Original article

Epidemiological profile of patients with Chronic Kidney Disease on hemodialysis at a referral clinic in the interior of Minas Gerais

Perfil epidemiológico de pacientes com Doença Renal Crônica em hemodiálise em uma clínica de referência no interior de Minas Gerais

Giovana Arrighi Ferrari[1], Laila Cristina Fernandes Piva Reis[1], Murilo Leone Miranda Fajardo[2], Gisele Aparecida Fófano[3]

1 Student, Governador Ozanam Coelho University Center, Ubá, Minas Gerais, Brazil
2 Student, Federal University of São João del-Rei, São João del-Rei, Minas Gerais, Brazil
3 Faculty, Governador Ozanam Coelho University Center, Ubá, Minas Gerais, Brazil
Corresponding Author: Giovana Arrighi Ferrari
Contact: giovanaferrari14@gmail.com

ABSTRACT

Chronic Kidney Disease (CKD) is a condition characterized by progressive loss of kidney function that affects millions of people. Early diagnosis and appropriate management of underlying causes are crucial to slow its progression and improve patients' quality of life. To analyze the epidemiological profile of CKD in hemodialysis patients at a referral clinic in the interior of Minas Gerais, correlating the socioeconomic profile of patients with to the primary etiology. This is a descriptive and quantitative cross-sectional study, in which data were collected in the first half of 2024, through direct approach to patients through a confidential and individual self-administered questionnaire containing questions on the subject, totaling a sample population of 96 patients. Most patients were men aged 18 to 60 years with incomplete elementary school education. The most prevalent etiology was hypertension (HTN), followed by diabetes mellitus (DM). the most prevalent epidemiological profile among clinic patients was men with low income and education, with HTN and DM.

RESUMO

A Doença Renal Crônica (DRC) é uma condição caracterizada pela perda progressiva da função renal, afetando milhões de pessoas. O diagnóstico precoce e o manejo adequado das causas subjacentes são cruciais para retardar sua progressão e melhorar a qualidade de vida dos pacientes. Objetivo: Analisar o perfil epidemiológico da DRC em pacientes em hemodiálise em uma clínica de referência no interior de Minas Gerais, correlacionando o perfil socioeconômico e demográfico dos pacientes com a etiologia primária. Método: Trata-se de um estudo descritivo, quantitativo e de recorte transversal, no qual os dados foram coletados no primeiro semestre de 2024, por meio de abordagem direta aos pacientes, utilizando-se um questionário autoaplicável, sigiloso e individual, contendo perguntas relacionadas à temática, em uma população amostral de 96 pacientes. Resultados: A maioria dos pacientes era composta por homens, na faixa etária de 18 a 60 anos, com nível de escolaridade correspondente ao ensino fundamental incompleto. A etiologia mais frequente foi a hipertensão arterial sistêmica (HAS), seguida pelo diabetes mellitus (DM). Conclusões: O perfil epidemiológico de maior prevalência entre os pacientes da clínica foi o de homens de baixa renda e escolaridade, portadores de HAS e DM.

INTRODUCTION

Chronic kidney disease (CKD) is a heterogeneous clinical syndrome resulting from structural and functional alterations of the kidneys, characterized by its irreversibility and slow progression[1]. According to the 2024 guidelines from Kidney Disease: Improving Global Outcomes (KDIGO), the diagnosis of CKD is based on the chronic reduction of kidney function and structural damage to these organs. An adult patient is considered to have CKD when, for a period of three months or more, they present a glomerular filtration rate (GFR) below 60 mL/min/1.73m², or a GFR above 60 mL/min/1.73m² with evidence of structural damage to the renal parenchyma. Indicators of structural damage include albuminuria, abnormalities detected on imaging exams, hematuria/leukocyturia, persistent electrolyte disturbances, histological alterations, and kidney transplantation[2].

