Analysis of Quality Care Indicators in a Nephrology Service in the Vale do Rio dos Sinos

Análise dos Indicadores de Qualidade Assistenciais de um Serviço de Nefrologia do Vale do Rio dos Sinos

Análisis de los Indicadores de Calidad Asistencial de un Servicio de Nefrología del Vale do Rio dos Sinos

RESUMO

Objetivo: Avaliar indicadores de qualidade assistenciais em pacientes submetidos à hemodiálise e hemodiafiltração em um serviço de nefrologia do Vale do Rio dos Sinos. **Método:** Estudo descritivo, retrospectivo e quantitativo, com análise de dados mensais do todo o ano de 2024. **Resultados:** A amostra fora predominantemente masculina, com faixa etária entre 41 e 60 anos. Glomerulopatias foi a principal etiologia de DRC. A fístula arteriovenosa foi o acesso mais utilizado e a maioria dos pacientes com tempo em programa superior a 12 meses. Predominância de pacientes em hemodiálise. A maioria dos parâmetros laboratoriais apresentou-se dentro das metas, com exceção da hemoglobina em alguns períodos. **Conclusão:** Os dados demonstram conformidade com os padrões nacionais de qualidade em terapia renal substitutiva. Apesar das limitações relacionadas à abrangência da amostra, os achados reforçam a importância da atuação da enfermagem na monitorização de indicadores e na qualificação da assistência.

DESCRITORES: Diálise renal; Insuficiência renal crônica; Indicadores de qualidade em assistência à saúde

ABSTRACT

Objective: To evaluate quality of care indicators in patients undergoing hemodialysis and hemodiafiltration at a nephrology service in the Vale do Rio dos Sinos region. **Method:** Descriptive, retrospective, and quantitative study, based on monthly data analysis from the entire year of 2024. **Results:** The sample was predominantly male, aged between 41 and 60 years. Glomerulopathies were the main etiology of chronic kidney disease. The arteriovenous fistula was the most commonly used access, and most patients had been in the program for over 12 months. There was a predominance of patients on hemodialysis. Most laboratory parameters were within target ranges, except for hemoglobin in certain periods. **Conclusion:** The data show compliance with national quality standards for renal replacement therapy. Despite limitations related to sample scope, the findings reinforce the importance of nursing in monitoring indicators and improving care quality.

DESCRIPTORS: Renal dialysis; Chronic renal failure; Quality indicators in health care.

RESUMEN

Objetivo: Evaluar los indicadores de calidad asistencial en pacientes sometidos a hemodiálisis y hemodiafiltración en un servicio de nefrología del Valle del Río de los Sinos. **Método:** Estudio descriptivo, retrospectivo y cuantitativo, con análisis de datos mensuales de todo el año 2024. **Resultados:** La muestra fue predominantemente masculina, con edades entre 41 y 60 años. Las glomerulopatías fueron la principal etiología de la enfermedad renal crónica. La fístula arteriovenosa fue el acceso más utilizado y la mayoría de los pacientes llevaba más de 12 meses en el programa. Se observó una predominancia de pacientes en hemodiálisis. La mayoría de los parámetros de laboratorio estuvieron dentro de los objetivos, con excepción de la hemoglobina en algunos períodos. **Conclusión:** Los datos demuestran conformidad con los estándares nacionales de calidad en terapia renal sustitutiva. A pesar de las limitaciones relacionadas con el alcance de la muestra, los hallazgos refuerzan la importancia del rol de enfermería en el monitoreo de indicadores y en la mejora de la atención.

DESCRIPTORES: Diálisis renal; Insuficiencia renal crónica; Indicadores de calidad en la atención de la salud.

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INTRODUCTION

Chronic kidney disease (CKD) affects millions of people worldwide. In Brazil, it affects about 1.5% of the population. In advanced stages, it requires renal replacement therapy: peritoneal dialysis, hemodialysis, hemodiafiltration or kidney transplantation.

According to the 2022 Dialysis Census, approximately 150,000 patients were on chronic dialysis. The prevalence rate rose from 696 patients per million inhabitants (ppm) in 2021 to 758 ppm in 2022. The majority (95.3%) underwent hemodialysis, 90.9% using the conventional model. Hemodiafiltration grew from 1.8% to 4.4%.

