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ORIGINALES

ORIGINAL BREVE

CASO CLÍNICO

The image of nurses in the media: situation analysis and actions for improvement

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Nursing is an essential yet often unknown profession[1]. It is essential because nurses care for people even before birth—by supporting mothers during pregnancy—until the very last breath, when providing palliative care at the end of life. Nurses are fundamental components of the health system, delivering not only physical care but also psychological and spiritual support. They care holistically, offering person-centred care[2].

The pandemic confirmed that without nurses, health systems collapse. Unfortunately, data show that we are facing a global shortage of care professionals[3,4].

Despite being the largest healthcare workforce—345,969 in Spain[5]—and despite the fact that everyone will receive nursing services at some point in life, nursing remains little known. Four factors supported by available evidence may help explain this lack of societal awareness[6]:

1. Nursing care is often difficult to make visible because it is both a science and an art. The art of caring for another is not easy to describe or narrate outside the interpersonal relationship created with each patient[7].
2. Nursing remains under-recognised because nurses are so focused on caring for others that they forget to care for themselves. They do not claim the protagonism they deserve. To care well for others, nurses must be cared for themselves, and their work must be valued by society as essential[8].
3. Nursing is practised predominantly by women. Thus, all the challenges faced by women are experienced by nurses, often magnified in the workplace[9].
4. Finally, nursing has changed significantly in a short time, at different paces across countries. These changes in education, roles, and competencies have not been effectively communicated to society[10,11].

The *Triple Impact* report prepared by the UK Parliament in 2016 confirmed that investing in nurses not only improves national health but also strengthens economies and advances gender equality[12]. By providing resources, governments contribute to achieving three of the Sustainable Development Goals.

What can nurses do to be more effective in achieving these three goals?

1. Advocate for the legal expansion of the fields in which they practise.
2. Demand the right to increase the competencies exercised within their discipline.
3. Work actively to make their professional performance more visible so that society better understands their contribution to health systems and patient care in the 21st century[13].

The invisibility and distorted image of nurses in the media

Is it common to see, hear, or read about nurses in the media? Reflect on whether you can recall a nurse as the protagonist of a film or series, or the last news item about a colleague in a newspaper, on the radio, or on television. Is that information representative and coherent with the professional identity of 21st-century nurses?

Studies show that, despite being the largest workforce in health systems, nurses are barely present in health news. Their portrayal in entertainment genres does not adequately reflect the discipline.[14-17]. This media invisibility—or distorted visibility—also helps explain society's limited understanding of the profession. A 1997 Sigma Theta Tau study showed that nurses were cited as information sources in only 4% of health news[18]. When this study was repeated 20 years later in 2017 by Diana Mason and her team, results confirmed the situation had worsened: nurses were sources in only 2% of health news published in the United States[19].

Has the pandemic increased nurses' media visibility?

Yes. Studies conducted in several countries confirm this[20-23]. Preliminary results from our research in Spain, Chile, and Argentina show that from 2019 to 2020 the number of press articles mentioning nurses quadrupled. Nevertheless, their role as information sources remained marginal during media coverage of the pandemic[24].

Given this evidence, another question arises: should nurses investigate the image of their profession disseminated by the media?

The answer is yes. In other countries, this has been studied for decades[8,25,26]. In 2022, our team published a scoping review analysing all studies on the image of nurses presented in the media. We identified 60 studies, most conducted in the United States, but evidence shows the issue is being investigated worldwide[27].

Although research on this topic began in the 1980s, most studies have been published in the past decade, reflecting its growing importance and the heightened academic interest during the pandemic. The most studied medium is the press, and qualitative methodologies are most frequently applied. A total of 40% of the reviewed studies confirmed that the image portrayed by the media is negative, and an additional 20% reported it is more negative than positive. Evidence clearly shows that nurses' presence is scarce, stereotyped, and highlights the challenge: to improve the image of nurses in the media[27].

The most common stereotypes and their consequences

The most common stereotypes used by the media to represent nurses include: the saint or angel; the sexy nurse; the incompetent fool; the doctor's assistant; the tyrant or killer; the technician; and the hero[25,28,29].

What misconceptions do these stereotypes generate in the minds of citizens?

The saint or nun stereotype leads society to believe nursing is a purely vocational calling requiring neither training nor education. The sexy nurse stereotype exposes nurses to violence and abuse[30]. The incompetent stereotype undermines the value of nursing education. Depicting nurses as mere assistants to doctors denies their professional competencies. Portraying them as tyrannical undermines teamwork with other health care professionals.31 The purely technical stereotype eliminates the humanistic contribution of nursing care. Finally, portraying nurses as heroes risks leading society to believe they do not need to care for themselves, deserve no pay, and can take risks without fear[32,35].

Beyond these, stereotypes generate other adverse consequences for nurses, their patients, and society as a whole[36].

When media portray false images of nurses, they may unknowingly discourage young people from pursuing this career, exacerbating the already critical global shortage of nurses[37-39].

For example, in Spain in 2020, the number of students selecting nursing as their first university choice increased by 32% vs 2019, according to the Spanish Ministry of Education[40]. What factor contributed to this rise? Objectively, the heavy workload, stress, and fatigue reported by the media could have discouraged students. Yet, despite this demanding image, interest increased by 32%. I am convinced that the quadrupling of nurses' media presence in 2020 contributed significantly. One cannot aspire to what one does not know; the pandemic made nurses visible, and for the first time, media presented them as the backbone of health systems. In an unprecedented event, nurse Amy O'Sullivan appeared on the cover of The Times as one of the 100 most influential people in the world[41].

In addition, some studies confirm that negative media portrayals impact nurses' self-esteem and may increase burnout[42,43].

This image can also hinder professional relationships with other team members. If patients are unaware of nurses' competencies or level of education, they may not understand what services nurses can provide, negatively affecting the nurse–patient relationship[44]. Moreover, a negative image means politicians may exclude nurses from decision-making forums on key public health issues[45,46], limit economic and human resources allocated to nursing, and contribute to increased violence and abuse from patients, families, and even colleagues[47].

Ultimately, this negative image harms the nurse–patient relationship and may reduce the quality of care provided[43,48].

Action plan to build a realistic and coherent image

Given this adverse reality, what can—and should—nurses do to change it?

The first step has already been taken: recognising the media image of nursing and becoming aware of the adverse consequences for nurses, patients, families, and society.

The second step is to embrace proactive communication based on shared professional identity, enabling nurses to explain—through their own narrative—what they contribute to 21st-century society[49,50]. As long as others define nurses and their work, visibility and social image will not improve[51,52]. Studies show that journalists are often unclear about what nurses do or where to find them as information sources, partly because health institutions prioritise doctors' voices[53,54]. In addition, many nursing associations lack strategic communication management, and few nurses are willing to appear in the press, radio, or television[55,56]. In this context, proactive communication becomes an effective antidote to invisibility and misunderstanding.

To effectively foster proactive nurse communication, it is essential that nurses receive training in communication competence—not only to successfully manage conversations with patients and families, but also to navigate interactions with other stakeholders with whom they engage[52,57]. Developing communication competence is, in my view, a challenge that must be undertaken by nursing faculties if we want future generations to have a voice in shaping society in the decades ahead.

Nursing associations and nursing directorates in health care centres represent, in my opinion, the other key pillars for laying the foundations that will allow a distinctive nursing narrative to emerge[55,56,58,59]. I would encourage them—drawing on steps already taken in other countries and more recently by Spain's General Nursing Council—to offer and support training designed to build this "multi-stakeholder" communication competence[60]. In these courses, beyond providing instruction and practice in communication techniques, I propose that nurses should also be equipped with tools to identify the topics on which they can serve as credible information sources. They should learn to discern what information truly contributes to improving citizens' health and to enhancing the image of their profession. Providing them with a safe ethical, legal, and institutional framework that strengthens their freedom of expression in all contexts is another element that should be included in such training[61]. In the medium term, this educational investment will transform practising nurses into qualified spokespersons, ensuring that nursing knowledge is effectively shared and heard in all forums. Furthermore, it will provide nursing associations with a robust database of experts to draw upon when journalists or policymakers seek informed sources, or when associations themselves wish to highlight issues they consider newsworthy or to ensure nursing expertise is represented in decision-making spaces.

I hope that what has been outlined in these paragraphs may spark nurses' interest in this field and that some, having recognised the current situation, may decide to take action—whether by actively monitoring media portrayals of the profession, developing their communication competence, engaging in public forums, or even conducting research on these matters.62 Whether we like it or not, in today's world, what is narrated—whether true or not—imposes itself as reality in the minds of citizens. What is real deserves—and must—be well narrated so that society perceives it as truth. There is no one better than practising nurses to put an end to their media invisibility or distorted image. Nurses must become the narrators of their own—and our—reality. I firmly believe it is worthwhile to invest in nursing communication, not only for the benefit of those who practise this discipline, but also to ensure that the care which all of us will need at some point in our lives remains viable. For all these reasons, I argue that investing in communicating a coherent image of nursing in the 21st century also means protecting and safeguarding care—because #CommunicatingIsAlsoCaring.

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Accuracy of first-generation methods in the detection of stenosis in native arteriovenous fistulae

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ABSTRACT

Objective: To determine the accuracy of first-generation methods in detecting stenosis in native arteriovenous fistulas.

