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QUALITY OF LIFE AND VASCULAR ACCESS IN HAEMODIALYSIS: AN INTEGRATIVE REVIEW

QUALIDADE DE VIDA E ACESSO VASCULAR EM HEMODIÁLISE: REVISÃO INTEGRATIVA

CALIDAD DE VIDA Y ACCESO VASCULAR EN HEMODIÁLISIS: REVISIÓN INTEGRADORA

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Abstract
Chronic kidney disease is associated with substantial physical, emotional and social burden, particularly among patients undergoing haemodialysis. Despite the growing literature on patient-reported outcomes in haemodialysis, the contribution of vascular access to quality-of-life perception remains inconsistently explored. This integrative review examined how vascular access, particularly central venous catheters, has been incorporated into studies evaluating quality of life in haemodialysis populations. Searches were conducted in PubMed, Scopus and SciELO, with complementary consultation of Google Scholar, between November and December 2025. The review followed the methodological stages proposed for integrative reviews, and PRISMA 2020 recommendations were used to guide study identification and screening procedures. Fourteen studies published between 2020 and 2025 were included. The analysed studies consistently described impairment in physical, psychosocial and functional dimensions of quality of life among haemodialysis patients. However, only a limited number of investigations directly evaluated vascular access as an analytical variable associated with patient-reported outcomes. Among the studies comparing access modalities, central venous catheters were generally associated with less favourable experiences than arteriovenous fistulae, including lower treatment satisfaction, greater psychosocial burden and increased perception of vulnerability. The findings indicate that vascular access remains insufficiently incorporated into analytical models investigating quality of life in haemodialysis. Although studies directly evaluating access modalities suggest less favourable experiences among catheter users, the available evidence remains methodologically heterogeneous and limited in its ability to establish causal interpretation. Further investigations using stratified analyses and adjustment for potential confounding factors may contribute to a more consistent understanding of how vascular access influences the haemodialysis experience.

Keywords: Haemodialysis; Chronic kidney disease; Quality of life; Vascular access; Central venous catheter; Patient-reported outcomes.

Resumo
A doença renal crônica está associada a importante sobrecarga física, emocional e social, particularmente entre pacientes submetidos à hemodiálise. Apesar do crescente número de estudos sobre desfechos relatados pelos pacientes em hemodiálise, a contribuição do acesso vascular para a percepção da qualidade de vida permanece explorada de forma inconsistente. Esta revisão integrativa analisou como o acesso vascular, especialmente os cateteres venosos centrais, tem sido incorporado em estudos que avaliam a qualidade de vida em populações submetidas à hemodiálise. As buscas foram realizadas nas bases PubMed, Scopus e SciELO, com consulta complementar ao Google Scholar, entre novembro e dezembro de 2025. A revisão seguiu as etapas metodológicas propostas para revisões integrativas, e as recomendações do PRISMA 2020 foram utilizadas para orientar os procedimentos de identificação e triagem dos estudos. Foram incluídos 14 estudos publicados entre 2020 e 2025. Os estudos analisados descreveram consistentemente comprometimento das dimensões física, psicossocial e funcional da qualidade de vida entre pacientes em hemodiálise. Entretanto, apenas um número limitado de investigações avaliou diretamente o acesso vascular como variável analítica associada aos desfechos relatados pelos pacientes. Entre os estudos que compararam modalidades de acesso, os cateteres venosos centrais estiveram geralmente associados a experiências menos favoráveis do que as fístulas arteriovenosas, incluindo menor satisfação com o tratamento, maior sobrecarga psicossocial e maior percepção de vulnerabilidade. Os achados indicam que o acesso vascular permanece insuficientemente incorporado aos modelos analíticos que investigam a qualidade de vida em hemodiálise. Embora estudos que avaliaram diretamente as modalidades de acesso sugiram experiências menos favoráveis entre usuários de cateter, as evidências disponíveis permanecem metodologicamente heterogêneas e limitadas quanto à possibilidade de estabelecer interpretação causal. Investigações futuras com análises estratificadas e ajuste para potenciais fatores de confusão poderão contribuir para compreensão mais consistente de como o acesso vascular influencia a experiência da hemodiálise.