Hemodialysis (HD) is the most wide-

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ly used treatment for chronic renal failure, removing creatinine, urea, and fluids through a dialyzer in 3- to 4-hour sessions three times a week[3]. Hemodiafiltration (HDF), considered the most modern therapy, combines the removal of fluids and larger molecules, such as β2-microglobulin, requiring replacement during the session[4]. This treatment has proven to be effective in improving patients' quality of life. According to the randomized CONVINCE study, it showed a 23% reduction in the relative risk of mortality in patients undergoing high-convection volume hemodiafiltration.

Assessing the adequacy of renal replacement therapy and service quality requires the measurement of specific variables. Healthcare quality indicators are metrics that assess the efficiency of therapy and the safety of care. [6]

Resolution No. 11/2014 of the Collegiate Board of Directors defines Good Practice requirements for dialysis services, requiring the use of quality indicators[7] . Ordinance No. 1,675/2018 establishes guidelines and quality indicators for monitoring and evaluating healthcare[8] .

The measurement of care indicators allows for the evaluation of patients' response to renal replacement therapy, guiding interventions and improving care, reducing complications, and increasing survival and quality of life. This raises the question: what are the results of the healthcare quality indicators for a nephrology service in the Vale do Rio dos Sinos region? This study aims to evaluate these indicators and outline the profile of chronic outpatients undergoing hemodialysis and hemodiafiltration.

METHOD

This was a descriptive, documentary, retrospective study with a quantitative approach, conducted with 27 chronic outpatients undergoing hemodialysis or hemodiafiltration at a private service in Vale dos Sinos.

Inclusion criteria: patients >18 years of age, both sexes, >90 days of treatment, with care indicators recorded between January and December 2024. Patients with <90 days of treatment, hospitalized, with ARF, <18 years of age, or eligibility in the records were excluded.

The study followed Resolution CNS/2012[9], approved by the Ethics Committee of Feevale University (Opinion No. 7,330,684; CAAE: 85193524.1.0000.5348).

Data collection was performed in the Nephrology service, through a Term of Commitment, using Nephrosys software for profile data (age, sex, underlying disease, vascular access, dialysis time, and type of therapy) and care indicators (phosphorus, hemoglobin, Kt/V, PTH, URR). The data were organized in spreadsheets in Notion and transferred to SQL Server 2022. Statistical analysis was performed using mean, standard deviation, absolute numbers, frequency, and percentage.

RESULTS

The results included 27 patients on renal replacement therapy, of whom 17 (63%) were on conventional hemodialysis (HD) and 10 (37%) on hemodiafiltration (HDF). The results were analyzed monthly and quarterly in 2024, noting that not all patients underwent tests every month of the year, which explains the difference between the number of patients and the total number of measurements recorded.

Table 1 shows the patient profile, with a mean age of 56.68 ± 15.93 years. Of the total, 55.5% were men and 44.5% were women. The main underlying diseases were glomerulopathies (29.6%), chronic pyelonephritis (18.5%), systemic arterial hypertension (18.5%), polycystic kidney disease (11.2%), and diabetes (14.8%); 7.4% had an undetermined cause. Regarding vascular access, 81.5% used AVF and 18.5% used long-term catheters. The duration of dialysis was >12 months in 81.5%, 7–12 months in 11%, and 3–6 months in 7.5%. Regarding therapy, 63% underwent hemodialysis and 37% underwent hemodiafiltration.

Tabela 1 – Perfil dos pacientes submetidos à hemodiálise e hemodiafiltração.

Variable	Result	N	%
Age*	-	56,68 ± 15,93	-
Gender	Male	15	55,5%
	Female	12	44,5%
Underlying disease	Polycystic kidney disease	3	11,2%
	Glomerulopathies	8	29,6%
	Chronic pyelonephritis	5	18,5%
	Diabetes	4	14,8%
	Hypertension	5	**18,5%**
	Undetermined	2	7,4%
Vascular Access	AVF (Arteriovenous Fistula)	22	81,5%
	Long-term catheter	5	18,5%
Dialysis Time	3 to 6 months	2	7,5%
	7 to 12 months	3	11%
	More than 12 months	22	81,5%
Type of therapy	Hemodialysis	17	63%
	Hemodiafiltration	10	37%

Source: Survey data (2024).

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Table 2 shows the monthly distribution of patients on hemodialysis and hemodiafiltration, in addition to those who achieved the phosphorus, hemoglobin, Kt/V, and URR targets. The number of patients on hemodialysis ranged from 21 to 26. For the indicators, phosphorus within the target ranged from 9 to 15 patients; hemoglobin, from 4 to 9; Kt/V, from 10 to 16; and URR, from 19 to 25 throughout the period analyzed.

Table 2 – Monthly results of care indicators considering quality parameters.