Also according to KDIGO 2024, CKD is classified into stages based on GFR and albuminuria, aiming to guide clinical management and stratify the risk of progression and complications. GFR is categorized into five stages: G1 (≥ 90 mL/min/1.73 m²), G2 (60–89), G3a (45–59), G3b (30–44), G4 (15–29), and G5 (< 15). Albuminuria is divided into three levels: A1 (< 30 mg/g), A2 (30–300 mg/g), and A3 (> 300 mg/g). The combination of GFR stages with albuminuria levels allows for a more accurate risk assessment, aiding in the development of personalized therapeutic strategies[2].

CKD shows a high prevalence among the global adult population. A global analysis conducted in 2016 through a systematic review and meta-analysis of 100 studies, involving 6,908,440 patients, estimated a prevalence of 13.4% for stages 1 to 5 and 10.6% for stages 3 to 5[3].

More recently, KDIGO 2024 has defined CKD as a global public health issue, affecting approximately 10% of the world's population, although awareness of the condition remains relatively recent and incomplete. Unfortunately, the numerous challenges posed by CKD—its prevalence, morbidity, mortality, and associated costs—are relentlessly increasing, especially in low-income countries[2].

In the Brazilian context, the 2024 Epidemiological Bulletin on CKD highlights a continuous upward trend in CKD-related healthcare visits between 2019 and 2023, with the Southeast and South regions showing the highest numbers in 2023. This increase may be associated with factors such as expanded access to and coverage of healthcare services, improved early diagnosis, higher disease prevalence, and better quality of electronic health record data used in Primary Health Care (PHC)[4].

Patients with chronic kidney disease (CKD) generally present with low socioeconomic status, a high risk of morbidity and mortality, and lower levels of health-related quality of life (HRQoL). The risk of death increases exponentially as kidney function declines and is, in most cases, attributable to cardiovascular complications. Similarly, HRQoL is substantially lower in individuals with CKD compared to the general population and decreases in tandem with glomerular filtration rate (GFR)[5, 6].

HRQoL refers to the analysis of how disease and treatment affect the patient's subjective sense of well-being. Therefore, the HRQoL of a patient with CKD is influenced by their lived experience with the disease. Understanding HRQoL dimensions is especially important in CKD, as this measure can serve as an independent predictor of disease progression as well as cardiovascular mortality[7].

CKD can affect HRQoL in various ways. The diagnosis alone is already impactful. In addition, multiple syndromic symptoms of CKD—such as hypertension, fluid retention, bone pain, peripheral neuropathy, pruritus, sleep disorders, and medication side effects—significantly contribute to this burden. Comorbidities are also relevant factors in perceived HRQoL deterioration, with some patients reporting that their HRQoL with CKD is

comparable to that of individuals with terminal illnesses[8].

When CKD progresses to the point of requiring renal replacement therapy (RRT), two main therapeutic modalities are available to maintain survival and ensure ongoing treatment: dialysis (hemodialysis and peritoneal dialysis) and kidney transplantation. According to the 2023 Brazilian Dialysis Census, among patients undergoing RRT, 88.2% were on hemodialysis, 8.0% on hemodiafiltration, and 3.8% on peritoneal dialysis[4].

Studying the sociodemographic, economic, etiological, and clinical characteristics of CKD patients undergoing RRT is an important contribution to clinical practice, as these data can help in understanding how and which aspects correlate with possible etiologies and comorbidities, while also emphasizing the importance of health promotion in this context. Given this scenario, the aim of this study was to analyze the epidemiological profile of CKD patients undergoing hemodialysis at a reference clinic in the interior of Minas Gerais, correlating the patients' socioeconomic and demographic profiles with the primary etiology.

MATERIALS AND METHODS

This is a descriptive, quantitative, cross-sectional study. Data were collected during the first half of 2024 through direct contact with patients at a reference clinic located in the microregion of the interior of Minas Gerais, using a structured, self-administered, individual, and confidential questionnaire.

