HEMODIALYSIS: NURSING CARE FOR PATIENTS WITH CHRONIC KIDNEY DISEASE

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Abstract: Hemodialysis is a renal replacement therapy mainly used in people with advanced chronic kidney disease, when kidney function is insufficient to maintain fluid, electrolyte, and metabolic balance. In Brazil, an estimated 157,357 people were receiving chronic dialysis on July 1, 2023, of whom 88.2% were undergoing hemodialysis (NERBASS et al., 2025). In 2024, the estimate increased to 172,585 people on dialysis, with 87.3% undergoing hemodialysis (NERBASS et al., 2026). The treatment involves extracorporeal blood circulation through a dialyzer, where accumulated substances and part of the excess fluid are removed. Although it contributes to life maintenance, hemodialysis requires continuous monitoring and may be associated with hemodynamic changes, anemia, electrolyte disorders, vascular access complications, infections, fatigue, and psychosocial impacts. This article aims to discuss the main aspects of hemodialysis, with emphasis on nursing care before, during, and after sessions. This is a narrative literature review with a qualitative and descriptive approach, based on scientific articles, guidelines, and normative documents related to the topic. The literature indicates that nursing care should include clinical assessment, monitoring of vital signs and weight, vascular access surveillance, early identification of complications,

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infection prevention, self-care education, and support for patients and families. It is concluded that nursing plays a fundamental role in procedure safety and continuity of care, contributing to treatment adherence and quality of life among people undergoing hemodialysis.

Keywords: Hemodialysis. Chronic kidney disease. Nursing. Renal replacement therapy. Vascular access.

INTRODUCTION

Chronic kidney disease (CKD) is a condition characterized by abnormalities in kidney structure or function that persist for more than three months and have implications for health. In advanced stages, reduced kidney function compromises the body's ability to eliminate metabolic waste products, regulate fluid volume, and maintain acid-base and electrolyte balance. In this situation, renal replacement therapy may be necessary to replace some of the functions that the kidneys can no longer adequately perform.

In Brazil, the Brazilian Dialysis Census of the Brazilian Society of Nephrology estimated that, as of July 1, 2023, there were 157.357 people receiving chronic dialysis, and that 51.153 started treatment that year. This corresponded to prevalence and incidence rates of 771 and 251 patients per million population, respectively. Among prevalent patients, 88,2% were receiving hemodialysis, 8,0% hemodiafiltration, and 3,8% peritoneal dialysis (NERBASS et al., 2025). In 2024, the estimate reached 172.585 people receiving dialysis, with 52.944 new patients starting treatment that year; among prevalent patients, 87,3% were receiving hemodialysis (NERBASS et al., 2026).

Historical data also demonstrate growth in the dialysis population. In 2010, an estimated 92.091 people in the country were receiving dialysis treatment, 90,6% of whom were receiving hemodialysis, and 13,6% of patients receiving hemodialysis were using a venous catheter as vascular access (SESSO et al., 2011). In 2017, the estimated number reached 126.583 patients, with 93,1% receiving hemodialysis and venous catheter use among

22,6% of patients receiving hemodialysis (THOMÉ et al., 2019). These data underscore the importance of ongoing monitoring and nursing care for this population.

Among the modalities of renal replacement therapy is hemodialysis, a procedure performed using an extracorporeal circuit connected to the patient through vascular access. Blood is removed from the body, passes through the dialyzer, and returns to the patient after certain substances and some excess fluid have been removed. The indication and prescription of treatment depend on individual clinical and laboratory assessment, and it is essential that care take into account each person's needs and characteristics.

Hemodialysis is not limited to the operation of the machine. Patients remain exposed to situations that may cause changes during the session, such as hypotension, cramps, nausea, headache, changes in heart rate, and reactions related to the circuit or vascular access. For this reason, continuous clinical observation is essential. Clinical practice guidelines emphasize the need for safety standards in the care of people undergoing hemodialysis, including aspects related to monitoring and vascular access (ASHBY et al., 2019).

In this context, the nursing team plays a prominent role. Nursing professionals participate in preparing the patient, assess clinical status before the procedure, monitor parameters during the session, and perform an assessment after it ends. They also work to prevent infections, manage vascular access, and provide health education, offering guidance on medications, diet, fluid management, warning signs, and access care.

Patient education is particularly important because treatment is usually part of a person's routine for a long period. Recent studies indicate that knowledge, family support, participation of health professionals, and self-care strategies can foster adaptation to treatment and improve outcomes related to quality of life (YASIN et al., 2024; BAĞRIAÇIK; TOTUR DIKMEN, 2024). Nursing educational interventions can also contribute to self-care and quality of life among people receiving hemodialysis (IBRAHIM; ALI; ALLAWY, 2024).

