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The Compliance of Chronic Kidney Failure Patients Underwent Hemodialysis at Gunung Jati Regional Hospital, Cirebon City

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Abstract
Background: Non-compliance in patients with hemodialysis has a tremendous negative impact. Complications of the disease result in a poor quality of life. This study aimed to determine the compliance and characteristics of patients with chronic kidney failure undergoing hemodialysis at Gunung Jati Regional Hospital, Cirebon City.
Methods: This study employed a non-experimental design, with data collected prospectively using a questionnaire. The subjects of this study were chronic renal failure patients who underwent hemodialysis therapy at the Hemodialysis Unit of Gunung Jati Regional Hospital in Cirebon City and were treated at the clinic from January to March 2020. Non-random sampling was used in this study because the sample size was not calculated. The total number of patients undergoing hemodialysis was 133, of whom 44 met the study criteria, with a total of 95 cases. The study tool assessed patients' compliance with chronic kidney failure undergoing hemodialysis, specifically the End-Stage Renal Disease Adherence Questionnaire (ESRD-AQ).
Results: The 44 research subjects were patients with chronic kidney failure who underwent hemodialysis therapy at the hemodialysis unit of Gunung Jati Regional Hospital in Cirebon City, and were treated at the clinic from January to March 2020. The data collection method involved filling out a questionnaire through interviews. Data were analyzed using qualitative descriptive analysis. The results showed that all patients with chronic renal failure who underwent hemodialysis at the hemodialysis unit at Gunung Jati Regional Hospital in Cirebon City have good adherence (100%) to therapy.
Conclusion: All patients in this study sample were reported to be compliant with hemodialysis therapy, with major cost consumption of Chronic Kidney Disease (CKD) patients at mental health clinics, and the lowest was for patients seeking treatment at the lung clinic.

Keywords: *Chronic Kidney Failure, Compliance, Hemodialysis.*

Introduction

Chronic Kidney Disease (CKD) is an increasing public health concern, with its prevalence and incidence nearly doubling over the past thirty years[1]. The prevalence increases with the rising incidence of chronic diseases and factors related to food and drink consumption. CKD ranks among the top ten causes of premature death in the United States, with its incidence on the rise[2]. In Indonesia, the prevalence of CKD was recorded at 0.38%. North Kalimantan had the highest prevalence at 0.64%, while West Sulawesi reported the lowest at 0.18%. Factor analysis grouped 15 identified risk factors into five major categories[3].

According to data from the Indonesia Renal Registry, a program by the Indonesian Nephrology Association (PERNEFRI), which involved data collection activities related to dialysis, kidney transplantation, and epidemiological data on kidney disease and hypertension throughout Indonesia, the number of patients undergoing hemodialysis increased from 2007 to 2017[4]. In 2017, the number of active patients increased sharply. This shows that more patients can undergo hemodialysis for longer periods; it appears that the National Health Insurance (JKN) factor plays a role in maintaining the continuity of this therapy.

CKD occurs due to decreased kidney function, which requires replacement therapy and is expensive. Various complications, such as cardiovascular disease, respiratory tract disease, gastrointestinal disease, bone and muscle disorders, and anemia, usually accompany CKD. Compliance with therapy for hemodialysis patients is an important thing to pay attention to because if the patient does not comply, there will be a build-up of dangerous substances in the body resulting from metabolism in the blood. So patients feel pain throughout the body, and if this is left untreated, it can cause death[5].

The need for more critical monitoring of therapy and compliance with hemodialysis therapy for patients with CKD with complications can be prevented, thereby minimizing treatment costs and improving the patient's quality of life. Medication therapy given to patients with CKD with comorbidities is essential to get the attention of health workers, especially pharmacists. Research on

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CKD patients with comorbidities and patient compliance during hemodialysis has not been conducted at the Gunung Jati Cirebon Regional Hospital. This research aims to determine the characteristics, compliance, and medication costs of chronic kidney failure patients undergoing hemodialysis at the Gunung Jati Regional Hospital, Cirebon City.

