

CLINICAL AND EPIDEMIOLOGICAL PROFILE OF PATIENTS WITH CHRONIC KIDNEY DISEASE UNDERGOING HEMODIALYSIS AT A REFERRAL CENTER IN LUANDA, ANGOLA

PERFIL CLÍNICO E EPIDEMIOLÓGICO DE PACIENTES COM DOENÇA RENAL CRÔNICA EM HEMODIÁLISE EM UM CENTRO DE REFERÊNCIA DE LUANDA, ANGOLA

Suzana do Céu Silva Rodrigues Costa¹

RESUMO: Objetivo: Caracterizar o perfil clínico e epidemiológico de pacientes com doença renal crônica submetidos à hemodiálise em um centro de referência de Luanda, Angola, no ano de 2024. Métodos: Estudo observacional, descritivo, retrospectivo, com abordagem quantitativa, realizado por meio da revisão de 100 prontuários selecionados aleatoriamente entre 207 pacientes com doença renal crônica em tratamento hemodialítico. Foram analisadas variáveis sociodemográficas e clínicas, utilizando estatística descritiva para apresentação das frequências absolutas, relativas, médias e desvios-padrão. Resultados: Observou-se predominância do sexo masculino (56,0%), de pacientes com idade igual ou superior a 50 anos (40,0%) e média de idade de $47,0 \pm 11,3$ anos. A hipertensão arterial constituiu a principal doença de base (75,6%), seguida da diabetes mellitus (15,4%). O tempo médio de permanência em hemodiálise foi de $6,0 \pm 3,5$ anos, com predominância de pacientes em tratamento entre cinco e sete anos (31,0%) e há oito anos ou mais (30,0%). Em 62,0% dos prontuários não havia registro do motivo de início da terapia dialítica; entre os casos registrados, a síndrome urêmica foi a principal indicação (31,0%). A maioria dos pacientes não apresentava comorbidades registradas (71,0%), sendo as doenças cardiovasculares (7,0%) e o hiperparatireoidismo secundário (6,0%) as condições mais frequentes. Conclusão: Os pacientes apresentaram predominância do sexo masculino, idade igual ou superior a 50 anos e elevada frequência de hipertensão arterial como doença de base. Os resultados reforçam a importância do diagnóstico precoce da doença renal crônica, do controle dos fatores de risco e do acompanhamento multiprofissional, além de evidenciarem a necessidade de aprimorar a qualidade dos registros clínicos para subsidiar a assistência e a produção de evidências científicas.

Palavras-chave: Doença renal crônica. Hemodiálise. Epidemiologia. Hipertensão arterial. Diabetes mellitus.

ABSTRACT: Objective: To characterize the clinical and epidemiological profile of patients with chronic kidney disease undergoing hemodialysis at a referral center in Luanda, Angola, in 2024. Methods: This was an observational, descriptive, retrospective study with a quantitative approach, based on the review of 100 randomly selected medical records from a population of 207 patients with chronic kidney disease undergoing hemodialysis. Sociodemographic and clinical variables were analyzed using descriptive statistics, with results expressed as absolute and relative frequencies, means, and standard deviations. Results: Most patients were male (56.0%), aged 50 years or older (40.0%), with a mean age of 47.0 ± 11.3 years. Hypertension was the main underlying disease (75.6%), followed by diabetes mellitus (15.4%). The mean duration of hemodialysis treatment was 6.0 ± 3.5 years, with most patients undergoing treatment for five to seven years (31.0%) or eight years or longer (30.0%). In 62.0% of the medical records, the indication for initiating hemodialysis was not documented; among the recorded cases, uremic syndrome was the most frequent indication (31.0%). Most patients had no recorded comorbidities (71.0%); among those with comorbidities, cardiovascular diseases (7.0%) and secondary hyperparathyroidism (6.0%) were the most common. Conclusion: The study identified a predominance of male patients, individuals aged 50 years or older, and hypertension as the main

¹ Doutoranda em Saúde Pública, Universidad de Ciencias Empresariales y Sociales. Médica.

underlying disease. The findings reinforce the importance of early diagnosis of chronic kidney disease, effective management of risk factors, multidisciplinary follow-up, and improvement of clinical record quality to support patient care and scientific research.

Keywords: Chronic kidney disease. Hemodialysis. Epidemiology. Hypertension. Diabetes mellitus.