Material and Method: Retrospective observational study. Sample: Patients with functioning native arteriovenous fistulas. First-generation methods include physical examination, manual tests, pulse increase test and arm elevation test, indirect methods, Kt/V, and arteriovenous fistula recirculation. The diagnosis of stenosis was confirmed by Doppler ultrasound. Sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), and accuracy of first-generation methods based on Doppler ultrasound were calculated.

Results: Sample 39 patients, 79.48% male. Ultrasound detected 19 stenoses, nonsignificant. Physical examination: sensitivity 31.5%, specificity 80%, PPV 60%, NPV 55.1%, accuracy 56.4%. Pulse rise test: sensitivity 5.2%, specificity 90%, PPV 33.3%, NPV 50%, accuracy 48.7%. Arm elevation test: sensitivity 52.6%, specificity 70%, PPV 62.5%, NPV 60.8%, accuracy 61.5%. Indirect methods: sensitivity 15.7%, specificity 55%, PPV 25%, NPV 40.7%, accuracy 35.9%. Kt/V: sensitivity 10.5%, specificity 75%, PPV 28.5%, NPV 46.8%, accuracy 43.5%. AVF recirculation: sensitivity 10.5%, specificity 100%, PPV 100%, NPV 54.1%, accuracy 56.4%.

Conclusions: All first-generation methods have high specificity and low sensitivity. The degree of stenosis (significant or non-significant) could influence the sensitivity of the physical examination but not the specificity. The arm elevation test is the most accurate first-generation method of detecting stenosis.

Keywords: native arteriovenous fistula; doppler ultrasound; complications; haemodialysis.

RESUMEN

Precisión de los métodos de primera generación en la detección de estenosis en fístulas arteriovenosas nativas

Objetivo: Determinar la precisión de los métodos de primera generación en la detección de estenosis en fístulas arteriovenosas nativas.

Material y Método: Estudio observacional retrospectivo. Muestra: Pacientes con fístulas arteriovenosas nativas funcionantes. Métodos de primera generación: exploración física, test manuales: test de aumento del pulso y test de elevación del brazo, métodos indirectos, Kt/V y recirculación de la fístula arteriovenosa. El diagnóstico de estenosis fue confirmado mediante ecografía doppler. Se calculó sensibilidad, especificidad, valor predictivo positivo (VPP), valor predictivo negativo (VPN) y precisión de los métodos de primera generación basándose en la ecografía doppler.

Resultados: Muestra 39 pacientes, 79,48% hombres. El ecógrafo detectó 19 estenosis, ninguna significativa. Exploración física: sensibilidad 31,5%, especificidad 80%, VPP 60%, VPN 55,1%, precisión 56,4%. Test aumento del pulso:

sensibilidad 5,2%, especificidad 90%, VPP 33,3%, VPN 50%, precisión 48,7%. Test elevación del brazo: sensibilidad 52,6%, especificidad 70%, VPP 62,5%, VPN 60,8%, precisión 61,5%. Métodos indirectos: sensibilidad 15,7%, especificidad 55%, VPP 25%, VPN 40,7%, precisión 35,9%. Kt/V: sensibilidad 10,5%, especificidad 75%, VPP 28,5%, VPN 46,8%, precisión 43,5%. Recirculación de la FAV: sensibilidad 10,5%, especificidad 100%, VPP 100%, VPN 54,1%, precisión 56,4%.

Conclusiones: Todos los métodos de primera generación presentan alta especificidad y baja sensibilidad. El grado de estenosis (significativa o no significativa) podría influir en la sensibilidad de la exploración física, pero no en la especificidad. El test de elevación del brazo es el método de primera generación más preciso en la detección de estenosis.

Palabras clave: fístula arteriovenosa nativa; ecografía doppler; complicaciones; hemodiálisis.

INTRODUCTION

Vascular access is the most important factor determining the success or failure of chronic haemodialysis (HD) programmes[1]. Vascular-access failure leads to a high number of hospital admissions and is a major cause of morbidity in patients on HD[2]. For these reasons, HD units are recommended to implement protocolised surveillance programmes for arteriovenous fistulae (AVF)[1,3]. These programmes include both the early diagnosis of significant stenoses using various screening methods and their pre-emptive correction to prevent thrombosis and increase AVF survival[1,3,4]. Stenosis—narrowing of the normal vessel diameter—is caused by a combination of impaired remodelling, shear stress, and venous neo-intima formation[3,5]. Stenosis is the leading cause of vascular-access thrombosis[1,3,5]. Access thrombosis results in loss of the access and the need for central venous catheters (CVCs); CVC use has been associated with numerous complications that translate into high morbidity and mortality[1,3,5,6].

Monitoring is the examination and assessment of vascular access to detect physical signs suggestive of stenosis[2]. Monitoring methods are grouped into first- and second-generation methods. Both first- and second-generation methods are effective for surveillance, monitoring, and reducing the incidence rate of thrombosis in native AVF[3,7]. These monitoring methods are complementary rather than mutually exclusive and can be used simultaneously to improve the yield of surveillance programmes[3]. However, only second-generation methods allow calculation of vascular access blood flow (QA). Among second-generation methods, Doppler ultrasound (DU) is the imaging test of choice to confirm, locate, and quantify AVF stenoses[3,8,9].

There are several first-generation methods for AVF monitoring. Physical examination is the foundation of all vascular-access monitoring: periodic inspection, palpation, and auscultation of the AVF. It is easy to learn and perform, time-efficient, and low cost. Detecting any change from baseline in the thrill, bruit, or pulse enables diagnosis of a stenosis and may help localise it[3,6]. Manual tests are the principal bedside tests used during the physical examination of an AVF; 3 tests are used to detect stenoses and collateral veins[3,6]. Indirect methods—also described as "problems during the HD session"—are indirect signs of AVF stenosis when they occur persistently in relation to recent HD sessions[3,6]. Kt/V is the amount of plasma cleared of urea during the HD treatment time relative to the patient's age- and sex-appropriate urea distribution volume; it is obtained from HD monitors. An unexplained decrease in Kt/V can be an indirect sign of vascular-access dysfunction[3,6]. AVF recirculation occurs when a portion of already-dialysed blood exiting the venous needle re-enters the dialyser through the arterial needle[5]. With a significant stenosis, the percentage of recirculation during HD increases; however, this monitoring method does not enable early detection of stenoses. Recirculation can be measured by urea recirculation or by the blood temperature monitor (BTM) module built into HD monitors[3,6].

Although first-generation methods have lost some prominence with the advent of dilutional methods and the incorporation of DU into HD services, their role in early stenosis detection is indisputable because they rapidly, simply, and effectively provide a large amount of information. Despite this, the accuracy of most of these monitoring methods compared with DU has not been studied. Therefore, the aim of this study was to determine the accuracy of physical examination, manual tests, indirect methods, Kt/V, and AVF recirculation for detecting stenoses in native AVF vs Doppler ultrasound.

MATERIAL AND METHOD

We conducted an observational, retrospective study from December 1st through December 31st, 2022 in the Haemodialysis and Renal Transplant Unit of *Hospital Universitario Miguel Servet* (Zaragoza, Spain).

All patients on a periodic haemodialysis programme with functioning native AVF as of December 1st, 2022 were included. Patients with functioning native AVF who were dialysed through another vascular access were not included.

From the electronic health record we collected sociodemographic variables (age and sex) and AVF variables (type of AVF and access vintage). Indirect methods, Kt/V, and AVF recirculation were retrieved from the Nefrolink® v4.5 system. The remaining variables were obtained by DU (stenosis, percentage reduction in vessel diameter [RVD], peak systolic velocity [PSV] ratio, and QA) and by physical examination.

The first-generation methods used were physical examination, manual tests, indirect methods, Kt/V, and

AVF recirculation. Two nurses in our unit assessed native AVF with first-generation methods. Physical examination and manual tests were performed on 5–6 December 2022 (the first dialysis day of the week) before patients were connected to the HD monitor. Indirect methods, Kt/V, and AVF recirculation were recorded between 5 and 10 December at the end of each HD session.

Physical examination: Thrill, bruit, and pulse were evaluated at the anastomosis and along the mid and distal segments of the native AVF. Thrill was assessed with the palm, bruit with a Littmann Classic III stethoscope, and pulse with the fingertips. The physical examination was considered positive for stenosis if at least one suggestive sign was present: diminished thrill and/or bruit at the anastomosis; systolic-only thrill; increased thrill over the lesion; high-pitched ("whistling") bruit over the stenotic lesion; hypopulsatility at the anastomosis; or hyperpulsatility over the stenotic lesion[3,7,10].

Manual tests: We used the pulse augmentation test and the arm elevation test; the sequential occlusion method was excluded because it is designed to detect collateral veins rather than stenoses. For the pulse augmentation test, the arterialised vein several centimetres above the anastomosis was transiently occluded with one hand while simultaneously assessing pulse strength with the other. A normal test was defined as an increased pulse distal to the occluding finger (between the finger and the anastomosis); hypopulsatility during the test suggested stenosis. For the arm elevation test, the AVF limb was raised above heart level to observe whether the arterialised vein collapsed. A normal test was defined as collapse of the native AVF on arm elevation. In the presence of a stenosis, only the segment proximal to the lesion collapses, whereas the segment distal to the stenosis does not; excessive collapse of the native AVF was also considered suggestive of stenosis[3,6]. The accuracy of each test was calculated separately.