Methods

This research is a non-experimental study with a prospective descriptive design, a research design that was conducted using an observational approach. Compliance was assessed through interviews with patients directly during their hemodialysis therapy at the hemodialysis unit at Gunung Jati Regional Hospital in Cirebon City from January to March 2020. The instrument used in this study is a questionnaire assessing the adherence of patients with chronic kidney failure undergoing hemodialysis, based on the End-Stage Renal Disease Adherence Questionnaire (ESRD-AQ) by Kim, which has been utilized in previous research[4].

The questionnaire contains six questions about adherence behavior, including attendance at hemodialysis sessions (item 1), the habit of shortening hemodialysis duration (items 2 and 3), medication adherence (item 4), fluid restriction behavior (item 5), and dietary adherence (item 6). Each question has five response options with predetermined scores. The scores were then analyzed and categorized into two categories: compliance, if the total score is ≥800, and non-compliance, if the total score is <800, from a total score of 1,200. This questionnaire also refers to a previous study conducted[6].

Data collection was carried out prospectively by conducting interviews with CKD patients in hemodialysis units and medication data from outpatient unit. The inclusion criteria are: a) patients undergoing hemodialysis at Gunung Jati Regional Hospital, Cirebon City, who are willing to participate as respondents, b) all patients undergoing hemodialysis at Gunung Jati Regional Hospital, Cirebon City, who are treated at the clinic, and c) patients who are willing to be interviewed for 10 to 20 minutes, according to the hemodialysis schedule. The exclusion criteria are hemodialysis patients with serious illnesses. This research began after obtaining a research permit and Ethical Clearance (EC). The EC was obtained from Gunung Jati Regional Hospital. Non-random sampling was used in this study because the sample size was not calculated. The first thing to do is identify the entire population, and then the sample is selected based on predetermined inclusion criteria. Respondents who have been selected are explained the purpose of the research, and the respondent agrees to participate by signing an informed consent form. The chosen subjects must meet the inclusion criteria and exclusion criteria. The data obtained was analyzed descriptively and presented as tables and descriptions. The questionnaire data were analyzed both descriptively and qualitatively.

Result

This research is a descriptive study, and data were collected prospectively regarding CKD patients undergoing hemodialysis at the Hemodialysis Unit at Gunung Jati Regional Hospital in Cirebon City. The number of patients undergoing hemodialysis and meeting the criteria for this study was 44 patients with 95 cases. Patient characteristics are presented in Table 1.

Table 1. Patients' characteristics

Characteristics	n=44	%
Gender		
Male	21	47.73
Female	23	52.27
Age (Year)		
17 – 25	2	4.55
26 - 35	2	4.55
36 – 45	9	20.45
46 – 55	5	11.36
56 – 65	14	31.81
> 66	12	27.27
Regional		
City	17	38.64
Urban	27	61.36
Occupation		
Private employee	10	22.73
Housewife	21	47.73
Teacher	1	2.27
Trader	1	2.27
Farmer	1	2.27
Retired	5	11.36
Doesn't work	5	11.36
Length of Therapy (years)		
0-1	23	54.55
1,1-3	9	20.45
3,1-5	7	15.91
> 5	4	9.09
Smoking		
Yes	11	25.00
No	33	75.00

The study results showed that all respondents (100%) were compliant with undergoing hemodialysis therapy, with a minimum score of 925 and the highest score of 1200 (Table 2). From the results of the interview, the patient was very compliant because they were afraid that something

would happen if they did not attend the therapy, which was carried out twice a week.

The average value for each question gave the highest value, item 1, regarding the behavior of hemodialysis attendance habits. The maximum response value was 300, and it was achieved in each patient because they were afraid that if they did not attend hemodialysis therapy, something would happen to their body. While items 2 and 3 are about the habit of accelerating the duration of hemodialysis, some respondents accelerated the time by 10 to 20 minutes because they complained of dizziness, nausea, aches, and leg and hand cramps when the hemodialysis therapy was about to end. However, patients with no complaints followed the standard hemodialysis therapy duration procedure, which was 4 hours of therapy. The habit of taking medication is item 4, on average, respondents comply with taking medication because they feel that if they do not take medication, something will happen to their illness, some obstacles to taking medication such as the elderly must have a companion, because they must always be reminded and their eyesight is no longer good. In item 5, specifically regarding fluid restriction behavior, respondents, on average, comply with the rules for the amount of fluid consumed, which is no more than 600 ml per day. Compliance with drinking fluids is always reminded by nurses because if it exceeds the specified amount, fluid will accumulate in the body and cause shortness of breath. In item 6, specifically diet behavior, patients must limit the amount of food they consume. Non-compliance with hemodialysis has a tremendous negative impact. Patients can experience many complications of the disease that interfere with their quality of life, physical, psychological, and social disorders, fatigue or extreme tiredness that causes frustration. This causes the high mortality and morbidity rates in chronic kidney failure patients to become even higher. As a result, all patients are compliant with undergoing hemodialysis therapy.

