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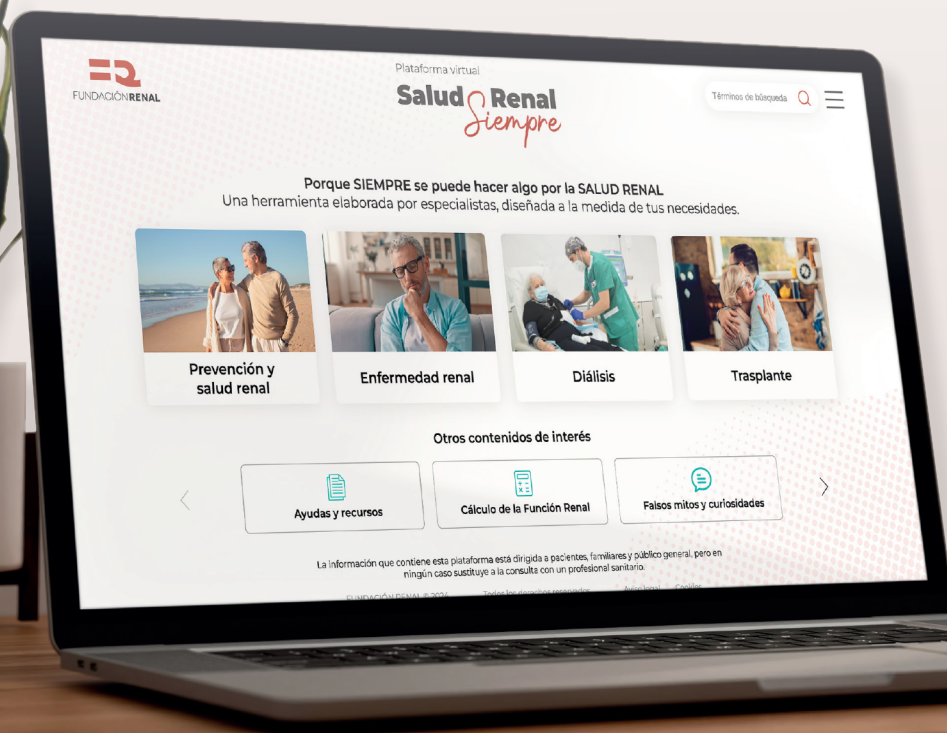
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The impact of generative Artificial Intelligence on scientific publishing

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Artificial intelligence (AI), defined as the capacity of machines to simulate the cognitive processes characteristic of the human species, has, in little more than two years, become a disruptive force across multiple sectors of knowledge management, especially in scientific publishing¹. Natural language processing, a fundamental capability of generative artificial intelligence (GAI) that has developed exponentially in less than a decade since the description of the transformer architecture², allows machines to understand, interpret, and generate human-like text in a fluent and plausible manner³. This facilitates automated writing of documents, synthesis of previous studies, and the production of new content. It profoundly affects the way information is produced, shared, accessed, and even evaluated. GAI applications will increase efficiency and accessibility in research, but they also raise ethical and security challenges that require careful consideration.

Without delving into a deep analysis of how GAI systems function, the process of content generation involves posing a question (known as a prompt), processing it through a neural network, and generating an output. Specifically, chatbots such as GPT (Generative Pre-trained Transformer) operate using language models trained on extensive text corpora (typically the internet, predominantly in English). These models understand and generate human language coherently and contextually across multiple languages⁴. When interacting with a chatbot, the model processes the input text, compares it with learned patterns, and generates a probabilistic response based on this information. AI algorithms can analyze large volumes of scientific literature, identifying patterns and trends that would be impossible to detect manually. This enables them to perform a variety of tasks—from answering questions to generating full written content—adapting to the nature and tone of the conversation in real time.

Because of these capabilities, chatbots help optimize several stages of the publication process, ranging from reviewing prior literature and drafting the manuscript to assisting in scientific question formulation, data collection and analysis, text writing, and dissemination of results⁵⁻⁸. Automating routine and resource-intensive tasks frees researchers to focus on other aspects of their work. This not only enhances productivity but also promotes the generation of higher-quality research. Editors, on the other hand, may use GAI to streamline the peer-review process—for example, by assessing the novelty of a manuscript, identifying plagiarism, selecting appropriate reviewers, or assisting in manuscript editing—thus accelerating publication⁹.

Despite its advantages, AI also presents significant challenges. The ability of these applications to generate synthetic content, including fabricated scientific articles, raises serious concerns about the integrity and credibility of research¹⁰. The proliferation of false information can undermine trust in science and hinder informed decision-making.

The use of synthetic data in research also poses ethical and methodological questions. Although such data may be useful under certain circumstances, their validity and representativeness must be evaluated carefully to avoid drawing incorrect or biased conclusions. It is essential to establish rigorous protocols for verifying and validating synthetic data used in research, ensuring the reliability of the results obtained. Data privacy and security are two additional major concerns. AI often requires access to large amounts of personal and confidential information, which increases the risk of data breaches and misuse. Robust protection measures must be implemented to safeguard individuals' privacy and ensure data security.

To fully leverage the potential of AI in scientific publishing, it is crucial to address these challenges proactively and responsibly. Establishing clear standards for transparency and authenticity in AI-generated content will allow readers to easily distinguish between human-generated and machine-generated work^{6, 9-11}.

In conclusion, GAI is transforming the landscape of scientific publishing, creating unprecedented opportunities to accelerate discovery and democratize access to knowledge. However, its responsible adoption requires careful attention to ethical and security challenges. By establishing clear standards, fostering collaboration, and prioritizing data protection, we can ensure that AI becomes a powerful tool for advancing science rather than a threat to its integrity. The future of scientific research depends on our ability to harness the potential of AI ethically and responsibly. Furthermore, it is crucial to implement mechanisms for transparency and accountability to ensure that the algorithms used in scientific research are fair and unbiased. This underscores the need to develop robust regulatory frameworks to oversee the use of GAI in scientific research and ensure that fundamental ethical principles are upheld¹².

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Health education in the renal transplant patient: an integrative review

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ABSTRACT

Introduction: The most advanced stage of advanced chronic kidney disease requires renal replacement therapy, with renal transplantation being a prominent option due to its benefits. It is crucial to guarantee compliance with certain aspects of post-transplantation to ensure its success, among which health education plays a fundamental role.

Objective: To understand and synthesise the scientific production of recent years on health education interventions in renal transplant patients.

Methodology: An integrative review was conducted following the recommendations of the PRISMA statement. Articles were extracted from the PubMed and Scopus databases. Articles published between 2013 and 2023 in English and Spanish addressing health education and post-renal transplantation were included.

Results: Sixteen articles were included (9 observational studies, 3 clinical trials, 3 qualitative studies, and 1 systematic review). The main variables that emerged were: characteristics of the population studied, different health education interventions, critical outcomes of the interventions, complications or challenges identified, and patient satisfaction.

Conclusions: Post-transplant education interventions for renal patients are especially effective if they involve aspects such as individualised and integrated care and take into account the patient's biopsychosocial sphere. They offer notable improvements in the satisfaction of renal transplant

recipients, strengthening their autonomy, independence, and confidence in facing their new stage in life.

Keywords: kidney transplantation; health education; educational interventions; nursing care.

RESUMEN

Educación sanitaria en el paciente trasplantado renal: una revisión integrativa

Introducción: La fase más avanzada de la enfermedad renal crónica avanzada, requiere tratamiento renal sustitutivo, siendo el trasplante renal una opción destacada debido a sus beneficios. Es crucial garantizar el cumplimiento de ciertos aspectos en el post-trasplante para asegurar su éxito, entre los cuales, la educación sanitaria desempeña un papel fundamental.

Objetivo: Conocer y sintetizar la producción científica de los últimos años acerca de las intervenciones de educación sanitaria en el paciente trasplantado renal.

Metodología: Se realizó una revisión integrativa siguiendo las recomendaciones de la declaración PRISMA. Se extrajeron artículos de las bases de datos PubMed y Scopus. Se incluyeron artículos publicados entre 2013 y 2023 tanto en inglés y español, que abordaban la educación sanitaria y el post-trasplante renal.

Resultados: Se incluyeron 16 artículos (9 estudios observacionales, 3 ensayos clínicos, 3 estudios cualitativos y 1 revisión sistemática). Como principales variables emergieron: características de la población estudiada, diferentes intervenciones de educación sanitaria, resultados claves de las intervenciones, complicaciones o desafíos identificados, y satisfacción del paciente.

Conclusiones: Las intervenciones de educación en el post-trasplante del paciente renal son efectivas especialmente si involucran aspectos como una atención individualizada e integrada, y se tiene en cuenta la esfera biopsicosocial del paciente. Ofrecen mejoras notables en la satisfacción de los trasplantados renales, fortaleciendo su autonomía, independencia y confianza para afrontar su nueva etapa vital.

Palabras clave: trasplante de riñón; educación sanitaria; intervenciones educativas; cuidados de enfermería.

INTRODUCTION

Justification

Chronic kidney disease (CKD) is currently a highly significant health problem¹, whose most advanced manifestation, known as end-stage renal disease (ESRD)², requires renal replacement therapy (RRT) by dialysis or kidney transplantation³.

According to data from the international non-profit organization World Kidney Day, CKD affects more than 10% of the world's population, with hypertension and diabetes standing out as the main risk factors⁴. In Spain, CKD affects nearly 7 million people⁵, a prevalence similar to that observed in the United States (where it affects approximately 14% of adults)⁶. In terms of incidence, in Spain it represents approximately 150 newly diagnosed cases per million population each year, according to the Spanish Society of Nephrology (SEN)⁷.

Of note, in Spain more than half of the people who need RRT have received a transplant (55%). This figure reflects the high level of effectiveness and access to organ transplantation in the Spanish national health system. On the other hand, a smaller percentage (39.8%) of patients receive treatment by hemodialysis, which also constitutes a vital component of ESRD management. In addition, 4.8% of patients opt for peritoneal dialysis, which offers an important alternative for those seeking greater autonomy or who have difficulties with other types of treatment⁷.

Kidney transplantation (KT) is the preferred therapeutic option for people with kidney disease who require RRT, due to greater survival and better quality of life. Receiving a transplanted organ in turn entails lifelong immunosuppressive treatment to prevent rejection, which requires strict

adherence to this therapy. Among the consequences of poor adherence to the immunosuppressive regimen are costly hospitalizations, complex laboratory testing, and anti-rejection therapies. All of this has a negative impact on the overall well-being of transplant recipients⁸.

However, the rate of non-adherence (NA) to immunosuppressants in KT (36%) is the highest compared with other types of solid organ transplantation (liver, 6% non-adherence, being the lowest figure)⁹.

Therefore, adherence to immunosuppressive treatment is highly relevant in KT patients, involving shared decision-making and responsibility between the patient and their caregivers. The reasons why such treatment is not followed may be intentional—for example, due to lack of trust in healthcare professionals or fear of possible side effects—or unintentional, related to a lack of understanding and information provided by health professionals¹⁰.

In this context, the importance of addressing health education in kidney transplant recipients stands out, as it is essential to maintaining good self-care, quality of life, and treatment follow-up in this new stage of life¹¹.

Given the high incidence rate of NA to immunosuppressive therapy among kidney transplant recipients and its impact on transplant outcomes⁹, it is crucial to understand and evaluate health education interventions designed to improve adherence and optimize clinical outcomes in this specific population. Therefore, the objective of this integrative review was to synthesize the scientific literature on health education interventions in kidney transplant recipients, as well as their effectiveness, with the following aims:

1. Analyze the effectiveness of health education interventions in KT.
2. Assess the influence of health education interventions on adherence in patients with KT.

METHODOLOGY

Design

We conducted a comprehensive review using studies from health sciences databases and following the guidelines of the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) statement¹², adapting its recommendations to the specific nature of this integrative review.

Search strategy

An in-depth literature search was performed in different databases to gather as much information as possible related to the topic. The databases consulted were PubMed and Scopus.

Data collection took place in December 2023.

The search method consisted of using the following descriptors or keywords: health education and post kidney transplantation, combined with the Boolean operator “AND”.

The databases used were PubMed and Scopus.

- **PubMed:** According to the inclusion and exclusion criteria, 125 articles were obtained, of which 12 were selected for further review. After excluding some following full-text reading, 9 articles remained.
- **Scopus:** Once the inclusion and exclusion criteria were applied, 141 articles remained, of which 11 were selected for in-depth reading after removing duplicates. Finally, 7 articles were retained for inclusion in the review.

Eligibility criteria

The criteria used to conduct a more focused search were:

Inclusion criteria:

- Articles addressing health education and kidney transplantation.
- Articles published between 2013 and 2023.
- Articles in English and Spanish.

Exclusion criteria:

- Articles without full-text available.
- Articles that did not present results.
- Articles in pediatric populations.

Quality analysis of the studies

To analyze the methodological quality of the articles, the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) checklist¹³ was used for observational and cross-sectional studies. The Consolidated Standards of Reporting Trials (CONSORT) tool¹⁴ was used to assess the quality of randomized clinical trial reports, the Assessing the Methodological Quality of Systematic Reviews (AMSTAR) tool¹⁵ was used for systematic reviews, and the Critical Appraisal Skills Programme Español (CASP)¹⁶ for qualitative studies.

Data extraction

Relevant information from each article was collected for this study. The title, authors, study design, sample used, main objective, and a summary of each article's main findings were specified.

Synthesis of the results

A total of 16 documents were selected, following the inclusion and exclusion criteria established above.

We used a thematic–categorical approach due to the disparity of variables and methodologies evaluated in the selected studies.

RESULTS

Search results

First, a general search was conducted without taking any inclusion or exclusion criteria into account, with the aim of determining the number of publications related to the topic and extracting as much information as possible. A total of 484 potentially related articles were identified.

Subsequently, a first screening was carried out using the inclusion and exclusion criteria in the databases, selecting 266 articles a priori, as shown in **figure 1**.

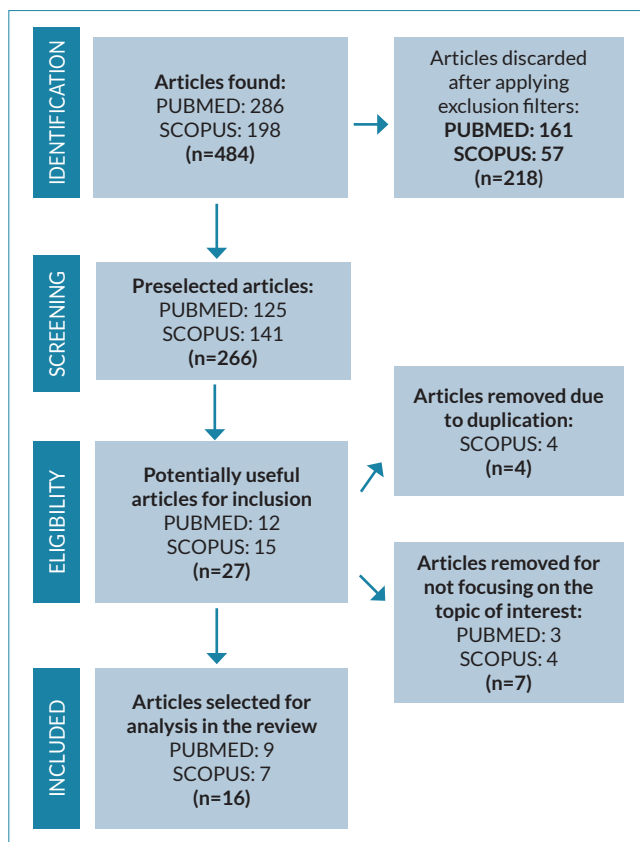


Figure 1. PRISMA flow diagram.

Flow diagram

Next, within the articles that met these criteria, a further selection was made by reading titles and abstracts, yielding 23 potentially useful articles, which were stored in a folder.

Finally, a filtering process was performed by reading the full text, and 16 articles were obtained; this is the total number of articles that met the inclusion criteria and were used for the review.

Characteristics of the study population

A total of 16 articles were selected for the review, of which 8 were from Europe, 4 from Oceania, 3 from North America,

and 1 from South America. In total, 1,280 kidney transplant recipients were studied. Nine observational studies, three clinical trials, three qualitative studies, and one systematic review that examined the relevant scientific literature on the topic were included.

The articles and their characteristics are summarized in **table 1**.

Description of the results

Characteristics of the study population

The mean age of the population included in this review at the time of receiving KT ranged from 44.5 to 68 years, although only two articles reported this figure^{18,26}.

In 11 of the reviewed articles, the time interval between kidney transplantation and the first educational intervention

Table 1. Characteristics of the studies included in the review.

AUTHOR, YEAR, COUNTRY	STUDY TYPE	SAMPLE	OBJECTIVES	MAIN RESULTS	QUALITY CRITERIA
Naile Aksit et al., 2022, Turkey ¹⁷	Randomized controlled clinical trial.	60 individuals, 30 in the intervention group and 30 in the control group.	Evaluate the effectiveness of health education and interviews to improve adherence to treatment in kidney transplant recipients (KTR).	The mean score of the Immunosuppressive Therapy Adherence Scale was higher in the intervention group. Knowledge scores increased in the intervention group from 12.17 ± 3.39 at the start of the study to 20.73 ± 1.57 after the intervention.	CONSORT 17/25
Cossart A.R. et al., 2022, Australia ¹⁸	Semi-structured qualitative study.	14 participants aged 66–77 years who were prescribed an average of 13 medications.	Examine how adults older than 60 behave regarding medication intake after kidney transplantation.	Patients felt empowered to be educated about their condition and medication. This also encouraged them to involve their loved ones. Additionally, they prioritized immunosuppressive medication mainly out of gratitude to their donor.	CASPe 9/10
Ostrowski P. et al., 2023, Poland ¹⁹	Cross-sectional observational study.	217 kidney transplant patients at least 3 months post-transplant, aged 18–82, who voluntarily agreed to respond anonymously.	Investigate psychological factors associated with medication adherence post-transplant.	Age and educational level were related to adherence: younger and less-educated patients showed higher non-adherence. Patients with regular meal schedules tended to be more adherent.	STROBE 19/22
Thet Z. et al., 2022, Australia ²⁰	Observational analytical cohort study.	50 patients: 25 kidney transplant recipients and 25 with glomerular disease.	Assess the effect of an integrated education program on skin cancer risk awareness and protective behaviors in KTR and people with glomerular disease.	Significant improvement was observed in skin cancer awareness questionnaire scores at the start, 3 months, and 6 months post-intervention. Frequency of self-skin exams increased, and adherence to protective measures improved.	STROBE 21/22
Lillehagen I. et al., 2018, Norway ²¹	Ethnographic observational study.	10 kidney transplant recipients (who received health education) and 13 trained nurses.	Understand how a new patient education program is adapted and internalized when implemented in daily hospital practice.	Nurses tried to apply program principles, but patients struggled to express their needs and understanding. Nurses also encountered some difficulties and limitations.	STROBE 14/22
Low J.K. et al., 2019, Australia ²²	Pilot randomized controlled clinical trial.	71 individuals, 36 in the control group and 35 in the intervention group.	Determine the effectiveness of an intervention designed for kidney transplant recipients (KTR) to improve medication adherence.	Higher adherence was observed at a specific time point among participants in the intervention group. The intervention was effective in maintaining stable adherence levels over time compared with the control group.	CONSORT 17/25

AUTHOR, YEAR, COUNTRY	STUDY TYPE	SAMPLE	OBJECTIVES	MAIN RESULTS	QUALITY CRITERIA
Yue-Harn Ng et al., 2021, United States ²³	Observational analytical cohort study.	173 participants (95% Black).	Identify pre-kidney transplant evaluation factors associated with non-adherence behaviors post-transplant across three domains, to support earlier interventions before and after transplantation in future studies.	Racial discrimination was associated with a 31% lower likelihood of adherence, while higher self-control was associated with increased adherence.	STROBE 21/22
Marsicano E.O., 2015, Brazil ²⁴	Cross-sectional observational study.	100 kidney transplant recipients.	Determine the prevalence of non-adherence to immunosuppressants in the Brazilian kidney transplant population.	Non-adherence prevalence was 51%. Higher family income (above 5 minimum wages) and access to private health insurance were associated with non-adherence.	STROBE 17/22
De Pasquale C. et al., 2016, Italy ²⁵	Descriptive observational study.	74 kidney transplant recipients.	Identify risk factors and post-transplant psychological symptoms influencing treatment adherence in kidney transplant recipients.	Those with higher education and more time since transplant had better mental balance. Women were less adherent, and although time since transplant influenced adherence, mental health did not significantly affect it.	STROBE 13/22
Gellén E. et al., 2018, Hungary ²⁶	Cross-sectional observational study.	221 kidney transplant recipients.	Investigate how pre-transplant sun exposure influences skin cancer risk in transplant recipients and evaluate sun-protection habits and skin cancer incidence.	Education received did not translate into reduced sun exposure nor better sun-protection methods post-transplant, highlighting the need for improved and better-adapted educational programs.	STROBE 18/22
Urstad K.H. et al., 2021, Norway ²⁷	Longitudinal observational study.	196 kidney transplant recipients.	Investigate knowledge and self-efficacy in kidney transplant recipients during the first year after transplantation.	The education program did not have a statistically significant impact on participants' knowledge or self-efficacy levels.	STROBE 18/22
G. Costa-Requena et al., 2016, Spain ²⁸	Longitudinal observational study.	73 participants, median age 57 years.	Evaluate treatment adherence after kidney transplantation and assess information received at 1 month and 18 months post-transplant, along with its influence on adherence.	Non-adherence rates ranged from 9.6% to 29.8% at different post-transplant stages. Not consulting a physician after missing a dose significantly affected adherence at 1 month. At 18 months, medication knowledge no longer influenced adherence.	STROBE 20/22
Belaiche S. et al., 2017, France ²⁹	Systematic review.	37 studies included.	Highlight the most relevant factors associated with lack of adherence to treatment, especially regarding immunosuppressive medications or overall medication regimens.	Non-adherence (NA) was associated with several factors: being male (rather than female), being younger (<50 years), having little social support, being unemployed, having a low educational level, being more than three years post-transplant, having received the organ from a deceased donor, having more than six comorbidities, taking more than five medications daily, having more than two daily doses, holding negative beliefs, exhibiting negative behaviors, and experiencing depression and anxiety.	AMSTAR 10/16

AUTHOR, YEAR, COUNTRY	STUDY TYPE	SAMPLE	OBJECTIVES	MAIN RESULTS	QUALITY CRITERIA
Gibson C.A. et al., 2020, United States ³⁰	Randomized controlled clinical trial.	10 participants who had undergone kidney transplantation 6–12 months prior.	Determine whether it is feasible and acceptable to implement a remote nutrition and physical activity intervention for kidney transplant recipients.	Adherence to healthy behaviors was high. All participants completed follow-up assessments. The control group maintained weight, while the intervention group showed weight gain at 3 and 6 months. Improvements were noted in physical activity, quality of life, and fruit and vegetable intake in both groups. Participants stated they would recommend the program to other transplant recipients.	CONSORT 25/25
Andersen M.H. et al., 2016, Norway ³¹	Exploratory qualitative study.	12 kidney transplant patients.	Explore the experiences of kidney transplant recipients participating in a new evidence-based educational program.	Participants felt the new educational program was tailored to their individual needs. However, they noted that recipients and healthcare staff considered different aspects when educating. The importance of evaluating patient understanding even after the program was emphasized, since knowledge may change in clinical settings compared with controlled studies.	CASPe 10/10
Williams A. et al., 2016, Australia ³²	Exploratory qualitative study.	35 healthcare professionals.	Understand how healthcare professionals support kidney transplant recipients in maintaining long-term adherence to medication regimens.	The analysis showed that adherence is a shared task involving both the transplant team and the patient. Effective strategies included educational activities in the hospital, identifying and managing non-adherence, promoting self-care, and enhancing collaboration between the patient and healthcare professionals.	CASPe 8/10

KT: Kidney Transplant. NA: Non-adherent.

was documented, showing significant variability ranging from a few days before transplantation to 3 months after surgery^{22,27,28,30,31}, or even several years after transplantation (minimum 3, maximum 8.7 years)^{18,24-26}. Of note, in 2 studies^{20,23}, the first educational intervention was carried out during the hospital stay, in the immediate post-KT period.

Demographic data on the sex of participants were collected in the selected studies¹⁷⁻³². Proportions varied across studies. There was a wide range of sex distributions: in 3 studies the gender distribution was approximately equal (50% men and 50% women)^{18,19,30}. In the remaining studies, larger deviations from this balance were found, with the proportion of women being <45% in 6 studies^{20,22,23,25,26,29}, and <35% in 5 studies^{21,24,27,28,31}. Only 2 studies had a higher proportion of women than men, at 58%¹⁷, and 64.3%³², respectively.

Participants represented a variety of ethnicities, with most identified as White in those studies that specified race^{18,20,23,24,26}.

Regarding donor type, 3 studies^{17,23,24} reported that more than half of the participants received a kidney from a living

donor. Conversely, in three studies and one systematic review^{22,27,29,30}, more than half of the organs were from deceased donors. Across the review, only four studies included living donors.

A variety of drug regimens were observed among kidney transplant recipients. Overall, mycophenolate mofetil^{18,25,26,30} and corticosteroids^{18,25,26,29,30} were frequently used as part of the immunosuppressive therapy. Three studies specified the number of medications patients took daily: in 1 study, the number exceeded 5 drugs with more than 2 doses per day²⁹, while in the other 2, the mean was 12 and 13 different drugs, respectively^{18,24}. Immunosuppressive regimens also included cyclosporine^{24,29} and tacrolimus^{17,24,30}.

Health education interventions and key findings

There is considerable diversity in the health education interventions analyzed in the selected studies¹⁷⁻³², reflecting the complexity and multiple facets of post-kidney transplant care. Among these interventions—delivered mostly through questionnaires, surveys, scales, integrated programs, or meetings—education focused on adherence to immunosuppressive therapy emerges as a recurrent

and priority topic, addressed in a total of 9 studies^{17-19,22-25,28,29}. Three of these studies focus on specific interventions aiming to increase adherence^{17,18,22}, while the remaining 6 investigate the most influential factors in maintaining adherence^{19,23-25,28,29}. These findings suggest a clear concern with ensuring optimal adherence to immunosuppressive medication, which is crucial for the viability and long-term success of KT. In addition to treatment adherence, other aspects of health education receive attention in the reviewed literature. For example, some studies explore awareness and prevention of skin cancer risk in kidney transplant recipients^{20,26}, recognizing the specific challenges these patients face due to their increased susceptibility to this type of condition. Likewise, lifestyle modification after transplantation—including aspects such as diet and exercise—is addressed in a specific study³⁰, underscoring the importance of promoting healthy habits to improve long-term kidney transplant outcomes.

Additionally, some studies focus on evaluating the effectiveness of existing health education programs²¹, offering a critical view of current strategies and their impact on KT recipients. Other studies investigate patients' self-efficacy during year 1 after transplant²⁷, shedding light on individuals' confidence and self-care skills during this crucial stage of recovery. Furthermore, the experiences and perceptions of kidney transplant recipients are explored, providing qualitative perspectives that complement quantitative data and enrich overall understanding of this patient group's needs and challenges³¹. Lastly, one study³² aims to understand how healthcare professionals support patients in sustaining long-term adherence to pharmacological treatments.

Regarding outcomes, several interventions—five in total—showed favorable results^{17,18,20,22,30}, with a positive impact on patient behavior leading to improved adherence^{17,18,22}, or increased awareness and implementation of knowledge related to risk factors and lifestyle modification^{20,30}. However, in 2 studies^{26,27}, implementation of the intervention did not necessarily result in improved patient behavior. The most influential factors in treatment adherence were analyzed in 6 articles^{19,23-25,28,29}, identifying several negative predictors such as younger age and lower educational level^{19,25,29}, experiences of racial discrimination²³, longer time since transplantation^{25,28}, and failing to consult a physician after forgetting a dose²⁸. Regarding gender, findings diverged: in 1 study lower adherence was more prevalent among women²⁵, whereas in another, lower adherence was associated with being male²⁹. Another interesting finding was the discrepancy related to economic status: in 1 study, low income was a major risk factor²⁹, while in another, having a family income >5 minimum wages and access to private health insurance were associated with non-adherence²⁴. Among the positive factors, the most notable included maintaining regular mealtimes¹⁹, higher educational level, better body mass index²³, and social support²⁹.

In another article, patients expressed appreciation for individualized education²¹, even though they felt that nurses sometimes prioritized standard hospital procedures³¹, and highlighted the importance of health care professionals being involved and demonstrating a collective commitment³².

Table 2 illustrates the interventions and the methods used to assess therapeutic adherence in the programs that addressed it.

Complications or challenges identified

Various types of complications or challenges for participants were reported across several studies^{17-22,25,30,32}. The most frequent was that patients felt overwhelmed and fatigued by the complexity and rigor of the post-transplant care regimen^{18,19,22,30}. Other notable issues included some patients' false belief that they were protected vs rejection simply because they had been on immunosuppression for many years¹⁷, and difficulties in adequately formulating each patient's interests—taking psychological and social aspects into account—which limited the effectiveness of individualized adaptation^{21,25}. One study showed that pre-transplant education might also have been insufficient²⁰.

Of note, the presence of feelings of “shame and fear” when informing the transplant team about incorrect treatment adherence, with patients not wanting “the doctor to find out”³².

Patient satisfaction

Some studies evaluated transplant recipients' satisfaction with educational programs, with several highlighting strong satisfaction with these interventions¹⁸. Another reason for greater satisfaction was the perception that the educational program was tailored to patients' individual needs³¹. One study also noted feelings of empowerment as participants took an active role in their self-care¹⁹, along with a marked awareness of their responsibility for their own health status²⁹.

In another study, involving a technology-based lifestyle modification program that included 12 weeks of remote, interactive, and personalized health coaching, participants expressed dissatisfaction with the brevity of the program, noting that it had been very helpful—especially during the post-transplant period when they were largely confined to the hospital. They highlighted the social value of the program, as it allowed them to share experiences and observe other kidney transplant recipients' journeys. They considered this support group highly beneficial, providing emotional support without the need to leave home³⁰.

DISCUSSION

Health education is a fundamental practice that becomes even more relevant in the context of transplantation. According to Rochera A, this practice has not always been a priority

Tabla 2. Intervenciones sanitarias realizadas.

AUTHOR	INTERVENTION
Naile Akşit. ¹⁷	Patient information form; pre- and post-test; medication monitoring form; measurement of tacrolimus blood levels; and a training leaflet. Questionnaire used: Immunosuppressive Therapy Adherence Scale.
Amelia R. Cossart, et al. ¹⁸	Patient interviews.
Piotr Ostrowski, et al. ¹⁹	Anonymous questionnaire with items related to medication aspects.
Zaw Thet, et al. ²⁰	Integrated skin cancer education program.
Ida Lillehagen, et al. ²¹	Observation of 19 learning sessions.
Jac Kee Low, et al. ²²	In-person meeting with patients and a series of six phone calls every 2 weeks. Questionnaire used: MEMS® (Medication Event Monitoring System).
Yue-Harn Ng, et al. ²³	Evaluations at transplantation and at 6 months post-transplant.
Elisa Oliveira Marsicano, et al. ²⁴	Non-adherence scale, collateral report, and blood levels of immunosuppressants. Questionnaire used: BAASIS (Basel Assessment of Adherence to Immunosuppressive Medications).
Colugnati, et al. ²⁵	Psychological/psychiatric assessment; evaluation of patients' perceived health status; and an interview on immunosuppressive medications.
Concetta De Pasquale, et al. ²⁶	Specific questionnaire (including questions about skin type, transplant date, type and number of transplanted organs, immunosuppressive medication history, and education received about increased skin cancer risk during the peri-transplant period).
Emese Gellén, et al. ²⁷	Kidney Transplant Recipients Knowledge Questionnaire and the General Self-Efficacy Scale.
Kristin Hjorthaug Urstad, et al. ²⁸	Questionnaire used: SMAQ (Simplified Medication Adherence Questionnaire).
G. Costa-Requena, et al. ²⁹	Electronic monitoring, blood levels of immunosuppressants, patient interviews, self-reports, refills, pill counts, physician judgment.
Stephanie Belaiche, et al. ³⁰	Technology-based lifestyle modification program
Cheryl A. Gibson, et al. ³¹	Interviews (40–60 minutes in duration).
Allison Williams, et al. ³²	Healthcare professionals participated in focus groups across five transplant units.

Virginia Henderson states that “to have health, it is necessary to have information.” It is impossible to enjoy good health without understanding how to preserve it, care for it, or restore it³³.

Under this premise, this review shows that educational interventions achieve quality and effectiveness when they are tailored to the individual context of each patient. By adopting an integrated approach, health education can be personalized to meet the specific needs of each patient^{20,21,32}. Therefore, it is crucial to explore each individual’s personal perceptions when implementing effective support strategies¹⁸, as well as to consider the use of new technologies as a tool to promote education³⁰.

Of note, various factors associated with variables such as age, gender, educational level, ethnicity, or donor type influence the degree to which these interventions are followed and adhered to, especially those related to immunosuppressive medication^{23-25,28,29}. Regarding adherence to immunosuppressive therapy, other authors such as Ruiz-Calzado R report that variables such as gender, employment status, or race are not significantly influential. However, factors such as age, treatment complexity, and certain psychological aspects are more relevant³⁴. These factors may vary widely, and it is essential to understand their impact on the experience of kidney transplant recipients to design effective, personalized interventions. Other influential aspects studied highlight that the importance of maintaining adherence is a shared responsibility between the patient and the medical team, although this is often limited by time constraints or may become unidirectional³².