1 INTRODUCTION

Chronic kidney disease (CKD) is a major global public health concern, characterized by the progressive and irreversible loss of kidney function, with significant impacts on morbidity and mortality, patients' quality of life, and healthcare system costs (Amorim et al., 2025; Farina et al., 2026).

In advanced stages, the decline in glomerular filtration rate impairs the body's ability to maintain homeostasis, making kidney replacement therapy, particularly hemodialysis, necessary to sustain the lives of affected individuals (Marinho et al., 2025; Ferraz & Rodrigues, 2025).

The progression of CKD is frequently associated with chronic non-communicable diseases, especially systemic arterial hypertension and diabetes mellitus, which are recognized as major risk factors for the development and progression of kidney disease (Ferreira et al., 2026). In addition, patients undergoing hemodialysis experience a high burden of comorbidities, particularly cardiovascular diseases, which contribute substantially to increased morbidity, mortality, and the complexity of clinical management (Franco, 2025). In this context, understanding the clinical and epidemiological characteristics of this population is essential to support prevention strategies, early diagnosis, and healthcare planning (Marinho et al., 2025; Rodrigues & Oliveira, 2025).

Although CKD represents a growing challenge for healthcare systems worldwide, studies describing the clinical and epidemiological profile of patients undergoing hemodialysis in African countries, particularly in Angola, remain scarce. The availability of information on the characteristics of this population may contribute to strengthening public health policies, improving the organization of nephrology services, and developing strategies aimed at controlling the main risk factors and complications associated with the disease (Oblanca et al., 2026; Paiva et al., 2026; Pinto et al., 2026).

Given this context, this study was justified by the need to expand knowledge regarding the profile of patients with chronic kidney disease undergoing hemodialysis in Luanda, Angola, providing evidence to support clinical practice, healthcare management, and health service planning. Therefore, the aim of this study was to characterize the clinical and epidemiological

profile of patients with chronic kidney disease undergoing hemodialysis at a referral center in Luanda, Angola, during 2024.

2 METHODS

This was an observational, descriptive, retrospective study with a quantitative approach, conducted through the review of medical records of patients with chronic kidney disease (CKD) undergoing hemodialysis.

The study was carried out at a peripheral hemodialysis center located in Luanda, Angola. Medical records of patients treated between January and December 2024 were reviewed.

The study population consisted of 207 medical records of patients diagnosed with chronic kidney disease who underwent hemodialysis during the study period.

The sample comprised 100 medical records selected through simple random probability sampling.

Medical records of patients with chronic kidney disease who underwent hemodialysis between January and December 2024 were included. Records containing incomplete, illegible, damaged, or inadequately completed information that prevented the collection of the variables of interest were excluded.

Sociodemographic and clinical variables were analyzed. Sociodemographic variables included age, sex, race, marital status, and municipality/province of residence.

Clinical variables comprised the underlying cause of CKD, indication for initiation of hemodialysis, duration of hemodialysis treatment, serological profile, type of vascular access, laboratory parameters (hemoglobin, calcium, phosphorus, and parathyroid hormone), associated comorbidities, and intradialytic complications.

The study was previously authorized by the competent institutional authorities following a formal request submitted through the Department of Teaching and Research of the Faculty of Medicine, Agostinho Neto University, and approval from the Clinical Directorate of the Hemodialysis Center to access the medical records. Patient anonymity, data confidentiality, and the exclusive use of the information for scientific and academic purposes were ensured.

Data were collected through a review of medical records using a previously designed standardized data collection form.

The data were entered into Microsoft Excel® 2016 spreadsheets and subsequently analyzed using the Statistical Package for the Social Sciences (SPSS), version 23.

Descriptive statistical analysis was performed. Categorical variables were expressed as absolute and relative frequencies, whereas quantitative variables were summarized using measures of central tendency (mean) and dispersion (standard deviation), including age, duration of hemodialysis, and laboratory parameters. The results were presented in tables and figures.

3 RESULTS

A total of 100 medical records of patients with chronic kidney disease (CKD) undergoing hemodialysis were analyzed. These records were randomly selected from a population of 207 patients treated at a hemodialysis center in Luanda, Angola, between January and December 2024. The sociodemographic characteristics of the study population are presented first, followed by the clinical variables related to chronic kidney disease and hemodialysis treatment.

