



Received: 14-06-2026
Accepted: 24-07-2026

International Journal of Advanced Multidisciplinary Research and Studies

ISSN: 2583-049X

Sociodemographic and Clinical Characteristics of Patients Undergoing Hemodialysis at Banda Aceh Regional General Hospital

¹ Mesya Geubrina Rahmah, ² Teuku Tahlil, ³ Hilman Syarif

¹ Master of Nursing Program, Faculty of Nursing, Universitas Syiah Kuala, Banda Aceh, Indonesia

² Department of Community Nursing, Faculty of Nursing, Universitas Syiah Kuala, Banda Aceh, Indonesia

³ Department of Emergency Nursing, Faculty of Nursing, Universitas Syiah Kuala, Banda Aceh, Indonesia

Corresponding Author: **Teuku Tahlil**

Abstract

Understanding the sociodemographic and clinical characteristics of patients undergoing hemodialysis is essential for identifying healthcare needs, supporting patient-centered care, and informing future clinical research. This study aimed to describe the sociodemographic and clinical characteristics of patients undergoing routine hemodialysis at a provincial general hospital in Aceh, Indonesia. A descriptive cross-sectional study was conducted involving 76 patients undergoing routine hemodialysis. Participants were selected using a consecutive sampling technique. Sociodemographic and clinical variables included age, sex, educational level, occupation, marital status, duration of hemodialysis, primary comorbidities, hemodialysis frequency, and vascular access.

Data were analyzed using descriptive statistics and presented as frequencies, percentages, means, standard deviations, and ranges. The mean age of the participants was 50.41 ± 11.51 years, and the mean duration of hemodialysis was 27.88 ± 23.54 months. Most participants were female, had completed higher education, had hypertension as the primary comorbidity, underwent hemodialysis twice weekly, and used an arteriovenous fistula as vascular access. These findings provide baseline information on the sociodemographic and clinical characteristics of patients undergoing routine hemodialysis and may support patient-centered care, healthcare planning, and future clinical research.

Keywords: Chronic Kidney Disease, Hemodialysis, Nursing, Sociodemographic Characteristics

1. Introduction

Chronic kidney disease (CKD) is a progressive and irreversible decline in kidney function characterized by an estimated glomerular filtration rate (eGFR) of less than 60 mL/min/1.73 m², albuminuria of ≥ 30 mg/g, or other markers of kidney damage. As kidney function deteriorates, patients require kidney replacement therapy, including hemodialysis or kidney transplantation, to maintain survival. Although these therapies prolong life expectancy, CKD remains associated with substantial physical, psychological, and social burdens that negatively affect patients' quality of life [1, 2]. The global burden of CKD continues to increase and has become a major public health concern. The World Health Organization has identified kidney disease as one of the leading causes of mortality worldwide. In the United States, approximately one in three adults is at risk of developing kidney disease, with an estimated 37 million people living with CKD. In Indonesia, CKD prevalence has reached 2.0% of the population, predominantly affecting adults and older adults. In Aceh Province, the number of patients with CKD has increased annually, with Banda Aceh representing one of the regions reporting a considerable number of cases requiring long-term hemodialysis [3-5].

Hemodialysis is the most commonly used kidney replacement therapy for patients with end-stage kidney disease and is generally performed two to three times per week throughout the patient's lifetime. Despite improving survival, long-term hemodialysis imposes substantial treatment burdens and requires continuous adaptation to physical limitations, lifestyle changes, and chronic comorbid conditions. Consequently, understanding the sociodemographic and clinical characteristics of patients undergoing hemodialysis is essential because factors such as age, sex, educational level, occupation, marital status, duration of hemodialysis, and comorbidities may influence healthcare needs, treatment adherence, and clinical outcomes [6, 7].

Previous studies have predominantly focused on psychological problems, quality of life, and therapeutic interventions among

patients undergoing hemodialysis. However, studies describing the sociodemographic characteristics of patients receiving maintenance hemodialysis in Indonesia remain limited. Baseline demographic information is essential for understanding patient profiles, supporting healthcare planning, and providing evidence for future nursing research. Therefore, this study aimed to describe the sociodemographic and clinical characteristics of patients undergoing routine hemodialysis at a provincial general hospital in Aceh, Indonesia.

2. Methods

This descriptive study was conducted at the Hemodialysis Unit of a provincial general hospital in Aceh, Indonesia. A total of 76 patients undergoing routine hemodialysis were recruited using a consecutive sampling technique. Sociodemographic and clinical characteristics assessed in this study included age, sex, educational level, occupation, marital status, duration of hemodialysis, primary comorbidities, hemodialysis frequency, and vascular access. These data were collected using a structured demographic data collection form during the study period from April to May 2026.