Despite the presence of complications such as stress and feeling overwhelmed by the complexity of the new medication regimen and lifestyle changes^{18,19,22,30}, or issues such as lack of personalized attention^{21,25} and misinformation accompanied by myths regarding treatment¹⁷, other authors emphasize that the difficulties faced after transplantation were insignificant vs the gratitude patients felt for being able to live 1 more day³⁵.

for health professionals³³. However, thanks to professional and legal demands regarding responsibility in the nursing profession, the philosophy related to the “patient’s right to know” has evolved.

In the results of this review, a high level of overall satisfaction with the interventions was observed, especially when these were tailored to individual needs³¹. This was largely due to the empowerment patients experienced when receiving such interventions¹⁹. However, De Pasquale

et al. found that transplant recipients often struggle to express their deeper psychological needs. They identified emotional constriction in 100% of patients and difficulties in interpersonal relationships and anxiety in 70% of them³⁶.

Of note, as mentioned in one study, that all patients would recommend the program they received to other transplant recipients³⁰.

Limitations of the study

One of the main limitations of this study is the limited amount of bibliographic information available on the topic and the difficulty in finding articles that matched it. Currently, nursing research in this area is limited. This lack of specific studies restricts the availability of data and scientific evidence to support and improve clinical practice in patient care, underscoring the need to promote and support further research in the nursing field.

Another limitation to note is the considerable variability in the results of some studies.

Practical considerations

Health education for kidney transplant recipients is crucial due to the high prevalence of this condition in society and its significant impact on the quality of life and safety of these individuals. It is vital to ensure that patients understand the importance of following the prescribed immunosuppressive regimen, including correct medication administration, adherence to scheduled dosing times, and prevention of interruptions in therapy.

Nurses play an essential role in this process, thanks to their proximity and close relationship with patients. The work of informing, educating, and raising awareness carried out by nursing professionals is indispensable to empower patients and help them manage their new lives in the best way possible.

In light of the results of this review, health education interventions are shown to be a fundamental tool in the comprehensive care of kidney transplant recipients, particularly due to their effectiveness in improving knowledge, promoting healthy behaviors, and fostering responsibility in treatment adherence. Moreover, these interventions are more effective when they are designed in an individualized and integrated manner, taking into consideration the biopsychosocial sphere of the kidney transplant recipient, as they also strengthen autonomy, independence, and confidence to face the challenges of this new stage of life.

It would be advisable to implement health education interventions in routine clinical practice, ensuring that they are culturally sensitive and respect patient autonomy. Equally important is to investigate the effectiveness of these interventions, especially from the perspective of nursing.

Conflicts of interest

None declared.

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The diabetic foot in people on haemodialysis. An integrative review

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ABSTRACT

Introduction: Diabetes mellitus remains one of the most prevalent causes of chronic kidney disease, which, in its last stage becomes subsidiary to renal replacement therapy, such as haemodialysis. The vascular problems derived from diabetes, together with the complications of haemodialysis, can create new health problems in these patients, among which the diabetic foot stands out.

Objective: To understand and synthesise the existing scientific evidence on risk factors and nursing care of diabetic foot in haemodialysis patients.

Methodology: Following the recommendations of the PRISMA statement, an integrative review was carried out in the databases WOS, Pubmed, and SCOPUS, using the descriptors DESC/MESH: "Diabetic Foot", "Foot ulcer", "Hemodialysis", and "Amputation". Articles less than ten years old, in English and Spanish, were included.

Results: Ten articles (2 systematic reviews, 1 clinical practice guideline, and 7 observational studies) were included. The main variables that emerged were the incidence, morbidity, and mortality of diabetic foot, associated risk factors, and diabetic foot prevention and nursing care.

Conclusions: In haemodialysis patients, diabetic foot significantly increases morbidity and mortality, negatively impacting their quality of life. Factors such as peripheral arterial disease, poor foot health, and limited knowledge of the subject contribute to foot problems in these patients. Therefore, it is urgent to encourage prevention and promote

self-care by patients, as these measures can potentially improve their health outcomes.

Keywords: chronic kidney disease; haemodialysis; diabetes; diabetic foot; care.

RESUMEN

El pie diabético en personas en tratamiento con hemodiálisis. Una revisión integrativa

Introducción: La diabetes mellitus se mantiene como una de las causas más prevalentes de enfermedad renal crónica, la cual, en su último estadio se hace subsidiaria de un tratamiento renal sustitutivo, como la hemodiálisis. Los problemas vasculares derivados de la diabetes unidos a complicaciones propias de la hemodiálisis pueden crear en estos pacientes nuevos problemas de salud, entre los que destaca el pie diabético.

Objetivo: Conocer y sintetizar la evidencia científica existente sobre los factores de riesgo y los cuidados de enfermería del pie diabético en los pacientes en hemodiálisis.

Metodología: Se llevó a cabo una revisión integrativa siguiendo las recomendaciones de la declaración PRISMA, en las bases de datos WOS, Pubmed y SCOPUS, empleando los descriptores DESC/MESH: "Diabetic Foot", "Foot ulcer", "Hemodialysis", "Amputation". Se incluyeron artículos con menos de 10 de antigüedad, en inglés y español.

Resultados: Se incluyeron 10 artículos (2 revisiones sistemáticas, 1 guía de práctica clínica y 7 estudios observacionales). Como principales variables emergieron la incidencia, morbilidad y mortalidad del pie diabético, los factores de riesgo asociados, y la prevención y cuidados de enfermería del mismo.

Conclusiones: En los pacientes en hemodiálisis el pie diabético supone un aumento de la morbilidad y mortalidad, con gran impacto negativo en su calidad de vida. La enfermedad arterial periférica, mala salud de los pies y conocimientos escasos sobre el tema, son factores desencadenantes de problemas en los pies de estos pacientes. Por tanto, es fundamental fomentar la prevención y promover el autocuidado por parte de los pacientes.

Palabras clave: enfermedad renal crónica; hemodiálisis; diabetes; pie diabético; cuidados.

INTRODUCTION

Chronic Kidney Disease (CKD) represents both a medical and public health problem due to its epidemic proportions, high frequency of complications, and associated costs^{1,2}. CKD may progress slowly over months or years until reaching an end stage, at which point renal replacement therapy (RRT), such as dialysis or kidney transplantation, becomes necessary^{3,4}.

Diabetes Mellitus (DM) is a powerful risk factor for CKD. According to the Spanish Registry of Renal Patients of the Spanish Society of Nephrology, the incidence of DM in patients with Progressive Kidney Disease remains around 25%, being higher in men (66% vs 34%) and with a mean age older than 65 years⁵.

Over the last three decades, the prevalence of DM has increased dramatically in countries of all income levels, bringing with it a series of associated complications such as diabetic neuropathy, diabetic nephropathy, diabetic retinopathy, poor cholesterol control, and elevated blood pressure—leading to vascular problems associated with the presence of ulcers and infections in the lower limbs (LL)^{6,7}.

In diabetic patients, the lifetime risk of developing foot ulcers is estimated at 15%, a percentage that increases as the disease progresses and complications worsen, including loss of functional status, infections, amputations, hospitalization, and death⁸.

Diabetic Foot (DF) is considered a global health problem. According to the WHO, it is defined as “the presence of ulceration, infection, and/or gangrene of the foot associated with diabetic neuropathy and varying degrees of peripheral arterial disease (PAD), resulting from the complex interaction of different factors induced by sustained hyperglycemia”⁹.

There are different degrees of LL lesions. **Table 1** shows the Meggitt-Wagner classification, which differentiates six stages of lower limb lesions and their associated characteristics, enabling identification of the degree of lesion severity¹⁰.

Table 1. Meggitt–Wagner Classification.

GRADE	LESION	CHARACTERISTICS
0	At-risk foot. No lesion.	Calluses, bony deformities, claw toes, prominent metatarsal heads.
1	Superficial lesion.	Full-thickness skin destruction.
2	Deep lesion.	Penetrates subcutaneous fat and ligaments; bone not involved. Infected ulcer.
3	Deep lesion involving bone (osteomyelitis).	Extensive and deep; discharge present; foul odor.
4	Limited gangrene (minor amputation).	Necrosis of part of the foot (toes, heel, or plantar area).
5	Extensive gangrene (major amputation).	Entire foot affected; systemic effects.

Foot lesions in diabetic patients with CKD occur twice as often vs their non-nephropathic counterparts, with an amputation rate 3 to 6 times higher. Additionally, patients with CKD on hemodialysis (HD) have up to a fivefold higher probability of presenting foot lesions vs individuals not receiving HD treatment¹¹.

The DF syndrome in HD patients can create new and increasingly frequent problems within this population. Therefore, it is essential to examine foot health in the HD setting, establish appropriate care measures, and implement strategies for health promotion and prevention to improve patient quality of life¹².

Consequently, the overall objective of this integrative review was to identify and synthesize the existing scientific evidence on the risk factors and nursing care associated with DF in patients with CKD undergoing HD.

METHODOLOGY

Study Design

We conducted integrative review of studies retrieved from health sciences databases. The review followed the recommendations of the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) statement¹³. The search was carried out between November 2023 and February 2024.

Search Methods

The databases used for the search were Web of Science (WOS), PubMed, and SCOPUS. The search strategy employed the following DECS/MESH descriptors: “Diabetic Foot”, “Foot ulcer”, “Hemodialysis”, “Amputation”. These terms were combined using the Boolean operators “AND” and “OR”.

Table 2 lists the specific search strategies used in each database.

Table 2. Literature search.

Database	Search Strategy	Total Articles	Selected Articles
PUBMED	((Diabetic foot) OR (Foot ulcer)) AND (hemodialysis)	306	5
WOS	((ALL = (Diabetic foot)) OR ALL = (Foot ulcer)) AND ALL = (hemodialysis)	163	3
SCOPUS	((Diabetic foot) OR (Foot ulcer)) AND (hemodialysis)	1,250	2
			TOTAL:10

Eligibility Criteria

Prior to conducting the search, the following inclusion and exclusion criteria were established:

Inclusion criteria:

- Original scientific articles on DF in CKD patients undergoing HD.
- Systematic reviews and clinical practice guidelines.
- Articles published between January 2014 and December 2023, in English or Spanish.

Exclusion criteria:

- Articles without full-text access.
- Narrative reviews.

Quality Assessment of the Studies

To assess the quality of the selected articles, the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) checklist¹⁴ was applied to observational studies, and the CASPe (Critical Appraisal Skills Programme Español) tool¹⁵ was applied to systematic reviews.

Data Extraction

The following variables were extracted from the selected articles: author, year, country, study design, sample, objectives, main results, and quality.

Synthesis of Results

Based on the established inclusion and exclusion criteria, a total of 10 articles were selected for the development of this

integrative review. A thematic–categorical approach was used due to the heterogeneity of outcomes and variables analyzed in the included studies.

RESULTS

Search Results

Once the search strategy was established in the selected databases, only articles less than 5 years old were initially considered. However, due to the limited availability of material needed to develop this integrative review, articles up to 10 years old were included.

The search and study selection process followed the PRISMA flow diagram (**figure 1**).

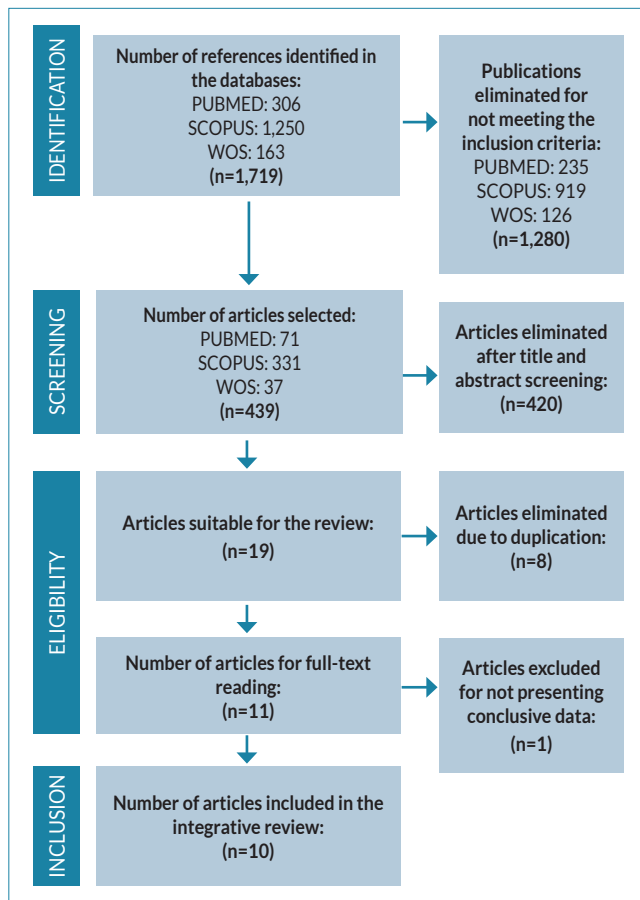


Figure 1. Flowchart of the search and selection of items.

Characteristics of the Selected Articles

Of the 10 selected articles, 2 were systematic reviews, 1 clinical practice guideline, 3 retrospective observational studies, 1 descriptive observational study, 1 prospective observational cohort study, and 2 cross-sectional observational studies. **Table 3** shows the main characteristics of the selected articles.

Table 3. Characteristics of the selected articles.

AUTHOR (YEAR), COUNTRY	STUDY TYPE	SAMPLE	OBJECTIVES	RESULTS	QUALITY
Al-Thani H, et al. (2014) Qatar ¹⁶ .	Retrospective observational study.	252 patients on HD.	To analyze the incidence, risk factors, and progression of foot ulcers in patients on HD.	<ul style="list-style-type: none"> - Higher incidence of foot lesions (41%), major amputations (14%), and mortality (80.5%) in patients with PAD, making PAD the main risk factor for DF in diabetic HD patients. - Older age, smoking, dyslipidemia, HbA1c < 7.2, DM, and previous minor amputation were also major risk factors for DF. - Transplant patients had a lower incidence of DF development. 	STROBE 19/22
Kaminski M, et al. (2019) Australia ¹⁷ .	Prospective observational cohort study.	450 patients on dialysis.	To investigate risk factors for lower-limb ulcers in a dialysis cohort.	<ul style="list-style-type: none"> - 18% of participants developed a new ulcer. The 12-month incidence was 122 per 1000 person-years (total 211 ulcers). - 12 patients required amputations due to PAD, recurrent ulceration, or osteomyelitis. - 6 patients died from foot-related complications. - In diabetic patients without prior ulcers, nail pathology and neuropathy were significant risk factors. - In those with prior ulcers, neuropathy, PAD, and stroke were significant risk factors. - 26.4% of patients developed ulcers or had a history of ulceration/amputation. 	STROBE 21/22
Kaminski M, et al. (2017) Australia ¹⁸ .	Cross-sectional observational study.	450 patients on dialysis.	To investigate risk factors for lower-limb ulceration in a dialysis cohort.	<ul style="list-style-type: none"> - High prevalence of previous ulceration (21.6%), new ulceration (10%), and LL amputations (10.2%). - Among DF patients: 64.7% male, mean BMI 28.2, mean age 67.5 years, and 94% on HD. - Many patients used improper footwear, had poor foot care, and only half had visited a podiatrist in the last year. - Amputation and PAD increased DF risk, which decreased with higher serum albumin levels. 	STROBE 20/22
Dòria M, et al. (2021) España ¹⁹ .	Retrospective observational study.	220 patients on HD.	To analyze whether DF in HD patients is associated with higher morbidity and mortality compared to DM and non-DM patients.	<ul style="list-style-type: none"> - 38.6% of patients on HD had DM; they showed a higher rate of mortality and morbidity and the highest incidence of LL lesions. - 35.3% of diabetics had previous or current ulcers vs. 6.7% of non-diabetics. 	STROBE 20/22
Lavery L, et al. (2013) Estados Unidos ²⁰ .	Descriptive observational study.	150 patients with DM on hemodialysis and 150 patients with previous ulceration.	To evaluate the incidence of foot ulcers, amputations, and hospitalizations in people with DM on dialysis compared with people with previous foot ulceration.	<ul style="list-style-type: none"> - 24.3% of subjects developed at least one ulcer in the lower limbs (LL), with a similar cumulative incidence in diabetic patients on dialysis and those with previous ulceration. - The amputation rate was higher in diabetic patients undergoing dialysis. - Hospital admissions due to LL lesions were higher in the dialysis group. 	STROBE 19/22

AUTHOR (YEAR), COUNTRY	STUDY TYPE	SAMPLE	OBJECTIVES	RESULTS	QUALITY
Marn-Pernat A, et al. (2016). Norteamérica ²¹ .	Retrospective observational study.	61,292 diabetic patients on HD.	To investigate the implementation of a routine podiatry screening program in diabetic patients on HD	<ul style="list-style-type: none"> - Higher comorbidity in the post-implementation group due to higher rates of HTN, IHD, HF, and PAD. - Monthly podiatry screening reduced LL amputation rates, with a 1.07% amputation rate post-implementation vs. 1.2% pre-implementation. - Estimated 17% reduction in amputations. 	STROBE 18/22
Schaper N, et al. (2020). Amsterdam ²² .	Clinical practice guideline.	Patients with DM.	To develop an updated guideline for the prevention and treatment of diabetic foot disease.	<ul style="list-style-type: none"> - Activities related to prevention, management, and patient/professional education, along with multidisciplinary care and close follow-up, significantly reduced the incidence of LL ulcers. 	N/A
Dòria M, et al. (2016) España ²³ .	Cross-sectional observational study.	92 diabetic patients on dialysis.	To evaluate the prevalence of diabetic foot and other diseases associated with DM in patients undergoing HD.	<ul style="list-style-type: none"> - Diabetic patients on HD had higher risk of diabetic foot and amputations. - 17.4% had DF; 53.4% developed ulcers; 19.6% ulcers + amputations; 16.3% amputations alone. - 87% had high risk of DF. - Mainly men with mean age 70 years. - 92.4% were on HD. - Cumulative incidence of amputations increased with time on HD. 	STROBE 20/22
Manewell S, et al. (2023) Australia ²⁴ .	Systematic review.	212 studies.	To summarize the available evidence on prevention and treatment of lower-limb complications in dialysis patients.	<ul style="list-style-type: none"> - 72% of the studies focused on DF prevention and LL complication control. - 75% used surgery as main intervention. - 6% focused on healthcare professionals' roles; 5% emphasized screening. - 4% emphasized medication; 2% rehabilitation/physical therapy. 	CASPE 8/10
Alshammari L, et al. (2022) Suiza ²⁵ .	Systematic review	4 studies.	To analyze the factors that facilitate or hinder the implementation of educational programs on foot care in patients receiving HD.	<ul style="list-style-type: none"> - The studies included in the review focused on assessing the feet of diabetic patients on HD and providing them with foot-care education. - Regarding foot assessments, 2 studies evaluated healthcare professionals. - One study found that foot evaluation improved patients' knowledge. - Two studies reported that foot examinations performed by nurses improved the frequency of foot checks, knowledge, and self-care behaviors among diabetic patients receiving HD. 	CASPE 9/10

IHD: Ischemic Heart Disease, PAD: Peripheral Arterial Disease, CVD: Cerebrovascular Disease, DM: Diabetes Mellitus, HbA1c: Glycated Hemoglobin, HD: Hemodialysis, HTN: Arterial Hypertension, CHF: Congestive Heart Failure, BMI: Body Mass Index, LL: Lower Extremities, DF: Diabetic Foot.

Description of Findings

Incidence, Morbidity, and Mortality

Four of the articles analyzed the incidence and prevalence of DF in the HD population, as well as the associated morbidity and mortality^{16,19,20,23}.

Dòria M, et al. (2021)¹⁹ found that mortality rates in patients receiving HD were higher in those with DM, cardiovascular disease, microvascular complications related to DM, lower-limb (LL) ulcers, and amputations. In addition, the development of a new ulcer was more frequent in patients

who had previously had an ulcer, with DF being associated with lower survival.

Lavery L, et al. (2013)²⁰ reported that the incidence rate of LL ulcers, amputations, and hospitalizations related to foot problems was higher in HD patients compared to the general diabetic population. However, the cumulative incidence of developing ulcers was the same between dialysis patients and those with prior ulceration but not on dialysis. These data show a higher risk of foot complications among diabetic patients receiving RRT.

Dòria M, et al. (2016)²³ included diabetic patients undergoing both types of dialysis (peritoneal dialysis and HD), although most belonged to the HD group (92.4%). The authors found that 87% of the studied population had a high risk of developing foot complications. Furthermore, the cumulative incidence of amputations increased as dialysis treatment progressed. Likewise, Lavery L et al. (2013)²⁰ highlighted a higher prevalence of DF syndrome in patients undergoing RRT vs the general, non-dialysis population. However, Al-Thani H, et al. (2014)¹⁶ reported that kidney transplant recipients had a lower incidence of foot complications.

Risk Factors

Peripheral Arterial Disease (PAD)

Three articles identified PAD as a strong risk factor for developing LL complications in dialysis patients¹⁶⁻¹⁸.

According to Al-Thani H, et al. (2014)¹⁶, HD patients with PAD had a higher incidence of foot ulcers regardless of the presence of DM, and PAD was also associated with higher mortality (39% vs. 13%).

Kaminski M, et al. (2019)¹⁷ found that in dialysis patients with a history of DF, PAD was one of the main risk factors. These authors later demonstrated that PAD was a predominant risk factor for DF development in the dialysis population, 94% of whom were on HD¹⁸.

Previous Amputation and Previous Ulcer

Al-Thani H, et al. (2014)¹⁶ and Kaminski M, et al. (2017)¹⁸ reported that previous LL amputation is a major risk factor that increases predisposition to ulceration. Kaminski M, et al. (2017)¹⁸ further established that previous ulcers and foot deformities are strong risk factors for amputation.

Foot Health

According to Kaminski M, et al. (2019)¹⁷ and Kaminski M, et al. (2017)¹⁸, nail pathology and the presence of foot deformities were risk factors for LL complications. Additionally, Kaminski M, et al. (2017)¹⁸ reported that most dialysis patients did not wear appropriate footwear, did not have adequate foot health, and only half had visited a podiatrist in the past year.

Other Risk Factors

Al-Thani H, et al. (2014)²³ identified advanced age, dyslipidemia, and smoking as risk factors for DF in the HD population.

According to Kaminski M, et al. (2019)²³, diabetic neuropathy and cerebrovascular disease (CVD) were also risk factors in this population.

Kaminski M, et al. (2017)¹⁸ additionally considered male sex, mean Body Mass Index (BMI) of 28.2, and a mean age of 67.5 years to be risk factors.

Prevention and Treatment

Four studies addressed concepts related to the prevention and treatment of DF in diabetic patients on HD^{21,22,24,25}.

Marn-Pernat A, et al. (2016)²¹ studied the implementation of a podiatric review program in diabetic patients on HD, which significantly reduced amputation rates in this population. The study demonstrated a 17% reduction in major amputation rates among patients who participated in the program.

Schaper N, et al. (2020)²² developed the practical guidelines of the International Working Group on the Diabetic Foot. This clinical practice guideline, consistent with Marn-Pernat A et al. (2016)²¹, stated that prevention of foot lesions is based on identifying the at-risk foot, routine podiatric screening in the at-risk population, and patient-family-healthcare professional education to increase knowledge and self-protective behaviors. Depending on each patient's risk factors, the guideline stratified risk into four levels (very low, low, moderate, and high), determining the appropriate frequency of podiatric follow-up.

Regarding the treatment of diabetic ulcers, the guideline proposed several therapeutic options to be selected based on each patient's needs. These treatments included offloading and ulcer protection, restoration of tissue perfusion, infection management, metabolic and comorbidity control, local ulcer care, and again, education of the patient and family.

Manewell S, et al. (2023)²⁴ summarized existing evidence on the prevention and treatment of LL problems in a dialysis population. According to the study, surgery was the most common intervention. However, 10 articles also demonstrated that screening by a healthcare professional was essential, as well as perfusion pressure evaluation, measurement of the Ankle-Brachial Index (ABI), and foot examination by the dialysis nurse. Additionally, 13 studies highlighted the importance of multidisciplinary care. Other studies focused on interventions such as medication optimization, post-amputation rehabilitation, negative pressure therapy, low-density lipoprotein apheresis, or ulcer treatment in specialized wound clinics. The study concluded that recognizing the dialysis population as high-risk is fundamental for prevention, treatment, and interdisciplinary care.

In another review, Alshammari L, et al. (2022)²⁵ found that all included studies focused on foot-care assessment and education in HD patients. This review demonstrated that foot-care interventions in HD patients lead to positive outcomes, improving knowledge and self-care behaviors in this population.

Nursing Care

Two of the studies refer to foot care provided by nursing professionals in the HD setting^{21,25}.

Marn-Pernat A, et al. (2016)²¹ proposed that patients with DM on HD should be included in a monthly foot examination program implemented by nursing professionals. First, nurses gathered background information related to each patient's LL problems. Afterwards, they carried out a physical examination, checking both the inside and outside of the shoes and socks. They then performed a thorough LL assessment, examining nail condition, calluses, erythema, or any sign of potential risk for developing DF. Finally, pedal pulses were palpated and a sensitivity test was performed using a monofilament. According to this study, health education provided by nurses was also considered important, and was adapted to each patient's knowledge level and needs.

Alshammari L, et al. (2022)²⁵ also analyzed the importance of nursing education in foot assessment, stating that the knowledge provided by nurses—through individual or group training—led to an increase in the number of patients who attended foot examinations, resulting in improved outcomes. Thus, educational activities related to foot care demonstrated significant improvements in self-care, LL examinations, patient knowledge, and complication rates affecting the lower limbs.

DISCUSSION

This integrative review demonstrates the impact of DF in patients with CKD on HD, emphasizing the risk factors that may lead to ulceration, effective prevention measures, and nursing care.

Among the findings of this review, it is clear that HD patients with DF present higher morbidity and mortality, with increased amputation rates^{19,20,23}. These data are consistent with Orimoto Y, et al. (2013)²⁶, who identified poor prognosis in HD patients with foot lesions, showing increased mortality and amputation rates. This study, like the one included in our review by Kaminski M, et al. (2017)¹⁸, found that increased serum albumin levels in these patients were associated with a reduced risk of developing foot lesions. Additionally, it noted that achieving permeable arterial reconstruction also decreased the risk of these lesions.

Regarding risk factors, several authors found that PAD is a predominant risk factor for LL lesions in diabetic patients undergoing HD¹⁶⁻¹⁸. However, García A, et al. (2012)²⁷, who analyzed PAD and DF prevalence in an HD population, found that cardiovascular disease was the most common risk factor (present in more than half of patients), while PAD accounted for 41% of the sample. PAD was identified through pulse assessment and measurement of the Ankle-Brachial Index (ABI) to accurately determine vascular insufficiency in the lower limbs. This study also highlighted that the risk of foot ulcers in HD patients is higher among diabetics due to loss of protective sensation in the LL.

Other studies noted that longer duration on HD and male sex were risk factors for DF^{18,23}. However, in the study by Lechuga M, et al. (2017)²⁸, no significant associations were found between DF and these variables. Additionally, deformities, nail pathology, and poor foot health were considered risk factors^{17,18}, consistent with findings from Lechuga M, et al. (2017)²⁸, who reported that HD patients with nail abnormalities and foot deformities were 1.2 times more likely to develop DF than those without podiatric issues.

Another important finding is that routine foot checks, good foot health, and education on proper LL care in diabetic HD patients contribute to improved outcomes, self-care, and knowledge among at-risk patients^{21,22,24,25}. These results are similar to the study by Bernal E, et al. (2009)²⁹, which concluded that prevention programs and appropriate patient education in HD can significantly reduce foot-related complications. Preventive measures included glycated hemoglobin control, routine examinations, peripheral pulse checks, sensitivity tests, and risk-based patient classification. The study showed that failure to thoroughly examine the feet of diabetic HD patients leads to inadequate management of complications and increased foot lesion prevalence, resulting in substantial quality-of-life deterioration. In another study by McMurray SD, et al. (2002)³⁰, a diabetes education program focused on self-care, follow-up, and foot examinations significantly improved patient self-management. Regarding nursing care, two studies in this review highlighted the essential role of nurses in preventing and managing DF in HD patients. They showed that implementing a foot-examination program and health education led by nurses improved patient knowledge and reduced LL complications^{21,25}. Similarly, Reda A, et al. (2012)³¹ found that a prevention program based on foot assessment and education by nursing staff was associated with reduced risk of LL complications during HD treatment. After implementing the program, improvements were observed in appropriate footwear use and a decrease in diabetic neuropathy prevalence.

In this regard, and to enhance nursing practice, Barnes T, et al. (2013)³² developed a training program for nursing professionals. Ensuring nurses received proper education on HD care helped provide HD patients with adequate self-care knowledge, encouraging their active involvement in treatment and improving nurse-patient relationships.

Study Limitations

The main limitation of this review was restricted access to many articles, preventing full-text retrieval. Additionally, several studies addressed RRT in general rather than HD specifically.

Finally, no full-text articles analyzing DF in peritoneal dialysis populations were found, making it impossible to compare outcomes across dialysis modalities.

Practical Considerations

Given that prevention is the most effective measure against DF in HD patients, nurses hold significant responsibility in caring for this population. It is essential to develop preventive programs that reduce DF incidence, as well as provide appropriate health education, foot assessments, and activities promoting self-care and knowledge among diabetic HD patients. These measures ensure better health status and consequently a higher quality of life.

Based on the main findings of this review, the development of lesions and complications in the feet of diabetic HD patients with DF is associated with higher mortality and morbidity, increased amputation rates, and potentially diminished quality of life.

PAD is identified as the main risk factor, as reduced blood flow to the extremities promotes lesion development. Poor foot health, deformities, calluses or nail abnormalities, lack of podiatric visits, and insufficient knowledge also predispose patients to LL ulcers.

Enhancing self-care and increasing patient knowledge through proper health education provided by a multidisciplinary team ensures improved prevention and management of DF in HD patients, with nurses playing a central role.

Conflicts of interest

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Analysis of nursing practices about the fixation of haemodialysis needles in Spain

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ABSTRACT

Objective: To analyse national haemodialysis nursing practices about the fixation of arteriovenous fistula puncture needles.

Material and Method: Cross-sectional descriptive study, conducted in April-May 2024, using an online questionnaire aimed at haemodialysis nurses throughout Spain. Variables collected: socio-demographics, type of centre, factors related to needle exit, fixation material/techniques and knowledge of recommendations.

Results: 363 nurses participated, 83.5% female, mean age: 44.09±10.7 years, mean experience: 15.18±10.94 years; 72.7% worked in public centres.

According to the respondents, the most influential factors for needle exit were "Patient skin condition" (96.7%) and "Fixation technique" (93.9%); the two least influential were "Having a risk assessment system" (53.4%) and "Type of puncture device" (51%). Chevron and Butterfly fixation techniques were used by 35.4% and 55.1% if we also consider U-Method/H-Method. Paper tape was the most used fixation material (75.3%), with 57.7% thought it the most secure. 66.7% were unaware of published documents with recommendations, and 65.4% did not have protocols covering these aspects in their units. Professionals working in subsidised/private centres have protocols for needle fixation ($p<0.01$), recommendations for patients and professionals ($p<0.01$) and use Butterfly fixation techniques, U-method/H-method ($p<0.01$) in a higher proportion than professionals in public centres.

Conclusions: Accidental needle exit during haemodialysis is an area for improvement. Approximately half of the practitioners use fixation techniques other than those recommended (Butterfly/Chevron/Method-U/Method-H).

Keywords: haemodialysis; arteriovenous fistula; adhesive tape; needle exit; nursing care; patient safety.

RESUMEN

Análisis de las prácticas enfermeras en relación a la fijación de las agujas de hemodiálisis en España

Objetivo: Analizar las prácticas enfermeras en hemodiálisis, a nivel nacional, en relación a la fijación de las agujas de punción de las fístulas arteriovenosas.

Material y Método: Estudio descriptivo transversal, realizado en abril-mayo 2024, mediante cuestionario online, dirigido a enfermeras de hemodiálisis de toda España. Variables recogidas: sociodemográficas, tipo de centro, factores relacionados con la salida de agujas, material/técnicas de fijación y conocimiento sobre recomendaciones.

Resultados: Participaron 363 enfermeras, 83,5% mujeres, edad media: 44,09±10,7 años, experiencia media: 15,18±10,94 años; un 72,7% trabajaban en centros públicos.

Según los encuestados, los factores que más influyen en la salida de agujas son “Estado del paciente”(96,7%) y “Técnica de fijación”(93,9%); siendo los menos influyentes “Tener un Sistema de evaluación del riesgo”(53,4%) y “Tipo de dispositivo de punción”(51%).

El 35,4% empleaban técnicas de fijación Chevron y Mariposa; siendo un 55,1% si consideramos también Método-U/ Método-H.

El material de fijación más utilizado fue el esparadrapo de papel (75,3%), considerándolo un 57,7 % como el más seguro.

El 66,7% desconocían la existencia de documentos publicados con recomendaciones y un 65,4% no disponían en sus unidades de protocolos que recogieran estos aspectos.

Los profesionales que trabajan en centros concertados/privados disponen de protocolos para fijación de agujas($p<0,01$), recomendaciones para pacientes y profesionales($p<0,01$) y utilizan técnicas de fijación Mariposa, Método-U/Método-H ($p<0,01$) en mayor proporción que los profesionales de los centros públicos.

Conclusión: La salida accidental de las agujas durante la hemodiálisis constituye un área de mejora. Aproximadamente la mitad de los profesionales utilizan técnicas de fijación diferentes a las recomendadas (Mariposa/Chevron/Método-U/Método-H).

Palabras clave: hemodiálisis; fístula arteriovenosa; esparadrapo; salida de agujas; atención de enfermería; seguridad del paciente.