Accordingly, this article aims to present a review of hemodialysis, addressing how it works, its main complications, vascular access care, and the role of nursing in patient monitoring. The relevance of this topic is related to the need for safe, individualized, and humanized care for people who depend on renal replacement therapy.

METHODOLOGY

A narrative literature review with a qualitative approach and descriptive nature was conducted. The literature search focused on publications related to hemodialysis, chronic kidney disease, nursing care, vascular access, self-care, quality of life, and patient safety.

The PubMed, SciELO, and LILACS databases were consulted, supplemented by searches on Google Scholar and a review of normative documents and guidelines issued by recognized scientific bodies and societies. The following descriptors and terms were used in combination: “hemodialysis”, “chronic kidney disease”, “nursing care”, “vascular access”, “self-care”, “quality of life”, and “patient safety”, along with their English equivalents when necessary.

Articles published between 2019 and 2026 were prioritized, without excluding earlier guidelines and normative documents considered fundamental to understanding the topic, such as RDC nº 11/2014 of the Agência Nacional de Vigilância Sanitária. Original articles, reviews, and technical and regulatory documents directly related to the study objective and available in Portuguese or English were included. Duplicate texts, publications not directly related to the topic, and materials that did not provide sufficient information for the proposed discussion were excluded.

Selection involved reading the titles and abstracts, followed by a full-text review of materials considered relevant. No meta-analysis or formal assessment of the risk of bias of the studies was conducted. To organize the discussion, the content was grouped into five thematic areas: characteristics of hemodialysis and chronic kidney disease; vascular access; complications during hemodialysis; nursing practice; and self-care and quality of life.

DEVELOPMENT

HEMODIALYSIS AND CHRONIC KIDNEY DISEASE

Hemodialysis is a modality of renal replacement therapy intended to remove

substances that accumulate in the blood and help control fluid volume when kidney function is severely reduced. The treatment uses a dialyzer, composed of a semipermeable membrane that allows certain substances to pass between the blood and the dialysis fluid. Solutes are removed mainly by diffusion, while water is removed by ultrafiltration (ASHBY et al., 2019).

The therapy prescription is individualized and takes into account clinical and laboratory factors, as well as factors related to the kidney condition itself. The frequency and duration of sessions may vary according to the clinical situation and the plan established by the specialized team. Hemodialysis quality also depends on proper vascular access function and monitoring of treatment parameters.

VASCULAR ACCESS

Vascular access is essential for hemodialysis. The main options include an arteriovenous fistula, a graft, and a central venous catheter. An arteriovenous fistula is a frequently used option when feasible, as it has characteristics that favor long-term treatment. Regardless of the type of access, its assessment should be part of routine nursing care (ASHBY et al., 2019).

National data show that the use of venous catheters for hemodialysis access increased from 13,6% of patients in 2010 to 22,6% in 2017 (SESSO et al., 2011; THOMÉ et al., 2019). The 2024 Brazilian Dialysis Census also recorded an increase in the use of catheters for hemodialysis vascular access compared with the previous year, along with unfavorable trends related to permanent vascular access (NERBASS et al., 2026). This situation underscores the need for systematic access assessment and strict adherence to handling techniques.

Before the session, the healthcare professional should inspect the access site for signs of infection, bleeding, edema, skin changes, and other changes that may indicate complications. In the case of a fistula, assessing the thrill and bruit may help identify functional changes. Guidance on avoiding trauma and unnecessary compression of the limb with the fistula is also important.

Vascular access care is directly related to treatment safety. Handling should follow appropriate infection prevention techniques and institutional standards. Early identification of changes can prevent treatment interruptions and reduce risks to the patient.

COMPLICATIONS DURING HEMODIALYSIS

Hypotension is one of the complications observed during hemodialysis and may be related to fluid removal, the patient's cardiovascular response, and other clinical conditions. It may manifest as dizziness, weakness, nausea, sweating, or altered level of consciousness. When signs of instability arise, the team should assess the patient and follow the institutional protocol.

Cramps, headache, nausea, vomiting, pruritus, and other manifestations may also occur. Electrolyte and metabolic changes may be related to the kidney disease itself or to the treatment. Chest pain, dyspnea, neurological changes, or hemodynamic instability require immediate assessment.

Complications related to vascular access require special attention. Bleeding, infection, thrombosis, and reduced flow can compromise therapy. Therefore, access assessment before, during, and after the session should be systematic.

