Factors Associated with Hemodialysis Patient Adherence at Dr. Wahidin Sudirohusodo General Hospital

Annisa Dwi Saputri[1*], Andi Selvi Yusnitasari[2], Nurzakiah Hasan[3]
[1,2,3] Hasanuddin University [2]Universitas Surabaya, Indonesia
Email Corresponding Author: annisadwisaputri853@gmail.com

ABSTRACT

Non-adherence among patients with chronic kidney disease (CKD) undergoing hemodialysis has been reported to range from 10% to nearly 60% and may lead to acute and chronic complications, reduced quality of life, and increased mortality risk. Variations in previous findings indicate that factors influencing adherence require further investigation within specific local contexts. This study aimed to analyze factors associated with adherence among hemodialysis patients at Dr. Wahidin Sudirohusodo General Hospital, Makassar. This study employed a quantitative cross-sectional design and was conducted at the hemodialysis unit of Dr. Wahidin Sudirohusodo General Hospital, Makassar, involving 103 patients selected through purposive sampling. Data were collected through structured interviews using validated questionnaires and review of medical records. Data were analyzed using the Chi-Square test and Fisher's Exact Test. Ethical approval was obtained from the Health Research Ethics Committee of the Faculty of Public Health, Hasanuddin University (Approval Number: 3500/UN4.14.1/TP.01.02/2024). The analysis showed significant associations between age (p=0.032), family support (p=0.025), and self-efficacy (p=0.025) with hemodialysis adherence. No significant associations were found between sex (p=0.447), education level (p=0.916), duration of hemodialysis (p=0.738), and anxiety level (p=0.738) with adherence. Self-efficacy was identified as the most strongly associated factor with patient adherence. Age, family support, and self-efficacy were significantly associated with hemodialysis adherence. These findings highlight the importance of psychosocial approaches, particularly strengthening self-efficacy and family support, in improving adherence among hemodialysis patients. Future research should employ longitudinal designs to better explore causal relationships.

Keywords: Chronic kidney disease; Hemodialysis; Patient adherence

INTRODUCTION

Chronic Kidney Disease (CKD) is a condition characterized by a gradual decline in kidney function, resulting in the inability of the kidneys to effectively filter electrolytes, maintain fluid and chemical balance, and produce urine optimally (1). CKD may occur in individuals who are otherwise generally healthy but exhibit decreased kidney function, indicated by albumin excretion exceeding 30 mg/day or an estimated glomerular filtration rate of less than 60 ml/min for at least three months, or other signs suggestive of kidney damage (2).

CKD remains a major global public health problem. Globally, the disease affects more than 10% of the world's population, with over 800 million individuals living with CKD (3). The World Health Organization (WHO) ranked CKD as the 10th leading cause of death in 2020 and projects it to become the fifth leading cause of death by 2040 (4). Indonesia is among the countries facing a substantial burden of CKD. The 2023 Indonesian Health Survey reported a CKD prevalence of 0.18% among individuals aged ≥15 years, with the highest prevalence observed in those aged ≥75 years (0.57%). In South Sulawesi Province, the prevalence of CKD was reported at 0.16%, indicating that CKD remains a significant regional public health challenge (5).

The increasing number of CKD cases has led to a growing demand for renal replacement therapy, particularly hemodialysis. Globally, approximately 1.5 million individuals are estimated to depend on hemodialysis for survival (6). Nationally, the proportion of CKD patients undergoing hemodialysis increased from 19.33% in 2018

to 21.1% in 2023 (5). Hemodialysis is a long-term therapy that must be performed routinely and continuously to maintain patients' quality of life. Therefore, patient adherence to hemodialysis therapy is a critical determinant of treatment success.

Non-adherence to scheduled hemodialysis sessions may result in acute and chronic complications, accelerate disease progression, reduce quality of life, and increase mortality risk (7). Nevertheless, several studies have shown that non-adherence among CKD patients undergoing hemodialysis remains prevalent. Studies conducted in Indonesia have reported non-adherence rates ranging from 10.6% to 58.8% (8,9,10,11). This variation indicates that hemodialysis adherence remains a significant issue requiring further attention.