Ethical approval was obtained from the Health Research

Ethics Committee (No. 78/ETIK-RSUDZA/2026) before the commencement of the study, and permission to conduct the research was granted by the study hospital. Written informed consent was obtained from all participants before enrollment. Descriptive statistical analysis was performed using computerized statistical software. Continuous variables are presented as means, standard deviations (SD), and ranges, whereas categorical variables are summarized as frequencies and percentages.

3. Results

Sociodemographic and clinical characteristics

A total of 76 patients undergoing hemodialysis were included in this study. The mean age of the participants was 50.41 years (SD = 11.51; range, 21–69 years), and the mean duration of hemodialysis was 27.88 months (SD = 23.54; range, 4–96 months). Most participants were female (60.5%) and had completed higher education (35.5%). Hypertension was the most frequently reported primary comorbidity (44.7%), followed by hypertension with diabetes mellitus (30.3%) and diabetes mellitus (25.0%). All participants underwent hemodialysis twice weekly, used an arteriovenous fistula (AVF/Cimino) as vascular access, and were Muslim (Table 1).

Table 1: Sociodemographic and Clinical Characteristics of Patients Undergoing Routine Hemodialysis

Characteristic		
Age (years), Mean ± SD Min-Max		50.41 ± 11.51 (21-69)
Duration of hemodialysis (months), Mean ± SD Min-Max		27.88 ± 23.54 (4-96)
	N	%
Sex		
Male	30	39.5
Female	46	60.5
Educational level		
Primary education	25	32.9
Secondary education	24	31.6
Higher education	27	35.5
Primary comorbidity		
Hypertension	34	44.7
Diabetes mellitus	19	25
Hypertension and diabetes Mellitus	23	30.3
Hemodialysis frequency		
Twice weekly	76	100
Arteriovenous fistula (AVF/Cimino)	76	100
Religion Islam	76	100

4. Discussion

This study described the sociodemographic and clinical characteristics of patients undergoing routine hemodialysis at a provincial general hospital in Aceh, Indonesia. The participants were predominantly female, with a mean age of approximately 50 years and an average duration of hemodialysis of nearly 28 months. Most participants had completed higher education, had hypertension as the primary comorbidity, underwent hemodialysis twice weekly, and used an arteriovenous fistula (AVF) as vascular access. Collectively, these findings characterize the profile of patients undergoing routine hemodialysis in the study setting and provide baseline information to support healthcare planning and future clinical research.

The mean age of the participants was 50.41 years, indicating that most patients undergoing routine hemodialysis were middle-aged adults. This finding is consistent with previous

studies reporting that chronic kidney disease (CKD) is more prevalent among middle-aged and older adults because kidney function progressively declines with age and prolonged exposure to risk factors such as hypertension, diabetes mellitus, and cardiovascular disease [8-10]. In addition to age-related physiological changes, cumulative exposure to these chronic conditions accelerates renal function decline and increases the likelihood of progression to end-stage kidney disease (ESKD) requiring kidney replacement therapy [11-13]. These observations emphasize the importance of early identification and effective management of CKD risk factors during adulthood to delay disease progression.

Female participants constituted the majority (60.5%) of the study population. Sex differences in the distribution of patients undergoing hemodialysis have been reported across previous studies, with some investigations demonstrating a

predominance of male patients, whereas others have reported a higher proportion of female patients [14-16]. These variations may be influenced by differences in population characteristics, the prevalence of CKD risk factors, healthcare access, referral patterns, and regional epidemiological profiles. Therefore, the predominance of female participants observed in the present study may reflect the characteristics of the study population rather than the overall distribution of patients undergoing hemodialysis.

Higher education was the most common educational level among the participants (35.5%), followed by primary and secondary education. Educational attainment has been recognized as an important determinant of health literacy, influencing patients' understanding of CKD, adherence to treatment recommendations, and engagement in self-management practices [17, 18]. Previous studies have shown that patients with higher educational levels tend to have better knowledge of their disease and are more likely to participate actively in treatment decisions and long-term care. These findings suggest that educational attainment may facilitate better disease management and encourage greater participation in routine hemodialysis care.

Hypertension was the most frequently reported primary comorbidity (44.7%), followed by the coexistence of hypertension and diabetes mellitus (30.3%) and diabetes mellitus alone (25.0%). These findings are consistent with the well-established role of hypertension and diabetes mellitus as the leading causes of CKD and progression to ESKD worldwide [19]. The coexistence of both conditions further increases the risk of kidney function decline through persistent hemodynamic and metabolic disturbances, highlighting the importance of optimal blood pressure and glycemic control to delay disease progression. These findings underscore the importance of comprehensive management of hypertension and diabetes mellitus to reduce the burden of CKD and improve long-term patient outcomes.