INTRODUCTION

Chronic kidney disease (CKD) represents an important public health problem, with the number of affected individuals increasing every year¹. According to the latest data published by the Spanish Renal Registry (2022), 55.4% of people receiving renal replacement therapy had a kidney transplant, 39.8% were on hemodialysis (HD), and 4.8% on peritoneal dialysis, with hemodialysis being the most widely used dialysis therapy².

Vascular access is a key element for performing HD, and the arteriovenous fistula (AVF) is the vascular access of choice when compared with the central venous catheter, because it presents fewer complications and a higher survival rate³. In the case of an AVF, treatment is carried out by accessing the bloodstream through cannulation with needles, and securing these devices is essential to prevent accidental dislodgement and ensure patient safety.

Accidental dislodgement of AVF needles during the HD session is a very infrequent situation, but it can be severe and lead to hemorrhagic shock within a very short time due to massive blood loss, as blood flow rates between 300–500 mL/min are used during HD⁴⁻⁶. According to the literature, several situations may increase the risk of accidental needle

dislodgement during HD⁷⁻⁹: patient condition (confusion, restlessness, agitation, cognitive impairment, dementia, semi-consciousness), patients who refuse to keep the access and bloodlines visible, difficult cannulation of the vascular access, the condition of the patient's skin, lack of observation by staff, or failure to replace tape with a new one each time needles are repositioned.

Other causes that may contribute to accidental needle dislodgement include insufficient adhesion of tape to the skin, poor-quality adhesive, traction on bloodlines, and unexpected movement of the AVF arm.⁹⁻¹¹

Working groups and/or scientific societies such as the Spanish Multidisciplinary Group for Vascular Access (GEMAV), the Spanish Society of Nephrology Nursing (SEDEN), the American Nephrology Nurses Association (ANNA), as well as other international authors, propose a number of recommendations regarding HD needle fixation^{4,9,11}. These include: the use of effective needle-fixation techniques; securing the bloodlines to the patient's arm while always keeping the vascular access and bloodlines visible during treatment; and, as patient-safety measures, close monitoring of disoriented patients and the use of blood-leak sensors¹²⁻¹³. Among the most effective needle-fixation techniques, the Chevron and Butterfly methods stand out as the safest and most resistant to traction, although the Uy H method is also recommended^{4,9,11}.

In routine practice, different techniques are used to secure HD needles, varying across centers and professionals, with some variations of the techniques shown in **table 1**^{10,11}.

Needle fixation and securing the bloodlines during the HD session are essential practices to prevent accidental needle dislodgement¹¹, although the best recommended techniques are not always applied, and protocols are not always available to professionals, particularly for inexperienced staff¹⁰.







Understanding the usual practices performed by nurses in different centers regarding AVF needle fixation, as well as the measures implemented to prevent accidental needle dislodgement, will allow us to identify variability in clinical practice and determine potential areas for improvement.

The general objective of the present study was to analyze nursing practices nationwide related to the fixation of AVF needles during hemodialysis.

The specific objectives were:

- To describe the materials and techniques used by nurses for HD needle fixation.
- To assess nurses' experience regarding accidental AVF needle dislodgement during HD sessions.
- To analyze HD nurses' perceptions of the existence of specific recommendations regarding prevention of accidental AVF needle dislodgement, as well as the existence of procedures in their units.

Table 1. Description of the most commonly used hemodialysis needle fixation techniques

TECHNIQUE	IMAGE	PROCEDIMIENTO
OVERLAPPED STRIPS		<ol style="list-style-type: none"> 1° Place a strip of tape horizontally over the wings, without covering the puncture site. 2° Reinforce with another horizontal strip further down.
CHEVRON		<ol style="list-style-type: none"> 1° Place a strip of tape horizontally over the wings, without covering the puncture site. 2° Place another strip of tape under the needle tubing, with the adhesive side facing up. 3° Cross the tape over the wings, securing them to the skin, without covering the puncture site.
BUTTERFLY		<ol style="list-style-type: none"> 1° Place a strip of tape under the needle tubing, with the adhesive side facing up. 2° Cross the tape over the wings, securing them to the skin, without covering the puncture site.
U METHOD		<ol style="list-style-type: none"> 1° Place a strip of tape under the needle tubing with the adhesive side facing up. 2° Place the tape over the wings, securing them to the skin so that the tape forms a "U" shape. 3° Place a strip of tape horizontally over the wings, without covering the puncture site. 4° Reinforce with another horizontal strip further down.
H METHOD		<ol style="list-style-type: none"> 1° Place a strip of tape horizontally over the wings, without covering the puncture site. 2° Place a strip of tape vertically over each wing, forming an "H."
DRESSING		<ol style="list-style-type: none"> 1° Apply the dressing to secure the wings and fix part of the needle tubing.

Population and sample: Nurses from HD units throughout Spain, including public and private/contracted centers. All bedside nurses working in HD units nationwide who could complete an online questionnaire were included; all individuals who did not agree to voluntary participation were excluded. A non-probabilistic convenience sampling method was used. Sample size was estimated using GRANMO version 8.0.

Since there is no registry in Spain indicating the number of nurses working in dialysis, we estimated the sample size assuming an infinite population.

To achieve an 8% precision in estimating a proportion with a two-sided 95% normal asymptotic confidence interval, assuming that 50% of nurses used at least one of the recommended needle-fixation techniques in consensus documents (Chevron/Butterfly/H method/U method)⁹⁻¹¹, and considering an expected dropout rate of 20%, it was necessary to recruit 189 professionals.

Variables

All variables were collected via a self-administered online questionnaire. The questionnaire had three parts: the first gathered sociodemographic data and previous experience concerning accidental HD needle dislodgement; the second asked about fixation techniques and materials used for AVF needles; and the third collected information on other nursing practices to prevent accidental needle dislodgement.

Sociodemographic variables: age, sex, type of workplace, years of hemodialysis experience, and autonomous community.

Additional variables included: having witnessed accidental needle dislodgement; its frequency; which needle dislodges most often; perception of needle dislodgement as a life-threatening event; factors associated with needle dislodgement; materials used for fixation; materials considered safest; existence of protocols/procedures for needle fixation; fixation technique used; knowledge of fixation technique names; knowledge of scientific-society guidelines and consensus documents; use of wingless needles and perceived risk; existence of informational documents for professionals/patients; knowledge and use of moisture-blood leak detection devices.

MATERIAL AND METHOD

Design: Descriptive cross-sectional study conducted between April and May 2024.

Data collection

Data were collected between April and May 2024 using a 25-item online questionnaire with multiple-choice responses, previously piloted in 10 HD nurses to ensure clarity. Distribution

was carried out through SEDEN via email, explaining the study and inviting participation. A survey link was sent, and nurses were encouraged to forward it to other HD nurses, including non-members, to increase participation and representativeness. It was also disseminated through other forums and working groups.

Data analysis

Data collected via the online questionnaire were stored in an anonymized database and analyzed using SPSS v27.

A descriptive statistical analysis was performed: qualitative variables with frequencies and percentages, quantitative variables with median and interquartile range (IQR). Bivariate analysis was conducted: Chi-square and Fisher's test for qualitative variables. Normality was assessed using Kolmogorov-Smirnov. Hypothesis testing for qualitative and quantitative variables employed non-parametric Mann-Whitney U and Kruskal-Wallis tests.

A p value ≤ 0.05 was considered significant.

Aspectos éticos

Participation was anonymous and voluntary, with participants providing informed consent.

The study received approval from the Research Ethics Committee of Hospital Universitario Fundación Alcorcón (Code 24/32).

The project complied with Organic Law 3/2018 on Personal Data Protection and the EU Regulation (GDPR) 2016/679.

RESULTADOS

A total of 363 nurses from 17 autonomous communities and 1 autonomous city responded; 72.7% (n=264) worked in public centers. The mean age was 45 years (IQR: 47, min 22, max 69), with a mean experience of 10 years (IQR: 40, min 0, max 40). Women represented 83.5% (n=303).

A total of 90.1% (n=327) had witnessed accidental needle dislodgement, although 73.8% (n=268) reported that this occurred twice or fewer per year. Most (98.3%, n=357) considered this situation to be or potentially to be life-threatening.

Regarding the needle most likely to dislodge, 44.4% (n=161) answered that both equally, 38% (n=138) the venous needle, and 17.6% (n=64) the arterial needle.

Factors perceived as most influential (Quite+Very) in needle dislodgement were "Patient condition" (96.7%) and "Fixation technique" (93.9%); the least influential (None+A little) were "Having a needle-dislodgement risk assessment system" (53.4%) and "Type of cannulation device used" (51%) (see **table 2**).

Figure 1 shows the fixation techniques used: 36.3% (n=131) used Chevron and Butterfly techniques, increasing to 55.1% (n=200) when including U and H methods.

Table 2. Main reasons for accidental needle dislodgement during hemodialysis from the professionals' perspective.

	None n (%)	Some n (%)	Quite a lot n (%)	A lot n (%)
Patient condition (movement, agitation, confusion...).	1 (0.3%)	21 (5.8%)	125 (34.4%)	226 (62.3%)
Technique used for needle fixation.	1 (0.3%)	21 (5.8%)	174 (47.9%)	167 (46%)
Type of cannulation device (e.g., winged needles, fistula-catheter Abbocath-type...).	29 (8%)	156 (43%)	135 (37.2%)	43 (11.8%)
Patient's skin condition (dry skin, sweating, dermatitis...).	13 (3.6%)	101 (28.8%)	167 (46%)	82 (22.6%)
Material used for fixation: fabric tape, paper tape, other dressing types.	3 (0.8%)	69 (19%)	164 (45.2%)	127 (35%)
Completely covering puncture site with sheets, blankets...	13 (4.4%)	72 (19.8%)	148 (40.8%)	127 (35%)
Bloodline-fixation technique.	4 (1.1%)	49 (13.5%)	182 (50.1%)	128 (35.3%)
Having a system to identify patients at higher risk of needle dislodgement.	40 (11%)	154 (42.4%)	129 (35.5%)	40 (11%)
Using new tape each time needles are repositioned.	31 (8.5%)	85 (23.4%)	130 (35.8%)	117 (32.2%)
Skin completely dry for fixation (after disinfection).	15 (4.1%)	46 (12.7%)	149 (41%)	153 (42.1%)

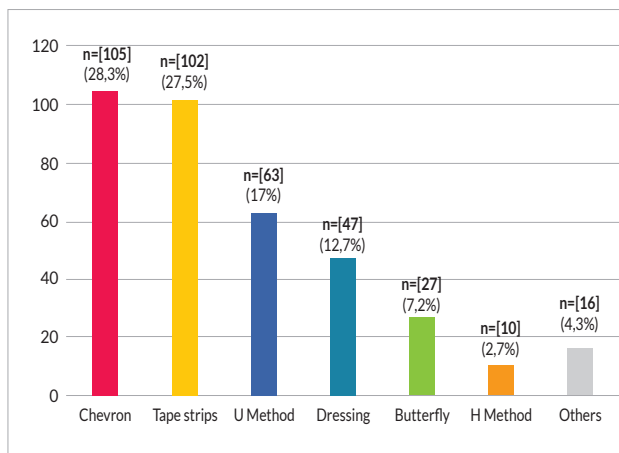


Figure 1. Hemodialysis needle fixation techniques used by professionals*.

* A single professional may have indicated using more than one needle-fixation technique regularly.

The most frequently used fixation material was paper tape (75.3%), and 57.7% considered it the safest (table 3).

A total of 63.6% (n=231) believed that using wingless needles poses a higher risk of accidental dislodgement, although 56.7% (n=206) had never used them.

Most respondents (66.7%, n=242) were unaware of published documents providing recommendations for needle fixation; 64.5% (n=234) lacked unit protocols addressing these issues, and 62.3% (n=226) indicated that their units lacked professional- or patient-directed documents with information on minimizing accidental needle dislodgement during HD.

Regarding knowledge and use of moisture-blood leak detectors, 86.2% (n=313) were unfamiliar with these devices and 96.4% (n=350) did not use them.

Table 3. Description of materials used for HD needle fixation and professionals' opinions on safety.

Needle Fixation Material n (%)	Most commonly used by professionals n (%)	Safest material according to professionals n (%)
Paper tape	280 (77.9%)	212 (58.4%)
Hypoallergenic tape	116 (31.9%)	92 (25.3%)
Gauze adhesive	58 (15.9%)	44 (12.1%)
Fabric tape	46 (12.9%)	68 (18.7%)
Transparent adhesive	31 (8.5%)	55 (15.1%)
Silk tape	21 (6.1%)	32 (8.8%)
Silicone tape	16 (4.4%)	25 (6.9%)
Others	14 (3.8%)	13 (3.6%)

No differences were found when comparing professional age according to fixation technique (p=0.977) or fixation material (p=0.171), nor when comparing experience according to fixation technique (p=0.643) or fixation material (p=0.439).

Knowledge and use of moisture-leak detectors were not related to age (p=0.908; p=0.106) or experience (p=0.115; p=0.247).

When grouping professionals by type of center, those working in private/contracted centers more frequently had protocols for needle fixation (p<0.01), patient/professional information documents (p<0.01), and used Chevron, Butterfly, U, and H techniques (p<0.01) than those in public centers (table 4).

Table 4. Comparison of needle-fixation technique and existence of protocols and/or informational materials according to type of workplace.

		Public center n (%)	Private center n (%)	p value
Use of Chevron Butterfly / U Method / H Method	YES	127 (48.5%)	73 (73.7%)	p=0.000*
	NO	135 (51.5%)	26 (26.3%)	
Existence of protocols	YES	68 (26.1%)	60 (60.6%)	p=0.000*
	NO	195 (73.9%)	39 (39.4%)	
Existence of informational material for staff/patients	YES	78 (29.5%)	59 (59.6%)	p=0.000*
	NO	186 (70.5%)	40 (40.4%)	

DISCUSSION

This study analyzes hemodialysis nurses' practices in Spain regarding AVF needle fixation.

Most participants considered accidental needle dislodgement a serious, albeit infrequent, complication. These findings are consistent with the ANNA survey, in which more than 75% of respondents had witnessed needle dislodgement and more than 50% were (very often/often/occasionally) concerned about blood loss¹⁴.

We did not find studies addressing whether venous or arterial needles dislodge more frequently; most documents refer to "needle dislodgement" without specifying which¹⁰⁻¹¹. Although one might expect the venous needle—subjected to higher positive pressure—to carry a higher extrusion risk, respondents most frequently reported that both dislodge equally.

Fixation technique was identified as one of the main factors favoring accidental needle dislodgement. Only one-third used one of the recommended techniques (Chevron or Butterfly), cited as the safest and most resistant⁹⁻¹⁰; however, when including the U and H methods—also recommended

by ANNA¹¹—this proportion increased to just over half. These findings are consistent with Parisotto et al., who in an international study of 171 dialysis units in Europe, the Middle East, and Africa, found that more than 50% used a technique other than Chevron, Butterfly, or U¹⁵.

Lack of awareness of published recommendations, the absence of unit protocols, and the lack of informational materials for patients and professionals represent areas for improvement to unify clinical practice and enhance patient safety. Variability in clinical practice has been described for decades; in the 1970s, authors such as Wennberg and Gittelsohn¹⁶ highlighted this issue, attempting to identify factors explaining variation in care. Several studies since then underline gaps in knowledge of best practices, uncertainty due to the nature of evidence, and the lack of standardization programs within institutions¹⁷⁻¹⁸.

Nurses in private/contracted centers were more likely to have protocols and informational materials and more frequently used recommended fixation techniques. Public centers typically develop protocols for the individual center only, whereas private chains or multinational dialysis companies produce and disseminate materials across multiple centers, increasing reach and uptake.

Patient condition was considered the most influential factor in needle dislodgement. The literature warns that mental, cognitive, and neurological impairment is a major risk factor for accidental needle dislodgement in HD^{11,19-20}, and recommends evaluating this risk in all patients^{7,11,19-20}. However, half of respondents did not consider having a patient-risk identification system to be influential. The European Dialysis and Transplant Nurses Association/European Renal Care Association (EDTNA/ERCA) has developed an online system to report accidental needle dislodgement incidents (<https://vnd.edtnerca.org/report>)²¹ and recommends identifying high-risk patients based on: restlessness, dementia, confusion, hypotension, cramps; skin condition (excess hair, sweating); difficult access; and patients who keep their access covered.

Poor skin condition is also described as a risk factor for needle dislodgement¹¹, yet it was not identified as highly influential by respondents. HD is a chronic treatment involving repeated adhesive use in a limited skin area. These materials may cause adhesive-related skin injuries, affecting needle security. Many authors show that chronic adhesive use endangers the skin and recommend correct selection of fixation materials and appropriate adhesive removal techniques, as they can significantly impact safety and quality of life²²⁻²⁶.

Paper tape was the most frequently used material, followed by hypoallergenic tape, both considered safe. Some professionals used the terms interchangeably. The latest SEDEN manual⁹ mentions hypoallergenic tape for HD needle fixation; meanwhile, studies by Chan et al.¹⁰ and the ANNA Workgroup¹¹ used paper tape to test traction resistance of fixation techniques. Due to lack of evidence on material

selection—and considering that skin condition is a risk factor¹¹ and HD patients are more susceptible to skin alterations—this topic deserves further study.

Most nurses were unaware of moisture-leak detectors, and very few had used them. Although the literature recommends these devices—especially for high-risk patients—because they provide early alerts¹¹, their use is limited due to high cost²⁷.

This study has limitations. A national, open, voluntary online survey cannot guarantee participant representativeness. However, participation exceeded 350 nurses, and sociodemographic characteristics (age, sex) aligned with the Spanish nursing population²⁸.

Based on the results, accidental needle dislodgement during HD sessions remains an area for improvement among Spanish HD nurses.

Although rare, blood loss is a major concern and may constitute a life-threatening emergency.

Almost half of the professionals use fixation techniques other than the recommended ones (Chevron, Butterfly, U, H), and there is a lack of awareness of published recommendations to prevent accidental needle dislodgement.

Development of protocols and availability of informational materials for patients and professionals represent key areas for improvement, especially in public centers.

Conflicts of interest

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Analysis of the degree of satisfaction with the choice of renal replacement therapy

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ABSTRACT

Introduction: Involving people with advanced chronic kidney disease in decision-making about their treatment promotes their autonomy and guarantees their free choice of treatment. This educational process culminates in selecting a treatment modality that should be consistent with their values, preferences, and lifestyle. However, little is known about their satisfaction with their choice once treatment has begun.

Objective: To determine the degree of satisfaction of the renal patient with the renal replacement therapy chosen.

Material and Method: A quantitative, cross-sectional, descriptive observational study was conducted in the Dialysis Unit of the Complejo Asistencial Universitario de León in 2024. We included chronic dialysis patients who had visited the Advanced Chronic Kidney Disease Unit for information on treatment options and had been on treatment for more than one month. Demographic and clinical variables and satisfaction with the choice were studied.

Results: Fifty-eight patients were studied. 67.24% were men. Mean age 67.1±13.98 years and median 69.5 years. The mean time on treatment was 30.64±31.67 months, 74.14% were on haemodialysis, and 98.3% were satisfied with their choice. We found no statistically significant differences in patient satisfaction between the dialysis options ($p=0.551$).

Conclusions: The percentage of regret was low, only 1.7%. Assessing patient satisfaction with their dialysis treatment can help to verify whether they are satisfied and/or wish to change the modality.

Keywords: chronic kidney disease; shared decision-making; dialysis; patient satisfaction.

RESUMEN

Análisis del grado de satisfacción con la elección de tratamiento renal sustitutivo

Introducción: Implicar a las personas con enfermedad renal crónica avanzada en la toma de decisiones sobre su tratamiento, fomenta su autonomía y garantiza la libre elección del mismo. Este proceso educativo, culmina con la elección de modalidad de tratamiento, que debe ser coherente con sus valores, preferencias y estilo de vida. Sin embargo, poco sabemos sobre su satisfacción con la elección realizada, una vez iniciado el tratamiento.

Objetivo: Conocer el grado de satisfacción del paciente renal con el tratamiento renal sustitutivo elegido.

Material y Método: Estudio cuantitativo, observacional descriptivo transversal, realizado en la Unidad de Diálisis del Complejo Asistencial Universitario de León en 2024. Se incluyeron pacientes crónicos en programa de diálisis, que hubieran pasado por la Unidad de Enfermedad Renal Crónica Avanzada para información sobre opciones de tratamiento, y llevaran más de 1 mes en tratamiento. Se estudiaron variables demográficas, clínicas y satisfacción con la elección.

Resultados: Se estudiaron 58 pacientes. El 67,24% fueron hombres. La edad media 67,1±13,98 años y mediana de 69,5

años. El tiempo medio en tratamiento $30,64 \pm 31,67$ meses, el 74,14% estaban en Hemodiálisis y el 98,3% estaban satisfechos con su elección. No hemos encontrado diferencias estadísticamente significativas en la satisfacción de los pacientes, entre las diferentes opciones de diálisis ($p=0,551$).

Conclusiones: El porcentaje de arrepentimiento fue bajo, solo el 1,7%. Valorar la satisfacción del paciente con su tratamiento dialítico, puede ayudar a verificar si está satisfecho y/o desea cambiar de modalidad.

Palabras clave: enfermedad renal crónica; toma de decisiones compartidas; diálisis; satisfacción del paciente.

INTRODUCTION

One of the priority objectives of Advanced Chronic Kidney Disease (ERCA) Units is to inform patients about the possibilities of renal replacement therapy (RRT) or conservative care and to prepare them, in a planned way, to receive the therapeutic option that is most appropriate for their needs¹.

It is advisable that this information be provided through a shared decision-making process between the patient (and/or family members), the physician, and the nurse, thus promoting patient participation and involvement². During this process, professionals must provide the patient with complete, impartial, and neutral information on all RRT modalities, based on scientific evidence, using simple language, support materials, and Decision Aid Tools, taking into account the risks and benefits of the different therapeutic options³.

The multidisciplinary team of the ERCA unit provides individualized information, helping the patient to carefully consider the treatment options, anticipating how each one may affect their lifestyle, and promoting participation, reflection, and/or analysis of the different modalities. This educational process culminates in the choice of treatment modality, which should be consistent with the patient's values, preferences, and lifestyle^{4,5}.

There is evidence that participating in decision-making regarding RRT increases patient satisfaction by making them feel more involved, improves decision quality, and leads to greater confidence in the treatment chosen^{3,5-9}.

However, we know little about their satisfaction with the choice once treatment has started, or whether they regret the decision made.

Therefore, the objective of this study was to determine the degree of satisfaction of renal patients with the renal replacement therapy they have chosen.

MATERIAL AND METHOD

Design and study period: We conducted a quantitative, observational, descriptive, cross-sectional study in the Dialysis Unit of Complejo Asistencial Universitario de León (León, Spain) during the first half of 2024.

Sample: All chronic patients who, at the time of data collection, were in a dialysis program—peritoneal dialysis (PD), home hemodialysis (HHD), and in-center hemodialysis (HD)—were included, provided they had passed through the ERCA Unit to receive information on treatment options and had been on treatment for more than one month. Patients who were unable to complete the questionnaire or who declined to participate were excluded. At the time of data collection there were 62 chronic HD patients and 30 on home therapies (HT).


Variables and measurement instruments: The variables studied were age, sex, time on dialysis, treatment modality, and satisfaction-with-choice questionnaire.

The “**Satisfaction with the choice**” questionnaire¹⁰ is part of the decision-aid tools documentation set used in ERCA and is endorsed by the following Scientific Societies: Spanish Society of Nephrology (SEN), Spanish Society of Nephrology Nursing (SEDEN), Andalusian Society of Nephrology, National Transplant Organization (ONT), and the renal patient associations ALCER and ADER.

It consists of 6 yes/no questions. The first three refer to the quality of the educational process and the last three to satisfaction with the option chosen (**figure 1**). Questionnaires were voluntary, self-administered, and anonymous.

Data collection: Data collection was conducted using the questionnaire during the first half of 2024. The questionnaire was handed out by the nurses participating in the study in the Dialysis Unit, after written informed consent had been obtained. The purpose of the study and how to complete the questionnaire were explained, they were informed that participation was voluntary, that they would not receive any advantage or disadvantage if they declined to participate, and that their anonymity would be guaranteed.

Data analysis: Data were collected using the Versia[®] software platform and analyzed with the JASP statistical package. Measures of central tendency and dispersion were calculated for quantitative variables and expressed as mean, standard deviation, median, and range. For qualitative variables, absolute frequencies and percentages were calculated. The Shapiro–Wilk test was used to assess normality. The non-parametric chi-square test was used to compare qualitative variables, and Student's t test and the Mann-Whitney U test were used to compare qualitative and quantitative variables. A p value <0.05 was considered statistically significant, with a 95% confidence interval.



Adapt dialysis to your life,
not your life to dialysis

Satisfaction with the choice

Date: Patient:

Do you clearly understand the benefits and the points to take into account in the option you have chosen? Yes No

Do you feel that you have had enough support and counselling to make your decision? Yes No

Do you know that you will be able to change treatment whenever you wish, provided there are no clinical reasons that prevent it? Yes No

Do you feel that you have chosen the option that best aligns with your preferences and lifestyle? Yes No

Do you feel SAFE with the option you have chosen? Yes No

Do you feel SATISFIED with the option you have chosen? Yes No

Figure 1. Template of the satisfaction-with-choice questionnaire.

Ethical aspects: Questionnaires were voluntary, self-administered, and anonymous to avoid participants feeling coerced in their responses.

Informed consent was obtained from patients, ensuring voluntary participation and the confidentiality of the information obtained. No personal data were included that could directly or indirectly identify patients, in accordance with universal ethical principles, international data protection standards, and current Spanish legislation. The research complied with the Declaration of Helsinki and took into consideration the current ethical and legal aspects in the field of biomedical research, in accordance with Regulation (EU) 2018/1725 of the European Parliament and of the Council of 23 October 2018, as well as Organic Law 3/2018 of 5 December on Personal Data Protection and Guarantee of Digital Rights.

RESULTS

A total of 62 questionnaires were distributed. Ultimately, 58 were correctly completed and 4 were returned blank, all of which belonged to the HT group. The participation rate was 71.74%, and the questionnaire response rate was 93.55%. Among respondents, 68.96% (n=40) were men (HD=28, HT=11). The mean age was 67.12±13.98 years (HD=68.83±14.81; HT=62.2±10.15), with a median age of 69.5 years (HD=72; HT=64) and a range from 19 to 92. Fifty percent of patients were older than 70 years. The mean time on treatment since receiving the information was 30.64±31.67 months (HD=35.69±34.75; HT=16.14±12.56), with a median of 21 months (HD=22.93; HT=12.17). Patient origin was as follows: 56.45% from the ERCA clinic, 24.2% from transplant, and 19.35% started HD as acute patients. Overall, 74.14% (n=43) of patients were on HD and 25.86% (n=15) on home therapy (PD and HHD).

When comparing the age of patients on HD and HT, we did not find statistically significant differences between the two modalities (p=0.114), although HT patients were on average younger. HD patients had been on treatment significantly longer (p=0.038). The overall results of the satisfaction questionnaire are shown in **figure 2**. No statistically significant differences were found between dialysis modality and satisfaction with the option chosen (p=0.551). We were unable to compare age and time on treatment with satisfaction with the choice, since only one patient reported not being satisfied. Results by therapy are shown in **table 1**.

DISCUSSION

The choice of renal replacement therapy is an important decision that determines patients' quality of life and survival⁹.

People with advanced CKD face a particularly complex decision-making process. Multiple treatment options, each with its advantages and disadvantages, the opinions of family and/or healthcare professionals, and the identification of patient preferences and values make it a complex decision, and it is not uncommon for patients sometimes to feel they have made a mistake and regret the decision taken¹¹. Decisional regret is a negative emotion that arises when patients feel that an alternative choice might have resulted in a more favorable outcome than their current option^{12,13}.

According to published surveys, the prevalence of regret about the chosen RRT modality among patients with advanced CKD ranges from 7% to 61%¹⁴⁻¹⁶. In our cohort, the percentage of regret was lower than reported in the literature; only 1.70% stated that they were not satisfied with their decision.

It is possible that these favorable results are related to having undergone a shared decision-making process, receiving

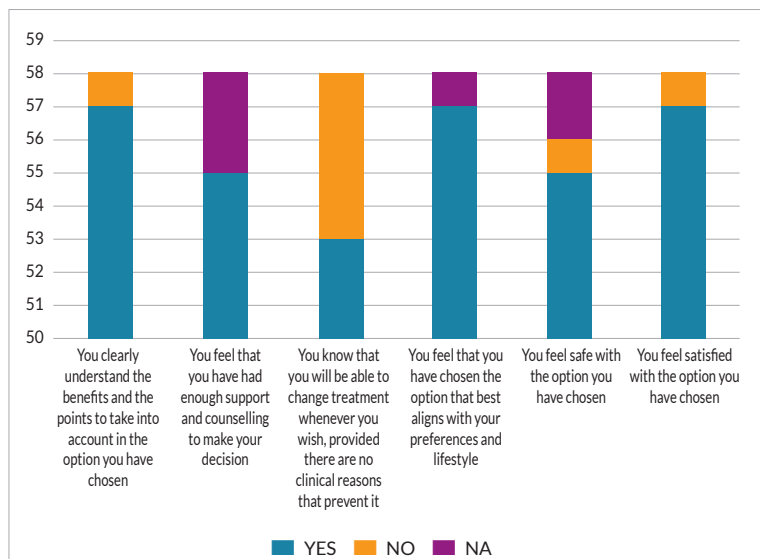


Figure 2. Results of the satisfaction-with-choice questionnaire for therapy selection.

* NA= No answer.

comprehensive information, and actively participating in the choice of treatment. According to previous studies, factors associated with regret include a decision-making process that reflects the preferences of family members and the physician, as well as suboptimal preparation and understanding of the dialysis process^{13,16,17}.

Another factor that we believe may have contributed to the low rate of regret is the advanced age of our patients, since half of those who responded were older than 70 years. However, we couldn't perform a comparative statistical analysis to confirm this, as only one person reported not being satisfied with their current treatment. This association was, however, confirmed in the study by Berkhout-Byrne et al., which reported the results of a Dutch National Survey

examining regret about the decision to start dialysis and found an association between older age and less regret and greater satisfaction with treatment^{16,17}. For the same reason, we were also unable to relate time on dialysis treatment to satisfaction with the choice made. Nonetheless, numerous publications support the high degree of satisfaction of dialysis patients in general, mainly associated with the quality of care and perceived safety^{18,19}.

Regarding the results of the questions related to the quality of the information provided, most patients reported having sufficient information and knowledge to make their decision. This, together with the low rate of regret and high level of satisfaction, highlights the importance of pre-dialysis education and shared decision-making in choosing renal replacement therapy. This finding is consistent with other published studies that found a direct association between insufficient information and a higher risk of regret^{17,20}.

We found no significant differences when comparing satisfaction between patients who chose a home therapy and those who chose in-center hemodialysis. This finding is noteworthy, as numerous studies have reported greater satisfaction in patients dialyzing at home, possibly due to a perceived sense of greater normality and not having to visit the hospital as frequently^{14,21,22}.

The Quality Standards for Pre-dialysis Education⁵ highlight the importance of regular follow-up to verify whether the patient remains satisfied and/or wishes to change to another modality or to conservative care. Such follow-up may be particularly important after major life changes (for example, the death of a spouse) or early problems with the chosen modality that may prompt patients to reevaluate their choice⁵.

Table 1. Results of the survey of satisfaction by treatment modalities.

	HD			DP			p value
	YES	NO	NA	YES	NO	NA	
Has clear the benefits and the points to take into account of the option they have chosen	42	1	0	15	0	0	0.551
Feels they have had enough support and counselling to make their decision	40	3	0	15	0	0	0.293
Knows they can change treatment whenever they wish, provided there are no clinical reasons that prevent it	38	5	0	15	0	0	0.167
Feels they have chosen the option that best matches their preferences and lifestyle	42	0	1	15	0	0	0.551
Feels safe with the option they have chosen	41	0	2	14	1	0	0.168
Feels satisfied with the option they have chosen	41	1	0	15	0	0	0.551

* NA= No answer.

Limitations

One of the limitations of this study was the anonymity of questionnaire completion, which prevented us from knowing the characteristics of those who answered “no” to any question or did not respond. However, anonymity allowed patients to answer freely and may have contributed to the high response rate (93.55%).

Another limitation is the small sample size, which reflects the reality of a single center.

We must also consider the possibility that these results may conceal a response bias, due to the exclusion of patients who were unable to complete the questionnaire because of their clinical condition, potentially leading to an overly positive picture of our results.

Practical considerations

It would be useful to implement the “satisfaction questionnaire” individually and systematically for all incident and prevalent dialysis patients. Adapting treatment to changes in the patient’s life and environment could improve their adjustment to treatment, autonomy, and quality of life.

In light of our results, we can see that the percentage of regret among our dialysis patients is low.

We found no differences in satisfaction with the choice of home therapy versus in-center hemodialysis.

Assessing patient satisfaction with their dialysis treatment may help to identify shortcomings in the educational process, as well as to verify whether the patient is satisfied and/or wishes to change treatment modality, particularly when there are changes in their life or environment.

Conflicts of interest

None declared.

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“JANDRY LORENZO”

GRANT 2024



THE SPANISH SOCIETY OF NEPHROLOGY NURSING (SEDEN) sponsors this grant to promote research projects aimed at expanding knowledge in the field of nephrology nursing. The deadline for grant applications is June 30, 2024, and applications must be submitted to the SEDEN headquarters in accordance with the following regulations.