Month	Patients	Hemoglobin n	Phosphorus n (%)	Kt/V n (%)	URR n (%)
January	22	9 (40,91%)	14 (63,64%)	10 (45,45%)	19 (86,36%)
February	23	8 (34,78%)	14 (60,87%)	16 (69,57%)	22 (95,65%)
March	22	4 (18,18%)	13 (59,09%)	12 (54,55%)	20 (90,91%)
April	21	6 (28,57%)	13 (61,90%)	13 (61,90%)	20 (95,24%)
May	25	7 (28,00%)	15 (60,00%)	16 (64,00%)	24 (96,00%)
June	25	9 (36,00%)	13 (52,00%)	15 (60,00%)	22 (88,00%)
July	24	6 (25,00%)	9 (37,50%)	12 (50,00%)	21 (87,50%)
August	26	5 (19,23%)	14 (53,85%)	15 (57,69%)	25 (96,15%)
September	25	6 (24,00%)	13 (52,00%)	14 (56,00%)	22 88,00%)
October	24	8 (33,33%)	15 (62,50%)	14 (58,33%)	23(95,83%)
November	25	7 (28,00%)	14 (56,00%)	13 (52,00%)	24 (96,00%)
December	25	9 (36,00%)	13 (52,00%)	13 (52,00%)	23 (92,00%)

Source: Survey data (2024).

The quarterly results of intact parathyroid hormone (PTH) as an indicator of care quality are presented in Table 3. It includes patients on hemodialysis and hemodiafiltration, showing the total number evaluated per month and the number with PTH within the reference value (≤150 mg/dL).

Table 3. Results of healthcare indicators measured quarterly, including intact parathyroid hormone (PTH)

Month	Patients (n)	Patients with PTH ≤150 mg/dL (n)
February	22	13 (59%)
May	24	14 (58%)
August	26	14 (54%)
November	24	17 (71%)

Fonte: Dados da pesquisa (2024).

The monthly measurements and results within the target range for care indicators between January and December 2024 are described in Table 4. In hemodialysis, the adequacy percentages were: phosphorus 54%, hemoglobin 29%, Kt/V 57%, URR 79%, and PTH 59%. In hemodiafiltration, phosphorus 25%, hemoglobin 60%, Kt/V 61% (91 measurements), URR 85%, and PTH 63%.

Table 4 – Description of total measurements and results of care indicators considering quality parameters among patients on hemodialysis and hemodiafiltration.

Modality	Indicator	Total Measurements (n)	Results (n)	Percentage (%)
Hemodialysis	Phosphorus > 3.5 and < 5.5	191	103	54%
	Hemoglobin > 10 and < 12.5	192	56	29%
	Kt/V > 1.2	188	107	57%
	URR > 60	188	149	79%
	PTH > 150 and < 600	64	38	59%
	Phosphorus > 3.5 and < 5.5	96	54	56%

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Hemodiafiltração	Hemoglobin > 10 and < 12.5	95	57	60%
	Kt/V > 1.2	91	56	61%
	URR > 60	91	77	85%
	PTH > 150 and < 600	32	20	63%

Source: Survey data (2024).

DISCUSSION

The results showed a predominance of males, as well as an average age consistent with the national epidemiological profile. These findings are consistent with the 2024 Brazilian Dialysis Census[10], which indicates that approximately 59% of individuals undergoing renal replacement therapy are male, with a predominant age range between 45 and 64 years. According to the 2024 Census[(10)] ,diabetes mellitus and systemic arterial hypertension remain the leading causes of renal failure in Brazil, together accounting for more than half of the cases of dialysis admission; this differs from the data in this study, which reveal that the main underlying diseases were glomerulopathies, while diabetes and hypertension are less prevalent in this population. This difference may be related to the younger age profile. A prospective study conducted in Bahia with 165 adult patients, most of whom were between 18 and 40 years of age (62.4%), identified glomerulopathies as the main underlying diseases, reinforcing the prevalence of these conditions in younger populations.

The predominant vascular access is in accordance with the recommendations of the Brazilian Society of Nephrology[10], which recommends AVF as the access of choice because it offers lower infection rates, greater durability, and better clinical performance compared to catheters; the use of long-term catheters is indicated only in situations where AVF is not feasible or during the initiation of therapy. The duration of treatment also revealed that most patients had been on dialysis for more than 12 months, which lends greater consistency and reliability to the data collected, since patients undergoing chronic treatment tend to show greater stability in clinical and laboratory parameters, in addition to allowing a more complete assessment of quality indicators over time. This finding is corroborated by a study published in the FT Journal [12], which analyzed 100 patients on hemodialysis for more than a year and observed that their laboratory values remained constant over a period of four months, indicating clinical and laboratory stability.