Various factors have been identified as being associated with hemodialysis patient adherence. Demographic factors such as age, sex, and educational level; clinical factors such as duration of hemodialysis; and psychosocial factors including family support, self-efficacy, and anxiety levels have been reported to be associated with patient adherence (12,13,14,15,16). However, previous findings have demonstrated inconsistencies across studies, particularly within different social and cultural contexts. Moreover, research that simultaneously examines the combination of demographic, clinical, and psychosocial factors within a single analytical model in referral hospitals in Eastern Indonesia remains limited.

Dr. Wahidin Sudirohusodo General Hospital in Makassar is one of the largest referral hospitals in Eastern Indonesia and manages a substantial number of hemodialysis patients. Despite this, no study has comprehensively explored factors associated with hemodialysis patient adherence in this hospital. This situation highlights the need for further investigation to obtain a clearer understanding of factors influencing patient adherence within the local context.

Based on the aforementioned background, this study aims to analyze factors associated with hemodialysis patient adherence at Dr. Wahidin Sudirohusodo General Hospital, Makassar.

METHOD

Research Type

This study employed a quantitative approach with a cross-sectional design. The design was used to analyze factors associated with hemodialysis patient compliance at a single point in time.

Population and Sample

The study population consisted of all hemodialysis patients at Dr. Wahidin Sudirohusodo General Hospital, Makassar, from January to December 2024, totaling 932 patients. The sample was selected using a non-probability sampling technique with a purposive sampling approach based on predetermined inclusion and exclusion criteria. A total of 103 hemodialysis patients who met the criteria and agreed to participate were included in the study.

The inclusion criteria were patients aged 18 years or older, able to communicate verbally, and willing to participate during the study period. The exclusion criteria included patients who were unconscious and those experiencing hemodialysis complications at the time of data collection, such as muscle cramps, pain, hypotension, nausea, vomiting, chills, or seizures.

Research Location

The study was conducted at the Hemodialysis Unit of Dr. Wahidin Sudirohusodo General Hospital, Makassar, over a one-month period from January to February 2025. This location was selected due to the high number of hemodialysis patients and the availability of supporting clinical data.

Instrumentation

The data used in this study consisted of primary and secondary data. Primary data were collected through direct interviews using a structured questionnaire developed based on the study variables. The dependent variable was hemodialysis patient compliance. The independent variables included age, sex, educational level, duration of hemodialysis, family support, self-efficacy, and anxiety level.

Secondary data were obtained from the hospital information system and the Hemodialysis Unit of Dr. Wahidin Sudirohusodo General Hospital. Information regarding respondents' comorbid conditions was validated by reviewing patients' medical records.

Data Collection Procedures

Primary data were collected through face-to-face interviews after respondents received an explanation of the study objectives and signed an informed consent form. Secondary data were obtained with official permission from the hospital and the relevant unit. All data collection procedures were conducted in accordance with research protocols while maintaining the confidentiality of respondents' identities.

Data Analysis

Data analysis consisted of univariate, bivariate, and multivariate analyses. Univariate analysis was performed to describe the frequency distribution of each variable. Bivariate analysis was conducted using the chi-square test to examine the association between independent variables and hemodialysis patient compliance. Multivariate analysis was performed to identify the most dominant factors associated with patient compliance. Statistical significance was set at $p < 0.05$.

The analyzed data were presented in the form of frequency distribution tables (one-way tabulation) and cross-tabulation (two-way tabulation), accompanied by narrative interpretation.

Ethical Approval

This study received ethical approval from the Health Research Ethics Committee of the Faculty of Public Health, Hasanuddin University (Approval Number: 3500/UN4.14.1/TP.01.02/2024). Written informed consent was obtained from all participants prior to data collection, and the confidentiality of all respondents was strictly maintained throughout the study.