The mean duration of hemodialysis was 27.88 months, indicating that most participants had been receiving routine hemodialysis for more than two years. Long-term hemodialysis reflects the chronic and progressive nature of ESKD, requiring continuous kidney replacement therapy to maintain survival and quality of life [20, 21]. However, prolonged treatment is also associated with considerable physical, psychological, and socioeconomic challenges, emphasizing the importance of comprehensive and patient-centered care throughout the treatment process.

All participants underwent hemodialysis twice weekly and used an arteriovenous fistula (AVF) as vascular access. Twice-weekly hemodialysis remains a common practice in many healthcare settings in Indonesia, where treatment schedules are individualized according to patients' clinical conditions, residual kidney function, and healthcare resource availability [22]. The universal use of AVF in the present study is consistent with current clinical recommendations, as AVF is considered the preferred vascular access because of its lower risk of infection, fewer thrombotic complications, longer patency, and better long-term outcomes than central venous catheters. These findings indicate good adherence to recommended vascular access practices in the study setting.

5. Conclusions

This study provides an overview of the sociodemographic and clinical characteristics of patients undergoing routine

hemodialysis at a provincial general hospital in Aceh, Indonesia. The study population was characterized by a predominance of female patients, middle-aged adults, higher educational attainment, hypertension as the primary comorbidity, routine twice-weekly hemodialysis, and the use of an arteriovenous fistula as vascular access. These findings provide valuable baseline information to support patient-centered care, healthcare planning, and future research involving patients undergoing routine hemodialysis.

6. References

1. Burnier M, Damianaki A. Hypertension as Cardiovascular Risk Factor in Chronic Kidney Disease. *Circ Res* [Internet], Apr 14, 2023; 132(8):1050-1063. Available from: <https://www.ahajournals.org/doi/10.1161/CIRCRESA.122.321762>
2. Heshmati Far N, Salari M, Rakhshani MH, Borzoe F, Sahebkar M. The effects of Benson relaxation technique on activities of daily living in hemodialysis patients; A single-blind, randomized, parallel-group, controlled trial study. *Complement Ther Clin Pract* [Internet], May 2020; 39:101133. Available from: <https://linkinghub.elsevier.com/retrieve/pii/S1744388119305948>
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* [Internet], Oct 14, 2022; 12:04074. Available from: <https://jogh.org/2022/jogh-12-04074>
4. Mark PB, Stafford LK, Grams ME, Aalruz H, Abd ElHafeez S, Abdelgalil AA, *et al.* Global, regional, and national burden of chronic kidney disease in adults, 1990-2023, and its attributable risk factors: A systematic analysis for the Global Burden of Disease Study 2023. *Lancet* [Internet], Nov 2025; 406(10518):2461-2482. Available from: <https://linkinghub.elsevier.com/retrieve/pii/S0140673625018537>
5. Indonesia KKR. Survei Kesehatan Indonesia 2023 (SKI): Dalam Angka [Internet]. Jakarta: Badan Kebijakan Pembangunan Kesehatan, Kementerian Kesehatan Republik Indonesia, 2024. Available from: <https://www.badankebijakan.kemkes.go.id/repositori/id/eprint/5539/>
6. Levin A, Ahmed SB, Carrero JJ, Foster B, Francis A, Hall RK, *et al.* Executive summary of the KDIGO 2024 Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease: Known knowns and known unknowns. *Kidney Int* [Internet], Apr 2024; 105(4):684-701. Available from: <https://linkinghub.elsevier.com/retrieve/pii/S0085253823007640>
7. Xie J, Song C. Analysis of quality of life and risk factors in 122 patients with persistent hemodialysis. *Pakistan J Med Sci* [Internet], Mar 10, 2022; 38(4). Available from: <https://pjms.org.pk/index.php/pjms/article/view/5308>
8. Ortiz A, Mattace-Raso F, Soler MJ, Fouque D. Ageing meets kidney disease. *Clin Kidney J* [Internet], Sep 22, 2022; 15(10):1793-1796. Available from: <https://academic.oup.com/ckj/article/15/10/1793/6605929>