Indirect methods: Indirect indicators were difficult cannulation; aspiration of clots during cannulation; increased pre-pump arterial negative pressure; failure to reach the prescribed blood-pump flow (QB); increased venous pressure; and prolonged haemostasis time in the absence of excessive anticoagulation. Indirect methods were considered positive for stenosis if at least one occurred persistently over 3 consecutive HD sessions. Prolonged haemostasis time (without excessive anticoagulation) was defined as > 20 minutes to haemostasis in patients not anticoagulated with acenocoumarol (Sintrom®)[3,4,6].

Kt/V: The Online Clearance Monitor (OCM) integrated into Fresenius 5008 HD monitors was used to obtain this parameter. The OCM calculates effective mean urea clearance (K) and the urea distribution volume (accounting for weight, height, age, and sex); with these and the treatment time, the dialysis dose (Kt/V) is calculated in real time[11]. Kt/V was measured over three consecutive HD sessions and averaged. Stenosis was considered present if Kt/V was < 1.15[3,6].

AVF recirculation: Recirculation was measured using the Blood Temperature Monitor (BTM) in Fresenius 5008 HD monitors. The monitor generates a thermal bolus by changing dialysate temperature by 2 °C; the change is first detected by the venous-line temperature sensor, and, based on the subsequent change detected in the arterial line, the percentage recirculation is calculated. Recirculation was measured over 3 consecutive HD sessions and averaged. Stenosis was considered present if recirculation was >15%[3,6,12].

We excluded the first-generation "access pressure" method because it is primarily useful for surveillance of prosthetic AVF and cannot be used to monitor distal native AVF[3,5,6].

Doppler ultrasound (DU): DU was the monitoring method used to confirm the diagnosis of stenosis. Examinations were performed between 12 and 30 December, 1 week after the first-generation measurements, by a single nurse expert in vascular-access ultrasound who did not participate in first-generation assessments. A Hitachi-Aloka F31 scanner was used. Scans were performed before the HD session with the patient supine and the AVF arm supported. The entire course of the native AVF was examined for stenoses. Where a stenosis was found, we measured the percentage RVD relative to the proximal native AVF segment (formula: original lumen − residual lumen / original lumen×100); the PSV ratio (post-stenosis PSV divided by pre-stenosis PSV); and vascular-access flow (QA)—3 measurements at the brachial artery, averaged, in mL/min[3,8].

We applied the criteria of the Spanish Multidisciplinary Vascular Access Group (GEMAV) to define a significant stenosis: both main criteria (%RVD >50% and PSV ratio >2) plus at least 1 additional criterion (residual diameter <2 mm and/or QA <500 mL/min in native AVF)[3]. We did not apply the additional criterion "QA decrease >25% if QA <1000 mL/min" because prior QA measurements were unavailable.

All patients were informed in advance, received written information, and provided written informed consent. Institutional and regional research-ethics approvals were obtained (*Comité de Ética de la Investigación de la Comunidad Autónoma de Aragón* [CEICA]).

Statistical analysis: Analyses were performed with Jamovi v2.2.5. Quantitative variables were expressed as measures of central tendency (mean, median) and dispersion (standard deviation [SD], interquartile range [IQR]) according to distribution; normality was assessed with the Shapiro–Wilk test. Sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), and accuracy of first-generation methods were calculated with MedCalc®[13], using DU as the reference standard; 95% confidence intervals (CI) were computed for all estimates. Associations between categorical variables were analysed with contingency tables and the chi-square test. Statistical significance was set at $p<0.05$.

RESULTS

The sample comprised 39 patients. Mean age was 63.27±13.4 years; 79.48% were men (n=31) and 20.52% women (n=8). By AVF type, 61.5% were radiocephalic (n=24), 30.76% brachiocephalic (n=12), and 7.49% brachiobasilic (n=3). Mean access vintage was 106 ± 69.6 months.

Among the indirect methods assessed, only prolonged haemostasis time in the absence of excessive anticoagulation and failure to reach the prescribed QB occurred over 3 consecutive HD sessions.

Ultrasound detected 19 stenoses. Median RVD was 33.9% (IQR, 11.1–61); 21.05% of stenoses had RVD >50% (n=4). The PSV ratio was >2 in 5.26% (n=1), and mean QA was 1363±856 mL/min. None of the stenoses detected met criteria for significance. Of the 19 stenoses detected by ultrasound, 26.3% were not detected by any first-generation method (n=5).

Stenoses detected by first-generation methods were as follows: physical examination, 10; pulse augmentation test, 3; arm elevation test, 16; indirect methods, 12; Kt/V, 7; AVF recirculation, 2.

Accuracy of first-generation methods: **Physical examination:** sensitivity 31.5% (95%CI, 12.5–56.5%), specificity 80% (95%CI, 56.3–94.2%), PPV 60% (95%CI, 33.3–81.8%), NPV 55.1% (95%CI, 45.8–64.1%), and accuracy 56.4% (95%CI, 39.6–72.1%). **Pulse augmentation test:** sensitivity 5.2% (95%CI, 1.3–26.1%), specificity 90% (95%CI, 68.3–98.7%), PPV 33.3% (95%CI, 4.7–83.5%), NPV 50% (95%CI, 45.5–54.5%), and accuracy 48.7% (95%CI, 32.4–65.2%). **Arm elevation test:** sensitivity 52.6% (95%CI, 28.8–75.5%), specificity 70% (95%CI, 45.7–88.1%), PPV 62.5% (95%CI, 42.9–78.6%), NPV 60.8% (95%CI, 47.2–73.1%), and accuracy 61.5% (95%CI, 44.6–76.6%). **Indirect methods:** sensitivity 15.7% (95%CI, 3.3–39.5%), specificity 55% (95%CI, 31.5–76.9%), PPV 25% (95%CI, 9.5–51.1%), NPV 40.7% (95%CI, 30.6–51.6%), and accuracy 35.9% (95%CI, 21.2–52.8%). **Kt/V:** sensitivity 10.5% (95%CI, 1.3–33.1%), specificity 75% (95%CI, 50.9–91.3%), PPV 28.5% (95%CI, 8.1–64.5%), NPV 46.8% (95%CI, 39.6–54.2%), and accuracy 43.5% (95%CI, 27.8–60.3%). **AVF recirculation:** sensitivity 10.5% (95%CI, 1.3–33.1%), specificity 100% (95%CI, 83.1–100%), PPV 100% (95%CI, 81.5–100%), NPV 54.1% (95%CI, 50.2–57.8%), and accuracy 56.4% (95%CI, 39.6–72.1%) **(table 1)**.

There was a statistically significant association between DU findings and indirect methods (chi-square=3.9, p=0.048).

DISCUSSION

First-generation methods are key for early detection of stenoses on HD wards. Despite this, their accuracy has not been widely studied, which was the rationale for our study. However, a number of stenoses were not detected by first-generation methods, making it necessary to implement surveillance programmes that combine first- and second-generation methods to detect as many stenoses as possible.

Table 1. Accuracy of first-generation methods for detecting stenosis in arteriovenous fistulas compared with doppler ultrasound.

	Physical Examination	Pulse Augmentation Test	Elevation Test Arm	Indirect Methods	Kt/V	AVF Recirculation
Stenosis	10	3	16	12	7	2
True Positive	6	1	10	3	2	2
False Positive	4	2	6	9	5	0
False Negative	13	18	9	16	17	17
True Negative	16	18	14	11	15	20
Sensitivity % (95%CI)	31.5 (12.5–56.5)	5.2 (1.3–26.1)	52.6 (28.8–75.5)	15.7 (3.3–39.5)	10.5 (1.3–33.1)	10.5 (1.3–33.1)
Specificity % (95%CI)	80 (56.3–94.2)	90 (68.3–98.7)	70 (45.7–88.1)	55 (31.5–76.9)	75 (50.9–91.3)	100 (83.1–100)
Positive Predictive Value, % (95%CI)	60 (33.3–81.8)	33.3 (4.7–83.5)	62.5 (42.9–78.6)	25 (9.5–51.1)	28.5 (8.1–64.5)	100 (81.5–100)
Negative Predictive Value, % (95% CI)	55.1 (45.8–64.1)	50 (45.5–54.5)	60.8 (47.2–73.1)	40.7 (30.6–51.6)	46.8 (39.6–54.2)	54.1 (50.2–57.8)
Accuracy, % (95%CI)	56.4 (39.6–72.1)	48.7 (32.4–65.2)	61.5 (44.6–76.6)	35.9 (21.2–52.8)	43.5 (27.8–60.3)	56.4 (39.6–72.1)
Chi-square test	0.68	0.38	2.06	3.9	1.39	2.22
P value	0.40	0.579	0.15	0.048	0.23	0.13

Two studies were found that assess the accuracy of physical examination for detecting stenoses in native AVF[7,10]. while 3 others were excluded because they evaluated physical-examination accuracy in prosthetic AVF[14-16]. Asif et al.[10] reported sensitivity and specificity of physical examination for detecting outflow stenoses of 92% and 86%, respectively, and 85% and 71% for inflow stenoses. Methodologically, however, that study differs from ours in that it used fistulography to detect stenoses, classified stenoses by location, relied only on morphological criteria to define stenoses, and did not indicate whether stenoses were significant. By contrast, the study by Campos et al.[7] is methodologically similar to ours. Those authors reported sensitivity and specificity of physical examination for detecting significant stenoses of 96% and 70%, respectively. Campos et al.[7] identified fifty significant stenoses by DU, whereas we found none. Both studies used the two main GEMAV criteria to determine whether a stenosis was significant[3], although in our case an additional criterion also had to be present to deem a stenosis significant. The higher number of significant stenoses found by Campos et al.[7] could explain the high sensitivity of physical examination in their study, suggesting that the sensitivity of physical examination may depend on stenosis severity—being higher for significant stenoses. In contrast, specificity in that study is similar to ours, which may indicate that specificity is not influenced by whether or not stenoses are significant.