The questionnaire was designed to be completed independently by participants, without direct intervention from the researcher. It consisted of 26 objective questions addressing sociodemographic and clinical aspects such as gender, age, city of residence, rural or urban residency status, marital status, religion, educational level, household income,

employment status, number of hemodialysis sessions, as well as information about the primary etiology of CKD and comorbid conditions associated with this etiology. The last two elements were also verified through data obtained from the patients' medical records.

The study included all patients undergoing treatment at the time of data collection, consisting of men and women over the age of 18 with CKD enrolled in a hemodialysis program at a reference clinic for the microregion of the city of Ubá, Minas Gerais. Participation required the signing of an Informed Consent Form (ICF).

Excluded from the study were individuals who did not agree to participate or who did not sign the ICF, patients under 18 years of age, patients with acute kidney diseases, and those who were absent at the time of data collection.

The sample size was determined based on the total number of patients treated at the clinic, which consisted of 120 individuals. For the calculation, a 95% confidence level and a 5% margin of error were adopted. The expected population proportion was set at 50% (p = 0.5), a conservative estimate typically used when no prior data are available.

The sample size for a finite population was calculated using the following formula:

$$n = \frac{N \cdot Z^2 \cdot p \cdot (1 - p)}{E^2 \cdot (N - 1) + Z^2 \cdot p \cdot (1 - p)}$$

By substituting the values (N = 120; Z = 1.96; p = 0.5; E = 0.05), a minimum required sample size of 92 patients was obtained. The final sample consisted of 96 participants, exceeding the estimated number and ensuring the statistical representativeness of the data in relation to the target population.

All 96 patients treated at the clinic met the established inclusion criteria and were included in the study. The participants were over 18 years of age, diagnosed with CKD, and undergoing renal replacement therapy (RRT)

with hemodialysis at a frequency of at least three times per week, totaling 12 hours per week. Patient recruitment took place within the institution itself, with proper authorization from the medical and administrative staff. The questionnaire ([Supplementary Material 1](#)) was administered in a single session, during the hemodialysis procedure, after the participants signed the Informed Consent Form (ICF).

After data collection, the information was organized and categorized according to similarity, and processed using IBM SPSS Statistics software (version 21). Results were presented in the form of tables with simple frequency distributions. A critical analysis of the findings and collected data was subsequently carried out.

Ethical and legal principles were followed throughout all stages of the study. Patient contact occurred only after the project had been approved by the Research Ethics Committee, under Certificate of Presentation for Ethical Consideration number 75610423.0.0000.8108, in accordance with Resolution CNS No. 466/2012.

RESULTS AND DISCUSSION

Sociodemographic Data

In accordance with the inclusion and exclusion criteria, the study sample consisted of 96 eligible patients. Among them, 39 (40.6%) were female and 57 (59.4%) were male. The most common age group was 31 to 60 years, representing 53.1% of the participants. Regarding marital status and religion, the majority of respondents were married and identified as practicing Catholics. In terms of education, most patients had only incomplete primary education, accounting for 56.3% of the sample. Concerning household income, 86.5% of patients reported earning up to one minimum wage. **Table 1** presents these data in detail.

Of the total number of patients, 94.8% stated that they relied exclusively on the Brazilian Unified Health System (SUS), while the remaining 5.2% had private health insurance. Despite some patients having private insurance, all individuals treated at the clinic were registered under the SUS.

Employment Conditions

Regarding employment status, 84.4% of patients were no longer working, and 66.7% reported that they stopped working due to CKD and the need for hemodialysis. In this context, 38.5% of the patients who had to interrupt their professional activities due to chronic kidney disease were between 31 and 60 years of age. Additionally, 34.4% had ceased working more than 10 years ago. **Tables 2 and 3** provide more detailed information on the data described above.

According to the information obtained from patients and their medical records, the primary etiologies of CKD in the study population, in descending order of prevalence, were: systemic arterial hypertension (SAH), diabetes mellitus (DM), chronic glomerulonephritis, and other pathological conditions such as IgA nephropathy and multiple myeloma, as presented in **Table 4**.