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Palavras-chave: Hemodiálise; Doença renal crônica; Qualidade de vida; Acesso vascular; Cateter venoso central; Desfechos relatados pelos pacientes.

Resumen

La enfermedad renal crónica está asociada a una importante sobrecarga física, emocional y social, particularmente entre los pacientes sometidos a hemodiálisis. A pesar del creciente número de estudios sobre resultados reportados por los pacientes en hemodiálisis, la contribución del acceso vascular a la percepción de la calidad de vida continúa siendo explorada de manera inconsistente. Esta revisión integradora analizó cómo el acceso vascular, especialmente los catéteres venosos centrales, ha sido incorporado en estudios que evalúan la calidad de vida en poblaciones sometidas a hemodiálisis. Las búsquedas se realizaron en las bases de datos PubMed, Scopus y SciELO, con consulta complementaria en Google Scholar, entre noviembre y diciembre de 2025. La revisión siguió las etapas metodológicas propuestas para revisiones integradoras, y las recomendaciones PRISMA 2020 fueron utilizadas para orientar los procedimientos de identificación y selección de los estudios. Se incluyeron 14 estudios publicados entre 2020 y 2025. Los estudios analizados describieron consistentemente compromiso de las dimensiones física, psicosocial y funcional de la calidad de vida entre los pacientes en hemodiálisis. Sin embargo, solo un número limitado de investigaciones evaluó directamente el acceso vascular como variable analítica asociada a los resultados reportados por los pacientes. Entre los estudios que compararon modalidades de acceso, los catéteres venosos centrales estuvieron generalmente asociados con experiencias menos favorables que las fístulas arteriovenosas, incluyendo menor satisfacción con el tratamiento, mayor sobrecarga psicosocial y mayor percepción de vulnerabilidad. Los hallazgos indican que el acceso vascular permanece insuficientemente incorporado en los modelos analíticos que investigan la calidad de vida en hemodiálisis. Aunque los estudios que evaluaron directamente las modalidades de acceso sugieren experiencias menos favorables entre usuarios de catéteres, la evidencia disponible permanece metodológicamente heterogénea y limitada en cuanto a la posibilidad de establecer interpretación causal. Investigaciones futuras con análisis estratificados y ajuste para posibles factores de confusión podrán contribuir a una comprensión más consistente de cómo el acceso vascular influye en la experiencia de la hemodiálisis.

Palabras clave: Hemodiálisis; Enfermedad renal crónica; Calidad de vida; Acceso vascular; Catéter venoso central; Resultados reportados por los pacientes.

1. Introdução

Chronic kidney disease (CKD) is marked by progressive and irreversible loss of renal function, resulting in metabolic and fluid-electrolyte alterations that affect several aspects of health and daily living (Ribeiro et al., 2020). Over recent years, the growing number of individuals diagnosed with CKD and the increasing demand for renal replacement therapy have intensified the clinical and social burden associated with the disease, especially among patients who require long-term haemodialysis treatment (Gouvêa et al., 2022).

Among patients with advanced CKD, haemodialysis remains one of the main forms of renal replacement therapy (Chaves et al., 2021). Even though it is essential

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for maintaining life, treatment commonly leads to substantial changes in daily routine, including frequent attendance at dialysis centres, continuous health monitoring, and dietary and fluid restrictions. Over time, these demands may affect independence, social interaction, and emotional well-being, with repercussions for the quality of life of individuals undergoing haemodialysis (Camargo et al., 2024; Borges et al., 2024).

Effective haemodialysis depends on adequate vascular access, usually obtained through arteriovenous fistulas, grafts, or central venous catheters. Central venous catheters are commonly used in urgent dialysis initiation or in patients without definitive vascular access (Matos et al., 2022). Despite their clinical applicability, complications such as infection, thrombosis, and dysfunction may compromise treatment stability and require repeated interventions. In addition to these clinical aspects, catheter use may also interfere with the patient's experience during treatment, particularly regarding feelings of safety, dependence, and limitations in daily activities (Silva et al., 2025).