RESULTS

This study was conducted at the Hemodialysis Unit of Dr. Wahidin Sudirohusodo Hospital, Makassar, involving a total of 103 respondents. The univariate analysis showed that the largest proportion of respondents was aged 51–60 years (24.3%), whereas the smallest proportion was aged >60 years (12.6%). The majority of respondents were male (53.4%). In terms of educational level, most respondents had completed senior high school or its equivalent (42.7%), and only 1.0% had no formal education**.** Most respondents had undergone hemodialysis for ≤1 year (61.2%) and had one comorbid condition (54.4%). The majority of respondents reported good family support (69.9%) and high self-efficacy (59.2%). Most respondents did not experience anxiety (61.2%). Regarding adherence, the majority of respondents were adherent to hemodialysis therapy (75.7%), while 24.3% were non-adherent (Table 1).

Table 1

Characteristics of Hemodialysis Patients at Dr. Wahidin Sudirohusodo General Hospital, Makassar, 2025

Respondent Characteristics	n	%
Age		
19-30 years	23	22,3
31-40 years	18	17,5
41-50 years	24	23,3
51-60 years	25	24,3
>60 years	13	12,6
Sex		
Male	55	53,4
Female	48	46,6
Educational Level		
No formal education	1	1,0
Elementary school	17	16,5
Junior High School	10	9,7
Senior High School	44	42,7
Higher Education	31	30,1
Duration of Hemodialysis		
≤ 1 year	63	61,2
> 1 year	40	38,8
Comorbid Condition		
1 Comorbid	56	54,4
> 1 Comorbid	47	45,6
Family Support		
Poor	31	30,1
Good	72	69,9
Self Efficacy		
Low	42	40,8
High	61	59,2
Anxiety		
No Anxiety	63	61,2
Anxiety	40	38,8
Adherence		
Non-adherent	25	24,3
Adherent	78	75,7
Total	**103**	**100**

Source: Primary Data

Bivariate analysis was performed using the chi-square test to assess differences in proportions between groups and to examine associations between categorical variables. The analysis of age and adherence showed that adherence to hemodialysis was higher among respondents aged ≥40 years (82.8%) compared to those aged <40 years (64.1%). The chi-square test yielded a p-value of 0.032 ($p<0.05$), indicating a significant association between age and adherence among hemodialysis patients at Dr. Wahidin Sudirohusodo Hospital. Female respondents demonstrated a higher adherence rate

(79.2%) compared to males (72.7%); however, overall adherence levels were relatively similar between the two groups. The chi-square test produced a p-value of 0.447 (p>0.05), indicating no significant association between sex and adherence.

Respondents with higher education had a slightly higher adherence rate (76.0%) than those with lower education (75.0%). Nevertheless, adherence levels were relatively balanced between the two groups. The chi-square test yielded a p-value of 0.916 (p>0.05), indicating no significant association between educational level and adherence. Regarding the duration of hemodialysis, respondents who had undergone treatment for >1 year demonstrated a higher adherence rate (77.5%) compared to those who had undergone treatment for ≤1 year (74.6%). Overall, adherence levels were relatively similar between the groups. The chi-square test resulted in a p-value of 0.738 (p>0.05), indicating no significant association between duration of hemodialysis and adherence.

Adherence was higher among respondents with good family support (81.9%) compared to those with poor family support (61.3%). Fisher's exact test yielded a p-value of 0.025 (p<0.05), indicating a significant association between family support and adherence. Similarly, respondents with high self-efficacy showed a higher adherence rate (83.6%) compared to those with low self-efficacy (64.3%). Fisher's exact test yielded a p-value of 0.025 (p<0.05), indicating a significant association between self-efficacy and adherence.

In terms of anxiety, adherence was slightly higher among respondents with anxiety (77.5%) than among those without anxiety (74.6%). However, adherence levels were generally comparable between the two groups. The chi-square test yielded a p-value of 0.738 (p>0.05), indicating no significant association between anxiety and adherence (Table 2).