The presence of comorbidities associated with the primary etiology of CKD was also evaluated. It was observed that 33.3% of patients diagnosed with diabetes mellitus (DM) presented an associated condition, and in 100% of these cases, it was systemic arterial hypertension (SAH). In other words, all 32 patients who reported DM as the primary etiology were also hypertensive. For the remaining etiologies, the associated comorbidities were varied, including hyperthyroidism, hypothyroidism, glaucoma, prostatic hyperplasia, among others, which do not have a direct relationship with the progression of CKD. **Table 5** presents the relationship described above, correlating the primary etiologies with additional associated conditions.

Considering the total number of patients with SAH as the primary etiology (49 patients), as shown in **Table 4**, and the number of patients with SAH associated with DM (32 patients), as shown in Table 5, the total number of patients with SAH reaches 81, corresponding to 84.4% of the study sample.

When correlating the main etiologies of Chronic Kidney Disease (CKD) with socioeconomic and demographic variables, it was observed that most patients diagnosed with systemic arterial hypertension (SAH) and diabetes mellitus (DM) had low educational attainment, predominantly incomplete primary education, and a household income of up to one minimum wage. These findings are detailed in **Table 6**.

It was also found that prior to the CKD diagnosis, 75% of respondents were unaware that they had comorbidities contributing to the development of the disease, with those conditions being diagnosed only after irreversible kidney damage had occurred. The remaining 25% reported prior knowledge of

Table 1. Sociodemographic and Economic Profile of the Patients (n = 96).

Sample Description		N	%
Gender	Female	39	40,6
	Male	57	59,4
Age Group	18–30 years	1	1,0
	31–60 years	51	53,1
	Over 60 years	44	45,8
Marital Status	Single	15	15,6
	Married	51	53,1
	Widowed	12	12,5
	Other	18	18,8
Religion	Catholic	76	79,2
	Evangelical	14	14,6
	No religion	4	4,2
	Other religion	2	2,1
Educational Level	Illiterate	3	3,1
	Incomplete primary education	54	56,3
	Complete primary education	20	20,8
	Complete secondary education	11	11,5
	Complete higher education	8	8,3
Household Income	Up to 1 minimum wage (MW)*	83	86,5
	From 1 to 3 MW	10	10,4
	From 3 to 5 MW	2	2,1
	Over 5 MW	1	1,0

*MW = Minimum Wage

Table 2. Patient Work Status (n = 96)

Relationship with work		N	%
Relationship with work	Never worked	9	9,3
	Currently working	6	6,3
	No longer working	81	84,4
Stopped working due to CKD and hemodialysis?	Yes	64	66,7
	No	32	33,3
How long ago did the patient stop working?	Still working	9	9,3
	Less than 1 year	6	6,3
	1–5 years	3	3,1
	5–10 years	26	27,1
	More than 10 years	19	19,8
	Still working	33	34,4

Table 3. Relationship Between Age Group and Work Activity Interruption (n = 96).

Age Group	Stopped working due to CKD and hemodialysis?	
	Yes	**No**
	N (%)	N (%)
18–30 years	1 (1,0)	0 (0,0)
31–60 years	37 (38,5)	14 (14,6)
Over 60 years	26 (27,1)	18 (18,8)

Table 4. Main Primary Etiologies Affecting the Patients (n = 96).

Primary Etiology of CKD	N	%
Systemic arterial hypertension	49	51,0
Diabetes mellitus	35	36,4
Chronic glomerulonephritis	6	6,3
Other	6	6,3

Table 5. Relationship Between the Primary Etiology of CKD and an Associated Comorbid Condition (n = 96).

Primary Etiology of CKD	Is there another comorbid condition present?	
	Yes	**No**
	N (%)	N (%)
Systemic arterial hypertension	8 (8,3)	41 (42,7)
Diabetes mellitus	32 (33,3)	3 (3,1)
Chronic glomerulonephritis	2 (2,1)	4 (4,2)
Other	1 (1,0)	5 (5,2)

Table 6. Relationship Between Primary Etiology, Educational Level, and Household Income (n = 96).