The arm-elevation test was the method that detected the most stenoses, yielded the highest number of true positives, and had the greatest sensitivity, NPV, and accuracy. In contrast, the pulse-augmentation test was the second-least sensitive method and produced the fewest true positives. These data are novel because the accuracy of the manual tests for detecting stenoses had not previously been studied, despite their being part of the physical examination. Studies on the accuracy of physical examination have only assessed changes in thrill, bruit, and pulse in AVF[7,10].

We found no literature on the accuracy of indirect methods for detecting stenoses. The absence of such studies may be due to the lack of reference values to interpret some of these methods properly—for example, how much arterial or venous pressure must rise to consider a stenosis present, what constitutes a prolonged haemostasis time, or which medicines should be considered excessive anticoagulation[3]. We defined prolonged haemostasis time as >20 minutes, in line with the GEMAV guideline[3]. and considered acenocoumarol (Sintrom®) use to represent excessive anticoagulation in the absence of studies or guidelines clarifying this point. Indirect methods were the second-best performer in terms of number of stenoses detected and the only method showing a statistically significant association with DU. Nonetheless, indirect methods produced the highest number of false positives, and therefore the number of stenoses detected may be overestimated, influencing the results obtained.

The accuracy of Kt/V for detecting stenoses has not been previously studied. We did, however, find one study on the accuracy of AVF recirculation measured by the BTM sensor. In that study, Wang et al.[17], reported that BTM-derived recirculation values >15% provided high sensitivity (81.8%) and specificity (98.6%) for identifying native AVF requiring elective intervention. In our study, by contrast, AVF recirculation showed low sensitivity and high specificity; these results are consistent with Ibeas et al.[5], who stated that AVF recirculation is a highly specific but poorly sensitive method. The paucity of literature on the accuracy of AVF recirculation and Kt/V may be due to the many factors that affect their measurements[6]. Moreover, neither method is useful for the early detection of stenoses[3]; indeed, Kt/V does not change until there is a high percentage of recirculation[6,18]. Furthermore, if a stenosis lies between the two needles, it will not cause recirculation and thus will not be detected[3]. All of this may explain why AVF recirculation was the method that detected the fewest stenoses in our study and why AVF recirculation and Kt/V have not been rigorously studied[6].

The main limitation of this study is methodological. The sample size is small, which widens confidence intervals and therefore reduces the precision of parameter estimates; our confidence intervals are wider than in other studies with larger samples[7]. In addition, the scarcity of studies on the accuracy of first-generation methods limits comparisons.

In light of these results, we conclude that, for detecting non-significant stenoses, first-generation methods have low sensitivity and high specificity; stenosis severity (significant vs non-significant) may influence the sensitivity—but not the specificity—of physical examination; and the arm-elevation test is the most accurate first-generation method for detecting stenoses.

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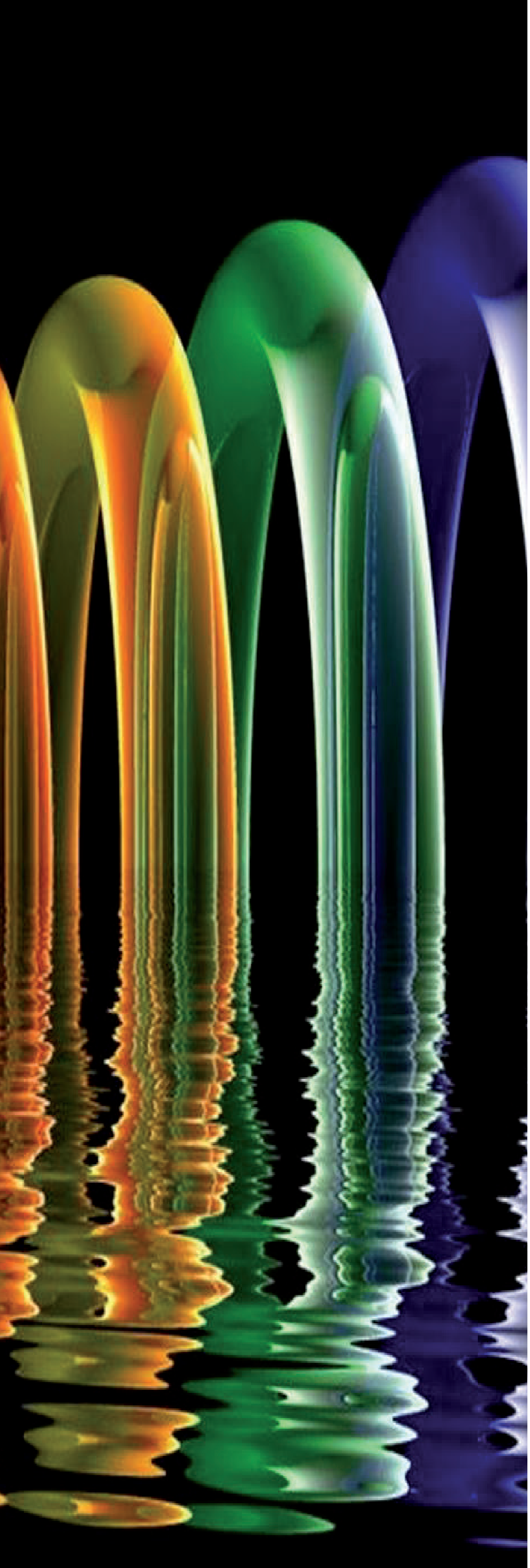

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Significance of the disease and live transplantation for kidney recipients

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ABSTRACT

Introduction: In living donor kidney transplantation, the personal experience of the disease situation significantly influences the emotional adaptation and coping of the individual.

Objective: This study aims to uncover the personal significance attributed by individuals with living donor kidney transplants to their disease and its treatment and to identify any changes in this perception before and after transplantation.

Material and Method: Qualitative phenomenological study. Seven people with kidney disease who received a preventive living donor kidney transplant participated. Data were obtained through semi-structured interviews and qualitative observation.

Results: Three themes emerged from the thematic analysis of the interviews: no feeling of illness (they did not feel ill either physically or psychologically); no need for transplantation (the disease did not alter their lives, but they trusted the professionals and accepted the surgery); and transplantation to maintain the same way of life (to avoid dialysis and recover activities).

Conclusions: The meaning of the disease and renal transplantation change according to the stage (pre- or post-transplant) in which the patient is: identification of the disease is related to the presence of symptomatology, to physical symptomatology and to routines of taking daily medication and follow-up visits; and renal transplantation, means avoiding dialysis, doing the same way of life, overcoming a challenge and recovering physical condition.

Keywords: kidney failure; qualitative research; narrative medicine; kidney transplantation.

RESUMEN

Significado de la enfermedad y el trasplante de vivo para las personas receptoras de riñón

Introducción: En el trasplante renal de donante vivo, la percepción de la situación de enfermedad y la vivencia personal influyen de forma significativa en la adaptación emocional y el afrontamiento de la persona.

Objetivo: Conocer el significado que atribuyen las personas con trasplante renal de donante vivo a su enfermedad y a su tratamiento, y detectar si existen cambios antes y después trasplante.

Material y Método: Estudio cualitativo fenomenológico. Participaron 7 personas con enfermedad renal que recibieron un trasplante renal de donante vivo preventivo. Se obtuvieron los datos mediante entrevistas semiestructuradas y observación cualitativa.

Resultados: Del análisis temático de las entrevistas emergieron tres temas: sin sentimiento de enfermedad (no se sentían enfermos ni a nivel físico ni psicológico); sin necesidad de trasplantarse (la enfermedad no les alteró su vida, pero confiaron en los profesionales y aceptaron la cirugía); y trasplantarse para mantener el mismo modo de vida (para evitar la diálisis y recuperar actividades).

Conclusiones: El significado de la enfermedad y del trasplante renal cambian según la etapa (pre o post trasplante) en la que esté el paciente: la identificación de la enfermedad está relacionada con la presencia de sintomatología, con la sintomatología física y con las rutinas de toma de medicación diarias y visitas de seguimiento; y el trasplante renal, significa evitar la diálisis, hacer la misma vida, superar un reto y recuperar la condición física.

Palabras clave: insuficiencia renal; investigación cualitativa; medicina narrativa; trasplante de riñón.

INTRODUCTION

A person who opts for a living donor kidney transplant (LDKT) will experience major physiological and psychosocial changes throughout the process, beginning a phase of individual and family decision-making, searching for a compatible donor, undergoing suitability testing, and scheduling surgery. Post-operatively, there is a period of recovery and adaptation for both the donor and the recipient. By understanding the lived experience of the person moving through these stages—viewed as transitions[1]—nurses can help facilitate a healthy transition through LDKT. Guerrero et al.[2] state that the meaning of Chronic Kidney Disease (CKD) varies according to the stage the person is in. Other studies, such as that by Boaz and Morgan[3], report that the experience of kidney transplantation (KT) involves a range of negative and positive emotions, notably guilt, gratitude, and fear. De Pasquale et al.[4] conclude that the KT process can pose a potential risk to a patient's psychological equilibrium. After KT, recipients who hold a positive view of the healthcare team and of coping with the disease have a better quality of life[5].