The relationship between vascular access and quality of life has received increasing attention in nephrology research, although the available evidence remains heterogeneous. Many investigations evaluating quality of life in haemodialysis populations focus predominantly on clinical or epidemiological outcomes, while the influence of vascular access is often addressed only descriptively. In several studies, vascular access appears merely as part of the clinical characteristics of the sample and is not analysed as a variable potentially associated with differences in patient-reported outcomes.

Quality of life in haemodialysis is influenced by multiple factors, including symptom burden, emotional distress, functional limitations, socioeconomic conditions, and dependence on long-term treatment. Within this context, vascular access may affect not only dialysis delivery, but also aspects related to body image, autonomy, insecurity, and adaptation to chronic therapy. Nevertheless, the available

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studies remain inconsistent regarding the extent to which central venous catheters contribute to poorer quality-of-life outcomes (Sikora et al., 2024).

Another relevant aspect is that most studies prioritise outcomes such as infection, hospitalisation, and mortality, whereas subjective experiences related to vascular access are explored less consistently. Fear associated with catheter handling, concern regarding complications, discomfort during daily activities, and feelings of vulnerability may influence treatment experience even when these dimensions are not formally incorporated into analytical models (Maguire et al., 2022; Sikora et al., 2024).

Considering these aspects, analysing the relationship between vascular access and quality of life in haemodialysis may contribute to a broader understanding of the available evidence and help identify limitations in current investigations. Therefore, this study aimed to analyse the relationship between vascular access and quality of life among patients undergoing haemodialysis, with emphasis on how different vascular access modalities have been addressed in the available scientific literature.

1.1 General objectives

To analyse the relationship between vascular access and quality of life among patients undergoing haemodialysis, with emphasis on how different vascular access modalities have been addressed in the available scientific literature.

2. Integrative Literature Review

Study selection

The selection process followed the PRISMA 2020 recommendations and enabled the progressive refinement of the evidence included in this review. A total of 333 records were retrieved from PubMed (n = 36), SciELO (n = 122), Scopus (n = 59) and Google Scholar (n = 116). After removing 33 duplicate records, 300 studies