Socioeconomic Profile and Patient Awareness Level According to Primary Etiology		HAS N (%)	DM N (%)	Other N (%)	Total N (%)
Educational Level	Illiterate	2 (2,1)	1 (1,0)	0 (0,0)	3 (3,1)
	Incomplete primary education	27 (28,0)	23 (23,9)	4 (4,2)	54 (56,3)
	Complete primary education	12 (12,5)	6 (6,3)	2 (2,1)	20 (20,8)
	Complete secondary education	2 (2,1)	3 (3,1)	6 (6,3)	11 (11,5)
	Complete higher education	6 (6,3)	2 (2,1)	0 (0,0)	8 (8,3)
Household Income	Up to 1 MW*	45 (46,9)	30 (31,2)	8 (8,3)	83 (86,5)
	From 1 to 3 MW	4 (4,2)	2 (2,1)	4 (4,2)	10 (10,4)
	From 3 to 5 MW	0 (0,0)	2 (2,1)	0 (0,0)	2 (2,1)
	Over 5 MW	1 (1,0)	0 (0,0)	0 (0,0)	1 (1,0)
	Acima de 5 SM*	1 (1,0)	0 (0,0)	0 (0,0)	1 (1,0)
Prior Knowledge of Etiology	No	41 (42,8)	23 (23,9)	8 (8,3)	72 (75,0)
	Yes	8 (8,3)	12 (12,5)	4 (4,2)	24 (25,0)

*MW = Minimum Wage

these comorbidities; however, they stated that they did not manage the conditions adequately nor maintained a regular routine of medical follow-up.

The present study aimed to outline the epidemiological profile of patients with Chronic Kidney Disease (CKD) undergoing treatment in the microregion of the city of Ubá, located in the Zona da Mata region of the state of Minas Gerais, Brazil.

Regarding age group, gender, and educational level, it was found that most patients were between 18 and 60 years old, male, and had incomplete primary education. These findings are consistent with those reported in other studies. Dos Santos et al.[9] (2018) identified that most patients were aged between 18 and 64 years (80.8%), were male (54.0%),

and had only basic education (40.0%). Similarly, Oliveira et al.[10] (2014) reported a predominance of younger patients aged 19 to 64 years (66.9%), with a slight predominance of males.

With regard to household income, the results were also similar to those found in the literature. However, it is important to note that the analyses by Dos Santos et al.[9] and Oliveira et al.[9, 10] considered the threshold of up to two minimum wages, identifying that most patients had a family income equal to or less than this amount.

In line with these findings, the results of this study are consistent with the national context described in the 2020 Census of the Brazilian Society of Nephrology (SBN)[11], which reported a predominance of male patients with low educational levels (incomplete

primary education) and a household income mostly of up to two minimum wages. That same year, a greater concentration of cases was observed in individuals over 60 years of age, a finding similar to that described by Nunes et al.[12] (2024). The 2023 Brazilian Dialysis Census[13], also conducted by SBN, estimated 157,357 patients undergoing dialysis in Brazil as of July 1st, 2023, with a prevalence rate of 771 patients per million population (pmp) and an incidence rate of 251 pmp. This report reaffirmed the predominance of male patients (59%) among those receiving dialysis. However, unlike the previous census, the 2023 report did not include specific data on education and household income, which limits broader sociodemographic analyses.

Regarding employment status, most patients reported having left the workforce due to chronic kidney disease. In this context, when relating this to the most prevalent age group — between 18 and 60 years — one can infer a direct impact on both household income and the quality of life of these individuals. In a similar analysis, Oliveira et al.[10] observed that the evaluated patients had a household income of up to two minimum wages and, in most cases, received assistance from social security, which negatively affected their quality of life.