Table 2
Bivariate Analysis of Factors Associated with Hemodialysis Patient Adherence at Dr. Wahidin Sudirohusodo General Hospital, Makassar, 2025

Research Variables	Adherence Level				Total		*P-Value*
	Non-adherent		Adherent				
	n	%	n	%	n	%	
Age							
<40 years	14	35,9	25	64,1	39	100	0,032
≥40 years	11	17,2	53	82,8	64	100	
Sex							
Male	15	27,3	40	72,7	55	100	0,447
Female	10	20,8	38	79,2	48	100	
Educational Level							
Low	7	25,0	21	75,0	28	100	0, 916
High	18	24,0	57	76,0	75	100	
Duration of Hemodialysis							
>1 year	9	22,5	31	77,5	40	100	0,738
≤1 year	16	25,4	47	74,6	63	100	
Family Support							
Poor	12	38,7	19	61,3	31	100	0,025

Research Variables	Adherence Level				Total		*P-Value*
	Non-adherent		Adherent				
	n	%	n	%	n	%	
Good	13	18,1	59	81,9	72	100	
Self Efficacy							
Low	15	35,7	27	64,3	42	100	0,025
High	10	16,4	51	83,6	61	100	
Anxiety							
Anxiety	9	22,5	31	77,5	40	100	0,738
No Anxiety	16	25,4	47	74,6	63	100	

Source: Primary Data

Multivariate analysis was performed on variables with a p-value <0.25 in the bivariate analysis. In this study, binary logistic regression was used, with age, family support, and self-efficacy included as candidate variables. Age (p=0.083) and family support (p=0.073) were not statistically significant and did not demonstrate a meaningful effect on adherence among hemodialysis patients. In contrast, self-efficacy (p=0.024) was significantly associated with adherence. Self-efficacy had a positive regression coefficient (B=1.121) with an Exp(B) of 3.068, indicating that higher self-efficacy was associated with a greater likelihood of adherence to hemodialysis therapy. Patients with high self-efficacy were 3.068 times more likely to adhere to hemodialysis therapy compared to those with low self-efficacy. Thus, self-efficacy was identified as the most dominant and strongly associated factor related to patient adherence in this study (Table 3).

Table 3
Multivariate Analysis of Factors Associated with Hemodialysis Patient Adherence at Dr. Wahidin Sudirohusodo General Hospital, Makassar, 2025

Variables	B	Wald	Sig.	Exp (B)	Confidence Interval (CI) 95% EXP (B)	
					Lower	Upper
Age	0,871	3,008	0,083	2,390	0,893	6,398
Family Support	0,918	3,216	0,073	2,505	0,918	6,833
Self Efficacy	1,121	5,075	0,024	3,068	1,157	8,137

Source: Primary Data

DISCUSSION

The multivariate analysis identified self-efficacy as the strongest factor associated with adherence among hemodialysis patients. Patients with high self-efficacy were 3.068 times more likely to adhere to hemodialysis therapy compared to those with low self-efficacy. High self-efficacy encourages patients to actively seek information about their condition, communicate with healthcare providers, and implement better self-management strategies. This finding is consistent with previous studies by Khoiriyah et al. (2020), Agustina and Yusra (2022), and Alavijeh et al. (2023), which reported a significant association between self-efficacy

and adherence among hemodialysis patients (15,17,18).

In this study, 83.6% of patients with high self-efficacy demonstrated good adherence. Family support appeared to contribute to this outcome, as most patients with high self-efficacy also reported good family support (70.5%). Family encouragement may strengthen patients' confidence in their ability to cope with treatment-related challenges.

Family support was also significantly associated with adherence in the bivariate analysis. Patients with good family support demonstrated higher adherence compared to those with poor support. This finding aligns with studies by Handoko et al. (2024) and Novitarum et al. (2024), which emphasized the importance of family involvement in improving adherence (19,20). During hemodialysis, patients experience major lifestyle changes, including dietary restrictions, activity limitations, and financial challenges. Instrumental, informational, emotional, and appraisal support from family members can therefore facilitate treatment compliance (21).