The relationship between emotional health outcomes and a person's perception of kidney disease has been studied from a psychological perspective. A recent Spanish study of people with advanced kidney disease[6] linked perceived disease threat with anxiety symptoms and depression, especially among women. Other research in people on haemodialysis programmes has related illness perception to quality of life[7], depression[8], and mortality[9]. In this regard, Rees et al.[10] argue that emotional consequences and impacts on quality of life may stem from how the disease is perceived or understood. Illness perception differs by renal replacement therapy modality. Griva et al.[7] found that kidney transplant recipients believed less strongly that their condition was chronic, had fewer symptoms, and perceived greater control and fewer disruptions due to their illness and/or treatment than people on dialysis.

Choosing LDKT as a treatment option means accepting a kidney from a donor—most often from within the family. Concern for the donor's health and fear that the relationship might change can lead to initial reluctance among recipients to accept the kidney offer[11,12] and may even lead to refusal[13]. Typically, the decision to donate a kidney arises from an offer by the prospective donor[14]. Reasons such as concern for the recipient's health and the desire to improve their quality of life—along with preventing complications or even death—have been cited in several studies[11,14-16]. Personal factors (e.g., love and responsibility towards an ill relative) and spiritual factors have also been highlighted as important motives for kidney donation[15]. A meta-analysis shows that the closer the relationship between people, the greater the tendency to donate[17]. However, the wish to donate a kidney is tightly interwoven within a web of complex family dynamics[18] and may be a source of family tension.16 In intrafamilial donation, notions of mutual obligation take concrete form within family roles[19].

According to Franklin and Crombie[20], LDKT creates a particular relationship between donor and recipient characterised by mutual emotional support, which helps them cope with this exceptional situation. A range of benefits for donors and recipients are associated with transplantation, including quality of life, satisfaction, and wellbeing[21-23].

The experience of kidney donation among donors has been a major focus of qualitative research, and several reviews have explored donor motivations, expectations, and the consequences of donation[24-26].

By contrast, the recipient's experience of LDKT has received less attention. A qualitative meta-synthesis[17] found only one study reporting recipients' experiences. In the review by Hanson et al.[27] on decision-making around living donor transplantation, more studies on the experiences of people with kidney disease appear, and the review by Ralph et al.[28] addresses the donor–recipient relationship in the context of kidney donation.

In this study, we explore the less-studied experiences of people receiving a kidney from a living donor to understand the meaning they attribute to their disease and treatment throughout the transplant process.

MATERIAL AND METHOD

We conducted a qualitative study using a hermeneutic phenomenological approach following Heidegger's principles.

Participants were living-donor kidney transplant recipients. Inclusion criteria were individuals with CKD awaiting pre-dialysis LDKT who were seen at the Renal Transplant Units of *Hospital Clínic de Barcelona*, *Hospital Germans Trias i Pujol*, or *Hospital del Mar.* Individuals awaiting LDKT were enrolled and followed for up to 6 months post-transplant. People who commenced dialysis during the study were excluded. The study was conducted from January 2019 to July 2021. An intentional (purposive) sampling strategy was used until data saturation was reached.

Data were obtained through semi-structured interviews conducted in participants' homes and audio-recorded after informed consent. To address the study objectives—understanding the meaning of illness and treatment before and after living-donor transplantation—each participant was interviewed multiple times. All participants were interviewed both before and after transplantation; in some cases where the pre-transplant phase was prolonged, an additional interview was conducted. This methodological decision allowed accompaniment of the person through their illness and treatment journey, capturing their experience and exploring whether changes occurred before and after transplantation. Data saturation was achieved at 17 interviews from 7 participants.

We conducted a thematic analysis to understand meanings within participants' narratives. First, interviews were transcribed verbatim. Transcripts were read repeatedly and initial notes made. Initial codes were then generated and inductively grouped into themes and subthemes. We verified that themes were relevant to the research objectives and, in the final analytic phase, findings were checked against the entire text. Two team members reviewed the data analysis, and Atlas.ti v.9 was used to support coding.

Participants received verbal and written information from the lead researcher regarding the study purpose and objectives and were informed that participation was voluntary and that confidentiality would be ensured by anonymising personal data. All participants provided written informed consent. The study received favourable ethics approval from *Consorci Hospitalari de Vic*, *Hospital Clínic de Barcelona*, and *Hospital Germans Trias i Pujol* Research Ethics Committee.

RESULTS

A total of 7 recipients took part in this study. Their characteristics are shown in **table 1**.

The thematic analysis of the interviews with recipients yielded 3 themes: not feeling ill; no need for a transplant; and undergoing transplantation to maintain the same life.

Theme 1: Not feeling ill

The recipients involved in the study did not experience a sense of illness. They were diagnosed with chronic kidney disease, underwent a living-donor kidney transplant, and stated that they had not felt ill throughout the process and treatment.

Experiencing (or not) a sense of illness was linked to having (or not) physical symptoms. They reported that kidney disease did not cause notable physical symptoms and therefore they did not feel ill. If anything, they noticed some tiredness just before the operation.

"I know my kidneys don't work, but I feel fine, I don't feel ill." (Participant 6, 60 years).
"I live a completely normal life; it's just that now I get tired a bit more." (Participant 4, 41 years).

The disease and the transplant did not negatively affect them psychologically. Going through this illness–care process was not a source of major concern: they were not constantly preoccupied with or reminded of having a disease, and they approached surgery with optimism. Once transplanted, participants described a feeling of having accepted and integrated the new organ as their own without generating confusing emotions.

"It's so integrated that you don't think about it much. It's like... I don't know... honestly, it's as if I'd had it all my life. You don't notice a before-and-after difference." (Participant 2, 73 years).

Future health and graft rejection did not appear to worry the living-donor transplant recipients excessively. If anything, they were concerned about the donor's health.

"Not for me, but for her. If it went badly, I'd say, 'Blimey, she has to go through all this... and then you reject it [the kidney]..." (Participant 3, 43 years).

Table 1. Characteristics of participants: kidney transplant recipients.

Participant	Sex	Age (y)	Type of KT	Relationship to Donor	Interviews Pre-KT	Interviews Post-KT
R1	Male	39	Paired Exchange	Son	2	2
R2	Male	73	Direct	Husband	1	2
R3	Female	43	Paired Exchange	Daughter	1	0
R4	Male	41	Direct	Son	1	2
R5	Male	74	Paired Exchange	Husband	1	2
R6	Male	60	Direct	Husband	1	1
R7	Male	71	Direct	Husband	1	0

KT: kidney transplant.

Recipients reported feeling ill only in the immediate postoperative period—within the first 2 or 3 months after surgery—while resuming usual activities, seeing the new scar, and being physically aware of the new kidney. These were the factors that reminded them they had gone through an illness process.

From 3 to 5 months onward, taking regular medication and frequent follow-up visits were the situations that reminded them they had undergone a kidney transplant.

"I never think I've been transplanted, only when I take my medication." (Participant 7, 71 years).

Theme 2: No need for a transplant

Participants did not feel a need to receive a kidney transplant. Their minimally affected physical condition and the fact that their lives had not been constrained by the disease were, in their view, the reasons for this experience.

"Of course, I don't 'need' to have it [a transplant]. Biologically speaking I do need it. Physiologically. But as I don't feel anything… For me it's a step I could completely do without. It feels… very strange. I don't feel ill; I don't feel anything." (Participant 1, 39 years).

Chronic kidney disease progresses slowly, and recipients did not experience abrupt physical changes that would have altered their personal, social, or work lives.

"My doctor says, 'You've got used to living like this.' I'm fine now because I've got used to it. It's been 15 years [laughs]. It didn't happen suddenly; it was progressive. And I feel fine." (Participant 7, 71 years).

Many testimonies conveyed a degree of hope about not having to undergo transplantation, related to their experience of "not being ill". Nevertheless, the surgical phase was seen as a process they had to go through, and they expressed a desire to proceed with it promptly.

"What I'd like now is to have already been through the transplant, that it's gone well, and that I'm… already starting to recover and get back to normal life." (Participant 1, 39 years).

Recipients' narratives showed acceptance of biomedicine as the reference medical system. Trust in test results and in the nephrology professionals caring for them was essential to proceed.

"Because the blood tests say so; otherwise, I'd say, 'Do I have to be transplanted? No. What for? I'm not unwell" (Participant 2, 73 years).

Theme 3: Undergoing transplantation to maintain the same life

Kidney recipients perceived transplantation as a way to continue with the same life they had before the operation. In their accounts, the possibility of avoiding dialysis offered by transplantation was one of the strongest meanings.

"I'm fully aware that this has allowed me not to do dialysis." (Participant 3, 43 years).

Having a transplant to keep 'feeling just as well' recurred frequently in pre-operative interviews. The desire not to get worse (which would occur with starting dialysis) was reaffirmed after surgery, as their accounts stated they 'felt the same as before'.

"I don't feel that I'm better or worse now. I feel the same—in terms of the energy I might have and life in general." (Participant 6, 60 years).

Undergoing kidney transplantation meant having completed 'something that had to be done' to carry on with their lives, which kidney disease had not markedly changed. One element that had been slightly affected was the ability to make plans—arranging trips, etc.—which was curtailed by uncertainty around the surgery date.

For some recipients—those who noticed more pre-operative tiredness—transplantation allowed them to regain their physical condition.