- TERMS AND CONDITIONS**
- 1.- Applications for the Jandry Lorenzo Grant may be submitted by research projects in which the authors are registered nurses who are full members of SEDEN and up to date with their membership fees. Other professionals may participate as coauthors to encourage multidisciplinary collaboration.
 - 2.- A detailed research project must be submitted, with no length limit, including the following sections: **Introduction** (background and current state of the topic), **Objectives** (hypothesis, if required by the study design), **Methodology** (setting, design, population and sample, measurement instruments, data collection, and statistical analysis), **References**, **Project timeline**, **Estimated budget**. The project must be submitted both in printed form and in electronic format.
 - 3.- An abbreviated curriculum vitae of the applicants must also be included.
 - 4.- For the awarding of the grant, the **SEDEN** Board of Directors will appoint an evaluation committee, which will act as the jury and communicate its decision to applicants before September 13th, 2024.
The grant consists of an official certificate presented to the awardees at the opening session of the 49th National SEDEN Congress (2024), and financial award of €1,800*. Fifty percent of the grant amount will be paid upon award of the grant, and the remaining 50% upon completion of the study.
 - 5.- The awardee undertakes to complete and submit the research project to the **SEDEN** Secretariat before September 13, 2025. If the study is not completed by that date, the authors may request a 6-month extension. After this period, if the study has not been submitted, the remaining funds will not be paid. The study will be considered complete when the final original manuscript is submitted, including the following sections: introduction, materials and methods, results, discussion, and references. The complete study will be presented at the 50th **SEDEN** Congress.
 - 6.- The final project must comply with the **publication guidelines of Enfermería Nefrológica** and will undergo peer review by its Evaluation Committee for possible publication. If it does not pass this review, it will be published on the **SEDEN** website.
 - 7.- The project may not be published or presented in any medium or forum until the requirements of Sections 5 and 6 have been fulfilled. The project must always state that it has been awarded the Jandry Lorenzo Grant 2024.
 - 8.- Submitting an application implies acceptance of these regulations and of the jury's final decision, which shall not be subject to appeal.
 - 9.- The grant may be declared void if no suitable applications are received.

**The financial award is subject to applicable tax withholdings.*

Native arteriovenous fistulae: risk factors involved in primary maturation failure

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ABSTRACT

Introduction: Primary failure includes early thrombosis and maturation failures.

Objectives: To determine the risk factors associated with primary failure of native fistulas and their relationship with survival. To analyse the sonographic differences between mature fistulas and fistulas with maturation failure.

Material and Method: Observational and retrospective study. Variables: sociodemographic, anthropometric, comorbidities, blood and ultrasound parameters. Statistical analysis: Descriptive. Logistic regression. Kaplan-Meier method.

Results: Sample 65 native fistulas, 72.3% male. Age 69.7 years. 60% mature fistulas and 40% fistulas with primary failure (20% maturation failure and 20% early thrombosis). Risk factors for maturation failure: arterial diameters <2mm (OR:16.8; p=0.016). Risk factors for early thrombosis: age \geq 65 years (OR:5.44; p=0.014), weight (OR:1.04; p=0.02) and body mass index (OR:1.17; p=0.027). Monocytes as a protective factor for early thrombosis (OR:0.0142; p=0.029). People \geq 65 years old, obese, and with arterial diameters <2mm had lower survival. Mature fistulas had a significantly higher vein diameter, peak systolic velocity, and vascular access flow (p<0.001).

Conclusions: Fistulas performed with arterial diameters <2mm present a higher risk of maturation failure. The higher the age, weight, and body mass index, the higher the risk of early thrombosis. The fewer monocytes, the lower the risk of early thrombosis. Age, arterial diameter, and weight influence

survival. There are ultrasound differences between mature fistulae and fistulae with maturation failure.

Keywords: haemodialysis; native arteriovenous fistula; primary failure; doppler ultrasound; survival.

RESUMEN

Fístulas arteriovenosas nativas: Factores de riesgo implicados en el fallo primario de maduración

Objetivo: El fallo primario incluye la trombosis precoz y los fallos de maduración.

Objetivos: Determinar los factores de riesgo asociados al fallo primario de fístulas nativas y su relación con la supervivencia. Analizar las diferencias ecográficas entre fístulas maduras y fístulas con fallos de maduración.

Material y Método: Estudio observacional y retrospectivo. Variables: sociodemográficas, antropométricas, comorbilidades, parámetros sanguíneos y ecográficos. Análisis estadístico: Descriptivo. Regresión logística. Método de Kaplan-Meier.

Resultados: Muestra 65 fístulas nativas, 72,3% hombres. Edad 69,7 años. 60% fístulas maduras y 40% fístulas con fallo primario (20% fallo de maduración y 20% trombosis precoz). Factores de riesgo de fallos de maduración: diámetros arteriales <2 mm (OR:16,8;p=0,016). Factores de riesgo de trombosis precoz: Edad \geq 65 años (OR:5,44;p=0,014), peso (OR:1,04;p=0,02) e índice de masa corporal (OR:1,17;

$p=0,027$). Monocitos factor protector de trombosis precoz (OR:0,0142; $p=0,029$).

Personas ≥ 65 años, obesas y con diámetros arteriales < 2 mm presentaron menor supervivencia. Diámetro de vena, velocidad pico sistólica y flujo del acceso vascular significativamente mayores en fístulas maduras ($p < 0,001$).

Conclusiones: Fístulas realizadas con diámetros arteriales < 2 mm presentan mayor riesgo de fallos de maduración. A mayor edad, peso e índice de masa corporal mayor riesgo de trombosis precoz. A menos monocitos, menor riesgo de trombosis precoz. La edad, el diámetro arterial, y el peso influyen en la supervivencia. Existen diferencias ecográficas entre fístulas maduras y fístulas con fallos de maduración.

Palabras clave: hemodiálisis; fístula arteriovenosa nativa; fallo primario; ecografía doppler; supervivencia.

INTRODUCTION

In our country, 78.4% of patients with advanced chronic kidney disease chose hemodialysis (HD) as their renal replacement therapy (RRT)¹. Vascular access is the most important factor determining the success or failure of HD programs^{2,3}. The native arteriovenous fistula (nAVF) is the vascular access of choice because of its greater long-term patency and lower rates of complications, healthcare expenditure, and mortality when compared with prosthetic arteriovenous fistulas and central venous catheters³⁻⁶.

Maturation is a process that begins after the creation of the arteriovenous anastomosis and ends when the nAVF is suitable for hemodialysis. An nAVF is suitable for HD when the venous diameter is ≥ 4 mm and the vascular access flow is ≥ 500 mL/min⁷⁻⁹. These parameters are generally reached after 6 weeks of maturation, although completion may be delayed up to 3-6 months⁷. During maturation, the increase in intravascular pressure and blood flow leads to vascular remodeling and vessel dilation^{3,5,10,11}. Vascular remodeling is affected by age, surgical factors, and patient comorbidities; these factors predispose to nAVF maturation failure and vascular access thrombosis^{5,6,11,12}.

Primary failure occurs when an nAVF is not suitable for HD at three months of maturation and includes early thrombosis and nAVF maturation failure^{2,11-14}. It is estimated that 20-50% of arteriovenous fistulas experience primary failure^{7,11,14,15}. Clinical and ultrasound criteria are used to determine whether an nAVF shows maturation failure or early thrombosis¹¹.

Several factors have historically been associated with primary nAVF failure: age, female sex, comorbidities (diabetes, obesity, hypertension), chronic inflammation, laboratory abnormalities, and the arterial/venous diameter used during nAVF creation^{3,4,6,11,14,16,17}. However, the role of these factors in primary failure and nAVF survival is not clearly defined¹⁴.

Therefore, the overall objective of this study is to determine the risk factors associated with primary failure of nAVFs in HD patients. The specific objectives are:

- To establish the relationship between the risk factors associated with primary failure and the cumulative survival of nAVFs.
- To determine the ultrasound differences between mature nAVFs and those with maturation failure during the first three months after creation.

MATERIAL AND METHOD

Design and setting: We conducted an observational study with retrospective data collection from February through March 2024 in the Vascular Access Clinic for Hemodialysis at Hospital Universitario Miguel Servet de Zaragoza (Zaragoza, Spain).

Population and sample: HD patients who received an nAVF at the hospital between January 1st, 2023, and January 31st, 2024.

Inclusion criteria: Patients > 18 years, with an nAVF with ≥ 3 months of maturation as of January 31st, 2024, and patients with nAVF thrombosis during the first three months of maturation.

Exclusion criteria: Patients whose nAVF required surgical repair during the first three months of maturation, and patients with prosthetic arteriovenous fistulas.

For patients who had more than one nAVF during the study period, each vascular access was considered independently, even if belonging to the same patient.

Study Variables

Sociodemographic: age (years), sex (male/female). **Anthropometric:** weight (kg), height (m), body mass index (BMI). **Comorbidities:** hypertension, diabetes, peripheral arterial disease, hyperparathyroidism, dyslipidemia. **nAVF characteristics:** type (radiocephalic, brachiocephalic, brachiobasilic), arterial and venous diameters used for nAVF creation (mm). **Laboratory parameters:** pH, bicarbonate (mmol/L), PCO₂ (mmHg), PO₂ (mmHg), potassium (mmol/L), PTH (pg/mL), iron (μ g/dL), ferritin (ng/dL), C-reactive protein (mg/dL), urea (mg/dL), creatinine (mg/dL), calcium (mg/dL), phosphorus (mg/dL), total cholesterol (mg/dL), triglycerides (mg/dL), albumin (g/dL), total white blood cell count ($10^3/\mu$ L), neutrophils ($10^3/\mu$ L), monocytes ($10^3/\mu$ L), lymphocytes ($10^3/\mu$ L), hemoglobin (g/dL), hematocrit (%), and platelets ($10^3/\mu$ L)^{3,11,14-16,18}.

The laboratory test closest to the nAVF creation date was used¹⁴. BMI was calculated using the Quetelet index and categorized by WHO criteria¹⁹: normal weight (18.5-24.9 kg/m²), overweight (25-29.9 kg/m²), and obesity (≥ 30 kg/m²). Age was categorized (≥ 65 vs < 65 years)^{3,4,11,14,15,20}, as were arterial

diameters (≥ 2 mm vs < 2 mm)^{7-9,16,18} and venous diameters (≥ 2.5 mm vs < 2.5 mm)^{7,8,16,18,20}.

The remaining variables were obtained through Doppler ultrasound. Three ultrasound evaluations were performed on the native arteriovenous fistulas (nAVFs) at 15, 45, and 90 days of maturation. The ultrasounds were performed by the nephrologist and the nurse from the Hemodialysis Vascular Access Clinic using a Hitachi-Aloka F31 ultrasound system. The ultrasound data collected included: anastomosis diameter (mm), peak systolic velocity (PSV) of the anastomosis and of the brachial artery (cm/s), resistance index of the anastomosis and of the brachial artery, vein diameter (mm), and vascular access flow (QA) (mL/min). All QA and vein-diameter measurements were obtained at the same anatomical sites: QA was measured three centimeters above the bifurcation of the brachial artery, and vein diameter was measured three centimeters from the arteriovenous anastomosis²¹. These measurements were not performed in thrombosed nAVFs. To obtain QA, three measurements were taken and the mean value was used.

The presence or absence of primary failure was also documented, as well as the type of failure—either early thrombosis (ET) or maturation failure (MF). The following diagnostic criteria were applied:

- **Early thrombosis (ET):** Thrombosis occurring within the first three months of maturation^{2,13,17}. Diagnosis was established through physical examination (absence of thrill and bruit) and ultrasound findings (absence of venous compressibility, absence of Doppler and color flow, and presence of high-resistance waveforms in the feeding artery). When all these signs were present, a diagnosis of early thrombosis of the nAVF was established⁷⁻⁹.
- **Maturation failure (MF):** An nAVF was considered mature when it presented a QA ≥ 500 ml/min and a vein diameter ≥ 4 mm at three months of maturation^{7-9,11}. Therefore, nAVFs were classified as MF when they did not meet both criteria at 3 months.

Ethical considerations: Permission for this study was obtained from *Hospital Universitario Miguel Servet* and the Research Ethics Committee of the Autonomous Community of Aragón (CEICA), approval report CEICA (C.I. PI24/032). The committee granted exemption from informed consent because the data extracted from the electronic health records were anonymized.

Statistical analysis: The Jamovi® software version 2.3.28 was used. The Shapiro–Wilk test assessed the normality of quantitative variables. Quantitative variables were expressed using measures of central tendency (mean and median) and dispersion (standard deviation and interquartile range), depending on whether they followed a normal distribution. Comparisons of quantitative variables were performed using the independent-samples Student's t test

(normal distribution) or the Mann–Whitney U test (non-normal distribution). Qualitative variables were expressed as frequency and percentage. Comparisons of qualitative variables used contingency tables with the Chi-square test or Fisher's exact test, as appropriate. Risk factors for MF and ET were identified using univariate and multivariate logistic regression. The Kaplan–Meier method was used to calculate nAVF survival at 15, 45, and 90 days of maturation. Additionally, survival was analyzed by sex, age, BMI, and arterial diameter used to create the nAVF. Statistical significance was set at $p < 0.05$.

RESULTS

The sample consisted of 65 nAVFs from 63 patients. Median age was 69.7 years (IQR, 43–85). A total of 72.3% were men ($n=47$) and 27.7% women ($n=18$). Of the accesses, 66% were radiocephalic nAVFs ($n=44$), 20% brachiocephalic ($n=13$), and 12.3% brachio basilic ($n=8$) (**table 1**).

A total of 60% ($n=39$) were mature nAVFs and 40% ($n=26$) had primary failure (20% MF [$n=13$] and 20% ET [$n=13$]) (**table 1**).

A statistically significant association was found between MF and the arterial diameter used to create the nAVF ($p=0.036$). ET was significantly associated with age ($p=0.048$), weight ($p=0.049$), BMI ($p=0.047$), and monocyte count ($p=0.021$) (**table 1**).

Univariate analysis of risk factors for MF showed that using arterial diameters < 2 mm was a risk factor (OR, 16.8; 95%CI, 1.67–169; $p=0.016$). In the multivariate analysis, arterial diameter < 2 mm remained an independent risk factor (OR, 20.12; 95%CI, 1.55–283; $p=0.020$) (**table 2**).

Univariate analysis for ET showed that age ≥ 65 years (OR, 5.44; 95%CI, 1.4–21.1; $p=0.014$), weight (OR, 1.04; 95%CI, 1.01–1.17; $p=0.02$), and BMI (OR, 1.17; 95%CI, 1.02–1.35; $p=0.027$) were risk factors. Conversely, monocytes acted as a protective factor: lower monocyte counts were associated with reduced ET risk (OR, 0.0142; 95%CI, 3.1–4–0.64; $p=0.029$). Multivariate analysis showed that being overweight was an independent risk factor for ET (OR, 31.28; 95%CI, 1.46–642; $p=0.044$) (**table 2**).

The cumulative survival of nAVFs at 15, 45, and 90 days of maturation was 73.3%, 72.6%, and 63.6%, respectively. Patients ≥ 65 years, those whose nAVFs were created using arterial diameters < 2 mm, and those with obesity had lower cumulative survival at all time points. Cumulative survival dropped markedly at 90 days in patients ≥ 65 years (50.6%), in those with arterial diameter < 2 mm (37.5%), and in patients with obesity (32.1%) (**table 3** and **figure 1**).

Ultrasound follow-up at 15, 45, and 90 days was performed on 52 nAVFs, of which 75% were mature ($n=39$) and 25% had MF ($n=13$). At all time points, vein diameter, QA, and brachial-artery PSV were significantly higher in mature

Table 1. Mature nAVFs vs. nAVFs with maturation failure and early thrombosis: sociodemographic, anthropometric, nAVF characteristics, and laboratory variables.

Variables	FAVn maduras (n=39)		Primary Failure (n=26)			
			Maturation Failure (n=13)	p	Early Thrombosis (n=13)	p
Sociodemographic variables						
Sex (%)						
Men	28 (71.7)		10 (76.9)	0.25 ¹	9 (69.2)	0.47 ¹
Women	11 (28.3)		3 (23.1)		4 (30.8)	
Age (years)	68.5 (IQR:43-84)		67 (IQR:48-85)	0.57 ²	74 (IQR:49-88)	0.048²
Categorized age (%)						
< 65 years	12 (30.7)		3 (23.1)	0.5 ¹	2 (15.4)	0.01¹
≥ 65 years	27 (69.3)		10 (76.9)		11 (84.6)	
Anthropometric measures						
Weight (kg)	77.2 (IQR:56-118)		81.4 (IQR:57-108)	0.14 ²	82.3 (IQR:73-131)	0.049²
Height (m)	1.67±0.15		1.69±0.07	0.4 ³	1.72±0.06	0.15 ³
BMI (kg/m²)	22.6 (IQR:17.5-34)		23.1 (IQR:18.2-31.2)	0.18 ²	23.6 (IQR:21.2-37)	0.047²
Categorized BMI (%)						
Normal	25 (64.1)		4 (30.7)	0.08 ¹	3 (23.1)	0.16 ¹
Overweight	12 (30.7)		7 (53.8)		7 (53.8)	
Obesity	2 (5.2)		2 (15.5)		3 (23.1)	
Comorbidities (%)						
Hypertension	38 (97.4)		12 (92.3)	0.41 ⁴	13 (100)	0.5 ⁴
Diabetes	16 (41.2)		6 (46.1)	0.7 ⁴	5 (38.4)	0.84 ⁴
Peripheral arterial disease	9 (23.07)		4 (30.7)	0.7 ¹	3 (23.07)	1 ¹
Previous central venous catheter	4 (10.2)		-	-	5 (38.4)	0.16 ¹
Hyperparathyroidism	2 (5.1)		2 (15.3)	0.2 ¹	-	-
Dyslipidemia	31 (79.4)		11 (84.6)	0.78 ⁴	9 (69.2)	0.7 ⁴
nAVF characteristics						
Type of nAVF (%)						
Radiocephalic	23 (58.9)		11 (84.6)	0.17 ⁴	10 (86.9)	0.34 ⁴
Brachiocephalic	9 (23.1)		1 (7.7)	0.41 ¹	3 (13.1)	0.93 ¹
Brachiobasilic	7 (18)		1 (7.7)	0.66 ¹	-	-
Artery diameter (mm)	2.65±0.7		2.31±0.6	0.036³	2.39±0.61	0.15 ³
Categorized artery diameter (%)						
≥ 2 mm	38 (97.4)		4 (30.8)	0.003¹	12 (92.3)	0.7 ¹
< 2 mm	1 (2.6)		9 (69.2)		1 (7.7)	
Vein diameter (mm)	3.2 (IQR:1.8-6)		3 (IQR:2-4.1)	0.13 ²	3 (IQR:1.9-4)	0.47 ²
Categorized vein diameter (%)						
≥ 2,5 mm	31 (79.5)		10 (76.9)	0.84 ¹	10 (76.9)	0.78 ¹
< 2,5 mm	8 (20.5)		3 (23.1)		3 (23.1)	
Laboratory parameters*						
Monocytes (10 ³ /μL)	0.56±0.17		0.61±0.35	0.07 ³	0.71±0.25	0.021³

nAVF: native arteriovenous fistula; ¹ Fisher's exact test; ² Mann-Whitney U test; ³ Student's t-test; ⁴ Statistic used chi²

*Only variables with statistically significant associations are shown.

nAVFs compared with those with MF ($p < 0.001$). Additionally, anastomotic PSV at 90 days was significantly higher in mature nAVFs ($p < 0.001$) (table 4 and figure 2).

DISCUSSION

A total of 40% of nAVFs presented primary failure (20% MF and 20% ET). These findings are consistent with the consulted literature, which reports primary failure rates between

Table 2. Univariate and multivariate analysis: risk factors associated with maturation failure and early thrombosis.

	Univariate analysis			Multivariate analysis		
	OR	95%CI	p-value	OR	95%CI	p-value
Risk factors associated with maturation failure						
Sex (female)	1.12	0.17–3.3	0.71	1.82	0.28–11.7	0.52
Age (≥65 years)	1.48	0.34–6.3	0.59	2.21	0.37–13.2	0.38
Weight	1.03	0.98–1.07	0.14	1.05	0.99–1.1	0.061
Artery (<2 mm)	16.8	1.67–169	0.016	20.12	1.55–283	0.020
Vein (<2.5 mm)	1.16	0.25–5.23	0.084	2.71	0.22–26.5	0.39
Risk factors associated with early thrombosis						
Sex (female)	1.07	0.27–4.1	0.91	1.16	0.41–2.56	0.11
Age (≥65 years)	5.44	1.4–21.1	0.014	1.87	0.35–9.9	0.46
Weight	1.04	1.01–1.17	0.02	-	-	-
BMI	1.17	1.02–1.35	0.027	-	-	-
BMI (overweight)	1.03	0.22–4.74	0.96	31.28	1.46–642	0.044
BMI (obesity)	1.17	0.24–0.25	0.081	40.1	1.88–828	0.088
Monocytes	0.0142	3.14–0.64	0.029	0.0607	8.844–4.15	0.16

BMI: Body mass index.

Table 3. Accumulated survival categorized by sex, age, body mass index, and arterial diameter.

	Total	Sex		Age		BMI			Artery diameter	
		Woman (%)	Man (%)	<65 years (%)	≥65 years (%)	Normal weight (%)	Overweight (%)	Obesity (%)	≥2 mm (%)	<2 mm (%)
15 days	73.3	70	74.6	83.4	56.2	75	81.8	38.5	74.7	60
45 days	72.6	70	73.7	82.3	56.2	75	79.7	38.5	73.9	60
90 days	63.6	62.5	64.1	71.3	50.62	68.7	65.4	32.1	63	37.5

20–50%^{11,14,15}. MF between 16–30%^{2,11,14,22}, and ET between 5–30%^{2,11,17}. In addition, the variables associated with primary failure in our study (age ≥65 years, elevated weight and BMI, low monocyte levels, and the use of arterial diameters <2 mm when creating the nAVF) are aligned with previous reports^{3,4,6,11,14,16,23}. Regarding the type of primary failure, all variables—except arterial diameter <2 mm—were associated with ET, whereas arterial diameters <2 mm were specifically related to MF.

Two studies have linked advanced age with an increased risk of primary failure. Delgado Ramírez et al. reported in their systematic review that advanced age increases the risk of primary failure by 50%³, while Pérez-Reyes et al. found that the risk increases by 1% per year starting at age 67⁴. In our study, individuals ≥65 years had a higher risk of ET. However, we found no literature specifically associating advanced age with ET. In contrast, Bashar et al. reported an association between advanced age and MF¹⁵.

Currently, the impact of weight on nAVF patency is not yet clear¹⁴. Nevertheless, both our findings and those of other authors indicate that higher weight is associated with greater pri-

mary failure risk^{4,11}. Similarly, elevated BMI was associated with primary failure; individuals with BMI ≥25 kg/m² have a 2.4-fold higher risk of primary failure²³. Our results also showed that higher weight and BMI increased the risk of ET. Obesity-related inflammation and atherosclerosis may promote endothelial injury and reduce blood flow, facilitating thrombosis¹⁴.

We only found 1 study analyzing the relationship between monocytes and primary nAVF failure, and its findings were similar to ours. BojaKoswki et al.²⁴, reported that monocytes are an independent risk factor for primary failure, and that lower monocyte counts reduce primary failure risk (OR, 0.02; p<0.001). In our study, lower monocyte counts were associated with reduced ET risk. Monocytes play a key role in the coagulation cascade by activating tissue factor, which triggers thrombin generation and thrombus formation²⁵; this mechanism may explain the association between monocyte levels and nAVF thrombosis.

Arterial diameter is one of the most extensively studied factors in primary failure⁷. In our study, arterial diameters <2 mm increased the risk of MF. Our findings are consistent with those of Ibeas et al.⁹, Iglesias et al.⁸ and the GEMAV guideline⁷,

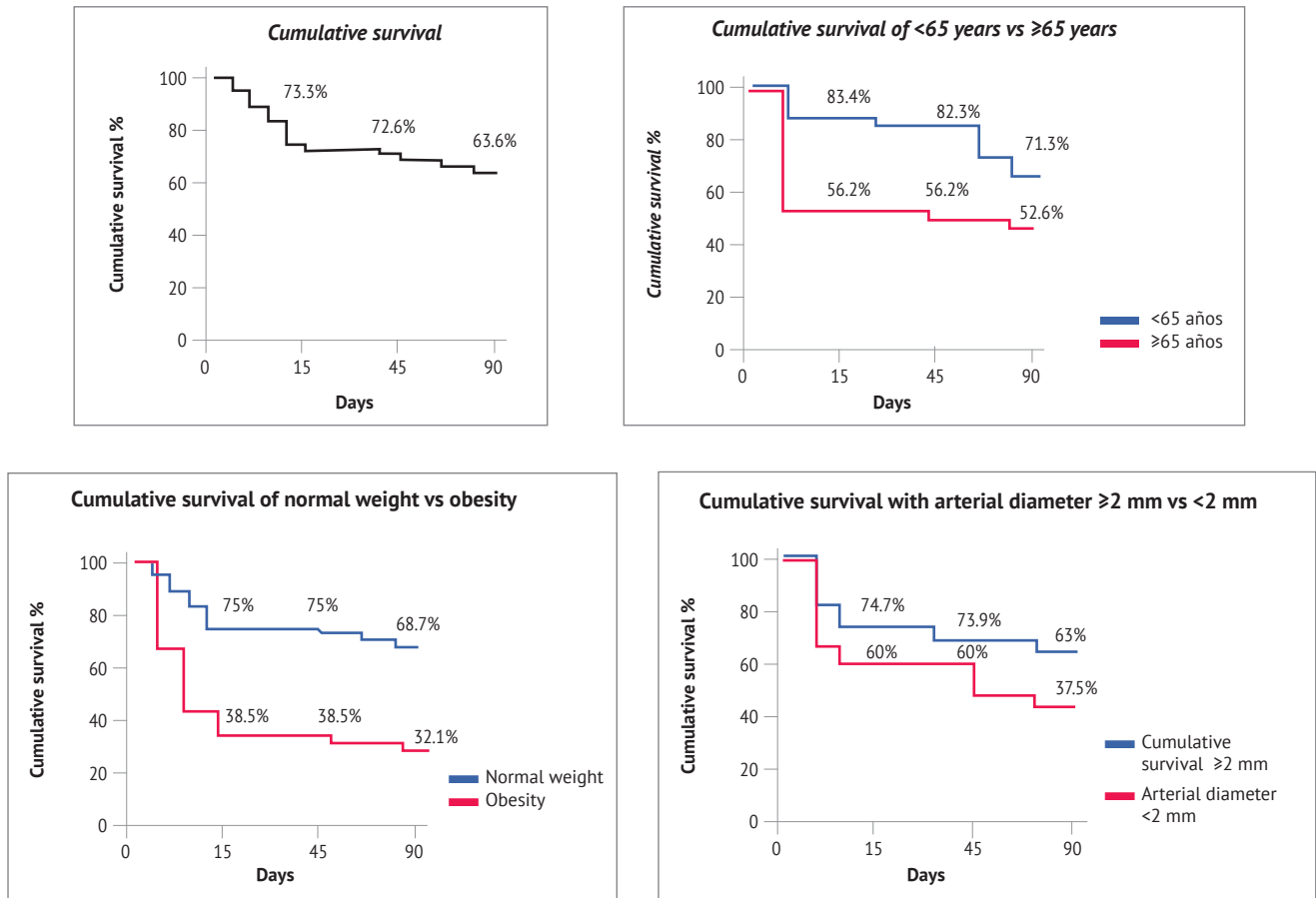


Figure 1. Cumulative survival categorized by age, body mass index, and arterial diameter.

all of which indicate that arterial diameters <2 mm negatively impact nAVF maturation.

We found no literature reporting cumulative nAVF survival within the first three months of maturation. Only Mateos-Torres et al.¹⁸ reported cumulative survival at one month, while most other studies report survival at 6 months, 1 year, or 2 years^{11,14}. Mateos-Torres et al.¹⁸ found a 97.5% cumulative survival at one month—much higher than ours at 45 days—although they excluded nAVFs created with arterial diameters <2 mm. However, several studies describe factors affecting nAVF survival, and consistent with our results, patients ≥ 65 years^{3,4,15}, individuals with obesity^{3,11,14}, and those whose nAVFs were created with arterial diameters <2 mm⁷ have reduced survival.

The main ultrasound differences between mature nAVFs and those with MF were vein diameter, QA, and brachial-artery PSV. These findings are consistent with Muray-Cases et al.¹¹, who reported significantly higher venous diameters and QA in mature nAVFs, although they did not measure PSV.

The main limitation of this study is methodological: the sample size was small, resulting in wider confidence intervals and therefore less precise estimates.

Based on our results, the risk factors associated with primary failure were arterial diameters <2 mm, elevated weight and BMI, monocyte levels, and age ≥ 65 years. Regarding MF and ET specifically, arterial diameters <2 mm increased MF risk, whereas older age, higher weight, and higher BMI increased ET risk. Conversely, lower monocyte counts reduced the risk of ET.

Cumulative survival was lower in patients ≥ 65 years, in those with arterial diameters <2 mm, and in individuals with obesity. Mature nAVFs consistently showed higher brachial-artery PSV, QA, and venous diameter at all ultrasound assessments compared with nAVFs with MF.

Conflicts of interest

None declared.

Funding

None declared.

Tabla 4. FAVn maduras vs FAVn con fallos de maduración: Mediciones ecográficas a los 15, 45 y 90 días de maduración.

Ultrasound Measurement	Mature AVFs (n=39)	AVFs With Maturation Failure (n=13)	U/t	p-value
AVF at 15 days of maturation				
Anastomosis diameter	3 (IQR. 1.4–4.9)	2.8 (IQR. 1.2–3.2)	208	0.3401
Anastomosis PSV	354 (IQR. 92–425)	280 (IQR. 28–439)	198	0.611
Anastomosis RI	0.44±0.09	0.5±0.12	-1.8	0.0752
Vein diameter	5.35±1.43	4.1±1.17	2.8	<0.0012
QA (flow)	713 (IQR. 230–1784)	362 (IQR. 180–600)	63.5	<0.0011
Humeral artery PSV	96.07±35.6	61.5±25.7	3.2	<0.0012
Humeral artery RI	0.58 (IQR. 0.37–0.72)	0.64 (IQR. 0.7–0.87)	216	0.431
AVF at 45 days of maturation				
Anastomosis diameter	3.2 (IQR. 2–6.7)	3 (IQR. 1.7–4.8)	203	0.61
Anastomosis PSV	325 (IQR. 58–500)	349 (IQR. 102–421)	195	0.8661
Anastomosis RI	0.458±0.09	0.48±0.11	-0.74	0.4622
Vein diameter	6.12±1.5	4.1±1.1	4.2	<0.0012
QA (flow)	912 (IQR. 125–2250)	326 (IQR. 100–415)	38.5	<0.0011
Humeral artery PSV	97 (IQR. 37–243)	53 (IQR. 27–127)	83.5	<0.0011
Humeral artery RI	0.55±0.07	0.62±0.09	-2.7	0.482
AVF at 90 days of maturation				
Anastomosis diameter	3.3 (IQR. 2.2–4.5)	3 (IQR. 1.7–4.2)	188	0.161
Anastomosis PSV	341.4±86.1	221.3±108.3	4.1	<0.0012
Anastomosis RI	0.46±0.07	0.52±0.14	-1.9	0.582
Vein diameter	6.3 (IQR. 5.1–9.8)	4.5 (IQR. 3–6.8)	52.5	<0.0011
QA (flow)	1091.48±378	321.9±126.1	7.1	<0.0012
Humeral artery PSV	95 (IQR. 53–225)	52 (IQR. 33–80)	45	<0.0011
Humeral artery RI	0.59 (IQR. 0.42–0.5)	0.64 (IQR. 0.46–0.88)	102	0.431

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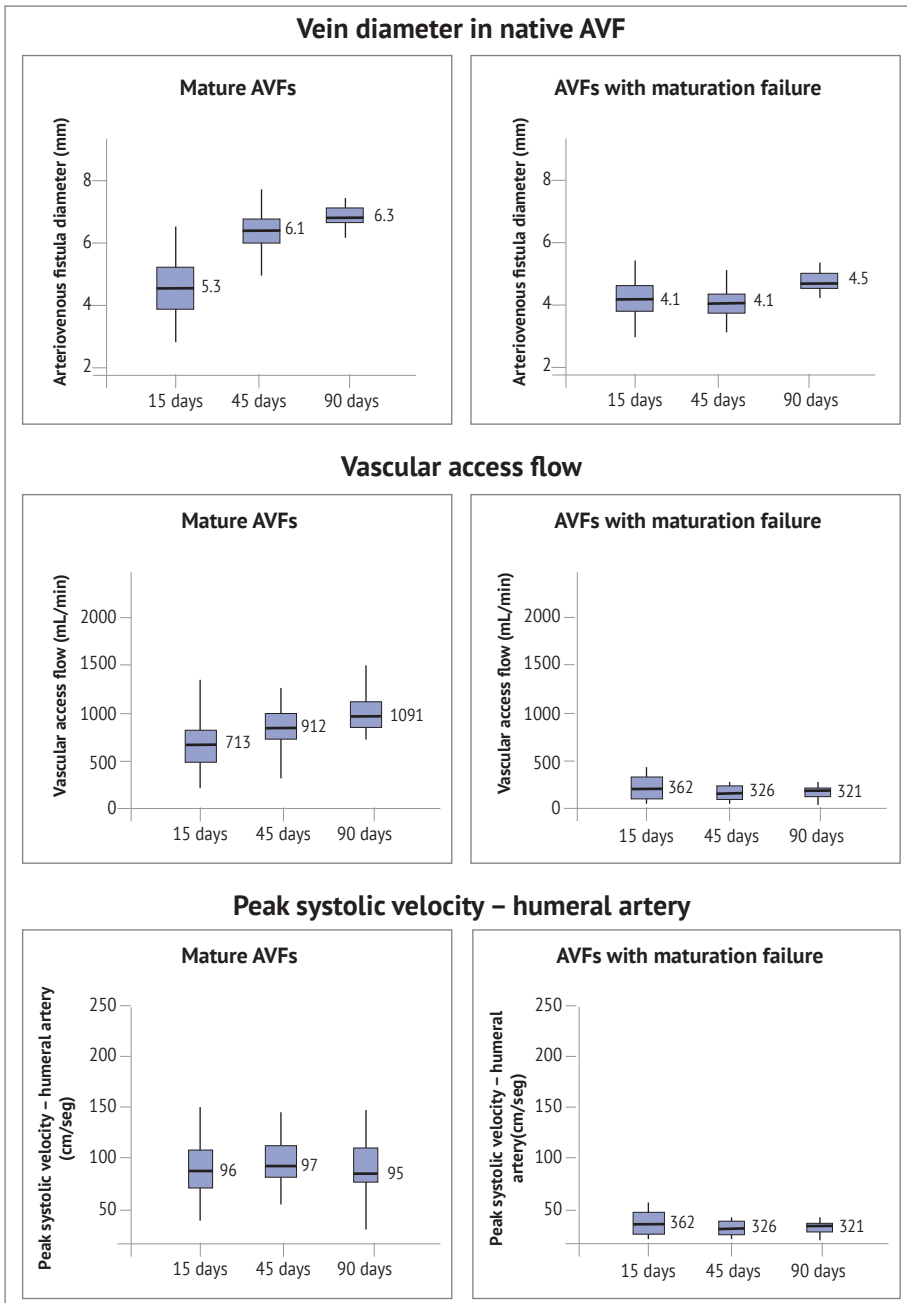


Figure 2. Mature AVFs vs AVFs With Maturation Failure: Main Ultrasound Differences.