Age was significantly associated with adherence in this study. Patients aged ≥40 years were more adherent than those aged <40 years. Older individuals may demonstrate greater maturity in decision-making and have more experience managing health problems. This finding is consistent with studies by Izzati and Annisha (2016), Laksono et al. (2019), Agustani et al. (2022), and Zher and Bahari (2022), which also reported an association between age and hemodialysis adherence (12,22,23,24). In this study, patients aged ≥40 years also had higher levels of family support (78.1%) and self-efficacy (59.4%), which may partly explain their better adherence.

Sex was not significantly associated with adherence, although female patients showed slightly higher adherence rates. Both male and female patients demonstrated relatively balanced adherence levels. This finding is consistent with Alhomayani et al. (2021) and Sari and Prajayanti (2019) (25,26). Although women are often considered more attentive to health-related behaviors, the similar distribution of comorbid conditions between men and women (one comorbid: 54.5% in males and 54.2% in females; more than one comorbid: 45.5% in males and 45.8% in females) may explain the comparable adherence levels observed in this study.

Educational level was also not significantly associated with adherence. Adherence levels were relatively similar among patients with high and low educational backgrounds. This finding is in line with Ansaf and Al-hamadani (2025) (27). Although higher education is theoretically linked to better understanding of medical information, patients with lower education in this study reported higher levels of family support (78.6%) compared to those with higher education (66.7%), which may have contributed to similar adherence outcomes.

The duration of hemodialysis was not significantly associated with adherence. Patients who had undergone hemodialysis for >1 year demonstrated slightly higher adherence compared to those treated for ≤1 year. Long-term patients showed higher self-efficacy (60%) compared to new patients (58.7%), which may explain this pattern. However, new patients reported higher family support (76.2%) compared to long-term patients (60%), which may have helped maintain comparable adherence levels.

Anxiety was not significantly associated with adherence. Patients with anxiety demonstrated slightly higher adherence compared to those without anxiety. This finding supports the theory proposed by Sadock (2014), which suggests that anxiety may function as a warning signal that motivates individuals to take protective

actions (28). In this study, patients with anxiety also reported higher family support (80%) compared to those without anxiety (63.5%), which may have mitigated the negative impact of psychological distress on adherence.

Overall, this study highlights self-efficacy as the most dominant factor associated with adherence among hemodialysis patients.

Limitations and Cautions

This study has several limitations. First, the cross-sectional design limits the ability to establish causal relationships between the identified factors and adherence. Therefore, the findings should be interpreted as associations rather than causal effects. Second, as the study was conducted in a single tertiary hospital, the findings may not be generalizable to other settings with different patient characteristics. These limitations should be considered when interpreting the results, and the use of causal language should be avoided when describing the relationships identified in this study.

Recommendations for Future Research

Future studies should consider using longitudinal designs to better determine causal relationships. Incorporating objective measures of adherence and involving multiple healthcare settings would improve the validity and generalizability of findings. Further research may also explore additional psychosocial and clinical factors to provide a more comprehensive understanding of adherence among hemodialysis patients.

CONCLUSION

Based on the findings of this study on factors associated with adherence among hemodialysis patients at Dr. Wahidin Sudirohusodo Hospital, Makassar, it can be concluded that age, family support, and self-efficacy were significantly associated with patient adherence. In contrast, sex, educational level, duration of hemodialysis, and anxiety were not significantly associated with adherence. Among all variables examined, self-efficacy showed the strongest association with adherence among hemodialysis patients.

Hemodialysis patients are encouraged to strengthen their self-efficacy by fostering positive thinking, seeking information regarding the benefits of hemodialysis therapy, and utilizing personal experiences or the experiences of other patients as sources of motivation. Spiritual approaches, such as strengthening religious practices and faith in God, may also be beneficial in supporting emotional stability and confidence in managing long-term treatment. Family members are encouraged to continuously provide support, particularly emotional support, including encouragement, attention, appreciation, and active listening to patients' concerns.