A situation highlighted especially by younger recipients was concern that others might suspect they had undergone transplantation. Worries about whether the operation would leave visible marks that revealed they had gone through this process arose in pre-operative interviews and dissipated afterwards. This relates to 'not feeling ill' and, above all, to not being labelled as ill. Consequently, they often chose not to disclose their disease and subsequent transplant to others. *"It doesn't matter if my dentist or the pharmacist knows. My closest circle won't see any change in me. But what I really couldn't be bothered with was telling people I see day to day and then having things change. You know… being treated as an ill person. And that's not what I want."* (Participant 1, 39 years).

Maintaining the same life also entailed hoping the relationship with the donor would not change—and post-transplant interviews confirmed this. Recipients expressed gratitude towards the person who had given them the kidney.

"I'm very grateful, of course. I don't tell her all the time, but I suppose she already knows." (Participant 5, 74 years).

DISCUSSION

Participants in our study did not hold a negative perception of their disease, unlike other studies in which anxiety, depression, or even a perception of threat to the patient appeared[6,8]. They construct their perception and identification with the disease through physical symptoms and changes in therapeutic habits, depending on the stage of their illness. Identification with illness has been shown to change over time[29]. Our findings are consistent with Rees's qualitative study[10], which showed that identifying oneself as 'ill' was constructed in relation to the physical symptoms experienced by people with CKD—the more symptoms perceived, the stronger the identification as 'ill'. However, that study differs from ours in showing that transplant recipients who had previously undergone dialysis accepted that they would always be people with kidney disease. We were unable to compare our findings on illness identification among recipients with similar studies because our study population is very specific: people who underwent pre-dialysis living-donor kidney transplantation.

As noted above, for our recipients transplantation meant avoiding dialysis. At the same time, it allowed them to maintain or preserve the same life—echoing the qualitative semantic-network study by Guerrero and Gallardo[2]. In that study, transplant recipients linked concepts such as 'normality in activities' with 'kidney transplantation', whereas people on dialysis linked it with 'improving health' or a 'second chance'. In Lonning et al.[30] the expectation of receiving a kidney among wait-listed patients on dialysis related to 'getting life back' and 'seizing the opportunity'; in Da Silva et al.[31], to 'starting a new life' and 'freeing oneself from limitations'. A comprehensive review of qualitative studies[32] found that people on dialysis hoped transplantation would lead to a 'more normal life' and reduce restrictions on work, travel, planning, and diet. Thus, the meaning of transplantation differs considerably by renal replacement therapy modality.

After transplantation, recipients' cultural construction of their illness related to medical follow-up activities and medication-taking—contexts in which the social category of 'being ill' addresses them directly.

Across recipients' narratives we can identify elements of the kidney disease and transplantation process that involve biological perspective, cultural construction, and social definition of illness. On the one hand, participants know and accept the diagnosis and treatment proposed by the biomedical system—a scientific–medical model accepted and shared within the same sociocultural context. At the same time, the lived meaning of their illness and treatment is constructed and evolves throughout the transplant process. Notably, although prior to transplantation there was a mismatch between subjective experience and biomedical parameters—showing significant physical impairment at this advanced disease stage—no problems with therapeutic adherence were perceived among interviewees. In Kleinman's terms[33], recipients and the professionals caring for them share similar explanatory models, and the therapeutic procedure—in this case living-donor kidney transplantation—is accepted with little conflict. Nevertheless, they display ambivalence towards transplantation as 'not necessary' and even express some hope of not needing it. One study[34] notes that denying or minimising the severity of illness delays the possibility of living-donor transplantation. Regarding the social dimension[35], we see that interviewees aimed not to be seen or labelled as 'ill people' throughout the process—so much so that behaviours related to appearance and communication were influenced.

Using a qualitative methodology allowed us to delve deeper into the living-donor transplant process and how it is constructed through recipients' voices and experiences.

However, the study has limitations. All recipients who participated underwent kidney transplantation without significant complications and with a functioning graft; therefore, people who experienced rejection or severe complications fall outside our results. Finally, the sample size does not allow generalisation—although this is not the aim of qualitative methodology, which seeks instead to explore and deepen recipients' narratives to understand the experience of living-donor kidney transplantation.

We conclude that the meaning of illness and of transplantation changes according to the stage (pre- or post-transplant) the kidney recipient is in: identification with illness is related to the presence of symptoms, to physical symptomatology, and to routines of daily medication and follow-up visits; and kidney transplantation means avoiding dialysis, living the same life, overcoming a challenge, and regaining physical condition and certain previously limited activities.

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Conflicts of interest

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Incidence of adverse events of the Covid-19 vaccine in a population of kidney transplant recipients

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ABSTRACT

Introduction: Early published series suggest that most renal transplant recipients remain at high risk of SARS-CoV-2 infection due to poor humoral response after vaccination. The aim was to study the occurrence of adverse events after two doses of mRNA-1273 vaccine in a population of renal transplant recipients.

Material and Method: Analytical, observational, and prospective study. Subjects were injected with two doses of mRNA-1273 vaccine against SARS-CoV-2 according to the schedule established by the laboratory. After injection of each dose, and up to 72 hours later, participants recorded local and/or systemic symptoms and their intensity.

Results: 187 patients were included. Eighteen percent of them became infected with SARS-CoV-2 in the pre-vaccination period or between the 1st and 2nd dose. The incidence of adverse events was 91.2%. Of these, the incidence of local (62%) was higher than that of systemic (55%). Past infection was a risk factor for the occurrence of local adverse events after vaccination (OR=2.4; p=0.045). The same association was detected for systemic adverse events, which were more frequent among those who had passed the disease (OR=3.83; p=0.003).

Conclusions: The mRNA-1273 vaccine does not appear to cause serious side effects. The incidence of local and systemic adverse events was higher in those patients with past disease.

Keywords: renal transplantation; mRNA-1273 vaccine; SARS-CoV-2 adverse reactions.

RESUMEN

Incidencia de eventos adversos de la vacuna frente a SARS CoV-2 en una población de receptores de trasplante renal

Introducción: Las primeras series publicadas sugieren que la mayoría de los receptores de trasplante renal siguen teniendo un alto riesgo de infección por SARS-CoV-2 debido a una pobre respuesta humoral tras la vacunación. El objetivo fue estudiar la presencia de eventos adversos tras 2 dosis de vacuna mRNA-1273 en una población de trasplantados renales.

Material y Método: Estudio analítico, observacional y prospectivo. A los sujetos se les inyectó dos dosis de la vacuna mRNA-1273 frente al SARS-CoV-2 según pauta establecida por el laboratorio. Tras la inyección de cada una de las dosis, y hasta las 72 horas posteriores, los participantes llevaron a cabo un registro de síntomas locales y/o sistémicos y la intensidad de los mismos.

Resultados: Se incluyeron 187 pacientes. Un 18% de ellos se infectaron de SARS-CoV-2 en el periodo prevacunación o entre la 1ª y 2ª dosis. La incidencia de eventos adversos fue de 91,2%. De ellos, la incidencia de los locales (62%) fue mayor que la de sistémicos (55%). Haber pasado la infección fue un factor de riesgo de aparición de eventos adversos locales tras la vacunación (OR=2,4; p=0,045). La misma asociación fue detectada en el caso de eventos adversos sistémicos, que fueron más frecuentes entre los que habían pasado la enfermedad (OR=3,83; p=0,003).

Conclusiones: La vacuna de mRNA-1273 no parece provocar efectos secundarios graves. La incidencia de eventos adversos locales y sistémicos fue mayor en aquellos pacientes que habían pasado la enfermedad.

Palabras clave: trasplante renal; vacuna mRNA-1273; SARS-CoV-2 reacciones adversas.

INTRODUCTION

The SARS-CoV-2 virus emerged in the city of Wuhan, China back in December 2019 and spread creating a global health crisis with vaccination being the only hope to control the pandemic[1]. Despite being an unknown virus until its appearance, vaccines with almost 100% efficacy have been developed to prevent moderate and severe disease in 90% of the overall population[2].

In patients with kidney disease, all-cause infection remains one of the most common causes of morbidity and mortality. Changes in the immune system explain the increased risk associated with this population[3].

Solid organ transplant recipients have been excluded from vaccine clinical trials on purpose. It is likely that the immune response could be significantly compromised by their underlying primary comorbid conditions and immunosuppressive treatments received[4]. Scientific medical societies have recommended vaccination against SARS-CoV-2 for these patients, and the studies published to this date have found evidence that a significant number of kidney transplant recipients still has a high risk of SARS-CoV-2 infection and moderate-to-severe disease due to a deficient humoral response[2].

The safety of vaccines is well established with a solid base of scientific evidence from clinical trials conducted prior to their commercialization and quality controls[5,6]. However, like any medication, vaccines can have unintended and harmful adverse effects that can occur coincidentally with the compatible temporal sequence following vaccine administration. Establishing causality in the occurrence of local adverse reactions is often straightforward. However, this is not always the case with systemic reactions[7,8].

Therefore, a concern that has particularly worried transplant teams is the possibility that these new mRNA vaccines could alter graft functionality or cause severe side effects. Some authors have described that symptoms following vaccine administration in this population are similar to those of the overall population. Also, no safety issues contraindicating their administration have been identified[9]. However, information is still limited, and therefore, studying systemic and local reactions due to SARS-CoV-2 vaccination in transplant patients will help increase confidence in vaccination for both the healthcare personnel and patients who still remain hesitant to be vaccinated.

Therefore, the objective of this research was to study the safety of mRNA-1273 vaccine (Moderna) against SARS-CoV-2, evaluate the presence of adverse effects and the possible impact on renal function.

MATERIAL AND METHOD

Study Design and Participants

This was an analytical, observational, and prospective cohort study conducted in a tertiary hospital of the Community of Madrid, Spain.