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Renal Foundation

Award for Excellence in Communication

Award Rules

PURPOSE

The Renal Foundation is a non-profit organization dedicated to the comprehensive care of individuals with kidney disease, as well as to awareness-raising and prevention of this condition. In line with its ongoing commitment to quality and excellence, the Renal Foundation establishes this award within the framework of the annual congress of the Spanish Society of Nephrology Nursing (SEDEN).

The first edition of this award will take place at the 49th SEDEN National Congress, to be held in Valencia from October 26th through 28th, 2024.

This award is created on the occasion of the Foundation's 40th anniversary, with the aim of further promoting research in nephrology nursing and recognizing excellence in scientific communication, rewarding both the content of the presentation and the quality of oral delivery during the congress.

CANDIDATES

Eligible candidates are nursing professionals or teams whose oral communication has been accepted for in-person presentation at the congress of the same year.

The five highest-rated oral presentations, as quantitatively assessed by the SEDEN evaluation committee for that year, will be automatically shortlisted for the award.

No submission may participate if any author is affiliated with the Renal Foundation or if the work has been carried out at any of its centers or dialysis units.

EVALUATION CRITERIA

The following aspects of the presentation will be assessed:

1. Quality: structure, presentation, and relevance of the content.
2. Clarity: ease of understanding of the oral presentation.
3. Innovation: originality of format and use of new technologies.
4. Presenter's dynamism and delivery style.
5. Impact and engagement with the audience.
6. Direct relevance to the care of patients with kidney disease.

PRIZE AMOUNT

This award is endowed with €1,000 (one thousand euros).

DISSEMINATION

The winning paper will be made available to the journal *Enfermería Nefrológica* for possible publication, subject to editorial decision.

The Renal Foundation may disseminate the winning work without this implying any transfer or limitation of the authors' intellectual or industrial property rights.

Whenever the authors use the work or its data, its origin as the Renal Foundation Award must be clearly acknowledged.

JURY

The jury will consist of an odd number of members appointed by the Board of Directors of SEDEN and the Renal Foundation. The latter reserves the right to appoint one additional member to avoid tie decisions. The award may be declared void.

AWARD CEREMONY

The official certificate will be presented to the principal author at the closing ceremony of the congress by a representative of the Renal Foundation or a person designated by the Foundation.

ACCEPTANCE OF THE RULES

Participation in this call implies full acceptance of these rules.

In compliance with the Spanish Organic Law on Personal Data Protection (LOPD), all personal data provided by applicants will be included in files owned by FUNDACIÓN RENAL IÑIGO ÁLVAREZ DE TOLEDO, for the purpose of managing educational events and research awards. Data will be retained as long as necessary for such purposes. Applicants may exercise their rights of access, rectification, cancellation, and opposition by sending a written request marked "Data Protection" to:

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Haemodialysis patients' perceptions of the role of nurses in Peru

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ABSTRACT

Introduction: The role of the haemodialysis nurse is becoming increasingly important as the use of haemodialysis therapy in people with chronic kidney disease increases because their care improves the quality of life and safety of patients.

Objective: To determine the perception of haemodialysis patients regarding the role of nurses in northern Peru.

Material and Method: A descriptive, cross-sectional, descriptive study. The population consisted of 85 patients from a haemodialysis centre in Peru. A survey technique was used for data collection and a 17-item questionnaire was used as an instrument, with expert judgement validity and a Cronbach's alpha reliability of 0.8.

Results: 85 questionnaires were obtained, with a refusal rate of < 1%. 32.9% were aged between 61-70 years, 49.4% of the patients had higher education, and the male sex predominated with 61.2%. Regarding the perception in the educational role dimension, 77.6% had a good perception; about the care role dimension, 84.7% had a good perception; in the administrative role dimension, 77.6% of the patients had a good perception.

Conclusion: Most haemodialysis patients had a good perception of the nurse's role; 20.0% had a fair perception. Interventions need to be developed to support continuous quality improvement in the role of the haemodialysis nurse.

Keywords: perception; haemodialysis; nursing care; nephrology nursing; patient care.

RESUMEN

Percepción de los pacientes con terapia de hemodiálisis respecto al rol de enfermería en Perú

Introducción: El rol de la enfermera en hemodiálisis cobra importancia ante el incremento de esta terapia en las personas con enfermedad renal crónica, porque sus cuidados mejoran la calidad de vida y seguridad de los pacientes.

Objetivo: Determinar la percepción de los pacientes con terapia de hemodiálisis respecto al rol de enfermería en el norte de Perú.

Material y Método: Estudio de diseño descriptivo y corte transversal. La población estuvo conformada por 85 pacientes de un centro de hemodiálisis en Perú. Para la recolección de datos se utilizó como técnica la encuesta y como instrumento un cuestionario de 17 ítems, tuvo validez de juicio de expertos y una confiabilidad de alfa de Cronbach de 0,8.

Resultados: Se obtuvieron 85 cuestionarios, con un índice de rechazo <1%. El 32,9% tenían edades entre 61-70 años, 49,4% de los pacientes tenían estudios superiores, predominó el sexo masculino con el 61,2%. Referente a la percepción en la dimensión rol educativo el 77,6% tenían una percepción buena, en relación con la percepción en la dimensión rol asistencial el 84,7% tenían una percepción buena, en la dimensión rol administrativo el 77,6% de los pacientes tenían una percepción buena.

Conclusión: La mayoría de los pacientes con terapia de hemodiálisis tenían una percepción buena del rol de la enfermera; el 20,0% tenían una percepción regular. Es necesario

desarrollar intervenciones para apoyar la mejora continua de la calidad en el rol de la enfermera de hemodiálisis.

Palabras clave: percepción; hemodiálisis; asistencia de enfermería; enfermería de nefrología; asistencia al paciente.

INTRODUCTION

Chronic kidney disease (CKD) is considered an epidemic^{1,2}, with hemodialysis (HD) being the main renal replacement treatment used by people who suffer from it³ and entailing a series of changes in how patient care is organized^{4,5}. It is managed almost exclusively by a multidisciplinary team working in the field of nephrology^{6,7}. Some authors indicate that patients must endure severe symptoms and changes in their daily lives^{8,9}, which means they experience psychological distress for several reasons, such as the limitations of the treatment itself, financial difficulties, and changes in body image. According to various authors^{10,11}, nurses play an important role in helping patients feel safe, promoting their psychological well-being, and supporting them in coping with their illness.

HD nurses face multiple challenges during patient care, which requires achieving and maintaining a high level of competence in both technical and humanistic aspects in order to deliver person-centered nursing care.

Watson¹² states that nursing care is the ability to help people give meaning to their existence, avoiding suffering and lack of harmony. The nurse-patient relationship allows for a deep connection between people; to this end, nurses must base their practice on a system of humanistic values that influence their attitudes and skills and guide their behaviors.

The role played by nurses has an important impact on how patients perceive nursing care. In this regard, Swanson¹³ highlights that a caring relationship is beneficial for patients, nurses, and health systems in terms of costs. Conversely, if patients are exposed to indifferent attitudes, they feel vulnerable, helpless, and afraid, which may prolong physical healing times^{14,15}.

In Peru, according to the Peruvian Society of Nephrology, more than 3 million people suffer from CKD and most die without having been included in dialysis programs. They also report that at present there are 415 people per million Peruvians in end-stage disease requiring dialysis, but only 12,773 receive treatment, of whom 80% dialyze in EsSalud and 20% in public hospitals⁷. In Peru, CKD is among the 10 leading causes of mortality, and the presence of uremic encephalopathy is associated with high mortality rates⁸.

In the Lambayeque region in northern Peru, 1 in 10 people had some form of kidney disease; moreover, in 2022 there were 450 patients on HD and, due to the COVID-19 pandemic,

this number increased. That is, each month there were 15–20 additional patients attending for care, of whom a high percentage died⁹.

In Brazil, the very important role of nurses in HD has been identified, both in activities that directly address complications and in the nurse-patient relationship, with approaches that promote adaptation to new conditions through dialogue and direct patient care; with education, effective work, and quality care, nurses can help prevent some complications of dialysis treatment⁶.

Based on all of the above, the objective of this study was to determine the perception of patients on HD regarding the nursing role in a Hemodialysis Center in Chiclayo, Peru.

MATERIAL AND METHOD

Study design: We conducted a descriptive, observational, cross-sectional study.

Study population and sample: The research was carried out at the Santa Rosa de Lima Nephrology Center located in Chiclayo, northern Peru. The population consisted of 85 patients treated at the Santa Rosa de Lima Nephrology Center; the sample was selected by non-probabilistic convenience sampling.

Inclusion criteria were patients undergoing hemodialysis who agreed to participate in the study, hemodynamically stable patients, and patients who regularly attended all scheduled sessions. Exclusion criteria were patients receiving hemodialysis therapy in other private centers, patients with mental disorders, and patients attending hemodialysis as emergency referrals from other centers.

Measurement instrument: Data were collected using an ad hoc questionnaire developed by the investigators on the perception of hemodialysis patients, which measured patient satisfaction with the nursing role. The questionnaire was organized into two parts. The first part contained sociodemographic data; the second part consisted of items presented as statements that measured the educational role, care (clinical/assistential) role, administrative role, and research role of nurses. The instrument contained 17 questions. Responses were coded as: A. Always, B. Almost always, C. Sometimes, D. Very rarely, E. Never, with numerical values from 5 to 1 points respectively. The total possible score range was: minimum 17 (1 point per question), maximum 85 (5 points per question). To divide the total score range (17–85) into four approximately equal categories, the total range was calculated as $85 - 17 = 68$ points; division into four categories yielded $68/4 = 17$ points per category. The following ranges were assigned: Very good: 69–85 points; Good: 52–68 points; Fair: 35–51 points; Poor: 17–34 points. These ranges allowed for an equitable and meaningful classification of scores, facilitating interpretation of the questionnaire results.

Instrument validity was established through “Expert Judgment” by three nephrology nursing specialists with at least 15 years of clinical experience and scientific publications on the topic. Questionnaire reliability was assessed with a pilot test, yielding a Cronbach’s alpha coefficient of 0.80.

Data collection procedure: First, the project was approved by the Faculty of the Señor de Sipán University (FACSA) in Peru by resolution No. 0314-2023/FCS-USS. Authorization was then requested from the director of the Nephrology Center. Subsequently, the investigators administered the data collection instrument in person to patients in a designated room within the same Nephrology Center. Data collection took place between August and October 2023; the approximate duration for completing each questionnaire was 12 minutes.

Statistical methodology: Data obtained from the questionnaire were recorded in an anonymous database and processed using SPSS v25. A descriptive analysis of the collected variables was performed using absolute and relative frequencies.

Ethical aspects: The study received a favorable report from the Research Committee of the School of Nursing at FACSA. The investigators obtained permission from all participants, and participation was voluntary. The Belmont ethical principles¹⁷ were observed.

RESULTS

A total of 85 patients participated in the study. The overall completion rate was 100%. The sociodemographic variables of the sample are shown in **table 1**.

Table 2 shows the results regarding patients’ general perception of the nurse’s role, where 80.0% (n=68) of patients had a “good” perception of these roles.

Table 3 presents the results of patients’ perception of the nurse’s educational role, where 77.6% (n=66) reported a good perception. Similarly, 64.7% (n=55) rated the advice on lifestyle habits indicator positively, 74.1% (n=63) did so for the pre-treatment preparation indicator, and 76.5% (n=65) expressed a good perception of the care-orientation indicator.

Table 4 presents the results on patients’ perception of the nurse’s care (assistential) role, where 84.7% (n=72) expressed a good perception. Likewise, 82.4% (n=70) rated the dialysis daily record indicator positively, 81.2% (n=69) did so for the immediate assistance indicator, and 83.5% (n=71) had a good perception of the complications indicator.

Table 1. Sociodemographic characteristics of the patients.

		n	%
Age	27–40 years	9	10.6%
	41–50 years	11	12.9%
	51–60 years	20	23.5%
	61–70 years	28	32.9%
	>70 years	17	20.0%
	Mean (SD)	47.24 (18.43)	–
Educational level	Illiterate	1	1.2%
	Primary	8	9.4%
	Secondary	34	40.0%
	Higher education	42	49.4%
Sex	Female	33	38.8%
	Male	52	61.2%

Table 5 presents the results on patients’ perception of the nurse’s administrative role, where 77.6% (n=66) showed a good perception. This positive assessment was also reflected in 90.6% (n=77) for the supervision indicator and 71.8% (n=61) for the organization indicator.

Table 2. Perception of patients under HD therapy regarding nursing roles.

Perception of Nursing Roles	n	%
Good	68	80.0%
Fair	17	20.0%
Total	85	100.0%

Table 6 shows the results regarding patients’ perception of the nurse’s research role, where 70.6% (n=60) expressed a good perception. The same positive assessment was seen in 87.1% (n=74) for the knowledge indicator and in 69.4% (n=59) for the quality-of-care indicator.

DISCUSSION

This study found that 61.2% of participants were men between 61 and 70 years of age with higher education; however, other studies have reported that CKD is more

Table 3. Patient perception of the nursing role in the educational role dimension.

	Educational Role		Indicator of orientation in habits		Indicator of of preparation before treatment		Indicator of of care guidance	
Good	66	77.6%	55	64.7%	63	74.1%	65	76.5%
Fair	19	22.4%	30	35.3%	22	25.9%	20	23.5%
Total	85	100.0%	85	100.0%	85	100.0%	85	100.0%

Table 4. Patient perception of the nursing role in the assistance (caregiving) role dimension.

	Assistance Role		Indicator of daily registry of dialysis		Indicator of immediate treatment care		Indicator of complications	
	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
Good	72	84.7%	70	82.4%	69	81.2%	71	83.5%
Fair	13	15.3%	15	17.6%	16	18.8%	14	16.5%
Total	85	100.0%	85	100.0%	85	100.0%	85	100.0%

international study, the nursing role was related to nurses' ethical perception and professional trust; reliable language and action were identified as aspects that improve nursing care practice²⁷.

In this study, hemodialysis patients perceived a high level of nurse competence in performing procedures, which provided them with a sense of safety. Similarly, another local study showed that 91.4% of hemodialysis

patients rated nursing care as excellent¹⁶.

Table 5. Patient perception of the nursing role in the administrative role dimension.

	Administrative Rol		Supervision indicator		Organization indicator	
	Count	Percentage	Count	Percentage	Count	Percentage
Good	66	77.6%	77	90.6%	61	71.8%
Fair	19	22.4%	13	15.3%	24	28.2%
Total	85	100.0%	85	100.0%	85	100.0%

In terms of patients' perception of the administrative role, 77.6% had a good perception. This dimension examined the hospital environment, organization of medication administration, and personalized care. Improvements in the hospital environment positively influence patients' perception of the care role provided by nurses²⁸, which leads to proposing organizational improvements to ensure a more comfortable environment for patients and families^{28,29}.

Table 6. Patient perception of the nursing role in the research role dimension.

	Research Role		Knowledge Indicator		Quality Care Indicator	
	Count	Percentage	Count	Percentage	Count	Percentage
Good	60	70.6%	74	87.1%	59	69.4%
Fair	25	29.4%	11	12.9%	26	30.6%
Total	85	100.0%	85	100.0%	85	100.0%

Barreda found that hemodialysis patients' perception of the nurse's administrative role was unfavorable in 89% and favorable in 11%; the study concluded that patients' perception of the nursing administrative role in that hospital was unfavorable¹⁵, which differs from our results.

An international study including 599 patients from different European countries associated the quality of nursing care for hospitalized hemodialysis patients with their health conditions, as well as with the perception of individuality during care. It found an association between perceived care quality and the patient's trust in the nurse, influenced by the provision of individualized care²⁸.

It is important to propose strategies to achieve patient satisfaction with HD care. It is suggested to provide space that fosters the nurse-patient relationship at an emotional and mental level to understand patients' experiences and reinforce their sense of protection. Nursing care generates positive effects in patients, ranging from routine care and education to minimizing complications, improving mental status and sense of safety, increasing life expectancy, and strengthening the interdependence between patient and nurse³⁰.

Overall, in this study, 80.0% of HD patients at the Santa Rosa Nephrology Center (Peru) had a good perception of the nursing role, while 20.0% had a fair perception, making it necessary to propose improvement strategies to achieve excellence in nursing care. Similar findings were reported in another Peruvian study, where 98.7% of patients perceived care as good, 1.3% as fair, and none had a poor perception¹³.

prevalent among men with low educational levels¹⁸⁻²⁰. It would be important to explore educational level more deeply within the context of hemodialysis patients²²⁻²⁴. Being a hemodialysis patient affects the family environment and finances, where nursing plays an important role.

Regarding patients' perception of the nursing role in the educational dimension, 77.6% of patients reported a good perception, while 22.4% reported a fair perception; for the care-orientation indicator, 76.5% perceived a good level.

In other studies with similar findings, these results were associated with the length of time on treatment and the existing opportunity for interaction and knowledge between patient and nurse, as the longer in-hospital time in hemodialysis increases the possibility of addressing educational and support needs, thereby reducing high levels of anxiety^{25,26}.

Regarding patients' perception in the care (assistential) dimension, 84.7% had a good perception. In this dimension, the nurse's empathy and the development of skills in immediate patient care are evaluated. In another

This may be interpreted as the need to maintain the technical component and theoretical knowledge inherent to renal units, while strengthening the relationships of trust, respect, and empathy nurses can offer. Nursing interventions proposed for the care of people with CKD have progressively incorporated educational, behavioral, and discipline-specific theories to support their effectiveness and promote their implementation in hospital practice²⁸. This reflects what every vulnerable person expects to receive: respect, empathy, and authenticity³¹.

Regarding patients' perception of the research role, 70.6% expressed a positive perception and 29.4% a fair perception in this dimension. A total of 87.1% had a favorable perception of nurses' knowledge, while only 12.9% had a fair perception in this regard. For the quality-of-care indicator, 69.4% perceived that nurses provided quality care, whereas 30.6% considered care quality to be fair.

These results were compared with a previous study³² in which the mean score for patients' perception of the nurse's research role was 81.78. That study also concluded that there was a positive correlation between nurses' research role and the satisfaction of patients on dialysis.

Among this study's limitations, it should be noted that it was conducted in a single hemodialysis center in Chiclayo, northern Peru, and the sample was selected by non-probabilistic convenience sampling, which limits the generalizability of the results. In addition, the questionnaire was developed by the investigators and was not the same instrument used in other studies, so comparisons may be biased. However, it was decided to develop a new tool because the pandemic context made it difficult to find a validated instrument from studies carried out during the health emergency.

It is advisable to also explore nurses' own perceptions of their care practice, including those of family members, and to develop programs that enhance nursing practice using indicators of how the nursing role is perceived.

In light of these results, we can conclude that most patients on HD have a good perception of the nurse's role; only 20.0% had a fair perception. It is necessary to develop interventions to support the continuous improvement of specialized care.

Conflicts of interest

None declared.

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AWARD

Donation and Transplant

Sponsored by the Spanish Society of Nephrology Nursing (SEDEN) with the goal of stimulating the work of professionals in this field, the 8th edition of the Donation and Transplant Award is announced under the following:

- All works submitted to the XLIX National SEDEN Congress related to the field of kidney transplantation are eligible.
- Submissions must be written in Spanish.
- Works must be unpublished and comply with all submission guidelines for the XLIX National SEDEN Congress.
- The submission deadline will be the same as that established for other submissions to the 2024 SEDEN Congress.
- The jury will consist of the SEDEN Scientific Committee for Abstract Evaluation.
- The award will be presented during the inaugural session of the XLIX National SEDEN Congress (2024).
- The winning work will be made available to the *Enfermería Nefrológica* journal for possible publication, at the discretion of the editorial committee. Authors must cite the work's origin as a SEDEN Award if using or publishing it later.
- To receive the award, the work must be presented at the 50th SEDEN Congress, and the presenter must be one of the listed authors. Presentations by individuals not involved in the authorship will not be accepted.
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- The award may be declared void.

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Neoplastic alterations in people with chronic kidney disease on haemodialysis: a retrospective analysis

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ABSTRACT

Introduction: Chronic kidney disease is one of the ten leading causes of death in Spain, being an underdiagnosed pathology. Kidney disease and cancer have a multifactorial and bidirectional association. Kidney Disease Improving Global Outcomes estimates a 12-25% incidence of neoplasms. The Spanish Society of Nephrology has set up a multidisciplinary working group called Onconephrology to better respond to these people's needs.

Objective: To determine the incidence and prevalence of neoplasms in people on haemodialysis, as well as to describe the most commonly diagnosed types of cancer and related variables.

Material and Method: A retrospective, single-centre cohort study from January 2021-December 2023 in a haemodialysis unit. Sociodemographic and clinical data were collected from a specific nephrology database and clinical history.

Results: Thirty patients were detected with some neoplasia: prevalence 31% and incidence 17% (83% men, mean age 73±11 years). 73% dyslipidaemic, 50% diabetic, 93% hypertensive, 73% cardiovascular disease, Charlson index 9.9±2.6 points, 30% obese and 50% smokers. Aetiology of renal disease: tumour-derived (27%) and diabetic nephropathy (17%). Some 7% had a previous transplant. Most common neoplasms: 40% genitourinary-20% haematological. 27% had more than one tumour. Oncological treatment: 33% medical-surgical and 33% chemotherapy-immunotherapy. Mortality was higher in oncological tumours (40%).

Conclusions: We found a high incidence and prevalence of neoplasms and a high mortality. The results need to be confirmed in prospective studies.

Keywords: chronic kidney disease; chronic renal disease; haemodialysis; mortality; neoplasia; onconephrology.

RESUMEN

Percepción de los pacientes con terapia de hemodiálisis respecto al rol de enfermería en Perú

Introducción: La enfermedad renal crónica se sitúa entre las diez primeras causas de muerte en España, siendo una patología infradiagnosticada. La enfermedad renal y el cáncer tienen una asociación multifactorial y bidireccional. La Kidney Disease Improving Global Outcomes, estima una incidencia de neoplasias del 12-25%. La Sociedad Española de Nefrología ha puesto en marcha un grupo de trabajo multidisciplinar denominado Onconefrología con el objetivo de dar mejor respuesta a las necesidades de estas personas.

Objetivo: Determinar la incidencia y prevalencia de neoplasias en personas en hemodiálisis, así como describir los tipos de cáncer más comúnmente diagnosticados y las variables relacionadas.

Material y Método: Estudio de cohortes retrospectivo y unicéntrico de enero 2021-diciembre 2023, en una Unidad

de Hemodiálisis. Se recogieron datos sociodemográficos y clínicos de una base de datos específica de nefrología y de la historia clínica.

Resultados: Se detectaron 30 pacientes con algún tipo de neoplasia; prevalencia 31% e incidencia del 17% (83% hombres, edad media 73±11 años). El 73% dislipémicos, 50% diabéticos, 93% hipertensos, 73% enfermedad cardiovascular, Índice de Charlson 9,9±2,6 puntos, 30% obesos y 50% fumadores. Etiología de enfermedad renal: derivada del tumor (27%) y nefropatía diabética (17%). Un 7% tuvo trasplante previo. Neoplasias más comunes: 40% genitourinarias-20% hematológicas. Un 27% presentó más de un tumor. Tratamiento oncológico: 33% médico-quirúrgico y 33% quimioterapia-inmunoterapia. La mortalidad fue superior en los oncológicos (40%).

Conclusiones: Se encontró una alta incidencia y prevalencia de neoplasias y una elevada mortalidad. Los resultados deben ser confirmados con estudios prospectivos.

Palabras clave: consulta monográfica; enfermedad renal crónica; hemodiálisis; mortalidad; neoplasia; onconeurología.

INTRODUCTION

Chronic kidney disease (CKD) has become a major public health problem, both globally and nationally. In Spain, the EPIRCE study¹ reported in 2010 that CKD affects approximately 10% of the adult Spanish population and more than 20% of people over 60 years of age, with a high rate of underdiagnosis. More recently, 2 additional studies—the ENRICA-renal study² in 2018 and the IBERICAN study³ in 2020—estimated CKD prevalence at 14.4% and 15.1%, respectively, higher than the estimate from The Global Kidney Health Atlas 2019⁴, which places Spain at 12% for stages 3 to 5. Indeed, CKD now ranks among the top ten causes of morbidity and mortality in Spain. As with prevalence, CKD-associated mortality has increased by 30% over the past ten years in our country, and it is expected to become the fifth leading cause of death by the year 2040⁵. According to the National Institute of Statistics (INE)⁶, in 2022 there were 464,417 deaths in Spain. Diseases of the circulatory system and tumors accounted for half of these deaths, making them the leading causes. These causes vary by age: while circulatory diseases are responsible for many deaths among the elderly, tumors are among the leading causes of death in individuals younger than 60 years of age. In addition, the World Health Organization (WHO) estimated that the age-standardized incidence of kidney cancer worldwide was 6.1% in men and 3.2% in women per 100,000 people in 2020 (4.6% overall). Global mortality was 1.8% in 2020⁷. The Kidney Disease Improving Global Outcomes (KDIGO)⁸ estimates an incidence of neoplasms in these patients between 12–25%.

In developed countries, improved cancer survival due to more effective treatments has resulted in a growing

population of cancer survivors who are at increased risk of nephropathy. Renal, oncologic, and hematologic diseases share overlapping areas of reciprocal influence, presenting a bidirectional, multifactorial, and causal relationship, since it has been demonstrated that one may act as a risk factor for the other. Cancer can affect the kidney due to the toxic effects of medications, radiation, and the tumor itself⁹. Likewise, patients requiring renal replacement therapy (RRT)—particularly those with a kidney transplant (KT)—are at high risk for cancer due to inherent immunosuppression^{10,11}. Additionally, renal cancer may require nephrectomy, in patients with or without prior CKD or in those with a solitary kidney, precipitating the need for dialysis.

Due to the complexity of managing these patients, most authors agree on the importance of creating multidisciplinary working groups with proactive collaboration to address their needs through dedicated clinics, where nursing plays an essential role¹²⁻¹⁵. The goal of these groups is to assess the patient holistically through joint participation of various specialists, establishing the best treatment to manage the oncologic condition while preserving renal function (RF) as much as possible, with treatment individualized for each patient. Along these lines, the Spanish Society of Nephrology (SEN) launched in 2018 a new working group called ONCONEPHROLOGY¹⁶ aimed at better addressing the needs of these patients. They also recommend conducting epidemiological studies, using renal biopsy as a fundamental diagnostic and prognostic tool, monitoring RF, creating a biobank, establishing consensus-based protocols for inclusion and management, developing training programs, and recognizing the need for a subspecialty.

Therefore, the general objective of the present study was to determine the incidence and prevalence of neoplasms in individuals undergoing hemodialysis (HD); and, as specific objectives, to describe the most widely diagnosed cancer types, the most frequent causes of mortality, and the related variables.

MATERIAL AND METHOD

Study design and setting. We conducted a retrospective, single-center cohort study conducted through review of electronic medical records (EMR) from patients followed in the HD Unit of Hospital Universitario de la Princesa. The aim was to analyze the evolution of both conditions and the clinical and/or sociodemographic determinants. The study was conducted between January 2021 and December 2023, with a median follow-up time of 21 (IQR, 25) months.

Population and sample. All adult patients with at least three months on RRT with HD, who received treatment in the chronic HD Unit during the study period, were included. As this was a retrospective study, informed consent (IC) could not be obtained from deceased or transplanted patients; therefore, only those actively undergoing HD at the Unit were able to sign consent. Regarding patients with

onconephrologic disease, both incident and prevalent cases were included. Incident cases were those who developed the tumor while on HD; prevalent cases were those previously diagnosed with a tumor before initiating HD or those who continued with active cancer during the 3-year follow-up. Patients transferred to other centers during the study period were excluded.

Study variables Primary variables included type of neoplasm, time of onset, progression, antineoplastic treatment received, and number of neoplasms developed. Secondary variables included: age, gender, smoking status, time on HD, history of KT, and pharmacologic treatment (angiotensin-converting enzyme inhibitors [ACEIs] and proton pump inhibitors [PPIs]). Data on comorbidities, CKD etiology, and Charlson Comorbidity Index were collected, along with causes of mortality.

Data collection. Sociodemographic, clinical, pharmacological, HD duration, and renal and oncologic disease data were collected from EMRs using the HP-HCIS information system and from Nefrosoft, a nephrology-specific care management database.

Statistical analysis. Results were processed using Microsoft Excel 2019 and SPSS 28.0. Categorical variables were expressed as absolute values and percentages; quantitative variables with normal distribution as mean \pm standard deviation; and tables and graphs were used for representation. Comparisons between normally distributed quantitative variables with similar variances were performed using Student's t-test. The Chi-square test was used for comparison of proportions. Mortality was analyzed using a multivariable logistic regression model. A $p < 0.05$ was considered statistically significant.

Ethical and legal aspects. Only patients undergoing active HD were informed of the study's objectives and signed IC, as previously explained. Confidentiality of collected records (anonymous and encrypted) was maintained in accordance with Organic Law 3/2018 on Personal Data Protection and Guarantee of Digital Rights. Personal data were protected and included in a file subject to the guarantees of Regulation (EU) 2016/679 of the European Parliament and of the Council (General Data Protection Regulation, GDPR). Required permissions were obtained from the Clinical Research Ethics Committee with Medicines (CEIm) of *Hospital Universitario de la Princesa* (Madrid, Spain) (5507). Ethical principles outlined in the Declaration of Helsinki (1964) were respected and supplemented by the Biomedical Research Law 14/2007 and the Basic Law 41/2022 on Patient Autonomy.

RESULTS

A total of 97 patients were evaluated, with a mean age of 73 ± 13 years; 69% ($n=67$) were men, of whom 30 (31%) had developed some type of neoplasm, with an incidence of cancer after initiation of HD of 17% ($n=16$).

Among the 30 patients with neoplastic disease, 83% ($n=25$) were men with a mean age of 73 ± 11 years and mean HD duration of 38 ± 28 months. Regarding comorbidities: 73% ($n=22$) had dyslipidemia, 50% ($n=15$) diabetes, 93% ($n=28$) hypertension (HTN), and 77% ($n=23$) cardiovascular disease (CVD). Additionally, 27% ($n=8$) were overweight, 3% ($n=1$) obese, with a mean Charlson Index of 9.9 ± 2.6 points. Half (50%, $n=15$) were smokers. The most frequent CKD etiology among patients with neoplastic disease was tumor-related in 27% ($n=8$), followed by diabetic nephropathy in 17% ($n=5$). Only 7% ($n=2$) had a KT.

Comparisons of sociodemographic and clinical characteristics and CKD etiology between patients with and without neoplastic disease are shown in **table 1** and **figure 1**. Significant associations were found between development of neoplasm and male sex ($p=0.042$), higher Charlson comorbidity index ($p=0.006$), and CKD etiology ($p=0.002$). Smoking approached statistical significance ($p=0.056$).

The most frequently diagnosed neoplasms were 67% ($n=20$) solid tumors, of which 40% ($n=12$) were genitourinary cancers and 23% ($n=7$) GI cancers. One patient could not have the primary tumor classified due to digestive metastases at diagnosis. Hematologic neoplasms accounted for 20% ($n=6$), and cutaneous neoplasms for 13% ($n=4$). A total of 27% ($n=8$) presented more than one tumor. Furthermore, 17% ($n=16$) developed a tumor while receiving active HD; of these, 31% ($n=5$) had had a prior tumor of a different origin before starting HD. Regarding tumor evolution, 30% ($n=9$) had active disease, 30% ($n=9$) had controlled disease, and 40% ($n=12$) had died. Regarding oncologic treatment, 33% ($n=10$) received medical-surgical management, 33% ($n=10$) chemotherapy-immunotherapy, 3% ($n=1$) radiotherapy, 20% ($n=6$) surgery alone, and 10% ($n=3$) received conservative management. Among the 30 patients with neoplasia, 12 (40%) died during follow-up, of whom 67% ($n=8$) had active neoplastic disease at the time of death. General characteristics of patients with neoplastic disease are shown in **table 2**.