From this perspective, the present study found that patients' financial limitations, combined with low educational levels, represent a relevant factor in the development and progression of CKD. This condition is directly related to reduced access to healthcare services, difficulty in managing comorbidities, and lower adherence to preventive measures.

The analysis conducted in this study showed that a substantial proportion of respondents (75%) reported not having received prior medical follow-up before starting hemodialysis treatment and were unaware of the existence of their comorbidities, corroborating the findings described by Dos Santos et al.[9].

Similarly, the study by Moraes et al. (2023)[14] showed that the studied population had little knowledge about CKD and its risk factors.

Studies conducted in Brazil indicate that socioeconomic level and educational attainment have a significant influence on the development of CKD, as evidenced in the research by Gonçalves et al., Albuquerque et al., and Moraes et al.[14–16]. Individuals with more favorable socioeconomic conditions, higher income, and higher levels of education tend to seek preventive care services and undergo routine testing more regularly. On the other hand, those with lower household income are more likely to seek healthcare only after disease onset, reflecting delayed access to preventive and diagnostic care[14–16]. This scenario highlights the inequality in access to healthcare and the importance of public policies to improve CKD prevention and treatment across all social strata.

In the present study, the primary etiology most commonly associated with CKD was systemic arterial hypertension (SAH), followed by diabetes mellitus (DM), corroborating findings from other studies. SAH is widely recognized as one of the primary risk factors for the development and progression of CKD, as damage to renal blood vessels can progressively impair kidney function. The study conducted by Amaral et al. (2019)[17] also found that SAH was one of the main conditions associated with CKD in the population. Furthermore, that study identified other comorbidities significantly associated with CKD, including DM, metabolic syndrome, obesity, and poor self-rated health.

Other studies support these findings, highlighting that systemic arterial hypertension (SAH) is the most frequently associated etiology of CKD in patients undergoing hemodialysis. Diabetes mellitus (DM), which affects a significant portion of the Brazilian population, also plays a crucial role in the development of CKD, as observed in the studies by

Dos Santos et al., Gonçalves et al., Aguiar et al., Duarte et al., and Moraes et al.[9, 14, 15, 18, 19]. These findings are in agreement with the results of the 2023 Brazilian Dialysis Census conducted by the Brazilian Society of Nephrology (SBN), which identified SAH (37%) and DM (31%) as the most common causes of CKD among dialysis patients[13]. A decrease was also observed in the prevalence of chronic glomerulonephritis, dropping from 8% in 2022 to 5% in 2023[13, 20]. These data reinforce the interdependence of these comorbidities in the onset and progression of CKD, emphasizing the importance of monitoring and controlling these conditions to prevent disease progression.

The limitations of this study are related to the small sample size. However, it is important to note that the service analyzed is the only referral center for hemodialysis in the region, serving patients from ten municipalities. In this context, the descriptive analysis allows for the characterization of the patient profile in this microregion and supports the implementation of primary and secondary healthcare strategies.

This study aimed to generate information to guide the planning of targeted prevention strategies for CKD and health promotion. Such initiatives are highly relevant to Primary Health Care (PHC), especially in the screening of at-risk groups and the management of triggering factors. Furthermore, the implementation of appropriate therapeutic approaches to delay the progression of CKD can not only minimize patient suffering but also improve health-related quality of life (HRQoL) and reduce the financial burden on the healthcare system associated with managing this condition.

The study enabled the characterization of the epidemiological profile of the population treated with renal replacement therapy (RRT) at a referral clinic in the municipality of Ubá, in the interior of Minas Gerais. A predominance was observed of individuals aged between 18 and 60 years, male, and with incomplete primary education. SAH was identified as the main comorbidity, followed by DM. Moreover, the financial limitations reported by some patients may constitute significant barriers to treatment adherence and seeking regular medical care, underscoring the importance of continuous multidisciplinary intervention and the implementation of primary and secondary care strategies to address these challenges.