NURSING PRACTICE

Nursing is involved in virtually every stage of care for patients undergoing hemodialysis. Before the session, it is important to conduct a clinical assessment, check weight and vital signs, assess the condition of the vascular access, review current complaints, and gather relevant information about the period between sessions. Comparing these findings with previous records helps identify clinical changes (PONCE et al., 2019).

During the session, the team should monitor vital signs according to the service's routine, observe the extracorporeal circuit, check the access, and remain alert to the patient's

complaints. Early identification of changes enables prompt intervention and contributes to procedural safety. Communication among nursing staff, the patient, and the multidisciplinary team is also essential.

In Brazil, the operation of dialysis services is regulated by Resolution of the Collegiate Board (RDC) No. 11, of March 13, 2014, issued by the Brazilian Health Regulatory Agency (BRASIL, 2014).

After the session, the patient's clinical condition, the access site, and any complications should be assessed. Proper documentation of information supports continuity of care. Nursing progress notes should contain objective and relevant data, in compliance with the service's regulations.

In addition to technical care, nursing plays an educational role. Patients need to understand the importance of adherence to treatment, the correct use of prescribed medications, fluid restriction, and the diet recommended by the team. They should also know how to recognize signs that require medical attention, especially changes in the vascular access or significant symptoms.

SELF-CARE AND QUALITY OF LIFE

The hemodialysis routine can alter habits, work, diet, social relationships, and everyday life planning. Therefore, treatment can have impacts that extend beyond physiological aspects. The literature shows that self-care is influenced by the patient's knowledge, family support, psychological condition, and the actions of health professionals (YASIN et al., 2024).

Health education can help patients take a more active role in their own care. Individualized guidance, accessible language, and opportunities to ask questions can facilitate understanding of the treatment. The rapport established by nursing staff also helps identify difficulties that could compromise adherence.

DISCUSSION

The studies analyzed demonstrate that hemodialysis should be understood as a complex treatment in which safety depends on both technological resources and clinical assessment and team performance. Specific guidelines emphasize the need for service organization and standardized care (ASHBY et al., 2019), while nursing research highlights the challenges involved in the ongoing care of these patients (PONCE et al., 2019).

Assessment of vascular access is one of the central aspects of care. Because access is essential to the procedure, local changes can compromise the session and increase the risk of complications. Data from Brazilian censuses show an increase over time in the use of catheters for vascular access, from 13,6% in 2010 to 22,6% in 2017, as well as a further increase in catheter use in 2024 (SESSO et al., 2011; THOMÉ et al., 2019; NERBASS et al., 2026). Thus, systematic inspection and monitoring need to be incorporated into the service's routine.

Epidemiological data also show a substantial increase in the dialysis population. The estimated number of patients rose from 92.091 in 2010 to 126.583 in 2017, reaching 157.357 in 2023 and 172.585 in 2024 (SESSO et al., 2011; THOMÉ et al., 2019; NERBASS et al., 2025; NERBASS et al., 2026). This growth increases demand for specialized services and underscores the need for professionals trained to monitor complications, manage vascular access, and develop health education initiatives.

Another important aspect is education for self-care. Recent reviews identify knowledge, family support, and professional follow-up as factors that can facilitate patients' ability to manage aspects of their treatment (YASIN et al., 2024; BAĞRIAÇIK; TOTUR DIKMEN, 2024). Nursing educational interventions also have the potential to improve self-care and quality of life (IBRAHIM; ALI; ALLAWY, 2024).

In practice, this means that nurses should not focus their work solely on the hemodialysis machine. They need to consider the patient as a whole, taking into account symptoms, emotional state, social difficulties, ability to understand, and capacity to follow recommendations. This approach contributes to more humanized care that is consistent with

individual needs.

This study has limitations. As it is a narrative literature review, no systematic review protocol, meta-analysis, or formal risk-of-bias assessment was applied. In addition, the selection of studies was guided by the proposed objective, which may limit the breadth of the findings. Therefore, the results should be interpreted as a narrative synthesis of the selected literature.

FINAL CONSIDERATIONS

Hemodialysis is an essential therapy for many people with advanced chronic kidney disease and requires specialized, ongoing follow-up. Although it can replace some kidney functions, the treatment involves risks and significant changes to the patient's routine.

This review highlights the fundamental role of nursing in hemodialysis safety. Clinical assessment before, during, and after sessions; care of vascular access; infection prevention; early recognition of complications; and appropriate documentation are indispensable components of care.

The importance of health education is also noteworthy. Providing patients with clear guidance, encouraging self-care, and recognizing their difficulties can promote treatment adherence and contribute to a better quality of life. Thus, nursing care should combine technical knowledge, clinical monitoring, communication, and compassionate care.

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