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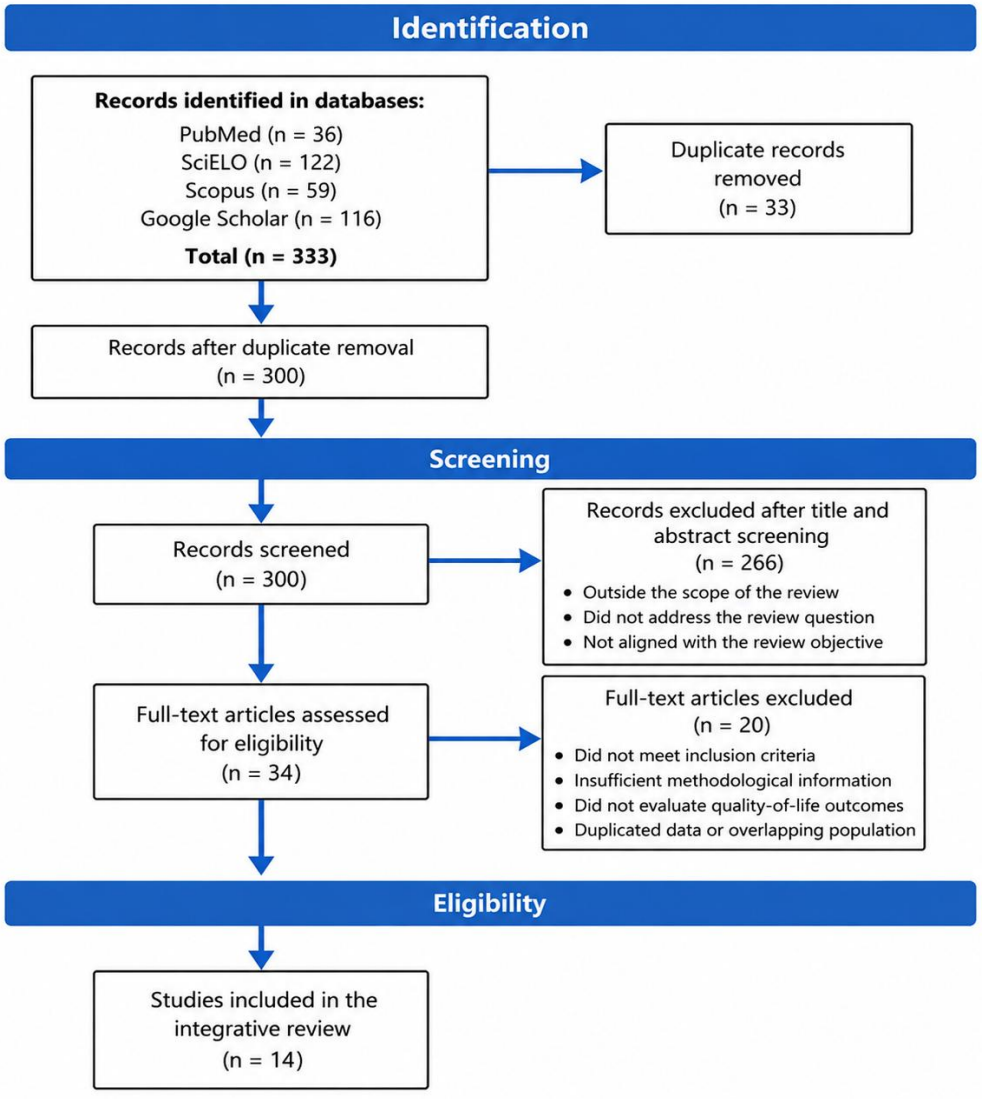
were screened by title and abstract. At this stage, 148 records were excluded because they did not address the scope of the review or were not aligned with the guiding research question.

Thirty-four full-text articles were subsequently assessed for eligibility. Of these, 20 were excluded according to the predefined criteria, resulting in 14 studies included in the final synthesis. The flow of identification, screening, eligibility assessment and inclusion is shown in figure 1.

Figure 1. Study identification and screening flowchart based on PRISMA 2020.



Source: Authors, 2025.

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Characteristics of the included studies

The 14 studies included in this review were published between 2020 and 2025 and comprised heterogeneous samples of patients undergoing haemodialysis. The studies differed in sample size, methodological design, quality-of-life assessment approach and degree of attention given to vascular access. The main characteristics of the included studies are presented in Table 2.

Table 2. Characteristics of the studies included in the review

Study	Author (Year) / Database	Sample	Vascular access	Main findings
A1	Kim et al. (2020) – PubMed	1,461 patients	AVF, AVG, CVC	Central venous catheter use was associated with lower quality-of-life scores, higher depressive symptoms and reduced survival when compared with arteriovenous fistulae.
A2	Castillo-Velarde and Caro (2024) – SciELO	122 patients	CVC, AVF	Patients using central venous catheters reported lower treatment satisfaction and greater perceived treatment-related risk.
A3	Maldonado et al. (2023) – SciELO	91 patients	AVF, CVC	Central venous catheter use was associated with lower satisfaction and greater negative impact on patient-reported outcomes.
A4	Barrios-Puerta et al. (2022) – SciELO	164 patients	Not specified	The study identified substantial impairment in quality of life among patients undergoing haemodialysis.
A5	Souza-Silva et al. (2024) – SciELO	214 patients	Not specified	Low quality-of-life scores were observed across multiple physical and psychosocial domains.