Table 2. Patients' compliance

No	Question	Score ± SD
1	Attendance behavior	289.77 ± 33.38
2	Frequency of HD time acceleration that occurs in a month	200 ± 0
3	Accelerated HD time duration in a month	78.98 ± 27.99
4	Medication-taking habits	195.45 ± 14.54
5	Fluid restriction behavior	162.5 ± 34.31
6	Dietary behavior	173.86 ± 33.22
	Total	**1100.57**

Table 3 presents data on comorbidities among chronic kidney failure patients undergoing hemodialysis at Gunung Jati Regional Hospital, Cirebon City. Hypertension is the most prevalent comorbidity, affecting 19 out of 44 patients, constituting 43.18% of the sample. Diabetes follows closely, affecting 14 patients (33%). Diabetes is another common comorbidity in CKD patients, as prolonged hyperglycemia can damage the kidneys over time, leading to diabetic nephropathy. Kidney stones and other kidney illnesses are reported in 3 patients each (6.82% respectively). These conditions can contribute to or complicate kidney failure, but are less common compared to hypertension and diabetes in this research.

Table 3. Patients' comorbidities

Diseases	n=44	%
Comorbidity		
Hypertension	19	43.18
Diabetes	14	31.82
Kidney Stones	3	6.82
Kidney Illness	3	6.82
Past medical history		
Pneumonia	1	2.27
Other	4	9.09

The most medications obtained by CKD patients undergoing hemodialysis were 6 types of medications (25%), then 4 types of medications (16%), 8 types of medications (15%), 7 types of medications (10%), 2 and 3 types of medications (8%), and the smallest percentage for 9 and 10 types of medications (1%). The amount of medication taken by the patient influences compliance with medication use, kidney condition, and the effect of the patient's therapy, so the rationality factor of the medication must be taken into account. Possible use of medications in all groups of medications used by patients with CKD undergoing hemodialysis, who are accompanied by comorbidities with several classes of medications, each of which has a therapeutic purpose, as shown in Table 4.

Table 4. Number of medications received by patients

Medication	n=95	%
1 type of medication	3	3.16
2 types of medications	8	8.42
3 types of medications	8	8.42
4 types of medications	15	15.79
5 types of medications	12	12.63
6 types of medications	24	25.26
7 types of medications	9	9.47
8 types of medications	14	14.74
9 types of medications	1	1.05
10 types of medications	1	1.05

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Table 5. Cost of outpatient unit

Clinic	Cost (IDR)		
	Min	Max	Mean
Geriatrics	14.952	407.744	124.410
Heart	23.654	504.306	156.853
Internal diseases	8.034	846.133	108.821
Lungs	10.386	21.350	15.564
Mental health	257.190	286.988	272.089

Discussion

The number of female patients with CKD undergoing hemodialysis is greater (52%) compared to the number of male patients (48%). This shows that men have the same risk of having CKD. According to Riskesdas 2013, the prevalence of CKD in men (0.3%) is higher than in women (0.2%). Previous research stated that the number of inpatients undergoing hemodialysis was higher among men, 51.1%, and 48.9% for women. With that being said, both men and women have the same risk of chronic kidney failure because the current lifestyle of all genders is the same[7]. Lifestyle patterns that influence eating and drinking patterns become factors in degenerative diseases. Women made up 62.2% which was higher than men at 37.8%, and women also dominated as patients undergoing hemodialysis[8]. This is also in accordance with previous research in 2014, which found that the prevalence of CKD is higher in women (56.3%) than in men (43.7%)[9].