Patients' ages ranged from 25 to 78 years, with a mean age of 47.0 years (standard deviation = 11.3). Most participants were aged ≥ 50 years (40.0%), male (56.0%), Black (98.0%), single (93.0%), and residents of Luanda Province (98.0%), particularly Luanda Municipality (47.0%). The remaining sociodemographic characteristics are presented in Table 1.

4

Table 1. Sociodemographic characteristics of patients with chronic kidney disease undergoing hemodialysis at a referral hemodialysis center in Luanda, Angola, 2024 (n = 100).

Variable	Category	n	%
Age group (years)	20–29	6	6.0
	30–39	20	20.0*
	40–49	34	34.0
	≥ 50	40	40.0
Age (years)	Mean $\pm$ SD	47.0 $\pm$ 11.3	—
Sex	Male	56	56.0
	Female	44	44.0
Race	Black	98	98.0
	White	2	2.0
Marital status	Single	93	93.0
	Married	6	6.0
	Divorced	1	1.0
Province of residence	Luanda	98	98.0
	Bengo	1	1.0
	Huambo	1	1.0
Municipality of residence	Luanda	47	47.0
	Talatona	16	16.0
	Viana	16	16.0

Variable	Category	n	%
	Other municipalities**	19	19.0
	Bengo	1	1.0
	Huambo	1	1.0

Source: Prepared by the authors based on the study data (2024).

The main clinical characteristics of patients with chronic kidney disease undergoing hemodialysis are presented in Table 2. The underlying causes of CKD, indications for initiation of hemodialysis, duration of kidney replacement therapy, and associated comorbidities were evaluated, providing an overview of the clinical profile of the study population.

Table 2. Clinical characteristics of patients with chronic kidney disease undergoing hemodialysis at a referral hemodialysis center in Luanda, Angola, 2024 (n = 100).

Variable	Category	n	%
Underlying cause of CKD	Hypertension	76	75.6
	Diabetes mellitus	15	15.4
	Chronic glomerulonephritis	3	3.3
	Obstructive uropathy	3	3.3
	Unknown etiology	2	2.4
Indication for initiation of hemodialysis	Not specified	62	62.0
	Uremic syndrome	31	31.0
	Acute pulmonary edema	4	4.0
	Metabolic acidosis	3	3.0
Duration of hemodialysis	<2 years	12	12.0
	2-4 years	27	27.0*
	5-7 years	31	31.0
	≥8 years	30	30.0
	Mean ± SD	6.0 ± 3.5 years	—
Associated comorbidities	None	71	71.0
	Cardiovascular disease	7	7.0
	Secondary hyperparathyroidism	6	6.0

Variable	Category	n	%
	Urinary tract infection	2	2.0
	Pulmonary tuberculosis	2	2.0
	Catheter-related sepsis	1	1.0
	Other comorbidities**	11	11.0

Source: Prepared by the authors based on the study data (2024).

In the present study, most patients were male (56.0%) and aged 50 years or older, with a mean age of 47 years. These findings partially agree with those reported by Vieira et al. (2025), who also found a predominance of male patients (55.6%) among individuals undergoing hemodialysis, although the most frequent age group in their study was 60–69 years. This difference in age distribution may reflect epidemiological, demographic, and healthcare access disparities across the study settings. Nevertheless, both studies demonstrate the predominance of chronic kidney disease among adult and older patients receiving kidney replacement therapy.

4 DISCUSSION

Regarding marital status, unlike the findings reported by Vieira et al. (2025), in which married or cohabiting individuals accounted for the majority of patients (55.6%), the study population was predominantly composed of single individuals (93.0%). This discrepancy may be explained by the specific sociodemographic characteristics of the study population and by cultural differences across the settings investigated (Oblanca et al., 2026; Paiva et al., 2026).

Hypertension was the most common underlying cause of chronic kidney disease among the patients evaluated, reinforcing its well-established role as one of the leading risk factors for the development and progression of CKD (Pinto et al., 2026; Rodrigues & Oliveira, 2025). According to Sacramento et al. (2025), the relationship between hypertension and CKD is bidirectional, as hypertension accelerates the progression of kidney damage, whereas declining renal function contributes to the persistence and worsening of hypertension through mechanisms such as volume overload, increased arterial stiffness, and activation of the renin–angiotensin–aldosterone system. Furthermore, Marinho et al. (2025) emphasized that CKD is a progressive and multifactorial disease frequently associated with hypertension, diabetes mellitus, and cardiovascular disease, highlighting the importance of controlling these risk factors to delay disease progression and reduce the need for kidney replacement therapy.