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A6	Sikora et al. (2024) – Scopus	202 patients	AVF, CVC, AVG	Moderate impairment in quality of life was identified; however, no isolated analysis according to vascular access type was performed.
A7	Hajomer et al. (2025) – Scopus	150 patients	Not specified	Reduced quality of life was identified in multiple assessment domains.
A8	Asanova et al. (2025) – Scopus	217 patients	Not specified	Socioeconomic vulnerability was associated with poorer quality-of-life outcomes.
A9	Doan et al. (2020) – Scopus	160 patients	Not specified	Clinical factors and comorbidity burden were associated with reduced quality of life.
A10	Abreu et al. (2025) – Google Scholar	10 patients	Not specified	Impairment was identified across multiple quality-of-life domains among haemodialysis patients.
A11	Menezes et al. (2025) – Google Scholar	83 patients	Not specified	Chronic kidney disease and haemodialysis treatment negatively affected quality of life.
A12	Gomes et al. (2021) – Google Scholar	53 patients	Not specified	Lower scores were observed predominantly in physical and emotional domains.
A13	Silva (2023) – Google Scholar	12 patients	Not specified	High symptom burden and pain perception were associated with impaired quality of life.
A14	Alves da Silva et al. (2023) – Google Scholar	268 patients	Not specified	The study suggested that vascular access may influence quality of life, although this relationship was not directly analysed.

Source: Authors, 2025.

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A relevant distinction emerged during data synthesis. Only three studies, A1, A2 and A3, directly examined vascular access as a variable related to quality of life. Study A6 reported different access modalities, including arteriovenous fistulae, arteriovenous grafts and central venous catheters, but did not isolate the specific effect of central venous catheters on quality-of-life outcomes. The remaining studies, A4–A5 and A7–A14, addressed quality of life in haemodialysis more broadly, without specifying vascular access type or without incorporating it as an analytical variable.

Quality of life in haemodialysis

Across the included studies, quality of life was consistently reported as impaired among patients undergoing haemodialysis. This impairment was not restricted to a single dimension, but involved physical, emotional and social domains, indicating that the burden of haemodialysis extends beyond the biological management of chronic kidney disease.

Studies A4, A5 and A7 described reduced quality of life across multiple domains, with greater impact on physical functioning and daily performance. These findings suggest that the limitations imposed by haemodialysis are closely related to reduced autonomy, dependence on regular treatment sessions and restrictions in usual activities.

Studies A10, A11, A12 and A13 reinforced this pattern by identifying persistent symptoms such as pain, fatigue and physical exhaustion, in addition to emotional burden. These findings indicate that symptom persistence contributes to a negative perception of well-being and may intensify the subjective burden of living with chronic kidney disease.

Studies A8 and A9 added a broader explanatory layer by associating poorer quality of life with clinical and socioeconomic factors. This suggests that the experience of haemodialysis is influenced not only by treatment-related demands, but also by the patient's clinical condition and social vulnerability.

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Vascular access and quality of life

The relationship between vascular access and quality of life was directly explored in a limited number of studies. In A1, A2 and A3, central venous catheters were associated with less favourable outcomes when compared with arteriovenous fistulae. These outcomes included lower treatment satisfaction, greater psychosocial burden, higher perceived risk, lower quality-of-life scores, higher depression scores and reduced survival.

Although these studies differed in design and sample size, their findings converged around a clinically relevant pattern: patients using central venous catheters appeared to experience haemodialysis with greater perceived vulnerability than those using fistula-based access. This vulnerability was reflected not only in clinical outcomes, but also in subjective dimensions of treatment experience, including satisfaction, psychosocial impact and perception of risk.

Study A6 occupied an intermediate position in the evidence base. Although it included patients with different vascular access types, it did not provide a separate analysis of central venous catheters. As a result, its findings contributed to the broader characterisation of haemodialysis-related quality of life, but did not allow a precise interpretation of the specific contribution of central venous catheters.