Patients with neoplastic disease had higher mortality than those without it (40% vs 31%, $p=0.406$). Mortality causes were analyzed between the two groups (**figure 2**), and associated factors showed significant differences in age ($p=0.004$), male sex ($p=0.022$), Charlson index ($p=0.004$), history of CVD ($p=0.001$), and ACEI treatment ($p=0.038$) (**table 3**). In a multivariable model adjusted for sex, Charlson Index, diabetes mellitus (DM), and oncologic disease, history of cardiovascular events (OR 6.9, 95% CI [1.4–35.2], $p=0.019$) and age (OR, 1.07, 95% CI [1.01–1.13], $p=0.014$) were independent predictors of mortality (**table 4**).

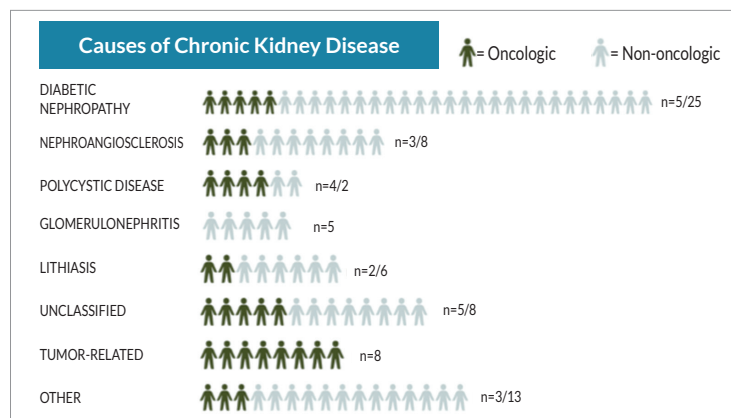
DISCUSSION

Our data show that oncologic disease is very common among individuals requiring HD. In our cohort, cancer prevalence reached 31% and incidence 17%. These data, although consistent with high cancer rates in HD patients, align with pu-

Table 1. Comparison of sociodemographic and clinical variables of the full sample according to diagnosis of neoplastic disease or no disease.

	Oncologic (n=30)	Non-oncologic (n=67)	Total (n=97)	P-value
Age (years)*	73±11	74±14	73±13	0.655 [^]
Time on HD (months)*	38±28	41±32	39±31	0.755 [^]
Charlson Index (points)*	9,9±2,6	8,3±2,4	8,8±2,5	0.006 [^]
Sex				
- Male	83% (n=25)	63% (n=42)	69% (n=67)	
- Female	17% (n=5)	37% (n=25)	31% (n=30)	0.042 ^{^^}
Pharmacological Treatment				
- Proton pump inhibitors	73% (n=22)	70% (n=47)	71% (n=69)	0.749 ^{^^}
- ACE inhibitors	10% (n=3)	16% (n=11)	14% (n=14)	0.406 ^{^^}
Comorbidity				
Diabetes %	50% (n=15)	55% (n=37)	54% (n=52)	0.633 ^{^^}
Dyslipidemia %	73% (n=22)	66% (n= 44)	68% (n=66)	0.455 ^{^^}
Arterial hypertension %	93% (n=28)	91% (n=61)	92% (n=89)	0.705 ^{^^}
Cardiovascular disease %	77% (n=23)	72% (n=48)	73% (n=71)	0.984 ^{^^}
Obesity %	3% (n=1)	8% (n=5)	6 % (n=6)	0.556 ^{^^}
Overweight %	27% (n=8)	33% (n=22)	31% (n=30)	
Tobacco use %	50% (n=15)	30% (n=20)	36% (n=35)	0.056 ^{^^}
Previous transplant %	7% (n=2)	18% (n=12)	14% (n=14)	0.145 ^{^^}

*Mean ± standard deviation; [^] Student's t-test; ^{^^} Chi-square test; n: sample size.



CKD: chronic kidney disease; n: sample size.

Figure 1. Etiology of CKD among individuals with neoplastic disease and without neoplastic disease.

blished series such as the KDIGO Controversies Conference on Onconephrology (2018), which reported a neoplasm incidence of 12–25%⁸, or data from the HD Unit at Hospital Universitario Infanta Sofía in Madrid, which reported a 20% incidence including peritoneal dialysis patients¹³. However, within the spectrum of advanced CKD requiring RRT, the subgroup with the highest oncologic burden is kidney transplant recipients. Although our study excluded kidney graft recipients, a recent systematic review¹¹ reported an incidence reaching 10–27%.

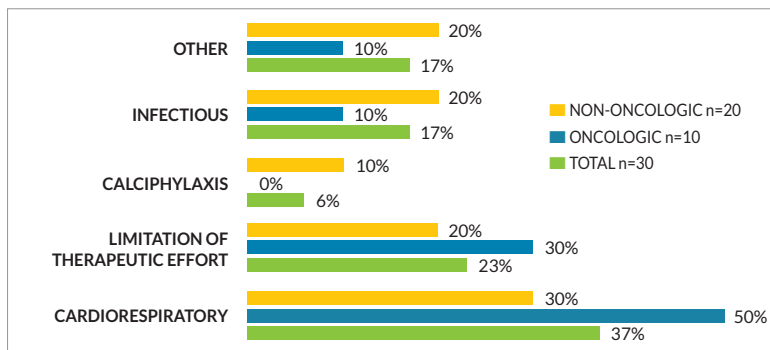
Regarding the type of neoplasm diagnosed, several studies describe solid tumors as more frequent than hematologic malignancies, with genitourinary cancers being the most prevalent^{8,9,11,15,18,19}. In our study, 67% were solid tumors (40% genitourinary), compared to 20% hematologic disease. In a case series from the National Cancer Institute of Colombia (2008)¹⁸, 61% of patients presented genitourinary neoplasms; the KDIGO Controversies Conference (2018) also supports this finding⁸. In a systematic review of KT recipients¹¹, most reports (11 of 14) found genitourinary tumors to be the most common, although in three studies cutaneous tumors predominated due to the increased risk of skin lesions from immunosuppressive treatment; hematologic diseases were the second most frequent. Furthermore, the *CORE Curriculum in Nephrology: Onconephrology* (2023)⁹ also highlights a high prevalence of solid tumors, hematologic malignancies, and skin cancers, with higher rates in KT recipients.

Regarding variables analyzed, several studies^{8,11} report that these patients tend to be older and predominantly male, except for the Colombian study¹⁸ in which female patients predominated. Additionally, risk factors such as DM, HTN, CVD, obesity, KT, certain medications like PPIs¹⁹, and smoking are considered associated factors^{8,12}. Our findings support that comorbidity (Charlson Index) and age were associated with the presence of neoplasia. Some authors also propose ACEIs

Table 2. General characteristics of patients with neoplastic disease.

Patient	Age (years)	Sex	Tumor Type	Neoplasm Status	CKD Etiology	Treatment Received	Number of Tumors
1 E	74	M	Lymphoma	Active	Nephrotoxicity	Chemotherapy	1
2 E	85	M	Epidermoid	Active	Non-affiliated	Surgical	1
3 E	63	M	Bladder cancer	Active	Non-affiliated	Medical-Surgical	3
4 E	68	M	Colon cancer	Active	Polycystosis	Surgical	2
5 E	73	M	MDS	Controlled	Non-affiliated	Conservative	1
6 E	78	M	MDS	Active	Chronic lithiasis	Chemotherapy	1
7 E	72	M	Gastric cancer	Active	Diabetic nephropathy	Surgical	1
8 E	87	M	Bladder cancer	Controlled	Chronic lithiasis	Surgical	1
9 E	75	M	Bladder cancer	Controlled	Nephroangiosclerosis	Medical-Surgical	1
10 E	86	M	Digestive metastases	Active	Polycystosis	Conservative	1
11 E	77	M	Prostate cancer	Controlled	Nephrotoxicity	Medical-Surgical	1
12 E	82	M	Prostate cancer	Active	Tumoral	Medical-Surgical	3
13 E	80	M	Bladder cancer	Controlled	Diabetic nephropathy	Surgical	1
14 E	61	M	Bladder cancer	Active	Polycystosis	Medical-Surgical	1
15	71	M	Epidermoid	Active	Diabetic nephropathy	Chemotherapy	2
16 E	53	M	Rectal cancer	Controlled	Non-affiliated	Medical-Surgical	1
17	91	M	Kidney cancer	Controlled	Nephrectomy	Surgical	1
18 E	85	M	Prostate cancer	Active	Diabetic nephropathy	Conservative	1
19	70	M	Kidney cancer	Active	Nephrectomy	Medical-Surgical	2
20	83	M	Colon cancer	Controlled	Nephroangiosclerosis	Chemotherapy	1
21	76	M	Colon cancer	Active	Diabetic nephropathy	Medical-Surgical	2
22	76	M	Colon cancer	Active	Diabetic nephropathy	Chemotherapy	1
23	69	M	Colon cancer	Controlled	Infectious	Chemotherapy	1
24	67	M	Lymphoma	Active	Tumoral	Chemotherapy	1
25	81	F	Multiple myeloma	Active	Tumoral	Chemotherapy	1
26	75	M	Epidermoid	Controlled	Tumoral	Radiotherapy	2
27	71	M	Bladder cancer	Active	Tumoral	Medical-Surgical	1
28	61	M	Lymphoma	Controlled	Polycystosis	Medical-Surgical	1
29	76	F	Ovarian cancer	Controlled	Tumoral	Chemotherapy	2
30	61	M	Epithelioma	Controlled	Non-affiliated	Chemotherapy	1

M: Male; F: Female; MDS: Myelodysplastic syndrome; CKD: Chronic kidney disease.

**Figure 2.** Causes of mortality in the entire sample.

as protective agents and recommend their use⁸; in our results, ACEI use was not significant among patients with neoplastic disease. However, when analyzing mortality-associated factors in the entire cohort, ACEI use did reach statistical significance. Regarding CKD etiology, tumor-related etiology (27%) was associated with higher rates of onco-nephrologic disease, consistent with other authors^{11,15}.

Cancer-related mortality was high (40%) in patients with neoplastic disease. Causes

Table 3. Comparison of sociodemographic and clinical variables between deceased and surviving patients.

n= 97	Deceased (n= 32)	Surviving (n=65)	p-value
Age (years)*	78.30±7.61	70.37±14.24	0.004 [^]
Time on HD (months)*	41.70±31.60	39.23±30.61	0.946 [^]
Charlson Comorbidity Index (points)*	9.91±2.17	8.28±2.56	0.004 [^]
Sex			
Male (n=67)	84% (n=27)	62% (n=40)	0.022 ^{^^}
Female (n=30)	16% (n=5)	38% (n=25)	
Pharmacologic Treatment			
PPIs (n=69)	(n=23)	(n=46)	0.910 ^{^^}
ACE inhibitors (n=14)	(n=8)	(n=6)	0.038 ^{^^}
Comorbidities			
Diabetes (n=52)	(n=17)	(n=35)	0.947 ^{^^}
Dyslipidemia (n=66)	(n=22)	(n=44)	0.916 ^{^^}
Arterial hypertension (n=89)	(n=29)	(n=60)	0.777 ^{^^}
Cardiovascular disease (n=71)	(n=30)	(n=41)	0.001 ^{^^}
Overweight (n=30)	(n=13)	(n=17)	0.285 ^{^^}
Tobacco use (n=35)	(n=11)	(n=24)	0.806 ^{^^}
Previous transplant (n=14)	(n=4)	(n=10)	0.704 ^{^^}
Oncologic disease (n=30)	40% (n=12)	60% (n=18)	0.326 ^{^^}

* Mean ± standard deviation; [^] Student's t-test; ^{^^} Chi-square test; PPIs: proton pump inhibitors; ACE inhibitors: angiotensin-converting enzyme inhibitors; n: sample size.

Tabla 4. Adjusted multivariable model for mortality.

Variable	Odds Ratio	95%CI (Lower/Upper)	p-value
Sex	2.551	0.741/8.788	0.138
Age	1.073	1.014/1.135	0.014
Charlson Index	1.232	0.961/1.579	0.100
CVD	6.973	1.378/35.392	0.019
Diabetes Mellitus	0.647	0.217/1.925	0.433
Enfermedad neoplásica	1.400	0.447/4.382	0.563

CVD: Cardiovascular disease; DM: Diabetes mellitus; CI: Confidence interval.

of death were analyzed, with cardiorespiratory causes being the most common (50%). Notably, 67% of patients had active neoplastic disease at the time of death. Few studies report cancer-related mortality causes, although published series highlight worse survival, especially among KT recipients^{11,15,18}. This underexplored area opens opportunities for future research.

In recent years, the introduction of immunomodulatory therapies for cancer treatment (e.g., mTOR and checkpoint inhibitors) has greatly improved survival, although these treatments

are not without toxic effects^{15,19}. In our study, specific chemotherapy-immunotherapy regimens and their toxic effects were not collected, representing a limitation. Regarding iodinated contrast and excessive radiation exposure, our hospital does have protocols to prevent and protect RF.

Study limitations include those inherent to retrospective design. Second, being a single-center study and including only one RRT modality introduces potential selection bias and limits external validity.

It is essential to address the role of nursing in the care of individuals receiving HD for RRT, encompassing dimensions that significantly impact quality of care and patient well-being. Effective communication and understanding of individual needs are key elements for delivering person-centered, holistic care. Nursing professionals caring for HD patients with neoplastic disease must provide highly specialized and complex care, as both diseases are extremely invasive. Nurses play an important role both in prevention and in the care of these neoplastic conditions, requiring profession-specific care skills in addition to optimal mastery of treatment techniques and monitoring²⁰.

Based on our findings and the considerations discussed, we believe that the presence of an Advanced Practice Nurse (APN) in Onconephrology is essential to address the special needs of these patients: providing education on self-care and care strategies, monitoring the progression of both diseases, and offering high-quality, holistic nursing care while proactively accompanying patients throughout their disease process. In a recent article by Crespo-Montero R²¹, regarding APN competencies, the Andalusian Care Strategy highlights APN roles in complex oncologic conditions and CKD care, referencing several hospitals that have implemented APN positions in nephrology nursing, including *Hospital de la Princesa*²², which is directly relevant to our study.

We conclude that our study shows that individuals requiring HD experience a high incidence and prevalence of oncologic disease, with a very poor prognosis. Although our findings should be confirmed in prospective studies, we believe that multidisciplinary onconephrologic evaluation is essential for proper management of these patients, where the APN role could be a key component of the care team.

Conflicts of interest

None declared.

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None declared.

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12. The prize may be declared void.
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*The monetary award is subject to tax withholding.



Did the pandemic change the image of Spanish nurses? Nurse identity and voice as sources of information

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ABSTRACT

Introduction: The media plays a crucial role in shaping nurses' social image. Disseminating a nursing image inconsistent with their professional identity has adverse consequences for nurses, the healthcare system, and society.

Objective: To compare nurses' image and role as information sources in 2019 and 2020, the professional identity framework agreed upon by ISPIN will be used for analysis. To study whether the image of nurses in the media during the COVID-19 pandemic was more comprehensive and whether they were given a more significant role as information sources.

Material and Method: Quantitative analysis using an instrument that evaluates the coherence between the published image and the professional nurse identity defined by ISPIN in 468 news articles published in *El País* and *El Mundo* in 2019 and 2020, which included the words nurse(s) or nursing.

Results: The media presence of nurses increased in 2020. The main topics in which they were mentioned during the two years were related to problematic issues within the profession. The number of reports describing their daily work

increased in 2020. The most widely publicized role remained caregiving, but their visibility as managers grew during the pandemic. Stereotypes used to represent them decreased, and the presence of male nurses was more significant.

Conclusion: Although the presence of nurses and their associations as information sources increased, they were not the primary sources in most of the news articles.

Keywords: nursing; nurse image; nurse identity; information sources; press.

RESUMEN

¿C cambió la pandemia la imagen de las enfermeras españolas? Identidad enfermera y voz como fuentes informativas

Introducción: Los medios de comunicación son claves en la configuración de la imagen social de las enfermeras. La difusión de una imagen de enfermería incoherente con su identidad profesional tiene consecuencias adversas para las enfermeras, para el conjunto del sistema sanitario y para la sociedad.

Objetivo: Comparar la imagen de las enfermeras y su papel como fuentes informativas en 2019-2020 tomando como marco para el análisis la identidad profesional consensuada por ISPIN. Estudiar si durante pandemia por COVID-19 la imagen de las enfermeras en los medios fue más completa y si se les dio un mayor protagonismo como fuentes informativas.

Material y Método: Análisis cuantitativo mediante instrumento que evalúa la coherencia entre la imagen publicada y la identidad profesional enfermera definida por ISPIN en las 468 noticias publicadas en El País y El Mundo en 2019-2020, que incluían la palabra enfermera/s, enfermeros/s o enfermería.

Resultados: La presencia mediática de las enfermeras aumentó en 2020. Las temáticas principales en las que se las mencionó durante los dos años estuvieron relacionadas con cuestiones problemáticas del ejercicio de la profesión. El número de informaciones publicadas en las que se describe su trabajo diario aumentó en 2020. El rol más difundido fue el asistencial, pero la visibilidad de su función como gestoras creció durante la pandemia. Los estereotipos para representarlas se redujeron y la presencia de hombres enfermeros fue mayor.

Conclusión: Aunque se incrementó la presencia de las enfermeras y de sus asociaciones como fuentes informativas, no fueron fuentes principales en la mayoría de las noticias.

Palabras clave: enfermería; imagen enfermera; identidad enfermera; fuentes informativas; prensa.

INTRODUCTION

The image of nurses in the media is key to the development of the profession. As in other professional fields, the way nursing work is portrayed not only affects social recognition¹ or the personal satisfaction of each nurse, but also the profession as a whole². Issues such as public investment in health systems, public and patient trust³, the quality of the services they provide^{4,5}, nurses' own perception of their profession⁶, their intention to leave their jobs, or the demand from students who wish to study nursing⁷ depend, to a large extent, on the image that public opinion builds through the media^{8,9}.

Studies analyzing the image of nursing disseminated through the press, radio, television, and social networks have increased over the years⁹. Most share a common finding: the published image of nurses does not correspond to the reality of their work nor to the evolution this discipline has undergone in recent decades. As the literature reviews on this topic conclude, there is a lack of media visibility of nurses and, in many cases, their image is distorted, simplified, stereotyped, and does not reflect the diversity, value, and richness of their work⁸⁻¹¹.

The most recent review concluded that in 40% of cases this image was negative and, in a further 20%, the negative traits outweighed the positive ones⁹.

For all these reasons, it is relevant to continue analyzing in detail and from different angles the problems that affect the image of nursing and its representation.

The more detailed and comprehensive the analysis, the more it will help nurses and the organizations that represent them to understand how to communicate their identity strategically^{12,14}. At the same time, it will help journalists, advertisers, and communicators to reflect on their practices, understanding what to avoid and which ingrained habits to challenge so that the image they disseminate is coherent with—or at least approximates—the identity of the nursing discipline in the twenty-first century^{15,16}. It should be added that, despite numerous studies, professional nursing identity¹⁷ is not yet globally agreed upon, making it essential that such research starts from a clear, prior definition that allows comparison with the published image^{11,13}.

Researchers who have examined this field have developed coding schemes to apply to specific samples of news, typically in a single type of medium (mainly print press) and over a defined period⁹. Before the pandemic, only two quantitative studies were identified that were replicated in two different time samples in order to compare whether the image had improved or worsened^{18,19}.

On the other hand, insufficient attention has yet been paid to the role of nurses as sources in health news. Sources are people, institutions, and organizations of all kinds that provide the information needed by the media to produce news. They are particularly relevant in specialized journalism, given that journalists rely on the specific knowledge and credibility of professionals, as well as on their ability to contrast and verify information^{20,21}. According to the *Observatorio de la Comunicación Científica* (2008), "the distribution in the use of sources is mainly disputed between those from the scientific-health sector and those from the political-administrative sector". However, the weight and role of different specific actors in the health sector, such as nurses in this case, still remain to be investigated²².

For all the above reasons, this article aims to analyze and compare two samples of news items published by the two most important Spanish national newspapers, in both print and online versions, over two consecutive years: 2019 and 2020. The objective is to observe which elements persist and which aspects change regarding the image of nurses conveyed in 2019 (a period of "normal" news conditions) and during the 2020 health crisis, so that their role as information sources can be evaluated. Some recently published studies confirm that the pandemic has led society to pay more attention to nurses, partly due to the increased media visibility of this profession, which has been on the front line of defense against the virus worldwide²³⁻²⁵. However, no study has yet shown in a comprehensive way what that image is like, whether it

corresponds to the image nurses and their associations have of their own work, and whether nurses have been heard as information sources.

Indeed, the scientific literature shows that, in times of pandemic, usual patterns of news presentation change and health-related information reaches its highest prominence due to the nature of the pathogen, with health professionals and biomedical experts taking on a particularly central role as information sources and authorities²⁶⁻²⁷. Considering that during the COVID-19 crisis media attention focused on health services and their main actors²⁸, this has opened an opportunity to conduct a content analysis of press coverage of nurses before and during COVID-19, not only because the volume of publications increased²⁷ but also because of the greater impact that such information may have had on public opinion^{23,29,30}.

ENDPOINTS

The specific endpoints of this study are to analyze whether the pandemic in Spain has contributed to increasing the visibility of nurses in the print press; reflecting nurses' identifying features, their work in the health system, and their professional competence; and strengthening their role as information sources on health issues.

Throughout the study, the term “nurses” will be used to refer collectively to female and male nurses, in line with the recommendation made by professional associations in the sector³¹.

MATERIAL AND METHODS

We conducted an exploratory, analytical, cross-sectional quantitative study. It follows the tradition of social sciences research on the image of nursing, applying in this case a quantitative content analysis tool (instrument) to a sample of news items⁹.

Sample selection

The analysis focused on the two leading Spanish national general-interest newspapers, *El País* and *El Mundo* (2019–2020), whose print and online versions are well established³². In this way, the study follows the line of research that analyzes the content of news about nurses in reference print media in countries such as Italy³³, Brazil^{24,34}, or China³⁵, contributing to the existing scientific discussion.

Unlike other studies that have searched for an explicit mention anywhere in the text or that have analyzed the presence of nurses in health news^{8,9,11}, this study opted to search for news in which nurses played a prominent role, that is, where they were—or could reasonably be expected to be—the main protagonists of the story, a criterion also used in previous research^{33,36}.

Therefore, following journalistic relevance criteria, which establish that the “who”, together with the other 5 Ws (what, when, where, why), must be present in the first level of reading of the news³⁷, we selected items in which the nurse or nursing appeared in the headline or subheadline.

The search for news items was carried out using My News. Its advanced search function was used to retrieve items that contained in the headline or subheadline any of the following terms: *enfermera*, *enfermero*, *enfermeras*, *enfermeros*, *enfermería*, using the Boolean operator OR. Eight searches were performed in four outlets—*El Mundo*, *elmundo.es*, *El País*, *elpais.com* (which also retrieves content from *El País Semanal*)—for 2 time intervals in each: from 1/1/2019 to 12/31/2019, and from 1/1/2020 to 12/31/2020.

News items were excluded when the term *enfermería* referred to the physical space for treatment or care, and when the word was part of the compound term *auxiliar de enfermería* (“nursing assistant”), as this is a different profession in Spain.

Following these criteria, a final corpus of 468 news items was obtained. **figure 1** shows the complete flowchart of the collection process.

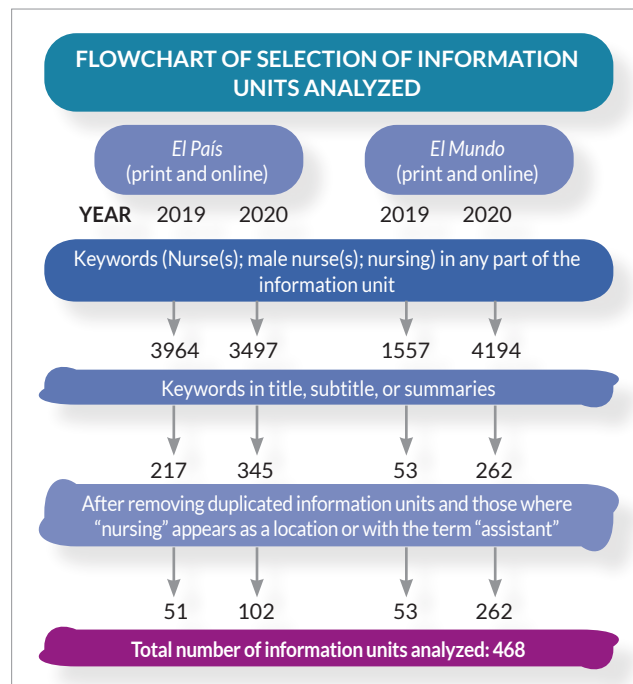


Figure 1. Collection Flowchart.

Analysis variables

Quantitative analysis variables from a previously designed instrument were applied to the units in the sample. Through 33 variables, the instrument makes it possible to assess the coherence between the definition of professional nursing identity provided by the International Society for Professional Identity in Nursing (ISPIN) and the image of the profession published in print and online media.

Table 1. Reliability coefficients among coders for formal variables.

Variable	Average % Agreement	Scott's Pi	Cohen's Kappa	Krippendorff's Alpha
Day of the week	100%	1	1	1
Day of the month	100%	1	1	1
Month	100%	1	1	1
Year	100%	1	1	1
Medium	100%	1	1	1
Front-page appearance	100%	1	1	1
Section of the medium	98%	0.973	0.973	0.974
Journalistic genre	100%	1	1	1
Graphic accompaniment	94.1%	0.875	0.875	0.876
News size	88.2%	0.804	0.804	0.805
Page type	100%	1	1	1
Duplication status (if repeated)	98%	0.962	0.962	0.963
Note signature (authorship)	94.1%	0.862	0.862	0.863

The first group of variables captures temporal aspects (day of the week, day of the month, month, and year of publication) and journalistic characteristics of the items (newspaper, section, appearance on the front page, genre, graphic accompaniment, size, even or odd page, publication online and/or in print, and authorship). The next group of variables explores, on the one hand, the domain of professional behavior (main topic of the item, main activity performed by the nurse, nurse's workplace, type of care or service provided); the knowledge domain (the care/service impacts on..., nurse's education level, nurse's specialty); the leadership domain (nurse as first, second or third information source; whether nurses are direct information sources; how nurses are referenced—anonously, by first name, by surname, etc.—and whether nurses speak with an individual or collective voice); and the values and ethics domain (nursing stereotypes and negligence). In parallel, another group of contextual variables was collected: gender of the first nurse mentioned, whether the COVID-19 pandemic is mentioned, whether COVID-19 is framed as a war, and the origin (work setting) of the first nurse mentioned, to assess whether these factors may have influenced the image conveyed.

Coding was carried out in two phases. The first phase consisted of coding 13 formal variables in 50 news items. This first phase was coded independently by two researchers, achieving high intercoder reliability (ICR). This indicator was calculated by assessing the percentage agreement between coders and by computing the most widely used reliability

coefficients (Scott's Pi, Cohen's Kappa, and Krippendorff's Alpha) (table 1).

The 2nd phase consisted of coding the remaining 19 content variables in a subsample of 31 of the 50 news items coded in the first phase. In this second phase, percentage agreement (Fleiss' Kappa, Cohen's Kappa, and Krippendorff's Alpha) was also calculated among the five researchers who coded the items (table 2).

The average agreement percentage ranged between 70% and 100%, achieving high intercoder reliability (ICR): agreement among the five coders ranged from 0.601 to 1 in Fleiss' Kappa (Krippendorff's Alpha=0.604 to 1, respectively), which, according to Altman's 1991 interpretation of Fleiss' Kappa, is classified as good to very good³⁸. In this regard, and considering that the coding team is interdisciplinary—coming from nursing and communication—the variable with the lowest agreement among coders was “care or health care assistance provided by nursing staff”, with 70.32%. The next variable reached 82% agreement, already classified as very good in the abovementioned interpretation³⁸.

After achieving good reliability indices, the five researchers applied the analysis instrument to the full set of 468 news items.

A descriptive analysis of the study variables was conducted using frequencies and proportions. Comparison of proportions by year was carried out using Pearson's Chi-square test. To calculate the probability that the first information source was a nursing professional, a logistic regression model was built with the variable “nurse/representative of a union, collective, or nursing association” as the dependent variable, and the following as independent variables: year (2019 vs. 2020); medium (print vs. online); service provided by the information source (patient/user/family, health system/organizational context, several of these, the nurse performs no health-related activity, nursing students); gender of the first source (woman, man, undefined); and workplace of the first source (hospital, primary care/schools/vaccination sites, nursing colleges/associations/unions, workplace not mentioned). Statistical analyses were performed using Stata/SE 15.1. Statistical significance was set at $p < 0.05$ (two-tailed).

RESULTS

Visibility of nursing

When analyzing the information that defines temporal aspects, we can see that of 468 texts published in the two Spanish media outlets, 364 (78%) correspond to the year

Tabla 2. Reliability Coefficients Among Coders for Content Variables.

Variable	Average % Agreement	Fleiss' Kappa	Cohen's Kappa	Alpha de Krippendorff
First search term mentioned	100%	1	1	1
Mention of COVID-19 or the pandemic	100%	1	1	1
Stereotype associated with the accompanying image	98.065%	0.947	0.947	0.948
Mention of the specialty of the first nursing source cited	98.065%	0.953	0.953	0.953
Manner of referring to COVID-19 or the pandemic	94.839%	0.917	0.917	0.918
Primary activity of the nursing personnel	94.194%	0.918	0.918	0.919
Presence of a direct quote from nursing personnel	94.194%	0.884	0.884	0.885
Gender of the first nursing source cited	94.194%	0.913	0.912	0.913
Third information source present	92.903%	0.878	0.879	0.879
Mention of the training of the first nursing source cited	92.903%	0.864	0.863	0.865
Workplace where the nursing personnel practice	92.258%	0.907	0.907	0.908
Main theme	91.613%	0.897	0.897	0.897
On whose behalf the first nursing source speaks	91.613%	0.862	0.862	0.863
Mention of geographic location	88.387%	0.84	0.84	0.841
How the first nursing source is referenced	87.097%	0.83	0.83	0.831
Content of the accompanying image	85.806%	0.815	0.816	0.817
First information source present	85.806%	0.803	0.803	0.804
Second information source present	83.871%	0.806	0.808	0.807
Type of care provided by nursing personnel	82.581%	0.773	0.774	0.775
Care or health care assistance provided by nursing personnel	70.323%	0.601	0.602	0.604

2020. During 2020, in the midst of the COVID-19 pandemic, there was a concentration of publications in March (12%), April (18%), and November (12%), critical moments in which media coverage of nurses' work reached its peak (**table 3**).

Regarding journalistic aspects, *El Mundo* stands out, with 67% (n=315) of the items. Sixty-five percent of all texts were published on the digital platforms *elmundo.es* and *elpais.com* (**table 3**), and 78% (n=365) of the items were not duplicated between print and online editions. In addition, the section with the greatest coverage was the regional section, with 35% (n=166). Of all publications, 63% (n=295) were signed by a journalist, which indicates the relevance and credibility of the news content. However, only 3% (n=15) of the items

appeared in weekend supplements, suggesting very little in-depth coverage of nurses in the press (**table 3**). This is also supported by the fact that there were only 57 (12%) full-page news items in the print editions. The predominance of even-numbered pages in print (21%, n=99) indicates that the topic did not open a section and was not the main subject in the outlet, since left-hand pages (even pages) in a print newspaper generally contain already-known information, whereas right-hand pages (odd pages) present new information³⁹.

With respect to the genre of the items, 61% (n=288) were news reports and 15% (n=71) were features or in-depth reports (**table 3**). As for front-page presence in print editions, only 0.4% (n=2) appeared on the front page. In 72%

(n=338) of the items, the visual accompaniment consisted of photographs; of these, only in 68 items (14%) were nurses the protagonists of the image, shown performing their work, while a slightly higher percentage, 15% (n=72), portrayed them in their private life. In addition, in 8.2% (n=38) of the items the photographs of nurses illustrating the news were anonymous stock images.

When analyzing information about the SARS-CoV-2 pandemic during 2020, of the 364 articles published that year, the word

“COVID” appeared in 312 (67%). In coverage of these articles, COVID was discussed in non-warlike terms in 50% (n=236), without associating it with aggressive metaphors such as struggle, combat, or war.

Of note, there was a significant increase in the number of news items during March and April 2020 (p<0.000) compared with the previous year. A significant association was also observed between month of publication in 2019 and 2020 and the level of coverage of nursing-related news (table 4).

Table 3. Articles related to nursing by month, newspaper, section, genre, and type of publication by year.