In terms of age, the youngest patient with CKD undergoing hemodialysis is 20 years old, and the oldest is 78 years old. Table 1 shows that the age group of CKD patients who underwent hemodialysis at the hemodialysis unit at Gunung Jati Regional Hospital, Cirebon City, from January to March 2020 was mostly aged 56–65 years (late elderly), with a percentage of 32%. This is in accordance with the Indonesian Renal Registry Report in 2017, which shows that the largest age group is aged 45–54 years, with a percentage almost the same as the age range of 55–64 years. Increasing age is associated with a progressive decline in Glomerular Filtration Rate (GFR) and Renal Blood Flow (RBF). The decrease occurs around 8 ml/minute/1.73 m^2 every decade from the age of 40 years[10].

Based on place of residence, most CKD patients undergoing hemodialysis at the Gunung Jati Regional Hospital in Cirebon City are from the Cirebon District (61%), followed by Cirebon City (39%). Cirebon Regency is a large area with a population of 2.126 million people, compared to Cirebon City, which has a population of 305,899 people. Many of the population from the Cirebon District seek treatment and therapy in Cirebon City. This is supported by a reasonably close distance (around 18 km or 30-minute drive), so this does not prevent patients from undergoing hemodialysis therapy or seeking treatment at the clinic.

The largest percentage of the patients are housewives (48%), followed by private employees (23%), retirees (11%), and those who do not work (11%). Teachers, farmers, and traders have the same percentage of 2%. This shows that housewives, even though they only do work at home, have a significant risk of developing chronic kidney failure. Therefore, the work of housewives cannot be taken lightly. They may do a lot of work at home, which causes stress, which results in hypertension, which is a disease that can cause kidney failure. This is a phenomenon in itself, where research with different results states that the work of chronic kidney failure patients is mostly self-employed, with as many people (50%)[11]. A research in 2018 stated that the jobs held by most respondents were private employees, with 35 respondents (28.2%)[12].

Based on the length of therapy, 0 to 1 year has the highest percentage, namely 54%. This shows that many new patients are undergoing hemodialysis. This is in line with previous research in 2019 which stated that related to the duration of hemodialysis, the average hemodialysis is 21 months or more than 6 months[13]. Based on the results of the interview, this was caused by hypertension, the drinks consumed, and rarely drinking water.

According to a previous study, patients who have undergone hemodialysis for > 8 months show a better quality of life compared to those who have undergone hemodialysis for ≤ 8 months[15]. Patients will have a better quality of life over time if they undergo regular hemodialysis, supported by improvements in the doctor-patient relationship to build patient trust. This is necessary because hemodialysis is not a therapy that restores the kidneys to their original state, but is a rehabilitative therapy. In this case, the time spent undergoing hemodialysis plays an important role in influencing patients' quality of life.

Based on the lifestyle of smoking habits, the majority of patients (75%) undergoing hemodialysis therapy have a non-smoking lifestyle. This is because in this study, the majority of respondents were women, where in general, women have the habit of not smoking. According to research in 2015, the number of patients who smoke is more than that of those who do not smoke[17]. Chronic kidney failure patients on hemodialysis who have a history of smoking have a 2 times greater risk of chronic kidney failure than patients who do not smoke[18].

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The assessment of patient adherence to hemodialysis therapy is conducted to evaluate the extent to which patients comply with their prescribed treatment regimen[19]. Therapy compliance in chronic kidney failure patients undergoing hemodialysis is a crucial thing to pay attention to. If the patient does not comply, there will be a build-up of harmful substances in the body resulting from metabolism in the blood. This way, patients feel pain throughout the body, and if this is left unchecked, it can cause death[20]. The research results showed that all respondents (100%) complied with hemodialysis therapy, achieving a minimum score of 925 and a maximum of 1200.

According to the results of an interview with the head of the hemodialysis unit at Gunung Jati Regional Hospital in Cirebon City, if a patient does not attend a scheduled hemodialysis therapy, a call will be made by telephone, and the patient will be interviewed regarding their absence. The program implemented for patients at the hemodialysis unit aims to continually educate patients on improving their quality of life by attending each therapy session according to their schedules. In each therapy, patients are always motivated and educated by the doctors and nurses on duty at the hemodialysis unit at Gunung Jati Regional Hospital in Cirebon City, so patient compliance increases.