BIBLIOGRAPHY

1. Gilbert SF, Weiner DE. National Kidney Foundation Primer on Kidney Diseases. Elsevier Health Sciences.; 2022.
2. Rosyanti L, Hadi I, Antari I. Faktor Penyebab Gangguan Psikologis pada Penderita Penyakit Ginjal Kronis yang menjalani Hemodialisis : Literatur Reviu Naratif Factors Causing Psychological Disorders in Patients with Chronic Kidney Disease undergoing Hemodialysis : Narrative Review Lite. Heal Inf J Penelit. 2023;
3. Kovesdy CP. Epidemiology of chronic kidney disease: an update 2022. Kidney Int Suppl. 2022;12(1):7–11.
4. Ulasi II, Awobusuyi O, Nayak S, Ramachandran R, Musso CG, Depine SA, et al. Chronic Kidney Disease Burden in Low-Resource Settings: Regional Perspectives. Semin Nephrol. 2023;42(5):1–14.

5. Kemenkes RI. Survei Kesehatan Indonesia (SKI) Dalam Angka. 2023.
6. Efendi Z, Irwan M, Zalni RI, Roni Y. Faktor-Faktor Yang Berhubungan Dengan Kualitas Hidup Pasien Dengan Gagal Ginjal Kronik Yang Menjalani Hemodialisa. J Kesehat Maharatu. 2021;2(2).
7. Prodyanatasari A, Purnadianti M. Hubungan Terapi Hemodialisa dengan Kadar Hemoglobin dan Kreatinin Pasien Gagal Ginjal Kronik. J Sint Sains Sains Terap Anal Lab Inst Ilmu Kesehat Bhakti Wiyata. 2024;5(1):83–93.
8. Pakpahan RA, Banjarnahor TR, Amsah, Simanungkalit CL. Hubungan Lama Dan Kepatuhan Menjalani Hemodialisa Pasien Gagal Ginjal Kronik Di Rumah Sakit Umum Royal Prima Medan. J Ners Univ Pahlawan. 2024;8(2):1879–87.
9. Agu KD, Tambunan EH. The Relationship Between Motivation Andadherence In Patients With Chronic Kidney Disease In Undergoing Hemodialysis Therapy In The Hospital. Nutr J. 2024;8(1).
10. Widianti AT, Gunasah AA, Gunawan H. Faktor Kepatuhan Pasien Penyakit Ginjal Kronis Dalam Menjalani Program Terapi Hemodialisis. J Keperawatan ‘Aisyiyah. 2023;10(2):119–30.
11. Renaldi, Zamaa MS, Arifin N. Hubungan Dukungan Keluarga dengan Kepatuhan Pasien Gagal Ginjal Kronik dalam Menjalani Terapi Hemodialisis di RSUP Dr. Tadjuddin Chalid Makassar. J Mitrasehat. 2021;12(2):200–6.
12. Agustani S, Suparman R, Setianingsih T, Mamlukah M. Analisis Faktor-Faktor Yang Berhubungan Dengan Kepatuhan Pasien Gagal Ginjal Kronik Dalam Menjalani Hemodialisa Di Unit Hemodialisa Rsud 45 Kuningan 2021. J Public Heal Innov. 2022;2(02):113–22.
13. Alhamad MA, Almulhim MY, Alburayh AA, Alsaad RA, Alhajji AM, Alnajjar JS, et al. Factors Affecting Adherence to Hemodialysis Therapy Among Patients With End-Stage Renal Disease Attending In-Center Hemodialysis in Al-Ahsa Region, Saudi Arabia. Cureus. 2023;15(10):1–11.
14. Sumah DF. Dukungan Keluarga Berhubungan dengan Kepatuhan Pasien Gagal Ginjal Kronik yang Menjalani Terapi Hemodialisa di RSUD dr . M . HAULUSSY Ambon. 2020;2(1):81–6.
15. Khoiriyah S, Sari Purbaningsih E, Wahyuni U. Hubungan Self Efficacy Dengan Kepatuhan Menjalani Hemodialisa Pada Pasien Gagal Ginjal Kronik Di Rsud Waled Kabupaten Cirebon. J Kesehat Mahardika. 2020;7(2):19–26.
16. Suriati, Nyorong M, Nuraini. Hubungan Tingkat Kecemasan Dan Dukungan Sosial terhadap Kepatuhan Pasien Menjalankan Terapi Hemodialisis di Rumah Sakit Umum Pusat H. Adam Malik Medan. JUMANTIK. 2022;7(2):182–91.
17. Agustina F, Yusra A. Efikasi diri dan dukungan sosial berhubungan dengan kepatuhan hemodialisis. J Keperawatan. 2022;1(1):11–9.
18. Alavijeh MM, Hamzeh B, Omrani H, Esmailli S, Khakzad S, Jalilian F. Determinants of medication adherence in hemodialysis patients : a cross-sectional study based on capability-opportunity-