The study was proposed to 211 patients with a functioning kidney transplant who received the SARS-CoV-2 vaccine between March 19th and April 24th, 2021. Ultimately, a total of 187 individuals who agreed to participate and undergo post-vaccination follow-up were included. Patients with active tumors and those experiencing SARS-CoV-2-like symptoms at the time of vaccination were excluded.

Study procedure

The subjects received 2 doses of the mRNA-1273 vaccine against SARS-CoV-2 following the pattern established by the laboratory that consisted of an injection on day 0 and a second dose 28 days later. The center sent a text message to all transplant recipients indicating the date and time for vaccination. Researchers, by the way, were not responsible for the selection process.

Following each dose, and up to 72 hours afterward, participants recorded symptoms, both local and systemic, on a questionnaire specifically designed for this purpose. After obtaining informed consent, the responsible nephrologist provided the patient with the registration form, and the nurse at the Renal Transplant Clinic collected the results during the patient's next visit. For each adverse event (AE), the onset time and intensity were recorded using a numerical scale from 1 to 3 being, 1 indicative of the lowest intensity and 3 the more. The local AEs recorded included pain, redness, swelling, and itching all at the injection site, axillary lymphadenopathy or swelling of neck/clavicle lymph nodes. Systemic AEs were classified as fever or lowgrade fever, headache, fatigue, digestive symptoms, myalgia, chills, general malaise, and dizziness or hypotension, as well as other unexpected symptoms.

Regarding the analysis of results, a database was created including the AEs and the following variables: comorbidities (like hypertension, diabetes), sociodemographic factors (age, sex), transplant-related factors (years since kidney transplantation, immunosuppressive treatment received, glomerular filtration rate measured by CKD-EPI prior to vaccination), and vaccination-related factors (prior SARS-CoV-2 infection before or during the vaccination process, positive humoral immune response defined as IgG titers in blood ≥50 AU/mL, and positive cellular response, CD4 and/or CD8).

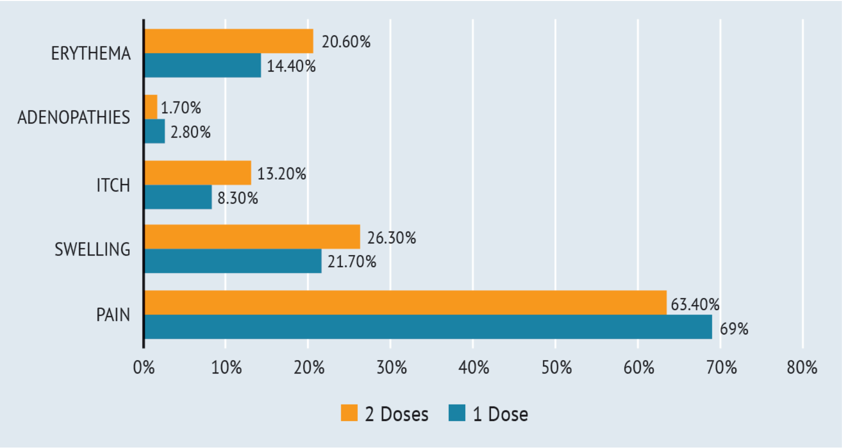

Figure 1. Rate of local adverse events.

Statistical Analysis

Quantitative variables were expressed as mean and standard deviation if they followed a normal distribution or with as median and interquartile range in cases of skewed distribution. Qualitative variables were expressed using percentages and total values. For the analysis of quantitative variables, the Student t test was used, and for the analysis of qualitative variables, the chi-square test was used. Finally, logistic regression was used for multivariate analysis to examine the relationship between each study variable and the occurrence of adverse events. The statistical analysis of results was performed using SPSS 26.0 statistical software package for Windows.

Ethical Considerations

Participation in the study was voluntary, and participants could withdraw their consent and leave the study at any time without this having any impact on their medical care relationship.

The project was conducted based on the latest version available of the Helsinki Declaration and the Good Clinical Practice Guidelines of the International Conference on Harmonization (GCP/ICH).

All personal data were identified with a code, and only the researcher could associate the data available with the patient and their medical history.

The data described in this study are part of a protocol that has been approved by Hospital Clínico San Carlos Ethics Committee.

RESULTS

The patients included had a mean age of 58.3±13.4 years (61.2% were man; n=114). The median time elapsed since transplantation was 9.6 years (IQR, 5.07-15). Among them, 18% (n=34) were infected with SARS-CoV-2 in the pre-vaccination period. A total of 92.8% (n=178) of the patients had hypertension, and 28.9% (n=54) diabetes. The mean glomerular filtration rate measured by CKD-EPI before and after vaccination was 50.78 (±21.48) mL/min/1.73 m^2 and 53.33 (±27.75) mL/min/1.73 m^2, respectively (P=0.98).

The overall rate of adverse events was 91.2% (n=165) with local events (n=151; 80.8%) being more common compared to systemic events (n=114; 60.8%).

Among the reported local AEs, the most common was local pain at the injection site (n=119; 64%) followed by swelling (n=49; 26.43%) and redness in the region of interest (n=26; 14.44%). The frequency of pain and erythema increased from the first to the second dose as shown in **figure 1** while itching, swelling, and lymphadenopathy decreased as seen in **figure 1**.

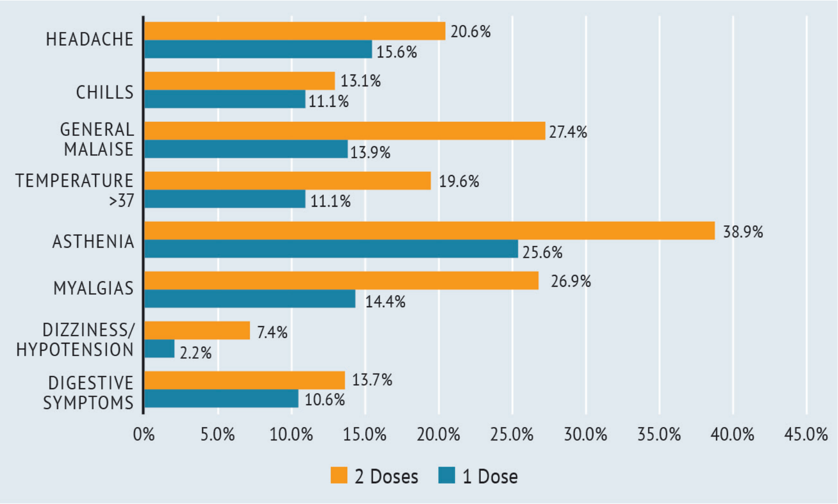

Figure 2. Rate of systemic adverse events.

Table 1. Relation of the comorbidities with the appearance of local and systemic adverse reactions.

		SYSTEMIC DRUG ADVERSE REACTIONS N (%)	P	LOCAL DRUG ADVERSE REACTIONS N (%)	P
Diabetes Mellitus	YES NO	26 (44.1) 49 (44.5)	0.952	45 (40.5) 31 (52.59)	0.134
Ischemic heart disease	YES NO	5 (41.7) 70 (45.5)	0.800	3 (25) 75 (48.4)	0.118
Hepatopathy	YES NO	1 (33.3) 71 (44.9)	0.689	3 (25) 75 (47.2)	0.105
Stroke	YES NO	1 (33.3) 74 (45.9)	0.677	1 (33.3) 77 (47)	0.639
Vasculopathy	YES NO	2 (28.6) 73 (45.9)	0.367	2 (28.6) 76 (47.5)	0.326

Among the systemic AEs, the most commonly reported ones were asthenia (n=73; 39.06%) and myalgia (n=50; 27.1%). Systemic AEs were more frequent after the administration of the second dose compared to the first one as seen on **figure 2**. In the univariate analysis, a significant difference was seen based on age such that a higher number of years was associated with a lower number of systemic reactions in the population studied (P=0.022).

Also, an association was also found between the rate of AEs and prior infection with SARS-CoV-2: the percentage of local effects, in general, was higher among those who had a previous infection (n=120; 64%) compared to those who had not been infected at all (n=88; 47.5%). Therefore, prior infection was a risk factor for the occurrence of local AEs after vaccination (OR, 2.4; 95%CI, 1.00-5.78; P=0.045). The same association was seen for systemic AEs, which were more common among those who had previously had the disease (OR, 3.83; 95%CI, 1.51-9.7; P=0.003).

Table 2. Association between sociodemographic and renal function variables and the appearance of systemic adverse reactions.

	SYSTEMIC DRUG ADVERSE REACTIONS N (%)	P	LOCAL DRUG ADVERSE REACTIONS N (%)	P
Age; mean ± standard deviation	60.49 (±13.2)	0.022	58.81 (±13.2)	0.533
Sex; N (%) **Men** **Women**	 33 (41.8) 56 (58.2)	0.410	 37 (45.7) 44 (54.3)	0.084
CKD –EPI; mean ± standard deviation	49.87 (±21.31)	0.837	49.79 (±19.67)	0.798

CKD-EPI Equation for Glomerular Filtration Rate.

In the multivariate analysis, prior COVID infection remained significantly associated with systemic AEs (OR, 3.42; 95%CI, 1.33-8.77; P=0.011), while age approached the significance threshold (OR, 0.97; 95%CI, 0.95-1.00; P=0.051) (**table 1** and **table 2**).

Following the administration of both doses, local AEs were more common compared to the systemic ones as shown on **figure 4**.