A higher proportion than the national average of patients were on hemodiafiltration, which according to the 2024 Census [10] is only approximately 7.1%. This data can be explained by the fact that the institution where the study was conducted is private, which allows greater access to this therapeutic modality. This differs from the scenario in the Unified Health System (SUS), where HDF is not yet widely available.

With regard to quality of care indicators, dialysis services in Brazil follow targets established by Ordinances No. 389/2014 [13]and No. 1675/2018 [(8)],which define reference values for laboratory and clinical parameters such as hemoglobin, phosphorus, and Kt/V. The target for hemoglobin is that at least 80% of patients have values between 10 and 12.5 g/dL; for phosphorus, at least 50% of patients are expected to maintain levels between 3.5 and 5.5 mg/dL; and for Kt/V, it is recommended that 80% or more of patients have values above 1.2. Although hemoglobin did not reach the target in all months, the indicator performed satisfactorily. This finding contrasts with the findings of a study [14]that evaluated 28 patients at a university hospital in the Federal District and found that none of the groups analyzed reached the minimum target of 80% of patients with hemoglobin between 10 and 12.5 g/dL. In patients undergoing hemodiafiltration, it is recommended that hemoglobin levels remain below 12 g/dL. Values above this limit increase blood viscosity, which can make it difficult to obtain adequate convective volumes, reducing the effectiveness of toxin removal in HDF. [15]

In chronic kidney disease, decreased kidney function compromises phosphorus excretion, resulting in hyperphosphatemia. This imbalance contributes to increased serum levels of phosphorus, calcium, and parathyroid hormone (PTH), leading to increased bone resorption and the risk of vascular calcifications. These changes increase the incidence of bone and cardiovascular complications, negatively impacting patient prognosis[12]. The adequacy rate was similar between the two types of therapy, both of which achieved the phosphorus indicator target. According to clinical guidelines for patients on renal replacement therapy, PTH is measured quarterly due to the characteristics of its metabolic variation and the need for periodic monitoring of mineral and bone metabolism. [16] PTH (parathyroid hormone) dosage in hemodialysis patients is extremely important because it allows monitoring and control of mineral and bone metabolism changes, which are common in chronic kidney disease (CKD). Kt/V and URR are indicators for assessing the effectiveness of hemodialysis. Kt/V measures urea clearance and should be greater than or equal to 1.2 to ensure adequate dialysis. URR indicates the rate of urea removal and is considered adequate when ≥ 65%. Both are directly related to reduced mortality and improved quality of life. Most patients in this study are within the appropriate dialysis parameters, reinforcing the adequacy of the renal replacement therapy provided by the service studied.

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CONCLUSION

The quality of care indicators show a scenario in line with national guidelines, demonstrating consistency in the care provided to chronic patients undergoing hemodialysis and hemodiafiltration. The data show a male profile, with an age range compatible with the national epidemiological standard, but with one particularity, which is the prevalence of glomerulopathies as the underlying disease—possibly reflecting the younger age profile of the sample. The predominant use of arteriovenous fistula as vascular access and the length of stay in the program reinforce the reliability of the indicators analyzed. The significant adherence to hemodiafiltration, higher than the national average, highlights the conditions due to the private nature of the service, pointing to the difficulties of the public system in bearing the costs of hemodiafiltration.

With regard to laboratory and clinical indicators, satisfactory performance was observed in most of the parameters evaluated, with patients on hemodiafiltration therapy demonstrating better performance in the indicators, evidencing the effectiveness of the therapy applied and the commitment to good practices recommended by current regulations.

It is concluded that, despite the limitations of this study—such as the analysis being restricted to a single service and the absence of long-term clinical outcomes—the results obtained highlight the relevance of the topic and reinforce the need for further studies on the quality of care in renal replacement therapy, especially in different populations and regions. In view of this, further research aimed at improving the quality of life of patients with chronic kidney disease is suggested. It should be emphasized that nursing care goes beyond the technical performance of dialysis; nurses must take an active role in identifying risks, analyzing indicators, providing ongoing education to the team, and, above all, establishing a solid therapeutic relationship with the patient, promoting acceptance, clarification, and adherence to treatment.

In addition, it is up to nurses to measure the impacts of the actions implemented and to promote the development of evidence-based protocols, contributing to safer, more effective, and more humanized care in the context of nephrology.

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