9. Alfano G, Perrone R, Fontana F, Ligabue G, Giovannella S, Ferrari A, *et al.* Rethinking Chronic Kidney Disease in the Aging Population. *Life* [Internet], Oct 28, 2022; 12(11):1724. Available from: <https://www.mdpi.com/2075-1729/12/11/1724>
10. Matsushita K, Ballew SH, Wang AYM, Kalyesubula R, Schaeffner E, Agarwal R. Epidemiology and risk of cardiovascular disease in populations with chronic kidney disease. *Nat Rev Nephrol* [Internet], Nov 14, 2022; 18(11):696-707. Available from: <https://www.nature.com/articles/s41581-022-00616-6>
11. Bahrami P, Tanbakuchi D, Afzalaghaee M, Ghayour-Mobarhan M, Esmaily H. Development of risk models for early detection and prediction of chronic kidney disease in clinical settings. *Sci Rep* [Internet], Dec 30, 2024; 14(1):32136. Available from: <https://www.nature.com/articles/s41598-024-83973-5>
12. Yoshizaki Y, Kato K, Fujihara K, Sone H, Akazawa K. Development of a machine learning tool to predict the risk of incident chronic kidney disease using health examination data. *Front Public Heal* [Internet], Nov 1, 2024; 12. Available from: <https://www.frontiersin.org/articles/10.3389/fpubh.2024.1495054/full>
13. Liu P, Sawhney S, Heide-Jørgensen U, Quinn RR, Jensen SK, Mclean A, *et al.* Predicting the risks of kidney failure and death in adults with moderate to severe chronic kidney disease: Multinational, longitudinal, population based, cohort study. *BMJ* [Internet], Apr 15, 2024; 385:e078063. Available from: <https://www.bmj.com/lookup/doi/10.1136/bmj-2023-078063>
14. Nuñez BD. Sociodemographic and Clinical Profile, Adherence to Treatment, and Perceived Social Support among Hemodialysis Patients. *Malaysian J Nurs* [Internet]. 2024; 15(4):128-138. Available from: <https://ejournal.lucp.net/index.php/mjn/article/view/2781>
15. Oliveira AV De, Rocha JF, Sato BB, Barnes RF, Bastos CO, Cunha JLZ, *et al.* Gender-based comparison of clinical, epidemiological, and laboratory characteristics in hemodialysis patients: A retrospective analysis. *Rev Assoc Med Bras* [Internet]. 2026; 72(1). Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0104-42302026000102216&tlng=en
16. Huang HL, Hsu YH, Yang CW, Hsu MF, Chung YC. Effects of a Health Literacy Education Program on Mental Health and Renal Function in Patients with Chronic Kidney Disease: A Randomized Controlled Trial. *J Nurs Res* [Internet], Feb 2024; 32(1):e310. Available from: <https://journals.lww.com/10.1097/jnr.0000000000000595>
17. Chesnaye NC, Carrero JJ, Hecking M, Jager KJ. Differences in the epidemiology, management and outcomes of kidney disease in men and women. *Nat Rev Nephrol* [Internet], Jan 20, 2024; 20(1):7-20. Available from: <https://www.nature.com/articles/s41581-023-00784-z>
18. Stømer UE, Wahl AK, Gøransson LG, Urstad KH. Exploring health literacy in patients with chronic kidney disease: A qualitative study. *BMC Nephrol* [Internet], Dec 29, 2020; 21(1):314. Available from: <https://bmcnephrol.biomedcentral.com/articles/10.1186/s12882-020-01973-9>
19. Toyama M, Satoh M, Nakayama S, Hashimoto H, Muroya T, Murakami T, *et al.* Combined effects of blood pressure and glucose status on the risk of chronic kidney disease. *Hypertens Res* [Internet], Jul 26, 2024; 47(7):1831-1841. Available from: <https://www.nature.com/articles/s41440-024-01683-x>
20. Di Marco S, Padovan AM, Conti N, Aimasso F, Viazzi F, Fontana V, *et al.* Improving well-being and enhancing awareness in patients undergoing hemodialysis through the person-centered IARA model: An exploratory study. *Front Med* [Internet], Jul 1, 2024; 11. Available from: <https://www.frontiersin.org/articles/10.3389/fmed.2024.1425921/full>
21. Imelda F, Susalit E, Marbun MBM, Rumende CM. Gambaran Klinis dan Kualitas Hidup Pasien Penyakit Ginjal Tahap Akhir yang Menjalani Hemodialisis Dua Kali Dibandingkan Tiga Kali Seminggu. *J Penyakit Dalam Indones* [Internet], Sep 30, 2017; 4(3):128. Available from: <https://scholarhub.ui.ac.id/jpdi/vol4/iss3/5/>
22. Fan L, Yang X, Shen H, Chen M, Zhang H, Ni Z, *et al.* A prospective, randomized, multicenter, open-label trial comparing survival in subjects receiving peritoneal dialysis or conventional in-center hemodialysis. *Med Adv* [Internet], Jun 5, 2024; 2(2):112-122. Available from: <https://onlinelibrary.wiley.com/doi/10.1002/med4.56>