MONTH OF PUBLICATION	Year 2019		Year 2020	
	n	%	n	%
	January	11	10.58	5
February	8	7.69	9	2.47
March	9	8.65	44	12.09
April	3	2.88	67	18.41
May	14	13.46	32	8.79
June	10	9.62	18	4.95
July	11	10.58	25	6.87
August	3	2.88	16	4.40
September	3	2.88	31	8.52
October	12	11.54	32	8.79
November	10.58	10.58	44	12.09
December	9	8.65	41	11.26

NEWS OUTLET	Year 2019		Year 2020		Total	
	n	%	n	%	n	%
	<i>El País</i>	21	20.19	48	13.19	69
<i>El País.com</i>	30	28.85	54	14.84	84	17.95
<i>El Mundo</i>	9	8.65	86	23.63	95	20.30
<i>El Mundo.es</i>	44	42.31	176	48.35	220	47.01
Total	104	100	364	100	468	100

PUBLICATION SECTION	Año 2019		Año 2020		Total	
	n	%	n	%	n	%
	Health	—	—	63	17.31	63
National	7	6.73	21	5.77	28	5.98
Economy and Labor	2	1.92	1	0.27	3	0.64
Opinion	2	1.92	14	3.85	16	3.42
Regional	45	43.27	121	33.24	166	35.47
International / World	9	8.65	13	3.57	22	4.70
Weekend Supplement	2	1.92	13	3.57	15	3.21
Society	23	22.12	32	8.79	55	11.75
Culture	1	0.96	2	0.55	3	0.64
Technology	—	—	1	0.27	1	0.21
Sports	1	0.96	2	0.55	3	0.64
TV / Screens	1	0.96	23	6.32	24	5.13
People / Social Life	1	0.96	5	1.37	6	1.28
Events	1	0.96	—	—	1	0.21
Specialized Supplements	8	7.69	33	9.07	41	8.76
Other	1	0.96	0	—	1	0.21
Special COVID Section	—	—	20	5.49	20	4.27

PUBLICATION GENRE	n	%
	News	288
Editorial	2	0.43
Column or Analysis	11	2.35
Letter to the Editor	6	1.28
Feature or Chronicle	71	15.17
Interview	13	2.78
Profile	3	0.64
Expert Article	35	7.48
Video	24	5.13
Side Story / Breakout Box	10	2.14
Photo Feature / Photo News	4	0.85
Review / Critique	1	0.21

A statistically significant relationship was confirmed between medium of publication (print or online) in both years (p<0.000), with more digital publications in 2020. The COVID-19 pandemic and associated restrictions may have accelerated this transition, as people increasingly turned to online media during this period (table 4).

The use of non-warlike terms to talk about COVID in 2020 was also statistically significant (p<0.000).

Table 4. Bivariate analysis for months and publication media, compared by year.

	Proportion (n)		Total Proportion (n)	p-value
	2019	2020		
Months				*0.00
January/February	18.27 (19)	3.85 (14)	17.52 (33)	
March/April	11.54 (12)	30.49 (111)	26.28 (123)	
May/June	23.03 (24)	13.74 (50)	15.81 (74)	
July/August	13.46 (14)	11.26 (41)	11.75 (55)	
September/October	14.42 (15)	17.31 (63)	16.67 (78)	
November/December	19.23 (20)	23.35 (85)	22.44 (105)	
Publication Medium				*0.00
<i>El País</i>	20.19 (21)	13.19 (48)	14.74 (69)	
<i>El País.com</i>	28.85 (30)	14.84 (54)	17.95 (84)	
<i>El Mundo</i>	9.65 (9)	23.63 (86)	20.30 (95)	
<i>El Mundo.es</i>	42.31 (44)	48.35 (176)	47.01 (220)	

Bivariate analysis for complete variables. Pearson's Chi-square test. $p < 0.05$.

Who nurses are, their work in the health system, and their professional competence

The most frequently used word in the articles was “enfermera(s)” (“nurse(s)” in the feminine), appearing in 54% ($n=254$). It is noteworthy that “enfermero(s)” (masculine “nurse(s)”) appeared in 33% ($n=155$), with this percentage being higher in 2019—42% ($n=43$), compared with 36% ($n=38$) for “enfermera(s)”. In 2020, “enfermera(s)” appeared first in a greater proportion of news items: 59.34% ($n=216$), compared with 30.69% ($n=112$) in 2019, which mentioned their male counterparts (table 5). However, when analyzing the gender of the first nurse source cited, the percentage of men was 15% ($n=16$) in 2019 and 19% ($n=69$) in 2020, representing a slight, non-significant increase.

With respect to nurses' education, it stands out that in 47% of the sample (49% in 2019 and 46% in 2020) their education level was not specified, and that in 2020 only 3% ($n=12$) were explicitly described as holding a bachelor's degree in Nursing, without mention of any specialty they might have.

Table 5. Bivariate analysis for first word and comparison by year.

	Proportion (n)		Total Proporción (n)	p-value
	2019	2020		
First word				*0.00
Nurse(s)	36.54 (38)	59.34 (216)	54.27 (254)	
Male nurse(s)	41.35 (43)	30.77 (112)	33.12 (155)	
Nursing	22.12 (23)	9.89 (36)	12.61 (59)	

Bivariate analysis for complete variables. Pearson's Chi-square test. $p < 0.05$.

Among the main topics of the news items, 30% ($n=142$) dealt with nursing working conditions related to staff shortages, salary demands, lack of personal protective equipment (PPE), and nurses' deaths due to COVID-19 (42% in 2019 and 26% in 2020). It is important to highlight the scarcity of news focusing on everyday nursing practice: 8% in 2019 and 14% in 2020. Despite the increase in 2020, the data show that the media devoted more coverage to problematic issues arising from the context in which the profession is practiced than to the outcomes achieved through nurses' day-to-day work on the front line of health care. Care-related competence, with 37% ($n=175$) of items—distributed evenly across both years (36% in 2019 and 38% in 2020)—was the main work activity attributed to nurses. Management competence ranked second, with 18% ($n=83$), almost doubling in 2020 (19%) compared with 2019 (10%). Teaching activity was mentioned in only 1% ($n=5$) of items and research in 0.9%, with no change between years.

Of note, in 34% ($n=162$) of the articles the workplace of nurses was not mentioned. When it was mentioned, the hospital was the most common setting, representing 32% ($n=151$). This result is related to the most widely known nursing role, which is direct clinical care. It is also interesting that only 29% ($n=136$) of the items indicated that nurses' work was directed at patients or users in general, while in 71% ($n=333$) the type of care provided was not specified.

In 68% ($n=318$) of the items, no stereotype was identified, with a very similar distribution across both years (63% in 2019 and 69% in 2020), which is a highly noteworthy finding (table 6), given that, according to previous studies, nursing has routinely been associated with various stereotypes. It is striking that in only 5% ($n=23$) of articles (1% in 2019 and 6% in 2020) nurses were portrayed as heroes and/or martyrs, despite the COVID-19 health crisis being a context in which there was significant social recognition of nurses' work and sacrifice.

On the other hand, analysis of the articles showed a statistically significant association between the first word mentioned (“enfermera”, “enfermero”, “enfermeras”, “enfermeros”, “enfermería”) ($p < 0.000$) and the year of publication, indicating that these terms were mentioned more often in 2020. No statistically significant association was found between the gender of the first nurse source and year of publication. Nor was there a significant correlation between year of publication and nurses' workplace, type of care provided, or level of professional training.

Table 6. Bivariate analysis for stereotype and comparison by year.

	Proportion (n)		Total Proportion (n)	p
	2019	2020		
Stereotype Presence				*0.00
Saint/nun/sexualized/assistant/servility	7.69 (8)	12.36 (45)	11.32 (53)	
No stereotype identified	63.46 (66)	69.23 (252)	67.95 (318)	
Incompetent/unqualified/negligent	17.31 (18)	3.02 (11)	6.20 (29)	
The word "nurse" appears, but no nurse (no subject)	11.54 (12)	15.38 (56)	14.53 (68)	

Bivariate analysis for complete variables. Pearson's Chi-square test. $p < 0.05$.

Role of nursing professionals as information sources on health issues

In 27% of the articles, the first source was a nurse, with a slight, non-significant increase from 24% in 2019 to 28% in 2020. It is noteworthy that, in the subset of items in which nurses were cited as sources, in 42% the first information source was either a nursing professional (27.35%, $n=128$) or a representative of the profession, with 15% ($n=71$) of this proportion corresponding to representatives of unions, collectives, or nursing associations (table 7).

Considering nurses broadly (including associations, nursing colleges, and general directorates of nursing), they appeared as direct information sources in 53% ($n=246$) of the news items. In 38% ($n=179$), the quote was not attributed to an individual nurse, male or female, but rather to collective bodies (colleges, associations, or unions). With regard to the gender of the nurse cited directly or indirectly, 32.48% ($n=152$) were women, 18.16% ($n=85$) were men, and 11.11% ($n=52$) were association representatives whose gender was not specified.

In terms of how the first nurse source was presented or identified, in 35% ($n=163$) they spoke in their own name, and in 20% ($n=93$) they spoke as part of a collective, representing a nursing association.

A multivariable regression model was developed to analyze the association between the first information source and variables such as year, medium of publication (print or digital), gender of the first source, type of service provided by the nurse, and workplace. It was observed that, independently of year, medium, and other factors, compared with the reference service category, the likelihood that the first nurse source would act as a representative of the health system/organizational context (working in the Nursing Council, associations, or political posts) and that this source would be a male nurse was doubled (adjusted OR 2.06 and 2.01, respectively) (table 8).

Table 7. First informative source.

FIRST INFORMATIVE SOURCE		
	n	%
Nurse (female/male)	128	27.35
Physician or immunologist/virologist	26	5.56
Other health care professionals (profession specified)	4	0.85
Health care professionals (unspecified)	4	0.85
Hospital manager/coordinator	8	1.71
Politician or political institution related to health competencies	46	9.83
Representative of nursing union, collective, association, or nursing councils	71	15.17
Representative of union/collective (health-related, not nursing)	5	1.07
Patient or family spokesperson; patient organizations (may include health care workers)	7	1.5
Patient's family member	2	0.43
Professors or academic authorities (schools of nursing)	2	0.43
Source unrelated to nursing or health	86	19.02
Nursing students or student associations	1	0.21
No informative sources mentioned	60	12.82
Citizens, not mentioned as patients	5	1.07
Other: non-university professionals related to health	10	2.14
TOTAL	468	100

DISCUSSION

Health, health systems, and their professionals have not been a priority topic in the media in the twentieth and twenty-first centuries⁴⁰. However, this field has gradually gained prominence, and the COVID-19 pandemic established it as one of the most heavily covered topics in 2020.

Studies published in recent decades have shown that, during health crises, citizens depend to a great extent on information disseminated by major news organizations. The use of a variety of sources emerges as one of the fundamental elements shaping the nature of that information⁴¹. Moreover, the diversity and reliability of the sources selected are key factors that reflect informational pluralism in media environments⁴².

Several studies have analyzed how the image of nurses has been portrayed by the media during the pandemic^{9,24,43-47}. In this context, the present study aimed to determine whether, during the pandemic caused by the SARS-CoV-2 virus, nurses gained greater visibility, whether their identity was better reflected, and whether their role as information sources in the media increased compared with the previous year. The results obtained reveal important patterns in how nursing was reported in the media during the two years studied in Spain, adding knowledge to similar comparative studies conducted in countries such as Korea⁴⁸ or Turkey⁴⁹.

The results of this study confirm that in 2020 there was an increase in digital media publications on nursing-related topics compared with 2019, particularly during the lockdown

and the first surge of the pandemic. These findings are consistent with another study on publications during the COVID-19 pandemic, in which digital media dominated news dissemination compared with print press and other media²⁷. Most of these items were written and signed by journalists, which confirms a clear interest in producing news targeted at a specific audience.

Pandemics are news events that can favor the presence of nurses in the media. Previous studies have examined how nurses were portrayed during the Spanish Flu pandemic⁵⁰, the SARS crisis⁵¹, and the Ebola outbreaks^{52,53}. These studies agreed that, despite the increase in the number of news items in which nurses were mentioned, overall, the image conveyed was inaccurate and inadequate. Analysis of coverage of the Spanish Flu concluded that what was published did not help improve nurses' social image⁵¹. In Ebola coverage, they were presented as heroes caring in contexts described as war-like, or as villains when they were depicted as failing to comply with protocols to prevent infection, or as being rejected by society as possible carriers of the virus⁵²—something also reflected in reports on the SARS pandemic⁵². Although news coverage of SARS showcased nurses' leadership in care delivery, journalists emphasized the barriers they faced in performing their work, their concerns, and the shortage of nurses—all aspects focused on conflictual elements of the profession.

These issues also appeared in COVID-19 coverage according to this study's findings, although to a much lesser extent (42% in 2019 and 26% in 2020). As in other research on the image of nurses during pandemics, this study also concludes that,

despite nurses being more visible, the fact that their daily work and contribution to the health system remained relegated to a secondary position means that their identity is still poorly communicated and does not help improve society's understanding of the profession. Furthermore, several findings reinforce this conclusion, such as the low number of feature reports and interviews about nursing in the press, the predominance of short hard news, and scarce interest in in-depth coverage. It is also noteworthy that nurses appeared on the front page only rarely. Photographs were the main visual accompaniment, but nurses seldom occupied a central role in those images and were most often portrayed in private settings or anonymously. A subsequent qualitative content analysis of these images could provide evidence supporting or refuting iconographic studies such as that by Martínez-López, which concluded that images published during the pandemic showed nurses in stereotyped ways, particularly through a hero narrative⁵⁶. It is also confirmed that, unlike what occurred in media from other countries^{45,55}, the Spanish press hardly used war-related terminology to describe the pandemic. Journalists' efforts to employ more neutral

Tabla 8. Model for dependent variable: nurse or representative of nursing union/collective/association.

Variable independiente	OR	IC 95%	p
Year			
2020	1.29	0.76–2.18	0.33
Type of Media			
Online	1.50	0.92–2.45	0.09
Service Performed			
Health system/Organizational context	2.06*	1.03–4.12	0.04
Performs several services	3.14	0.8–12.37	0.06
The nurse performs no activity	0.96	0.55–1.66	0.79
Nursing students	1		
Gender of Source			
Male	2.01*	1.06–3.79	0.03
Other	0.20	0.12–0.33	0.00
Place of Practice			
Primary care/schools/vaccination sites	2.09	0.86–5.07	0.10
Multiple settings/associations/unions	1.72	0.80–3.68	0.15
No workplace mentioned	1.12	0.30–1.26	0.19

Own source. CI, Confidence Interval; Pseudo R², 0.1886; Model chi-square (10)=110.58; *p<0.05.

language, less tied to war or conflict metaphors and aimed at conveying information in a more precise, less negative, and more empathic way may be linked to the #ReframeCovid movement, which began in Spain⁵⁶.

When analyzing whether the articles reviewed provided information about who nurses are, what their work in the health system is like, and what their professional training involves, we can emphasize that in more than half of the documents the first term used was “nurses” (*enfermeras*). According to data published by the Spanish National Statistics Institute (INE), in 2020 there were 323,915 registered nurses in Spain, of whom 51,691 (15.95%) were men and 222,223 (84.04%) were women—percentages similar to those in 2019, when 15.77% were men and 84.23% women (INE). Although the first word used in the articles was “*enfermera(s)*” (feminine “nurse(s)”) in 54% (n=254) of cases, it is noteworthy that “*enfermero(s)*” (masculine “nurse(s)”) appeared in 33% (n=155), with this percentage being higher in 2019—42% (n=43)—compared with 36% (n=38) for *enfermera(s)*. In 2020, nurses were mentioned first in a higher percentage of news items—59.34% (n=216) compared with 30.69% (n=112). These results contrast with those of Martínez-Rodríguez, who identified predominant use of the masculine form in generalist online press during COVID, versus a predominance of the feminine form in specialized press⁴³.

However, when analyzing the gender of the first nurse source cited between 2019 and 2020, it is relevant to note that the percentage of male nurses increased from 15% to 19%. The data presented above show that men in the profession are overrepresented in the news (both in mentions and as sources) in a profession that has historically been and continues to be predominantly female. Without access to journalists’ intentions—which opens a line for future research—this overrepresentation of men could indicate the persistence of a male-biased sexist pattern or, conversely, an attempt to avoid gender stereotypes⁵⁷, in this case favoring men. In any case, it may help make men in nursing more visible, which in turn may encourage more men to choose the profession. Making men’s caregiving work visible in the media could be a useful strategy, especially if combined with existing initiatives in other countries, such as campaigns specifically aimed at recruiting male nurses⁵⁸ or rethinking undergraduate training to include a male-gender perspective⁵⁹. Together, these may help reduce stereotypes associated with men in nursing^{60,61} and encourage new generations of men to train and work as nurses, thereby contributing to tackling the global nursing shortage⁶².

With regard to nurses’ education, it is striking that in almost 50% of the news items their level of education was not specified and that only in a very small percentage was it made explicit that they held a bachelor’s degree, with no mention of additional qualifications such as specialties, master’s degrees, or doctorates. This lack of media visibility of degree-level training and of postgraduate qualifications may partly explain why significant segments of the Spanish population still do not know that nurses must obtain a university degree

to practice³⁰. From a more optimistic perspective, it could also be interpreted that the word “nurse” automatically implies a graduate-level qualification, as happens with “doctor” or “teacher”.

All of this, together with the main work activity attributed to nurses in the articles, shows no differences between the 2 years analyzed. The results confirm that the function with greatest media visibility in both years was direct care, which is mainly performed in hospitals or clinics. Management functions were second, although far behind. Nonetheless, it is worth highlighting that the evidence found in this study allows us to affirm that nursing management gained greater visibility during the pandemic, probably because of the visibility of organizational activities in which nurses’ managerial roles were essential. Finally, teaching and research roles were mentioned, but with very low percentages. These figures are minimal considering the importance of both roles in advancing the discipline and training new generations of professionals⁶³. The results show that, although in other countries such as Brazil the pandemic has given somewhat more visibility to nursing research²⁴, in Spain this remains a pending issue, as former studies have already concluded⁶⁴.

Within the main themes of the news items, nurses’ working conditions stand out: staff shortages, salary claims, lack of PPE, and nurses’ deaths from COVID, as identified in other studies⁶⁵. Although these issues remained a priority during the pandemic, it is notable that, despite the extremely difficult working conditions faced by nurses, such topics actually decreased vs 2019. Coverage of nurses’ day-to-day work almost doubled in 2020, although it remains low, given the wide range of tasks carried out by this professional group during the pandemic. Coverage of managerial work also remained very limited but likewise doubled in 2020.

Regarding nurses’ workplaces, the setting most frequently mentioned by journalists was the hospital, thereby confining their work to the hospital setting and rendering other fields such as primary care invisible, where more than 40,000 nurses work (Spanish National Health System, SNS, 2022). It is also important to highlight that most of the news analyzed did not reflect information on the holistic care provided by nurses, with physical care being most visible. The analysis shows that in less than 30% of the items the care provided by nurses was explicitly directed at patients or users, without journalists making visible that nurses’ work also impacts families, communities, and health systems, among others. This media invisibility of actual nursing care confirms findings from previous studies^{66,67} and underscores the need for proactive communication by nurses to reverse this situation⁶⁸.

Although many studies confirm that the published image of nurses is often represented through multiple stereotypes—such as nun, evil/authoritarian, sexy/silly, doctor’s assistant, and hero, among others^{61,69-72}—the results of this research refute that tendency, since such stereotypes were hardly used in the news analyzed.

Moreover, only a small percentage of articles portrayed nurses as heroes and/or martyrs. These results suggest the hypothesis that the most recent pandemic may have helped blur such stereotyped images, or that the media may be more aware of and resistant to stereotypes. Likewise, the absence of references to heroism may be a consequence of avoiding war-like terminology in this type of discourse.

However, this interpretation is not supported by studies from other countries showing that nurses were in fact portrayed as heroes, a label that can be dangerous in terms of remuneration (as it implies “emotional compensation” instead of fair pay) and risky for their physical and mental health, since a hero is expected to face all risks without protection and without being allowed to appear vulnerable^{46,54,73-75}.

Several studies point to a scarcity of health information sources in the media (especially nurses)^{18,19}, even during the pandemic^{22,45}. However, research conducted in the United States has confirmed that nurses can provide valuable information that enriches health news⁴⁵.

In this study, when analyzing the role of nursing professionals as information sources on health issues, in fewer than 30% of the publications was the first source a nurse. It is confirmed that not even a health crisis is sufficient to change the media's tendency to sideline experts and professionals as sources of health information^{20,21}, and that politicians and non-health care sources continue to predominate, as also happens in other health-related fields⁷⁶ and in other media, including during the pandemic²².

Nursing associations, professional colleges, and general directorates of nursing are cited as direct information sources more frequently, doubling the likelihood of appearing as the first source. These results confirm that nurses in management roles and professional organizations are more likely to be contacted by journalists¹⁴. Although the institution often appears anonymously, in many cases a specific representative is mentioned. These findings confirm increased visibility of the profession thanks to communication actions by professional organizations, a strategy identified in other studies^{14,77,78}. The results highlight the importance of investigating the communication strategies used by these institutions to assess their effectiveness and propose improvements if necessary.

Journalists' lack of knowledge about the nursing profession^{15,16} and about the informational contributions nurses could make to their stories, combined with nurses' limited training in communication skills^{68,79} and the absence in many countries of an ethical, legal, and institutional framework that safely supports nurses' freedom of expression⁸⁰ are the main barriers identified in the literature to nurses' voices being heard in the media.

Studying how these barriers can be removed would open up new lines of research and action that could counteract the adverse consequences of a scarce and poorly aligned

media presence with nurses' professional identity—such as workforce shortages or declining quality of care⁴.

The present research confirms that the pandemic has increased nurses' media visibility and has partly improved coherence between some aspects of their professional identity and their published image, for example by giving greater prominence to their managerial role and daily work. Some studies already confirm that society's image of nurses has improved thanks to the pandemic and that media coverage has contributed positively to this^{23,29,30}. However, as some authors point out, it is crucial that nurses and all institutions representing them continue working to ensure that these gains are not lost^{25,81}.

Of note, this analysis is based on a specific sample of articles from the 2 highest-circulation national newspapers in Spain and does not cover all media reporting on nursing in 2019 and 2020. The study was limited first by the restriction to two years of analysis, which reduced sample size and underlines the importance of extending the time frame in future research. Second, given the topic, it would be relevant to use the same methodology to examine the image of nursing in the press of other countries to determine whether the Spanish experience is replicated elsewhere. Finally, it would be valuable to develop other longitudinal quantitative studies to trace the trajectory of nursing's professional identity, as well as qualitative studies to explore how journalists perceive nurses' experience, meaning, and role as information sources on health issues.

Practical implications

This study provides valuable insights for the health sector and highlights the importance of nurses' media visibility during health crises. Better understanding of their role and appropriate recognition of their competencies can help strengthen the professional image of nurses in society. In terms of nursing research and education, the study suggests the need to develop training programs that include communication and media skills, enabling nurses to be better prepared to interact with the media and to act as competent, credible information sources. It also underscores the importance of promoting research that analyzes how nurses are represented in the media and how this affects public perception.

Nurses' media presence increased in 2020 compared with 2019, and the presence of nurses and their associations as information sources also rose, although there is still a lack of longitudinal, cross-country evidence to analyze this phenomenon more broadly. Although the number of stories showing nurses' day-to-day work has grown, coverage of this topic remains scarce and continues to fail to make visible what nurses actually do (their specific roles, specialties, and workplaces), nor does it consistently position them as primary sources in health news in which they are mentioned. What has improved significantly is the absence of stereotypes in their portrayal and the visibility

of male nurses in the press, even though they remain a minority in the profession. In analyzing this health crisis, it is paradoxical that, despite being one of the pillars of the health system, nurses did not play a more prominent role as information sources. We can see that longstanding problems persist: although visibility in terms of the number of news items has improved, it remains a challenge to reflect who nurses are, what their work in the health system entails, how their professional training develops, and the leadership they exert in care delivery.

This study has identified that the role nurses can play as health information sources is a field that has been little explored to date and may be highly valuable for nursing, journalism, and society as a whole. There is still work to do in conveying that nurses are highly trained and qualified, working not only in hospitals and with individual patients but also in disease prevention and health promotion, research, and teaching, among other functions.

Conflicts of interest

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NEPHROLOGY NURSING AGENDA

CONGRESSES

■ Dubai, September 26–29, 2024 ISPD 40th Anniversary

Dubai World Trade Center
<https://ispd.org/dubai2024/>

■ 52nd INTERNATIONAL CONFERENCE EDTNA/ERCA

Athens, Greece, September 21-24, 2024

More information:
EDTNA/ERCA Secretariat
Ceskomoravská 19, 190 00 Prague 9,
Czech Republic
Phone: +420 284 001 422
E-mail: secretariat@edtnaerca.org
www.edtnaerca.org

■ 49th NATIONAL CONGRESS OF THE SPANISH SOCIETY OF NEPHROLOGY NURSING

Valencia, November 11–13, 2024

Scientific Secretariat: SEDEN
C/ de la Povedilla 13, Ground Floor, Left
28009 Madrid, Spain
Tel.: +34 914 093 737
E-mail: seden@seden.org
www.congresoseden.es

AWARDS

■ LOLA ANDREU RESEARCH AWARD 2024

All original articles published in issues
26/4, 27/1, 27/2, and 27/3 without prior
publication are eligible.

Grant: €1,500
Information: Tel. +34 914 093 737
E-mail: seden@seden.org
www.seden.org

■ “JANDRY LORENZO” GRANT 2024

To support members in conducting re-
search projects or studies aimed at expan-
ding knowledge in the field of Nephrology
Nursing.

Deadline: June 30, 2024
Grant: €1,800
Information: Tel. +34 914 093 737
E-mail: seden@seden.org
www.seden.org

■ 23rd ÍÑIGO ÁLVAREZ DE TOLEDO AWARD 2024

*35th Edition of the Nephrology Nursing
Research Awards*

Grant: €5,000

*1st Edition of the Awards for Humanization
of Socio-Healthcare for People with Kidney
Disease*

Grant: €5,000
More information:
Tel.: +34 914 487 100 | Fax: +34 914 458
533
E-mail: info@friat.es
www.fundacionrenal.com

■ DONATION AND TRANSPLANT AWARD 2024

Prize: Registration for the 49th National
Congress

Information: Tel. +34 914 093 737

E-mail: seden@seden.org
www.seden.org

■ PERITONEAL DIALYSIS AWARD 2024

To promote the work of nephrology nurses
in the field of peritoneal dialysis.

Prize: Registration for the 49th National
Congress

Information: Tel. +34 914 093 737

E-mail: seden@seden.org
www.seden.org

■ ADVANCED CHRONIC KIDNEY DISEASE AWARD 2024

To highlight the work of nephrology nurses
in the field of Advanced Chronic Kidney
Disease (ACKD).

Prize: Registration to the 49th National
Congress

Information: Tel. +34 914 093 737

E-mail: seden@seden.org
<http://www.seden.org>

■ IZASA MEDICAL AWARD FOR VASCULAR ACCESS AND NEW TECHNOLOGIES 2024

To promote nursing research and recognize
nursing professionals.

Grant: €1,200

Information: Tel. +34 914 093 737

E-mail: seden@seden.org
www.seden.org

■ MEDTRONIC AWARD FOR THE BEST RESEARCH ON INNOVATION IN DIALYSIS TECHNIQUES AND OUTCOMES 2024

To promote research and innovation
in dialysis techniques, monitoring and
biofeedback, vascular access, and health
outcomes.

Grant: €1,800

(€600 poster award and €1,200 oral
presentation award)

Information: Tel. +34 914 093 737

E-mail: seden@seden.org

www.seden.org

■ RENAL FOUNDATION AWARD FOR EXCELLENCE IN COMMUNICATION 2024

To recognize excellence in oral presentations
at the national congress, rewarding both
content and quality of delivery.

Grant: €1,000

Information: Tel. +34 914 093 737

E-mail: seden@seden.org

www.seden.org

MEETINGS

■ Salamanca, November 2024 37th NATIONAL CONFERENCE FOR PEOPLE WITH KIDNEY DISEASE

ALCER National Federation
C/ Don Ramón de la Cruz, 88, Office 2
28006 Madrid, Spain

Tel.: +34 915 610 837 | Fax: +34 915 643 499

E-mail: amartin@alcer.org

www.alcer.org

The journal of the Spanish Society of Nephrology Nursing will publish in this section all scientific activities related to Nephrology submitted by Scientific Associations, Health care Institutions, and Training Centers.

AWARD FOR THE BEST RESEARCH PROJECT on Innovation in Dialysis Techniques and Outcomes

RULES

1. A total prize of €1,800 is established, divided as follows: €1,200 for the best oral communication and €600 for the best poster presentation. The award is intended for the best research project related to: **Home dialysis therapies (HDD), innovation in dialysis techniques (online HDF, pre-, post-, pre + post-, mid-dilution, adsorptive therapies – HFR and SUPRA), monitoring and biofeedback (Soglia, Aequilibrium), and innovation in vascular access.**
2. This prize may be awarded to an individual or group, provided that the corresponding author holds a Nursing Degree or equivalent qualification, and that the project focuses on the topics listed above.
3. Manuscripts must be original and unpublished and written in Spanish.
4. The format, length (number of pages), and submission deadline must comply with the official SEDEN abstract submission guidelines.
5. Submissions must be sent exclusively through the SEDEN website: www.seden.org, under the “Congress” section.
6. The selection of submissions and award decision will be made by a jury appointed from the SEDEN Selection Committee.
7. The award will be presented at the Opening Ceremony of the next SEDEN National Congress.
8. The rights for the publication of all submitted works will belong to the Spanish Society of Nephrology Nursing (SEDEN) and Mozarc Medical, who may use them in any medium.
9. Submission of a manuscript implies full acceptance of these rules.

SEDEN

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PUBLICATION GUIDELINES

Enfermería Nefrológica is the official journal of the Spanish Society of Nephrology Nursing (SEDEN). Although the preferred language for the journal is Spanish, it also accepts articles in Portuguese and English.

Enfermería Nefrológica regularly publishes four issues a year, on the 30th of March, June, September and December, and a shorter paper version. All of the contents are available to access free of charge on the website: www.enfermerianefrologica.com. The journal is financed by the Spanish Society of Nephrology Nursing and distributed under the Creative Commons Attribution-NonCommercial 4.0 International (CC BY-NC 4.0). This journal does not charge any article processing fees.

The journal is included in: CINAHL, IBECS, SciELO, CUIDEN, SIIC, Latindex, Capes DULCINEA, Dialnet, DOAJ, ENFISPO, Scopus, Sherpa Romeo, C17, RECOLECTA, ENFISPO, Redalyc, REBIUN, REDIB, MIAR, WordCat, Google Scholar Metric, Cuidatge, Cabells Scholarly Analytics, AURA, JournalTOCs and Proquest.

Enfermería Nefrológica publishes nursing research articles related to nephrology, high blood pressure and dialysis and transplants, which aim to increase scientific knowledge and ultimately lead to better renal patient care. It also accepts articles from other nursing fields or broader topics which result in greater professional knowledge of nephrological nursing.

In terms of publishing submissions, Enfermería Nefrológica follows the general guidelines described in the standard requirements for submissions presented for publication in biomedical journals, drafted by the International Committee of Medical Journal Editors (ICJME), available at <http://www.icmje.org>. The editorial committee will consider how well the submissions they receive follow this writing protocol.

JOURNAL SECTIONS

The journal essentially contains the following sections:

Editorial. Concise article which expresses an opinion or in which various facts or other opinions are stated. Short reviews by the editorial committee.

Long articles. These are articles in which the author(s) focus(es) on a health problem, which requires a specific nursing action performed with qualitative or quantitative methodologies, or both.

Long articles with qualitative or quantitative methodologies must contain: a structured summary (maximum 250 words in English and in the original language), introduction, objective, method, results, discussion and conclusions (maximum length of 3,500 words for quantitative methodologies and 5,000 words for qualitative methodologies, a maximum of six tables and/or figures and a maximum of 35 bibliographic references).

Reviews. Bibliometric studies, narrative, integrative and systematic reviews, meta-analysis and meta-synthesis regarding current and relevant topics in nursing and nephrology, following the same structure and guidelines as the original qualitative work, but with a maximum of 80 bibliographic references.

Clinical case. Essentially descriptive reports of one or a few cases related to the clinical practice of nurses, in any of the various facets of their work. The report must be concise and will describe the methodology employed leading to resolution of the case from a nursing care perspective. It should include a 250-word summary in Spanish and English and cover: case description, care plan description, plan evaluation and conclusions. Maximum desired length is 2,500 words, with the following structure: introduction; presentation of case; complete nursing evaluation indicating model; description of care plan (containing the possible nursing diagnoses and problems regarding collaboration, aims and nursing interventions, wherever possible using the NANDA-NIC-NOC taxonomy); care plan evaluation and conclusions. A maximum of three tables/figures and 15 bibliographical references will be permitted.

Cover letter. These are short letters which agree or disagree with previously published articles. They can also be observations or experiences of a current topic of interest in nephrological nursing. They should be no longer than 1,500 words with up to five bibliographic references and one figure/table.

Brief articles. Research work in the same vein as the longer articles, but narrower in scope (series of cases, research on experiences with very specific aims and results), which can be communicated more concisely. These will follow the same structure: structured summary (250 words in English and Spanish), introduction, objective, method, results, discussion and conclusion (2,500 words in length, maximum three tables and/or figures, maximum 15 bibliographical references).

Other sections. These will include various articles that may be of interest in the field of nephrological nursing.

Lengths indicated are for guidance purposes only. Submission length excludes: title, authors/affiliation, summary, tables and bibliographical purposes. The structure and length of each section of the journal are summarised in **table 1**.

FORMAL ASPECTS OF SUBMISSIONS

Authors grant the publisher the non-exclusive licence to publish the work and consent to its use and distribution under the **creative commons atribución - no comercial 4.0 international (CC BY-NC 4.0)** licence. Read the licensing information and **legal text** here. This must be expressly stated wherever necessary.

Previously published submissions or those sent simultaneously to other journals will not be accepted. Authors will inform the editorial committee of any submissions that are presented at scientific events (conferences or workshops). It would be advisable for all papers to have passed an ethics committee.

Submissions are to be uploaded to the digital platform found on the website: <http://www.enfermerianefrologica.com>, (Under the "Make a submission" section).

As part of the submission process, authors are obliged to check that their submission meets all of the requirements set out below. Any submissions that do not meet these guidelines will be declined for publication.