Analytical pattern identified in the literature

A central finding of this review was the imbalance between the consistent documentation of impaired quality of life in haemodialysis and the limited analytical incorporation of vascular access as a determinant or associated factor. Most studies described quality of life as a global outcome, without examining how different access modalities may shape the patient's physical, emotional and social experience.

This pattern indicates that vascular access is frequently treated as a descriptive clinical characteristic rather than as a variable with potential explanatory value. Consequently, the current literature provides stronger evidence on the

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general burden of haemodialysis than on the specific contribution of central venous catheters to quality-of-life impairment.

Discussion

Quality of life in patients undergoing haemodialysis

The studies included in this review consistently indicated impaired quality of life among patients undergoing haemodialysis, although differences were observed regarding how this outcome was assessed and interpreted. In studies A4, A5 and A7, impaired quality of life was described more broadly, particularly within the physical and functional domains, highlighting limitations related to daily activities, treatment dependence and reduced autonomy.

This pattern was also reflected in studies A10, A11, A12 and A13, in which persistent symptoms such as pain, fatigue, physical exhaustion and emotional distress were associated with poorer perceptions of well-being. However, whereas A4, A5 and A7 primarily emphasised overall reductions in quality of life, studies A10–A13 focused more specifically on subjective manifestations of illness experience, suggesting that the impact of haemodialysis extends beyond physical functioning and also involves emotional burden and negative perceptions associated with chronic disease.

Studies A8 and A9 expanded this interpretation by associating poorer quality-of-life indicators with clinical and socioeconomic factors. These findings are relevant because they shift the analysis from an interpretation centred exclusively on dialysis treatment towards a broader perspective in which clinical condition, social vulnerability and life context influence how haemodialysis is experienced by patients. Thus, despite differences in analytical approach, the studies showed coherence in indicating that quality of life in haemodialysis results from the interaction between therapeutic burden, persistent symptoms, functional limitations and social conditions.

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Vascular access and quality of life

The relationship between vascular access and quality of life was addressed directly only in studies A1, A2 and A3. These studies converged in indicating that patients using central venous catheters experienced less favourable outcomes when compared with those using arteriovenous fistulae. In A1, central venous catheter use was associated with lower quality-of-life scores, greater presence of depressive symptoms and reduced survival. Studies A2 and A3, in turn, highlighted lower treatment satisfaction, increased perception of risk and greater psychosocial impact among catheter users.

The combined interpretation of these findings suggests that central venous catheters should not be understood solely as a technical route for haemodialysis treatment. In studies A1–A3, this type of vascular access appeared associated with both clinical and subjective dimensions of the therapeutic experience. The increased perception of risk, lower treatment satisfaction and psychosocial burden described in these studies indicate that vascular access type may influence how patients perceive safety, autonomy and stability throughout treatment.

Nevertheless, these findings should be interpreted cautiously. Although studies A1, A2 and A3 pointed in a similar direction, the limited number of studies directly examining this relationship restricts broader generalisation of the findings. Furthermore, differences in sample size, methodological design and quality-of-life assessment methods limited direct comparison between studies.

Study A6 occupies an intermediate position within this body of evidence. Although it included different vascular access modalities, it did not perform a separate analysis of the specific effects of central venous catheters on quality-of-life outcomes. This characteristic places A6 closer to studies that recognise vascular access as part of the clinical profile of haemodialysis patients, but do not incorporate it as an explanatory variable for patient-reported outcomes.

Analytical patterns identified in the literature

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The analysed studies demonstrated important differences regarding how vascular access was incorporated into analyses of quality of life. In A1, A2 and A3, vascular access was treated as a variable directly related to patient experience and perceived treatment outcomes. In contrast, studies A4–A5 and A7–A14 approached quality of life more broadly, without specific examination of the role played by vascular access type.

This distinction does not reduce the relevance of the included studies but demonstrates that the available literature still presents different analytical perspectives on the same phenomenon. While some publications prioritised the overall understanding of quality of life in haemodialysis, others focused on specific therapeutic components, such as vascular access.