Non-compliance with hemodialysis has tremendous negative impacts. Patients can experience many disease complications that interfere with their quality of life, such as physical, psychological, and social disorders, fatigue, or extreme exhaustion that causes frustration. This causes the already high mortality and morbidity rates in chronic kidney failure patients to become even higher[3,21].

Patients with CKD receive an average of ten to twelve medications or even more, and may need to be taken several times a day[21]. Apart from that, patients with CKD also experience changes in pharmacokinetics, which include changes in Absorption, Distribution, Metabolism, and Elimination (ADME). Changes in ADME in patients with CKD can result in changes in medication disposition and pharmacological effects. The number of medications used is a risk factor that significantly influences the emergence of Drug-Related Problems (DRPs)[22].

The average cost-effectiveness ratio of antipsychotic treatment is 126,898/day – 132,781/day[23]. Meanwhile, the average cost of dispensing medicines at geriatric clinics is IDR 124,410, at the heart clinic, IDR 156,853, and at the internal medicine clinic, IDR 108.821. The guarantee for the cost of the medicine is covered by the Healthcare and Social Security Agency (BPJS). If, on average, the total cost of medicines for hemodialysis patients who go to clinics is IDR 49,893.

This research shows that the smallest and largest costs are in the internal medicine clinic. The smallest cost is the amount of medicine for 7 days, which has a generic name, while the most significant amount is due to the patient receiving three syringes of insulin. This cost range is used to determine the largest and smallest costs incurred by each clinic, allowing each clinic to assess its effectiveness in disbursing medication costs.

Conclusions

Characteristics of patients undergoing hemodialysis at the study site were diverse. All patients in this study sample were reported to be compliant with hemodialysis therapy.

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Ethical Consideration

This research was conducted by Description of Ethical Exemption No. 047/LAIKETIK/KEPKRSGJ/XII/2019.

Author Contribution

Study design	:	YSK, NMY, RW
Data acquisition	:	YSK, NMY, RW
Data analysis	:	YSK, NMY, RW
Manuscript writing	:	YSK, RW

Competing Interests

None declared.

Abbreviation

ADME	:	Absorption, Distribution, Metabolism, and Elimination
BPJS	:	*Badan Penyelenggara Jaminan Sosial*
CKD	:	Chronic Kidney Disease
DRPs	:	Drug-Related Problems
EC	:	Ethical Clearance
ESRD-AQ	:	End-Stage Renal Disease Adherence Questionnaire
GFR	:	Glomerular Filtration Rate
HD	:	Hemodialysis
JKN	:	*Jaminan Kesehatan Nasional*
PERNEFRI	:	*Perhimpunan Nefrologi Indonesia*
RBF	:	Renal Blood Flow