A letter of presentation addressed to the journal's Chief Editor must accompany the submission, in which the author(s) ask(s) for their

work to be accepted for publication in a section of the journal. This will include completing the **publication agreement form**, vouching for the submission's originality and providing assurances that it has not been published elsewhere.

Submissions will be accepted in word format, one in which the author is identifiable, and the other which is anonymous for peer review. Pages must be DIN-A4 sized, double-spaced and with size-12 font, with 2.5-cm top, bottom and side margins. Pages will be numbered consecutively. Headings, footnotes and highlighting are not recommended, as they can cause problems with layout should the submission be published.

Enfermería Nefrológica's management tool will acknowledge the receipt of all submissions. Once receipt has been acknowledged, the editorial process starts, which can be followed by authors via the aforementioned platform.

Submissions must comprise three files to be uploaded onto the journal's OJS platform.

File 1:

- ▶ Letter of presentation that accompanies the submission.
- ▶ Publication agreement form, content liability and assurance that it has not been published elsewhere.

File 2:

- ▶ Full submission (including tables and appendices) with name of author(s).

File 3:

- ▶ Full submission (including tables and appendices) with no identifying details of author(s).

The ethical responsibility section must be accepted before the files can be submitted.

The original submissions must adhere to the following presentation guidelines:

First page. This begins with the article title, authors' full names and surnames, work centres, countries or origin, email addresses and ORCID number (unique researcher ID). Indicate which author any correspondence is to be addressed to, as well as whether the surnames of the authors are to be joined by a hyphen or just one surname is to be used.

Summary. All articles must include a summary (in the original language and in English). This is to be a **maximum** length of **250 words**. The summary must contain sufficient information so that readers can gauge a clear idea of the article's content, without any reference to the text, bibliographical references or abbreviations and follow the same sections as the text: introduction, objectives, methodology, results and conclusion. The summary will not contain any new information not contained within the text itself.

Keywords. Some 3-6 keywords must be included at the end of the summary, which are directly related to the main study principles (advisable to use DeCS controlled vocabulary <https://decs.bvsalud.org/es/> and MeSH <https://www.ncbi.nlm.nih.gov/mesh>).

Text. In observational or experimental submissions, the text is usually divided into sections or the following: **Introduction**, which must provide the necessary items to understand the work and include its objectives.

Method employed in the research, including the centre where the research was conducted, its duration, characteristics of the series, sample selection criteria, techniques employed and statistical method. **Results**, which must provide data and not comment or discuss it. Results must exactly answer the objectives set out in the introduction. Tables and/or figures can be used to supplement information, although superfluous repetitions of results that are already included in the tables must be avoided, focusing instead on only the most relevant information. In the **Discussion** the authors must comment on and analyse the results, linking them to those obtained in other

studies that are bibliographically referenced, as well as any conclusions they have reached with their work. The **Discussion** and **Conclusion** must stem directly from the results, with no statements made that are not validated by the results obtained in the study.

Acknowledgements. Should they wish to, authors may express their gratitude to anyone or any institution that has helped them to conduct their research. This section should also be used to acknowledge anyone who does not meet all of the criteria to be considered as an author, but who has helped with the submission, such as those who have helped with data collection, for example.

Statement on the use of generative Artificial Intelligence (AI) in scientific writing. AI and AI-assisted technologies should not be listed as author, co-author, or cited as author. Authorship implies responsibilities and tasks that can only be attributed to and performed by humans. If it has been used, authors should include a paragraph before the bibliography reporting the use of AI: "During the preparation of this paper, the authors used [NAME TOOL/SERVICE] for [REASON]. After using this tool/service, the authors reviewed and edited the content as necessary and take full responsibility for the publication's content". This statement does not apply to using essential tools to check grammar, spelling, bibliographic references, etc. If there is nothing to declare, there is no need to add this section.

References. References will follow the guidelines indicated in the ICJME with the guidance of the National Library of Medicine (NLM), available on: https://www.nlm.nih.gov/bsd/uniform_requirements.html.

Bibliographical references must be numbered consecutively according to the order of first appearance in the text, in superscript Arabic numerals, in the same font type and size as that used for the text. When they coincide with a punctuation mark, the reference will come before the mark. Journal titles must be abbreviated in accordance with the style used in Index Medicus; looking at the "List of Journals indexed" included every year in the January issue of Index Medicus. You can also consult the collective catalogue of periodic publications from the Spanish Health Sciences Libraries, or c17 (<http://www.c17.net/>). Should a journal not appear in either Index Medicus or the c17, its name must be written out in full.

The bibliography of the articles should be updated to the last 7 years and it is recommended to cite an appropriate number of references.

Some examples of bibliographical references are given below.

Journal article

To be written as:

Zurera-Delgado I, Caballero-Villarraso MT, Ruíz-García M. Análisis de los factores que determinan la adherencia terapéutica del paciente hipertenso. *Enferm Nefrol*. 2014;17(4):251-60.

In the case of more than six authors, name the first six authors, followed by the expression "et al":

Firaneck CA, Garza S, Gellens ME, Lattrel K, Mancini A, Robar A *et al*. Contrasting Perceptions of Home Dialysis Therapies Among In-Center and Home Dialysis Staff. *Nephrol Nurs J*. 2016;43(3):195-205.

In the event that it is a supplement:

Grupo Español Multidisciplinar del Acceso Vascular (GEMAV). Guía Clínica Española del Acceso Vascular para Hemodiálisis. *Enferm Nefrol*. 2018;21(Supl 1):S6-198.

Online journal article:

Pérez-Pérez MJ. Cuidadores informales en un área de salud rural: perfil, calidad de vida y necesidades. Biblioteca Lascasas [Internet]. 2012 [cited 10 Mar 2015];8:[about 59 p.]. Available from: <http://www.index-f.com/lascasas/documentos/lc0015.php>

Article published electronically ahead of the print version:

Blanco-Mavillard I. ¿Están incluidos los cuidados paliativos en la atención al enfermo renal? *Enferm Clin*. Available from: 2017; <http://dx.doi.org/10.1016/j.enfcli.2017.04.005>. Epub 2017 Jun 6.

Book chapter:

Pulido-Pulido JF, Crehuet-Rodríguez I, Méndez Briso-Montiano P. Punciones de accesos vasculares permanentes. En: Crespo-Montero R, Casas-Cuesta R, editores. *Procedimientos y protocolos con competencias específicas para Enfermería Nefrológica*. Madrid: Sociedad Española de Enfermería Nefrológica (SEDEN); 2013. p. 149-54.

Website

Sociedad Española de Enfermería Nefrológica. Madrid. [cited 5 Feb 2007]. Available from: <https://www.seden.org>.

Authors are advised to study the checklists on the website <http://www.equator-network.org/reporting-guidelines/> for guidance on the study design of their submission.

- ▶ CONSORT for clinical trials.
- ▶ TREND for non-randomised experimental studies.
- ▶ STROBE for observational studies.
- ▶ PRISMA for systematic reviews.
- ▶ COREQ for qualitative methodology studies.

Tables and Figures. All will be referred to within the text (without abbreviations or hyphens), and consecutively numbered with Arabic numerals, without superscript, according the order mentioned within the text. They are to be presented at the end of the submission, on a separate page, with titles at the top.

Tables must be clear and simple, and any symbols or abbreviations must be accompanied by an explanatory note under the table. Images (photos or slides) must be of good quality. It is advisable to use the jpg. format.

ETHIC RESPONSIBILITY ACCEPTANCE

Enfermería Nefrológica adheres to the ethical guidelines established below for publication and research.

Authorship: Authors making a submission do so on the understanding that it has been read and approved by all of its authors and that all agree to submitting it to the journal. ALL of the listed authors must have contributed to the conception and design and/or analysis and interpretation of the data and/or the writing of the submission and the author information must include the contribution of each on the first page.

Enfermería Nefrológica adheres to the definition and authorship established by The International Committee of Medical Journal Editors (ICMJE). In accordance with the criteria established by the ICMJE, authorship must be based on 1) substantial contributions to the conception and design, acquisition, analysis and interpretation of data, 2) drafting of article or critical review of its significant intellectual content and 3) final approval of the published version. All conditions must be fulfilled.

Ethical approval: When a submission requires the collection of research data that involves human subjects, it must be accompanied by an express statement in the materials and method section, identifying how informed consent was obtained and a declaration, wherever necessary, stating that the study has been approved by an appropriate research ethics committee. Editors reserve the right to decline the article when questions remain as to whether appropriate processes have been followed.

Conflict of interests: Authors must disclose any potential conflict of interest when they make a submission. These may include financial conflicts of interest, patent ownership, shareholdings, employment in dialysis/pharmaceutical companies, consultancies or conference payments by pharmaceutical companies relating to the research topic or area of study. Authors must remember that reviewers have to notify the editor of any conflict of interest that may influence the authors' opinions.

Any conflict of interest (or information specifying the absence of any conflict of interest) must be included on the first page under the title "Conflict of interests." This information will be included in the published article. The following sentence must be included when authors have no conflict of interest: "Author(s) declare(s) no conflict of interest."

Sources of funding: Authors must specify the source of financing for their research when they make a submission. Providers of the assistance must be named and their location included (city, state/province, country).

PLAGIARISM DETECTION

Enfermería Nefrológica does not condone plagiarism and will not accept plagiarised material for publication under any circumstances.

Plagiarism includes, but is not limited to:

Directly copying text, ideas, images or data from other sources with the corresponding, clear and due acknowledgement.

Recycling text from the authors' own work without the corresponding referencing and approval by the editor (read more on recycling text in the policy on redundant publication, copying and recycling of text).

Using an idea from another source with modified language without the corresponding, clear and due acknowledgement.

The journal uses the **iThenticate-Similarity Check** service by Crossref to cross-match texts and detect plagiarism. All of the long articles submitted to Enfermería Nefrológica are processed by an anti-plagiarism system before being sent to peer review.

Enfermería Nefrológica follows the decision tree recommended by COPE in the event of suspecting a submission or an already-published article contains plagiarism (<http://publicationethics.org/files/Spanish%20%281%29.pdf>). Enfermería Nefrológica reserves the right to contact the institution to which the author(s) belong(s) in the event of confirming a case of plagiarism, both prior to and subsequent to publication.

Table 1. Summary table of the structure and length of each journal section.

Submission type	Summary (English and original article language)	Main text	Tables and figures	Authors	References
Editorial.	No.	Maximum length: 750 words, including references.	None.	Maximum recommended 2.	Maximum 4.
Long articles Quantitative Methodology.	250 words. Structure: introduction, objective, method, results and conclusions.	Maximum length: 3,500 words. Structure: introduction, objective, method, results, discussion and conclusions.	Maximum 6.	Maximum recommended 6.	Maximum 35.
Long articles Qualitative Methodology.	250 words. Structure: introduction, objective, method, results and conclusions.	Maximum length: 5,000 words. Structure: introduction, objective, method, results, discussion and conclusions.	Maximum 6.	Maximum recommended 6.	Maximum 35.
Brief articles.	250 words. Structure: introduction, objective, method, results and conclusions.	Maximum length: 2,500 words. Structure: introduction, objective, method, results, discussion and conclusions.	Maximum 3.	Maximum recommended 6.	Maximum 15.
Reviews.	250 words. Structure: introduction, objective, methodology, results and conclusions.	Maximum length: 3,800 words. structure: introduction, objective, methodology, results, discussion and conclusions.	Maximum 6.	Maximum recommended 6.	Maximum 80.
Clinical case.	250 words. Structure: case description, care plan description, plan evaluation, conclusions.	Maximum length: 2,500 words. Structure: introduction; presentation of case; (complete) nursing evaluation indicating model; description of care plan (containing the possible nursing diagnoses and problems regarding collaboration, objective and nursing interventions), care plan evaluation and conclusions.	Maximum 3.	Maximum recommended 3.	Maximum 15.

NORMAS DE PUBLICACIÓN

La revista *Enfermería Nefrológica* es la publicación oficial de la Sociedad Española de Enfermería Nefrológica (SEDEN). Aunque el idioma preferente de la revista es el español, se admitirá también artículos en portugués e inglés.

Enfermería Nefrológica publica regularmente cuatro números al año, el día 30 del último mes de cada trimestre y dispone de una versión reducida en papel. Todos los contenidos íntegros están disponibles en la web de acceso libre y gratuito: www.enfermerianefrologica.com. La revista es financiada por la entidad que la publica y se distribuye bajo una licencia Creative Commons Atribución No Comercial 4.0 Internacional (CC BY-NC 4.0). Esta revista no aplica ningún cargo por publicación.

La revista está incluida en: CINAHL, IBECS, SciELO, CUIDEN, SIIC, Latindex, Capes, DULCINEA, Dialnet, DOAJ, ENFISPO, Scopus, Sherpa Romeo, C17, RECOLECTA, Redalyc, REBIUN, REDIB, MIAR, WordCat, Google Scholar Metric, Cuidatge, Cabells Scholarly Analytics, AURA, JournalTOCs y Proquest.

Enfermería Nefrológica publica artículos de investigación enfermera relacionados con la nefrología, hipertensión arterial, diálisis y trasplante, que tengan como objetivo contribuir a la difusión del conocimiento científico que redunde en el mejor cuidado del enfermo renal. Asimismo, se aceptarán artículos de otras áreas de conocimiento enfermero o de materias transversales que redunden en la mejora del conocimiento profesional de la enfermería nefrológica.

Para la publicación de los manuscritos, *Enfermería Nefrológica* sigue las directrices generales descritas en los requisitos de uniformidad para manuscritos presentados para publicación en revistas biomédicas, elaboradas por el comité internacional de editores de revistas biomédicas (ICJME). Disponible en <http://www.icmje.org>. En la valoración de los manuscritos recibidos, el comité editorial tendrá en cuenta el cumplimiento del siguiente protocolo de redacción.

SECCIONES DE LA REVISTA

La revista consta fundamentalmente de las siguientes secciones:

Editorial. Artículo breve en el que se expresa una opinión o se interpretan hechos u otras opiniones. Revisiones breves por encargo del comité editorial.

Originales. Son artículos en los que el autor o autores estudian un problema de salud, del que se deriva una actuación específica de enfermería realizada con metodología cuantitativa, cualitativa o ambas.

Los originales con metodología cuantitativa y cualitativa deberán contener: resumen estructurado (máximo de 250 palabras en inglés y en el idioma original), introducción, objetivos, material y método, resultados, discusión y conclusiones (extensión máxima de 3.500 palabras para los de metodología cuantitativa y 5.000 palabras para los de metodología cualitativa, máximo 6 tablas y/o figuras, máximo 35 referencias bibliográficas).

Revisiones. Estudios bibliométricos, revisiones narrativas, integrativas, sistemáticas, metaanálisis y metátesis sobre temas relevantes y de actualidad en enfermería o nefrología, siguiendo la misma estructura y normas

que los trabajos originales cualitativos, pero con un máximo de 80 referencias bibliográficas.

Casos clínicos. Trabajo fundamentalmente descriptivo de uno o unos pocos casos relacionados con la práctica clínica de las enfermeras, en cualquiera de sus diferentes ámbitos de actuación. La extensión debe ser breve y se describirá la metodología de actuación encaminada a su resolución bajo el punto de vista de la atención de enfermería. Incluirá un resumen de 250 palabras en castellano e inglés estructurado en: descripción caso/os, descripción del plan de cuidados, evaluación del plan, conclusiones. La extensión máxima será de 2.500 palabras, con la siguiente estructura: introducción; presentación del caso; valoración enfermera completa indicando modelo; descripción del plan de cuidados (conteniendo los posibles diagnósticos enfermeros y los problemas de colaboración, objetivos e intervenciones enfermeras. Se aconseja utilizar taxonomía NANDA-NIC-NOC); evaluación del plan de cuidados y conclusiones. Se admitirá un máximo de 3 tablas/figuras y de 15 referencias bibliográficas.

Cartas al director. Consiste en una comunicación breve en la que se expresa acuerdo o desacuerdo con respecto a artículos publicados anteriormente. También puede constar de observaciones o experiencias sobre un tema de actualidad, de interés para la enfermería nefrológica. Tendrá una extensión máxima de 1.500 palabras, 5 referencias bibliográficas y una figura/tabla.

Original breve. Trabajos de investigación de las mismas características que los originales, pero de menor envergadura (series de casos, investigaciones sobre experiencias con objetivos y resultados muy concretos), que pueden comunicarse de forma más abreviada. Seguirán la siguiente estructura: resumen estructurado (250 palabras en inglés y castellano), introducción, objetivos, material y método, resultados, discusión y conclusiones (extensión 2.500 palabras, máximo 3 tablas y/o figuras, máximo 15 referencias bibliográficas).

Otras secciones. En ellas se incluirán artículos diversos que puedan ser de interés en el campo de la enfermería nefrológica.

Las extensiones indicadas son orientativas. La extensión de los manuscritos excluye: título, autores/filiación, resumen, tablas y referencias bibliográficas. La estructura y extensión de cada sección de la revista se resume en la **tabla 1**.

ASPECTOS FORMALES PARA LA PRESENTACIÓN DE LOS MANUSCRITOS

Los autores ceden de forma no exclusiva los derechos de explotación de los trabajos publicados y consiente en que su uso y distribución se realice con la licencia **creative commons atribución - no comercial 4.0 internacional** (CC BY-NC 4.0). Puede consultar desde aquí la versión informativa y el **texto legal** de la licencia. Esta circunstancia ha de hacerse constar expresamente de esta forma cuando sea necesario.

No se aceptarán manuscritos previamente publicados o que hayan sido enviados al mismo tiempo a otra revista. En el caso de que hubiera sido presentado a alguna actividad científica (Congreso, Jornadas) los autores lo pondrán en conocimiento del comité editorial. Sería recomendable que todos los trabajos hayan pasado un comité de ética.

Los manuscritos se remitirán por la plataforma digital de la revista que se encuentra en su página web, a la que se accede en la siguiente dirección: <http://www.enfermerianefrologica.com>. (Apartado “Enviar un artículo”).

Como parte del proceso de envío, los autores/as están obligados a comprobar que su envío cumpla todos los elementos que se muestran a continuación. Se devolverán a los autores/as aquellos envíos que no cumplan estas directrices.

Junto al manuscrito deberá remitirse una carta de presentación al editor jefe de la revista, en la que se solicita la aceptación para su publicación en alguna de las secciones de la misma. En ella se incorporará el formulario de acuerdo de publicación, originalidad del trabajo, responsabilidad de contenido y no publicación en otro medio.

La presentación de los manuscritos se hará en dos archivos en formato word, uno identificado y otro anónimo para su revisión por pares. El tamaño de las páginas será DIN-A4, a doble espacio y un tamaño de letra de 12, dejando los márgenes laterales, superior e inferior de 2,5 cm. Las hojas irán numeradas correlativamente. Se recomienda no utilizar encabezados, pies de página, ni subrayados, que dificultan la maquetación en el caso de que los manuscritos sean publicados.

La herramienta de gestión de la revista Enfermería Nefrológica acusará recibo de todos los manuscritos. Una vez acusado recibo, se inicia el proceso editorial, que puede ser seguido por los autores en la plataforma mencionada anteriormente.

Los manuscritos se separarán en tres archivos, que se incluirán en la plataforma OJS de la revista:

Archivo 1:

- ▶ Carta de presentación del manuscrito.
- ▶ Formulario de acuerdo de publicación, responsabilidad de contenido y no publicación en otro medio.

Archivo 2:

- ▶ Trabajo identificado completo (incluidas tablas y anexos).

Archivo 3:

- ▶ Trabajo anónimo completo (incluidas tablas y anexos).

Antes del envío definitivo habrá que aceptar el apartado de responsabilidad ética.

Los manuscritos originales deberán respetar las siguientes condiciones de presentación:

Primera página. Se inicia con el título del artículo, nombre y apellidos completos de los autores, centros de trabajos, país de origen, correo electrónico y Orcid (identificador único de investigadores). Se indicará a qué autor debe ser enviada la correspondencia, así como si los apellidos de los autores irán unidos por un guión o sólo utilizarán un solo apellido.

Resumen. Todos los artículos deberán incluir un resumen (en el idioma de origen y en inglés). La **extensión máxima** será de **250 palabras**. El resumen ha de tener la información suficiente para que el lector se haga una idea clara del contenido del manuscrito, sin ninguna referencia al texto, citas bibliográficas ni abreviaturas y estará estructurado con los mismos apartados del trabajo (Introducción, Objetivos, Metodología, Resultados y Conclusiones). El resumen no contendrá información que no se encuentre en el texto.

Palabras clave. Al final del resumen deben incluirse 3-6 palabras clave, que estarán directamente relacionadas con las principales variables del estudio (se aconseja utilizar lenguaje controlado DeCS <https://decs.bvsalud.org/es/> y MeSH <https://www.ncbi.nlm.nih.gov/mesh>).

Texto. En los manuscritos de observación y experimentales, el texto suele dividirse en apartados o secciones denominadas: **Introducción**, que debe proporcionar los elementos necesarios para la comprensión del trabajo e incluir los objetivos del mismo. **Material y Método**, empleado en la investigación, que incluye el centro donde se ha realizado, el tiempo que ha durado, características de la serie, sistema de selección de la muestra, las técnicas utilizadas y los métodos estadísticos. **Resultados**, que deben ser una exposición de datos, no un comentario o discusión sobre alguno de ellos. Los resultados deben responder exactamente a los objetivos planteados en la introducción. Se pueden utilizar tablas y/o figuras para complementar la información, aunque deben evitarse repeticiones innecesarias de los resultados que ya figuren en las tablas y limitarse a resaltar los datos más relevantes. En la **Discusión** los autores comentan y analizan los resultados, relacionándolos con los obtenidos en otros estudios, con las correspondientes citas bibliográficas, así como las conclusiones a las que han llegado con su trabajo. La **Discusión** y las **Conclusiones** se deben derivar directamente de los resultados, evitando hacer afirmaciones que no estén refrendados por los resultados obtenidos en el estudio.

Agradecimientos. Cuando se considere necesario se expresa el agradecimiento de los autores a las diversas personas o instituciones que hayan contribuido al desarrollo del trabajo. Tendrán que aparecer en el mismo aquellas personas que no reúnen todos los requisitos de autoría, pero que han facilitado la realización del manuscrito, como por ejemplo las personas que hayan colaborado en la recogida de datos.

Declaración de uso de Inteligencia Artificial (IA) generativa en la redacción científica. La IA y las tecnologías asistidas por IA no deben figurar como autor o coautor, ni citarse como autor. La autoría implica responsabilidades y tareas que solo pueden ser atribuidas y realizadas por humanos. Si se ha utilizado la misma, los autores deben incluir un apartado antes de la bibliografía, informando sobre el uso de la IA: “Durante la preparación de este trabajo, los autores utilizaron [NOMBRE HERRAMIENTA / SERVICIO] para [MOTIVO]. Después de utilizar esta herramienta/servicio, los autores revisaron y editaron el contenido según sea necesario y asumen total responsabilidad por el contenido de la publicación”. Esta declaración no se aplica al uso de herramientas básicas para verificar la gramática, la ortografía, las referencias bibliográficas, etc. Si no hay nada que declarar, no es necesario agregar este apartado.

Bibliografía. Se elaborará de acuerdo a lo que indica el ICJME con las normas de la National Library of Medicine (NLM), disponible en: https://www.nlm.nih.gov/bsd/uniform_requirements.html.

Las referencias bibliográficas deberán ir numeradas correlativamente según el orden de aparición en el texto por primera vez, en números arábigos en superíndice, con el mismo tipo y tamaño de letra que la fuente utilizada para el texto. Cuando coincidan con un signo de puntuación, la cita precederá a dicho signo. Los nombres de las revistas deberán abreviarse de acuerdo con el estilo usado en el Index Medicus; consultando la “List of Journals indexed” que se incluye todos los años en el número de enero del Index Medicus. Así mismo, se puede consultar el catálogo colectivo de publicaciones periódicas de las bibliotecas de ciencias de la salud españolas, denominado c17 (<http://www.c17.net/>). En caso de que una revista no esté incluida en el Index Medicus ni en el c17, se tendrá que escribir el nombre completo.

La Bibliografía de los artículos debe estar actualizada a los últimos 7 años y se recomienda citar un número apropiado de referencias

A continuación se dan algunos ejemplos de referencias bibliográficas.

Artículo de revista

Se indicará:

Zurera-Delgado I, Caballero-Villarraso MT, Ruiz-García M. Análisis de los factores que determinan la adherencia terapéutica del paciente hipertenso. *Enferm Nefrol.* 2014;17(4):251-60.

En caso de más de 6 autores, mencionar los seis primeros autores, seguidos de la expresión «et al»:

Firaneq CA, Garza S, Gellens ME, Lattrel K, Mancini A, Robar A *et al.* Contrasting Perceptions of Home Dialysis Therapies Among In-Center and Home Dialysis Staff. *Nephrol Nurs J.* 2016;43(3):195-205.

En caso de ser un Suplemento:

Grupo Español Multidisciplinar del Acceso Vascular (GEMAV). Guía Clínica Española del Acceso Vascular para Hemodiálisis. *Enferm Nefrol.* 2018;21(Supl 1):S6-198.

Artículo de revista de Internet:

Pérez-Pérez MJ. Cuidadores informales en un área de salud rural: perfil, calidad de vida y necesidades. Biblioteca Lascasas [Internet]. 2012 [consultado 10 Mar 2015];8:[aprox. 59 p.]. Disponible en: <http://www.index-f.com/lascasas/documentos/lc0015.php>

Artículo publicado en formato electrónico antes que en versión impresa:

Blanco-Mavillard I. ¿Están incluidos los cuidados paliativos en la atención al enfermo renal? *Enferm Clin.* 2017; Disponible en: <http://dx.doi.org/10.1016/j.enfcli.2017.04.005>. Epub 6 Jun 2017.

Capítulo de un libro:

Pulido-Pulido JF, Crehuet-Rodríguez I, Méndez Briso-Montiano P. Punciones de accesos vasculares permanentes. En: Crespo-Montero R, Casas-Cuesta R, editores. *Procedimientos y protocolos con competencias específicas para Enfermería Nefrológica*. Madrid: Sociedad Española de Enfermería Nefrológica (SEDEN); 2013. p. 149-54.

Página Web

Sociedad Española de Enfermería Nefrológica. Madrid. [consultado 5 Feb 2007]. Disponible en: <https://www.seden.org>.

Se recomienda a los autores, que dependiendo del diseño del estudio que van a publicar, comprueben los siguientes checklists, consultables en la página web <http://www.equator-network.org/reporting-guidelines/>:

- ▶ Guía CONSORT para los ensayos clínicos.
- ▶ Guía TREND para los estudios experimentales no aleatorizados.
- ▶ Guía STROBE para los estudios observacionales.
- ▶ Guía PRISMA para las revisiones sistemáticas.
- ▶ Guía COREQ para los estudios de metodología cualitativa.

Tablas y Figuras. Todas se citarán en el texto (en negrita, sin abreviaturas ni guiones), y se numerarán con números arábigos, sin superíndices de manera consecutiva, según orden de citación en el texto. Se presentarán al final del manuscrito, cada una en una página diferente, con el título en la parte superior de las mismas.

Se procurará que las tablas sean claras y sencillas, y todas las siglas y abreviaturas deberán acompañarse de una nota explicativa al pie de la tabla. Las imágenes (fotografías o diapositivas) serán de buena calidad. Es recomendable utilizar el formato jpg.

ACEPTACIÓN DE RESPONSABILIDADES ÉTICAS

Enfermería Nefrológica se adhiere a las guías éticas establecidas abajo para su publicación e investigación.

Autoría: Los autores que envían un manuscrito lo hacen entendiendo que el manuscrito ha sido leído y aprobado por todos los autores y que todos los autores están de acuerdo con el envío del manuscrito a la revista. TODOS los autores listados deben haber contribuido a la concepción y diseño y/o análisis e interpretación de los datos y/o la escritura del manuscrito y la información de los autores deben incluir la contribución de cada uno en la página inicial del envío.

Enfermería Nefrológica se adhiere a la definición y autoría establecida por The International Committee of Medical Journal Editors (ICMJE). De acuerdo con los criterios establecidos por el ICMJE la autoría se debe basar en 1) contribuciones substanciales a la concepción y diseño, adquisición, análisis e interpretación de los datos, 2) escritura del artículo o revisión crítica del mismo por su contenido intelectual importante y 3) aprobación final de la versión publicada. Todas las condiciones han de ser cumplidas.

Aprobación ética: Cuando un envío requiere de la colección de datos de investigación en los que se involucra sujetos humanos, se debe acompañar de un estamento explícito en la sección de material y método, identificando cómo se obtuvo el consentimiento informado y la declaración, siempre que sea necesaria, de que el estudio ha sido aprobado por un comité de ética de la investigación apropiado. Los editores se reservan el derecho de rechazar el artículo cuando hay dudas de si se han usado los procesos adecuados.

Conflicto de intereses: Los autores deben revelar cualquier posible conflicto de intereses cuando envían un manuscrito. Estos pueden incluir conflictos de intereses financieros, es decir, propiedad de patentes, propiedad de acciones, empleo en compañías de diálisis/farmacéuticas, consultorías o pagos por conferencias de compañías farmacéuticas relacionadas con el tópico de investigación o área de estudio. Los autores deben tener en cuenta que los revisores deben asesorar al editor de cualquier conflicto de interés que pueda influir en el dictamen de los autores.

Todos los conflictos de intereses (o información especificando la ausencia de conflicto de intereses) se deben incluir en la página inicial bajo el título "Conflicto de intereses". Esta información será incluida en el artículo publicado. Si los autores no tienen ningún conflicto de intereses se deberá incluir la siguiente frase: "No se declaran conflictos de interés por el/los autor/es".

Fuentes de financiación: Los autores deben especificar la fuente de financiación para su investigación cuando envían un manuscrito. Los proveedores de la ayuda han de ser nombrados y su ubicación (ciudad, estado/provincia, país) ha de ser incluida.

DETECCIÓN DE PLAGIOS

La revista Enfermería Nefrológica lucha en contra del plagio y no acepta bajo ningún concepto la publicación de materiales plagiados.

El plagio incluye, pero no se limita a:

La copia directa de texto, ideas, imágenes o datos de otras fuentes sin la correspondiente, clara y debida atribución.

El reciclado de texto de un artículo propio sin la correspondiente atribución y visto bueno del editor/a (leer más sobre reciclado de texto en la "Política de publicación redundante o duplicada y reciclado de texto").

Usar una idea de otra fuente usando un lenguaje modificado sin la correspondiente, clara y debida atribución.

Para la detección de plagios la revista utilizará el servicio **iThenticate-Similarity Check** de Crossref para la comprobación de similitud. Todos los originales remitidos a Enfermería Nefrológica son, previo a su envío a revisión por pares, evaluados por el sistema antiplagio.

Enfermería Nefrológica sigue el árbol de decisiones recomendado por la COPE en caso de sospecha de plagio de un manuscrito recibido o de un artículo ya publicado (<http://publicationethics.org/files/Spanish%20%281%29.pdf>). Enfermería Nefrológica se reserva el derecho de contactar con la institución de los/as autores/as en caso de confirmarse un caso de plagio, tanto antes como después de la publicación.

Tabla 1. Tabla resumen estructura y extensión de cada sección de la revista.

Tipo de manuscrito	Resumen (Inglés e idioma original del artículo)	Texto principal	Tablas y figuras	Autores	Referencias
Editorial.	No	Extensión máxima: 750 palabras, incluida bibliografía.	Ninguna.	Máximo recomendado 2.	Máximo 4.
Originales Metodología Cuantitativa.	250 palabras. Estructura: introducción, objetivos, material y método, resultados y conclusiones.	Extensión máxima: 3500 palabras. Estructura: introducción, objetivos, material y método, resultados, discusión y conclusiones.	Máximo 6.	Máximo recomendado 6.	Máximo 35.
Originales Metodología Cualitativa.	250 palabras. Estructura: introducción, objetivos, material y método, resultados y conclusiones.	Extensión máxima: 5000 palabras. Estructura: introducción, objetivos, material y método, resultados, discusión y conclusiones.	Máximo 6.	Máximo recomendado 6.	Máximo 35.
Originales Breves.	250 palabras. Estructura: introducción, objetivos, material y método, resultados y conclusiones.	Extensión máxima: 2500 palabras. Estructura: introducción, objetivos, material y método, resultados, discusión y conclusiones.	Máximo 3.	Máximo recomendado 6.	Máximo 15.
Revisiones.	250 palabras. Estructura: introducción, objetivos, metodología, resultados y conclusiones.	Extensión máxima: 3800 palabras. Estructura: introducción, objetivos, material y método, resultados, discusión y conclusiones.	Máximo 6.	Máximo recomendado 6.	Máximo 80.
Casos Clínicos.	250 palabras. Estructura: descripción caso, descripción del plan de cuidados, evaluación del plan, conclusiones.	Extensión máxima: 2500 palabras. Estructura: introducción; presentación del caso; valoración enfermera (completa); descripción del plan de cuidados (conteniendo los posibles diagnósticos enfermeros y los problemas de colaboración, objetivos e intervenciones enfermeras); evaluación del plan de cuidados y conclusiones.	Máximo 3.	Máximo recomendado 3.	Máximo 15.

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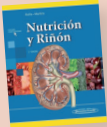
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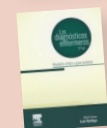
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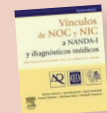
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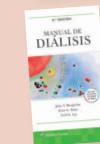
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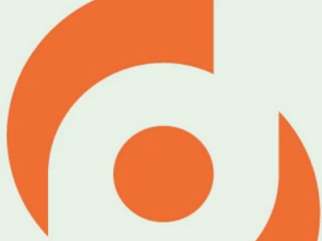
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