AUTHOR CONTRIBUTIONS

GAF, LCPFR, MLMF and GAF was responsible for the conception and design of the study, data analysis and manuscript writing. GAF, LCPFR and MLMF data collection, statistical analysis, and critical revision of the manuscript. GAF provided technical support, conducted the literature review, and performed the final revision of the text. All authors read and approved the final manuscript version and agree to take responsibility for its content.

ACKNOWLEDGEMENTS

CONFLICT OF INTEREST

We wish to confirm that there are no known conflicts of interest associated with this publication and that no significant financial support has influenced its results.

DECLARATION REGARDING THE USE OF GENERATIVE AI

The authors declare that generative artificial intelligence tools (such as ChatGPT, Grammarly, Deepseek, etc.) were not used in the manuscript. However, the editorial board made the

decision to utilize ChatGPT, an AI language model developed by OpenAI, for the translation of this manuscript from the original language, Portuguese, to English.

REFERENCES

1. Taal MW, Brenner BM. Predicting initiation and progression of chronic kidney disease: Developing renal risk scores. Kidney International [Internet]. novembro de 2006;70(10):1694–705. Disponível em: https://linkinghub.elsevier.com/retrieve/pii/S0085253815517808

2. Stevens PE, Ahmed SB, Carrero JJ, Foster B, Francis A, Hall RK, et al. KDIGO 2024 Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease. Kidney International [Internet]. abril de 2024;105(4):S117–314. Disponível em: https://linkinghub.elsevier.com/retrieve/pii/S0085253823007664

3. Hill NR, Fatoba ST, Oke JL, Hirst JA, O'Callaghan CA, Lasserson DS, et al. Global Prevalence of Chronic Kidney Disease – A Systematic Review and Meta-Analysis. Remuzzi G, organizador. PLoS ONE [Internet]. 6 de julho de 2016;11(7):e0158765. Disponível em: https://dx.plos.org/10.1371/journal.pone.0158765

4. Ministério da Saúde. Cenário da doença renal crônica no Brasil no período de 2010 a 2023 [Internet]. Secretaria de Vigilância em Saúde e Ambiente; 2024. Disponível em: https://www.gov.br/saude/pt-br/centrais-de-conteudo/publicacoes/boletins/epidemiologicos/edicoes/2024/boletim-epidemiologico-volume-55-no-12.pdf/@@download/file

5. Webster AC, Nagler EV, Morton RL, Masson P. Chronic Kidney Disease. The Lancet [Internet]. março de 2017;389(10075):1238–52. Disponível em: https://linkinghub.elsevier.com/retrieve/pii/S0140673616320645

6. Cruz VFESD, Tagliamento G, Wanderbroocke AC, Faculdade Dom Bosco, Brazil, Universidade Tuiuti do Paraná, Brazil, Universidade Tuiuti do Paraná, Brazil. A manutenção da vida laboral por doentes renais crônicos em tratamento de hemodiálise: uma análise dos significados do trabalho. Saude soc [Internet]. dezembro de 2016;25(4):1050–63. Disponível em: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0104-12902016000401050&lng=pt&tlng=pt

7. Porter A, Fischer MJ, Wang X, Brooks D, Bruce M, Charleston J, et al. Quality of Life and Outcomes in African Americans with CKD. Journal of the American Society of Nephrology [Internet]. agosto de 2014;25(8):1849–55. Disponível em:https://journals.lww.com/00001751-201408000-00027

8. Pretto CR, Winkelmann ER, Hildebrandt LM, Barbosa DA, Colet CDF, Stumm EMF. Quality of life of chronic kidney patients on hemodialysis and related factors. Rev Latino-Am Enfermagem [Internet]. 2020;28:e3327. Disponível em: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0104-11692020000100372&tlng=en

9. Dos Santos. KK, Lucas TC, Glória JCR, Pereira Júnior ADC, Ribeiro GDC, Oliveira Lara MO. Perfil epidemiológico de pacientes renais crônicos em tratamento. Rev enferm UFPE on line [Internet]. 8 de setembro de 2018;12(9):2293. Disponível em: https://periodicos.ufpe.br/revistas/revistaenfermagem/article/view/234508