Diabetes mellitus was the second most common underlying cause identified in this study (15.4%). Although its frequency was lower than that of hypertension, this finding reinforces its importance as a major risk factor for the development and progression of CKD. Rodrigues and Oliveira (2025) also reported a high prevalence of diabetes mellitus among patients undergoing hemodialysis and highlighted its association with cardiovascular disease. These findings underscore the need for strict glycemic control and preventive strategies aimed at reducing the progression of kidney disease and cardiovascular complications in individuals with diabetes.

The mean duration of hemodialysis treatment was six years, with most patients having undergone treatment for five to seven years or for eight years or longer. These findings suggest that a substantial proportion of patients remain on kidney replacement therapy for prolonged periods, reflecting the chronic nature of CKD and the long-term dependence on dialysis treatment. Similar findings have been reported in studies involving patients undergoing hemodialysis, emphasizing that long-term follow-up requires continuous clinical monitoring and multidisciplinary care because of the complications associated with both disease progression and dialysis therapy (Vieira et al., 2025).

Another relevant finding was the high proportion of medical records lacking documentation of the indication for initiation of hemodialysis (62.0%). Among the records in which this information was available, uremic syndrome was the most frequent indication for initiating dialysis therapy. The absence of this information limits the understanding of the timing of referral for kidney replacement therapy and compromises the quality of clinical data used for both patient care and epidemiological research. Moreover, the predominance of uremic syndrome among the documented indications suggests that a considerable proportion of patients initiated dialysis at advanced stages of CKD, when clinical manifestations of severe renal dysfunction were already established.

Finally, most patients had no documented comorbidities in their medical records. Among those with recorded comorbidities, cardiovascular disease and secondary hyperparathyroidism were the most frequently reported. Cardiovascular disease is a major cause of morbidity and mortality among patients with CKD and is promoted by the coexistence of hypertension, diabetes mellitus, chronic inflammation, and metabolic disturbances resulting from impaired kidney function. Rodrigues and Oliveira (2025) also reported a high prevalence of cardiovascular disease among patients undergoing hemodialysis, mainly associated with

older age and diabetes mellitus, reinforcing the importance of systematic cardiovascular monitoring in this population.

The findings of this study contribute to a better understanding of the clinical and epidemiological profile of patients with chronic kidney disease undergoing hemodialysis in Luanda, Angola. The high prevalence of hypertension as the primary underlying cause of CKD, the prolonged duration of kidney replacement therapy, and the occurrence of cardiovascular disease underscore the importance of strategies focused on early diagnosis, effective management of risk factors, and continuous multidisciplinary follow-up. Furthermore, the high proportion of medical records lacking documentation of the indication for initiation of hemodialysis highlights the need to improve the quality of clinical record-keeping, thereby supporting both patient care and the generation of reliable scientific evidence.

5 CONCLUSION

This study characterized the clinical and epidemiological profile of patients with chronic kidney disease undergoing hemodialysis at a referral center in Luanda, Angola. The study population was predominantly composed of male patients aged 50 years or older, with hypertension and diabetes mellitus identified as the main underlying causes of CKD. In addition, prolonged duration of kidney replacement therapy and the presence of cardiovascular disease were the most frequent clinical characteristics observed among patients with documented comorbidities.

8

These findings highlight the importance of early diagnosis and appropriate management of CKD risk factors, particularly hypertension and diabetes mellitus, as well as the implementation of multidisciplinary follow-up strategies aimed at preventing complications and improving the quality of care provided to patients undergoing hemodialysis.

A limitation of this study was the use of retrospective data obtained from medical records, some of which contained incomplete information, particularly regarding the indication for initiation of hemodialysis and the documentation of comorbidities. This may have influenced the analysis of some study variables.

Future multicenter studies with prospective designs and larger sample sizes are recommended to further characterize the profile of patients with chronic kidney disease in Angola and to provide evidence to support public health policies and strategies aimed at strengthening nephrology care in the country.

Declaration on the Use of Artificial Intelligence

The authors declare that the artificial intelligence tool ChatGPT (OpenAI) was used exclusively to assist with text organization, improvement of academic writing, and linguistic revision of the manuscript. The tool was not used for data generation, analysis, or interpretation. All scientific content, including the study conception, data collection and analysis, interpretation of the findings, and preparation of the conclusions, remains the sole responsibility of the authors, who critically reviewed and approved the final version of the manuscript.

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