This methodological characteristic directly influenced the type of interpretation possible from the available findings. Studies that specifically analysed vascular access enabled identification of differences between central venous catheters and arteriovenous fistulae regarding treatment perception and psychosocial impact. Conversely, studies adopting broader analytical approaches contributed to demonstrating that impaired quality of life in haemodialysis remains consistent across different populations and clinical contexts.

Accordingly, the studies should not be interpreted as contradictory, but rather as complementary perspectives on a complex and multifactorial phenomenon. Taken together, they contribute to a broader understanding of the haemodialysis experience by indicating that quality of life is influenced simultaneously by clinical, emotional, social and therapeutic factors, among which vascular access may represent a relevant component.

Analytical implications for understanding quality of life

The dialogue established between the included studies allowed identification of two principal levels of evidence. The first, more consistently established, concerns impaired quality of life among patients undergoing haemodialysis, a

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finding recurrently observed in studies A4, A5, A7, A8, A9, A10, A11, A12 and A13. The second, still more limited, concerns the influence of vascular access on this outcome, particularly observed in studies A1, A2 and A3.

This distinction is methodologically relevant. The literature more consistently supports the interpretation that haemodialysis is associated with reduced quality of life. However, the evidence remains insufficient to establish with the same level of certainty the specific magnitude of the impact exerted by central venous catheters on this outcome. Thus, the studies indicate a relevant tendency, although one that still depends on further investigations involving more specific and stratified analyses according to vascular access type.

Based on these findings, central venous catheters appear associated with less favourable outcomes when directly analysed, yet they remain insufficiently explored in much of the scientific literature addressing quality of life in haemodialysis. This characteristic suggests that vascular access represents a clinically relevant variable that has not yet been consistently incorporated into analytical models evaluating patient-reported outcomes in haemodialysis

Limitations of the Included Studies

The findings of this review should be interpreted in light of the methodological and analytical heterogeneity observed among the included studies. Differences were identified regarding study design, characteristics of the populations evaluated, quality-of-life assessment instruments and analytical approaches applied to haemodialysis-related outcomes. This variability influenced the degree of comparability between studies and limited the possibility of a more homogeneous interpretation of the available evidence.

An additional aspect concerns the diversity of instruments used to assess quality of life, as different assessment tools may prioritise distinct physical, emotional and social dimensions of the haemodialysis experience. Consequently, variations in instrument sensitivity and domain emphasis may have influenced how quality-of-life impairment was characterised across the studies. Nevertheless,

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despite these methodological differences, the included studies demonstrated interpretative convergence regarding impaired quality of life among patients undergoing haemodialysis, particularly within physical, emotional and psychosocial domains. Similarly, studies that specifically analysed vascular access consistently indicated less favourable outcomes among patients using central venous catheters when compared with those using arteriovenous fistulae.

3.Final considerations

The included studies showed that patients undergoing haemodialysis experience important limitations in physical, emotional, and social aspects of daily life. These findings reinforce the broad impact of chronic kidney disease and the demands imposed by long-term renal replacement therapy.

Among the investigations that specifically evaluated vascular access, patients using central venous catheters generally reported less favourable experiences than those with arteriovenous fistulas. The main findings included lower treatment satisfaction, greater psychosocial burden, and increased feelings of insecurity and vulnerability during treatment. Nevertheless, these results were observed in a limited number of studies and should be interpreted cautiously.

Most of the available studies did not analyse vascular access as an independent variable in the assessment of quality of life. In many cases, the type of access was mentioned only as part of the clinical description of the sample, without stratified analysis according to catheter, fistula, or graft use. This methodological limitation reduces the possibility of understanding more clearly how different vascular access modalities may influence the haemodialysis experience.

Overall, the findings indicate that quality of life is substantially affected in patients undergoing haemodialysis, while the role of vascular access remains insufficiently explored in the current literature. The review also demonstrates the need for studies with more consistent analytical approaches capable of evaluating

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vascular access together with other clinical and psychosocial factors that may influence patient-reported outcomes.

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