motivation and behavior model. BMC Nephrol. 2023;24(174):1–8.
19. Handoko ST, Wijayanti D, Tukan RA, Lesmana H, Ose MI. Hubungan Dukungan Keluarga dengan Kepatuhan Pasien Gagal Ginjal Kronik dalam Menjalani Terapi Hemodialisis. Pendek J Pendidik Berkarakter. 2024;7(2):191–5.
20. Novitarum L, Ginting A, Barus MB, Sitorus YL. Hubungan Dukungan Keluarga Dengan Kepatuhan Menjalani Hemodialisa Pada Pasien Dengan Gagal Ginjal Kronik Di Rumah Sakit Santa Elisabeth Batam Kota Tahun 2022. J Cakrawala Ilm. 2024;3(6):1931–46.
21. Sary EW, Ghina NN. Korelasi Antar Dukungan Keluarga, Efikasi Diri Dan Kepatuhan Hemodialisa Pada Pasien GGK. J Nurs Invent. 2022;3(1).
22. Izzati W, Annisha F. Faktor-faktor Yang Berhubungan Dengan Kepatuhan Pasien Yang Menjalani Hemodialisis Di Ruang Hemodialisa Di RSUD dr. Achmad Mochtar Bukittinggi Tahun 2015. Afiyah. 2016;3(I):11–40.
23. Laksono GD, Septiwi C, Astuti DP. Faktor Faktor yang Mempengaruhi Kepatuhan Pasien Gagal Ginjal Kronik dalam Menjalani Program Therapi Hemodialisa di RS PKU Muhammadiyah Gombong. Univ Res Colloqium. 2019;581–90.
24. Zher WL, Bahari R. Relationship Between Resilience , Depression , Stress , Anxiety , And Treatment Adherence Amongst Haemodialysis Patients. J Posit Sch Psychol. 2022;6(7):5550–64.
25. Alhomayani FKH, Bukhara M, Al-ghamdi JS, Ali R, Almehmadi, Al-Amri LJ. Demographic Factors Affecting Level of Adherence amongst Hemodialysis Patients in a Single Center of Taif, Saudi Arabia. Ann RSCB. 2021;25(6):8627–46. Available from: http://annalsofrscb.ro
26. Sari IM, Prajayanti ED. Faktor-Faktor yang Berkontribusi Terhadap Kepatuhan Pada Pasien yang Menjalani Hemodialisa. Med Sci. 2019;6(2):63–70.
27. Ansaf TS, Al-hamadani FY. Exploring factors affecting hemodialysis patients adherence in Iraqi patients : a cross-sectional study. Pharm 72. 2025;1–8.
28. Sari RP, Utami U. Hubungan Kecemasan dan Kepatuhan dalam Pelaksanaan Protokol Kesehatan di Posyandu Malangjiwan Colomadu. STETHOSCOPE. 2020;1(2):114–22.