References

1. Provenzano M, Coppolino G, Faga T, Garofalo C, Serra R, Andreucci M. Epidemiology of cardiovascular risk in chronic kidney disease patients: the real silent killer. Rev Cardiovasc Med. 2019 Dec 30;20(4):209–20.
2. Adair KE, Bowden RG. Ameliorating Chronic Kidney Disease Using a Whole Food Plant-Based Diet. Nutrients. 2020 Apr 6;12(4):1007.
3. Hustrini NM, Susalit E, Rotmans JI. Prevalence and risk factors for chronic kidney disease in Indonesia: An analysis of the National Basic Health Survey 2018. J Glob Health. 2022;12(October):04074.
4. Indonesian P, Registry R, Renal I, Indonesia PN, Kesehatan D, Kesehatan D, et al. 9 th Report Of Indonesian Renal Registry 2016. 2017;1–46.
5. Afriana Riza Devi. Hubungan Motivasi Kesehatan Dengan Kepatuhan Pasien Gagal Ginjal Kronik Yang Menjalani Hemodialisis Di Rsup Dr. M. Djamil Padang Tahun 2017. Angew Chem Int Ed 611 951–952. 2017;6(November):5–24.
6. Syamsiah 2011. Faktor-faktor yang Berhubungan Hipertensi. J Visikes. 2011;10(2):115–23.
7. Tandah MR, Ihwan I, Diana K, Zulfiah Z, Ambianti N. Analisis Biaya Pengobatan Penyakit Ginjal Kronik Rawat Inap Dengan Hemodialisis Di Rumah Sakit Umum Daerah Undata Palu. Link. 2019;15(2):1–7.
8. Puspasari S, Nggobe IW. Hubungan Kepatuhan Menjalani Terapi Hemodialisa Dengan Kualitas Hidup Pasien Di Unit Hemodialisa RSUD Cibabat-Cimahi. J Kesehat. 2018;12(3):154–9.
9. Hervinda, Sundari; Novadian; Suryadi Tjekyan RM. Prevalensi dan Faktor Resiko Penyakit Gagal Ginjal Kronik di RSUP Dr. Mohammad Hoesin Palembang Tahun 2012. Mks. 2014;4(4):276–82.
10. Weinstein JR, Anderson S. The Aging Kidney: Physiological Changes. Adv Chronic Kidney Dis. 2010;17(4):302–7.
11. Najjini SA, Sudyasih T. Hubungan Religiusitas dengan Kualitas Hidup Pasien Gagal Ginjal Kronik di RSUD Kota Yogyakarta. Univ 'Aisyiyah Yogyak. 2017;
12. Ariyanto A, Hadisaputro S, Lestariningsih L, Adi MS. Beberapa Faktor Risiko Kejadian Penyakit Ginjal Kronik (PGK) Stadium V pada Kelompok Usia Kurang dari 50 Tahun (Studi di RSUD dr.H.Soewondo Kendal dan RSUD dr.Adhyatma,MPH Semarang). J Epidemiol Kesehat Komunitas. 2018;3(1):1.
13. Wahyuni A, Lawati UZ, Gusti E. Korelasi Lama Menjalani Hemodialisa Dengan Pruritus Pada Pasien Hemodialisa. J Endur. 2019;4(1):117.
14. Wahyuni A, Kartika IR, Asrul IF, Gusti E. Korelasi Lama Hemodialisa Dengan Fungsi Kognitif. REAL Nurs J. 2019;2(1):1.
15. Permata Sari S, AZ R, Maulani M. Hubungan Lama Hemodialisis dengan Kualitas Hidup Pasien Penyakit Ginjal Kronik di Ruang Hemodialisa Rumah Sakit Bhayangkara Kota Jambi. J Ilm Ners Indones. 2022;3(2):54–62.
16. Alencar SBV de, de Lima FM, Dias L do A, Dias V do A, Lessa AC, Bezerra JM, et al. Depression and quality of life in older adults on hemodialysis. Rev Bras Psiquiatr Sao Paulo Braz 1999. 2020 Apr;42(2):195–200.
17. Tsang WT, Wang S. Grating masks suitable for ion-beam machining and chemical etching. Appl Phys Lett. 1974;25(7):415–8.
18. Kim Y, Evangelista LS, Phillips LR, Pavlish C, Kopple JD. The End-Stage Renal Disease Adherence Questionnaire (ESRD-AQ): testing the psychometric properties in patients receiving in-center hemodialysis. Nephrol Nurs J J Am Nephrol Nurses Assoc. 2010;37(4):377–93.
19. Strand LM, Morley PC, Cipolle RJ, Ramsey R, Lamsam GD. Drug-related problems: Their structure and function. DICP Ann Pharmacother. 1990;24(11):1093–7.
20. Khanmohamadi SA. In light of another's word: European ethnography in the middle ages. Light Anothers Word Eur Ethnogr Middle Ages. 2014;2:1–211.
21. St. Peter WL. Improving Medication Safety in Chronic Kidney Disease Patients on Dialysis Through Medication Reconciliation. Adv Chronic Kidney Dis. 2010;17(5):413–9.
22. Hassan Y, Al-Ramahi R, Abd Aziz N, Ghazali R. Drug use and dosing in chronic kidney disease. Ann Acad Med Singapore. 2009;38(12):1095–103.
23. Abdulah R, Siregar RF, Alfian SD. Cost-effectiveness Analysis of Antipsychotic Combination Therapy in Schizophrenia Inpatients. Indones J Clin Pharm. 2017;6(1):61–6.