient chronic renal failure undergo hemodialysis', *Jurnal Ners*, 15(Special Issue), pp. 569–573. doi: 10.20473/jn.v15i1Sp.22127.

Jemali, C. M., Munyua, J. and Atoni, R. (2023) 'Effect of depression on level of compliance with hemodialysis among chronic kidney disease patients at Moi Teaching and Referral Hospital, Kenya', *Hybrid Journal of Psychology*, 4(1), pp. 30–42. doi: 10.58256/hjp.v4i1.1296.

Kerr, M. *et al.* (2024) 'Experiences of indigenous patients receiving dialysis: Systematic review of qualitative studies', *American Journal of Kidney Diseases*, 83(2), pp. 139-150.e1. doi: 10.1053/j.ajkd.2023.07.014.

Mailani, F. *et al.* (2024) 'Good health literacy leads to better quality of life and medication adherence among hemodialysis patients', *Jurnal Ners*, 19(1), pp. 101–109. doi: 10.20473/jn.v19i1.49247.

Mehrotra, R. *et al.* (2023) 'Managing the symptom burden associated with maintenance dialysis: conclusions from a Kidney Disease Improving Global Outcomes (KDIGO) Controversies Conference', *Kidney International*, 104(3), pp. 441–454. doi: 10.1016/j.kint.2023.05.019.

Melastuti, E. *et al.* (2022) 'Self-care adherence in hemodialysis patients: A structural equation modeling', *Open Access Macedonian Journal of Medical Sciences*, 10(B), pp. 1107–1112.

Ministry of Health Republic Indonesia (2019) *RISKESDAS National Report 2018*. Jakarta: Lembaga Penerbit Badan Penelitian dan Pengembangan Kesehatan.

Mirzaei-Alavijeh, M. *et al.* (2023) 'Determinants of medication adherence in hemodialysis patients: A cross-sectional study based on capability-opportunity-motivation and behavior model', *BMC Nephrology*, 24(1), pp. 1–8. doi: 10.1186/s12882-023-03231-0.

Mukakarangwa, M. C. *et al.* (2020) 'Motivators and barriers of adherence to hemodialysis among patients with end-stage renal disease (ESRD) in Rwanda: A qualitative study', *International Journal of Africa Nursing Sciences*, 13(March), p. 100221. doi: 10.1016/j.ijans.2020.100221.

Mundakir, M. *et al.* (2019) 'The relationship between partner support and interdialytic weight gain (IDWG) hemodialysis patient', *Jurnal Ners*, 14(2), pp. 210–214.

Naalweh, K. S. *et al.* (2017) 'Treatment adherence and perception in patients on maintenance hemodialysis: A cross-sectional study from Palestine', *BMC Nephrology*, 18(1), pp. 1–9. doi: 10.1186/s12882-017-0598-2.

Nielsen, T. M. *et al.* (2023) 'Non-adherence, medication beliefs and symptom burden among patients receiving hemodialysis -a cross-sectional study', *BMC Nephrology*, 24(1), pp. 1–10. doi: 10.1186/s12882-023-03371-3.

Niihata, K. *et al.* (2017) 'Association of coping strategies with mortality and health-related quality of life in hemodialysis patients: The Japan Dialysis Outcomes and Practice Patterns Study', *PLoS ONE*, 12(7), pp. 1–13. doi: 10.1371/journal.pone.0180498.

Ok, E. and Kutlu, Y. (2021) 'The effect of motivational interviewing on adherence to treatment and quality of life in chronic hemodialysis patients: A randomized controlled trial', *Clinical Nursing Research*, 30(3), pp. 322–333. doi: 10.1177/1054773820974158.

Pretto, C. R. *et al.* (2020) 'Quality of life of chronic kidney patients on hemodialysis and related factors', *Revista Latino-Americana de Enfermagem*, 28(e3327), pp. 1–11. doi: 10.1590/1518-8345.3641.3327.

Quality Division of PKMK FK UGM (2024) *Kemenkes sebut gagal ginjal jadi penyakit dengan beban kematian tinggi*.

Sapkota, A. *et al.* (2022) 'Adherence to Treatment among Patients With End-Stage Renal Disease Undergoing Hemodialysis In Selected Centers In Nepal', *Journal of Nepal Health Research Council*, 20(1), pp. 72–78. doi: 10.33314/jnhrc.v20i01.3828.

Sheikh, V. *et al.* (2022) 'Factors related to treatment adherence behaviors among old-age hemodialysis patients in Hamadan, Iran: The application of the extended theory of planned behavior during Covid-19 pandemic', *BMC Nephrology*, 23(1), pp. 1–9. doi: 10.1186/s12882-022-02694-x.

Sousa, H. *et al.* (2023) 'Designing family-based interventions in kidney failure: The perspectives of the triad 'patients on haemodialysis/family caregivers/healthcare professionals', *British Journal of Health Psychology*, 28(3), pp. 672–689. doi: 10.1111/bjhp.12647.

Stømer, E. U. *et al.* (2020) 'Health literacy in kidney disease: Associations with quality of life and adherence', *Journal of Renal Care*, 46(2), pp. 85–94. doi: 10.1111/jorc.12314.

Sultan, B. O., Fouad, A. M. and Zaki, H. M. (2022) 'Adherence to hemodialysis and medical regimens among patients with end-stage renal disease during COVID-19 pandemic: A cross-sectional study', *BMC Nephrology*, 23(1), pp. 1–9. doi: 10.1186/s12882-022-02756-0.

Syamsiah, N. (2011) *Faktor-faktor yang berhubungan dengan kepatuhan pasien CKD menjalani hemodialisia di RSPAU Dr. Esnawan Antariksa Halim Perdana Kusuma Jakarta*. Universitas Indonesia.

Tiksnadi, B. B. *et al.* (2023) 'Validation of Hospital Anxiety and Depression Scale in an Indonesian population: A scale adaptation study', *Family Medicine and Community Health*, 11(2), pp. 1–8. doi: 10.1136/fmch-2022-001775.

Ulusoy, S. I. and Kal, Ö. (2020) 'Relationship among coping strategies, quality of life, and anxiety and depressive disorders in hemodialysis patients', *Therapeutic Apheresis and Dialysis*, 24(2), pp. 189–196. doi: 10.1111/1744-9987.12914.

Utami, M. P. S. and Dwi Susanti, B. A. (2022) 'Awareness questionnaire Indonesian version for chronic kidney disease (CKD) patients with hemodialysis: Development and validity', *Jurnal Ilmiah Kesehatan Sandi Husada*, 11(1), pp. 175–181. doi: 10.35816/jiskh.v11i1.720.

Wen, J. *et al.* (2023) 'Mental health and its influencing factors of maintenance hemodialysis patients: A semi-structured interview study', *BMC Psychology*, 11(84), pp. 1–11. doi: 10.1186/s40359-023-01109-2.

Xu, F. *et al.* (2023) 'Knowledge, attitude, and practice of patients receiving maintenance hemodialysis regarding hemodialysis and its complications A single-center, cross-sectional study in Nanjing', *BMC Nephrology*, 24(275), pp. 1–10.

Yasin, F. *et al.* (2024) 'Factors influencing self-care management in adult hemodialysis patients: An integrative review', *Qatar Medical Journal*, 1(12), pp. 1–17. doi: 10.5339/qmj.2024.12.

Zher, W. L. and Bahari, R. (2022) 'Relationship between resilience, depression, stress, anxiety, and treatment adherence amongst hemodialysis patients', *Journal of Positive School Psychology*, 6(7), pp. 5550–5564.

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