10. Oliveira Junior HMD, Formiga FFC, Alexandre CDS. Clinical and epidemiological profile of chronic hemodialysis patients in João Pessoa - PB. Jornal Brasileiro de Nefrologia [Internet]. 2014;36(3). Disponível em: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0101-28002014000300367

11. Nerbass FB, Lima HDN, Thomé FS, Vieira Neto OM, Lugon JR, Sesso R. Brazilian Dialysis Survey 2020. Braz J Nephrol [Internet]. setembro de 2022;44(3):349–57. Disponível em: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0101-28002022000300349&tlng=en

12. Nunes DS, Moura MFD, Bausen T, Silveira BBP, Schreider PS, Mozdzen VF, et al. ANÁLISE DO PERFIL EPIDEMIOLÓGICO DE PACIENTES INTERNADOS POR DOENÇA RENAL CRÔNICA NO ESPÍRITO SANTO ENTRE 2019 A 2023. Braz J Implantol Health Sci [Internet]. 18 de maio de 2024;6(5):1219–27. Disponível em: https://bjihs.emnuvens.com.br/bjihs/article/view/2143

13. Nerbass FB, Lima HDN, Strogoff-de-Matos JP, Zawadzki B, Moura-Neto JA, Lugon JR, et al. Brazilian Dialysis Survey 2023. Braz J Nephrol [Internet]. março de 2025;47(1):e20240081. Disponível em: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0101-28002025000100309&tlng=en

14. Moraes BPL, Oliveira FSADSE. Percepção da população de São José dos Campos sobre a doença renal crônica. RSD [Internet]. 15 de novembro de 2023;12(12):e73121243946. Disponível em: https://rsdjournal.org/index.php/rsd/article/view/43946

15. Gonçalves FA, Dalosso IF, Borba JMC, Bucaneve J, Valerio NMP, Okamoto CT, et al. Quality of life in chronic renal patients on hemodialysis or peritoneal dialysis: a comparative study in a referral service of Curitiba - PR. Jornal Brasileiro

de Nefrologia [Internet]. 2015;37(4). Disponível em: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0101-28002015000400467

16. Albuquerque ACRMDM, Pinto GN, Pereira GA, Silva LF, Fontenele TAS, Oliveira JGRD, et al. Conhecimento da população sobre a doença renal crônica, seus fatores de risco e meios de prevenção: um estudo de base populacional em Fortaleza, Ceará, Brasil. Braz J Nephrol [Internet]. junho de 2023;45(2):144–51. Disponível em: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0101-28002023000200144&tlng=pt

17. Amaral TLM, Amaral CDA, Vasconcellos MTLD, Monteiro GTR. Prevalence and factors associated to chronic kidney disease in older adults. Rev saúde pública [Internet]. 16 de maio de 2019;53:44. Disponível em: http://www.revistas.usp.br/rsp/article/view/158063

18. Aguiar LKD, Prado RR, Gazzinelli A, Malta DC. Fatores associados à doença renal crônica: inquérito epidemiológico da Pesquisa Nacional de Saúde. Rev bras epidemiol [Internet]. 2020;23:e200044. Disponível em: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S1415-790X2020000100450&tlng=pt

19. Duarte ABA, Santos SNLP, Araújo MS, Macário ESDF, Farias MAGMD, Lima MMP, et al. Perfil epidemiológico da insuficiência renal no Brasil de 2012 a 2022. RSD [Internet]. 4 de outubro de 2023;12(10):e31121043360. Disponível em: https://rsdjournal.org/index.php/rsd/article/view/43360

20. Nerbass FB, Lima HDN, Moura-Neto JA, Lugon JR, Sesso R. Censo Brasileiro de Diálise 2022. Braz J Nephrol [Internet]. junho de 2024;46(2):e20230062. Disponível em: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0101-28002024000200306&tlng=pt