Finally, the relationship between local and systemic AEs with the development of humoral and cellular immunity post-vaccination was studied. However, no statistically significant differences were found as shown in **figure 5** and **figure 6**.

DISCUSSION

The unique circumstances surrounding the renal transplant process like associated comorbidities and immunosuppression put transplant recipients at a higher risk for developing severe disease from SARS-CoV-2[10]. Therefore, effective and safe vaccination is considered crucial in this population.

Back in 2021, Spanish health authorities recommended a three-dose regimen of mRNA vaccines against SARS-CoV-2 for immunocompromised individuals assuming a lower immunogenicity to these vaccines in solid organ transplant recipients compared to the overall population[12].

Regarding the sociodemographic variables of the study sample, they are consistent with those of former studies conducted on renal transplant recipients in the Spanish population[13]. This suggests that the findings associated with adverse reactions to the vaccine in this study could be extrapolated to the renal transplant population.

The data from this research show an association between age and the number of systemic adverse reactions reported. This finding is consistent with the data reported for the overall population in the pharmacovigilance report issued by the Spanish Agency of Medicines and

Medical Devices (AEMPS)[14] regarding COVID-19 vaccines. It indicates that overall adverse reactions were reportedly 10 times more common in individuals under 65 years of age and 3 times more common in women. These differences may be attributed to immune, genetic, and hormonal factors[15], although no gender differences were found in our study.

Regarding immunosuppressive treatment of transplant recipients included in the study, the data are very much consistent with those reported in the study conducted by López-Oliva et al[16]. The approaches followed for cases of SARS-CoV-2 infection were similar among the different Spanish hospitals involved since with mild symptoms treatment was not warranted. However, as the infection grew adjustments were made based on the patient's needs.

During the vaccination process against SARS-CoV-2, it has been reported that mRNA vaccines can cause mild to moderate side effects with local adverse events (AE) being predominant. The most common local AE reported is pain at the injection site, which is consistent with the findings of this research[13].

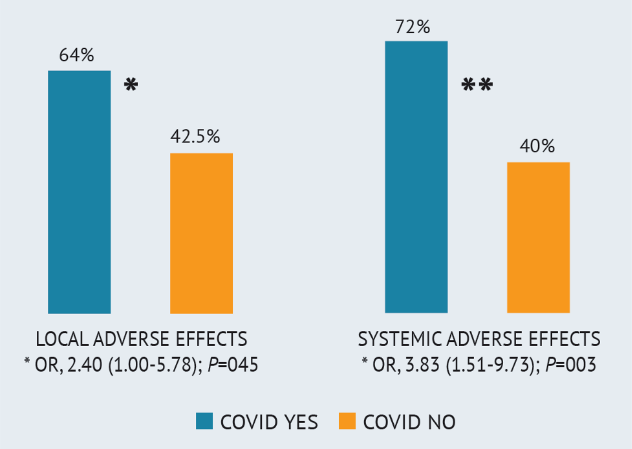

Figure 3. Relation between local and systemic adverse events and prior COVID-19 infection.

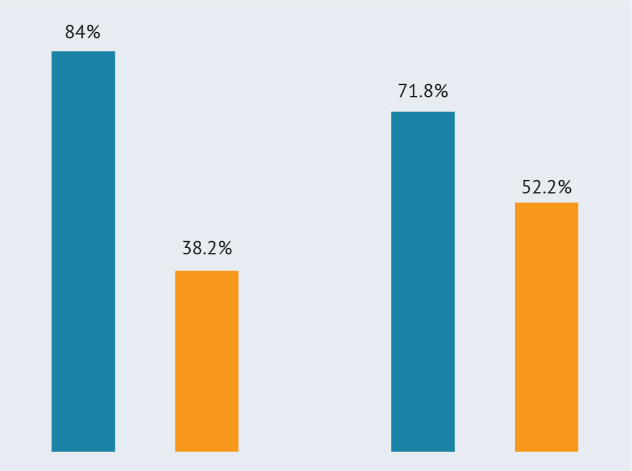

Figure 4. Percentage of local and systemic events after each dose.

The rate of AEs in the study population increased from the first to the second dose as observed in the investigation conducted by Massa et al[13]. However, other studies have reported that reactogenicity with booster doses was higher especially regarding systemic adverse effects[17]. This is consistent with the results found in our study as shown in **figure 2**.

The findings of our study are similar to those reported in clinical trials of the BNT1162b and mRNA-1273 vaccines being pain at the injection site and asthenia two of the most commonly reported symptoms in healthy adults just like in our study population[18].

Overall, the adverse reactions reported by the patients in this study are similar to those reported in the general population by the AEMPS[14]. However, there is a discrepancy in the percentages of symptom presentation being systemic AEs (headache [21%], fever [33%], and myalgia [15%]) more prevalent in the overall population and local AEs (pain at the injection site reported by 13% of the sample) more prevalent in renal transplant recipients. The reason for this difference may be attributed to the method of information collection, as our study methodology relied on a questionnaire while the data reported by the AEMPS come from pharmacovigilance changes that may not be as comprehensive.

In this study, no significant safety issues like myocarditis or neurological symptoms were observed, which is somehow similar to what has been reported in clinical trials and vaccine registries of mRNA-based COVID-19 vaccines[19,20].

In the study conducted by Connolly et al[21], patients on immunosuppressive therapies for rheumatic and musculoskeletal diseases who received the BNT162b2 or mRNA-1273 vaccine reported that 69% of participants experienced, at least, one systemic side effect being fatigue the most commonly reported symptom, and 86% reporting local symptoms being pain at the injection site the most prevalent of all. These results are consistent in terms of percentages (62% for local AEs and 55% for systemic AEs) and symptomatology with those found in our study. This coincidence may be due to both studies being conducted in immunocompromised patients. However, these data were only collected after the first vaccine dose and were obtained through a questionnaire from those who voluntarily decided to participate, which could introduce information bias.

In the study conducted by Fernández Prada M.[22] that focused on the safety and efficacy profile of other vaccines administered to immunocompromised patients, the rate of AEs was higher with inactivated virus vaccines at around 88.7%. Regarding the percentage of adverse event reports, 35.8% were local, 49.1% systemic, and 15.1% both types. The difference with the results found in our study could be attributed to the type of vaccine and the specific dosing regimen administered to the patients. However, the symptoms reported by the patients were similar being pain and fever the most commonly described symptoms of all[22].

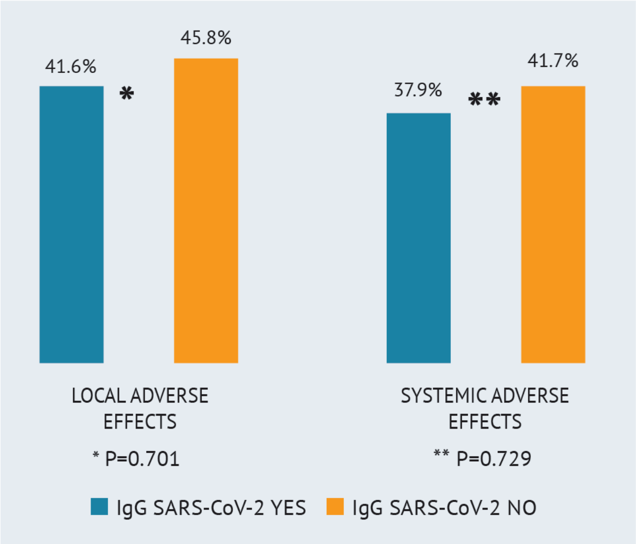

Figure 5. Relation between local and systemic adverse events and development of humoral immunity post-vaccination.

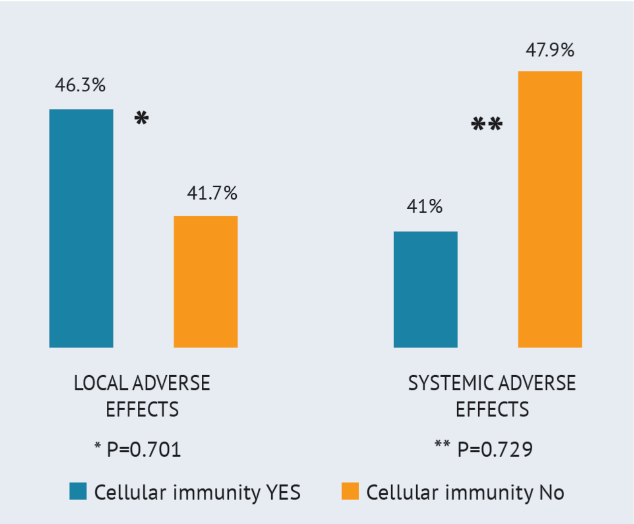

Figure 5. Relation between local and systemic adverse events and development of humoral immunity post-vaccination.

The main strengths of our study include a representative sample of the renal transplant population as participation was offered to all vaccinated patients. Also, the rate of refusal was low. The information was collected thoroughly using a specifically designed questionnaire. However, a major limitation is that it is a single-center study.

CONCLUSIONS

The conclusions drawn from the results obtained in this study are of great relevance to the medical community, as they provide crucial data on the frequency of adverse events caused by the SARS-CoV-2 vaccine in kidney transplant patients. Systemic and local adverse events were found to be significantly more frequent in subjects who had previously been infected with SARS-CoV-2. Additionally, the rate of systemic adverse events was higher in younger patients, showing a significant association. In our sample, vaccination mostly resulted in local adverse events, which is consistent with the overall population.

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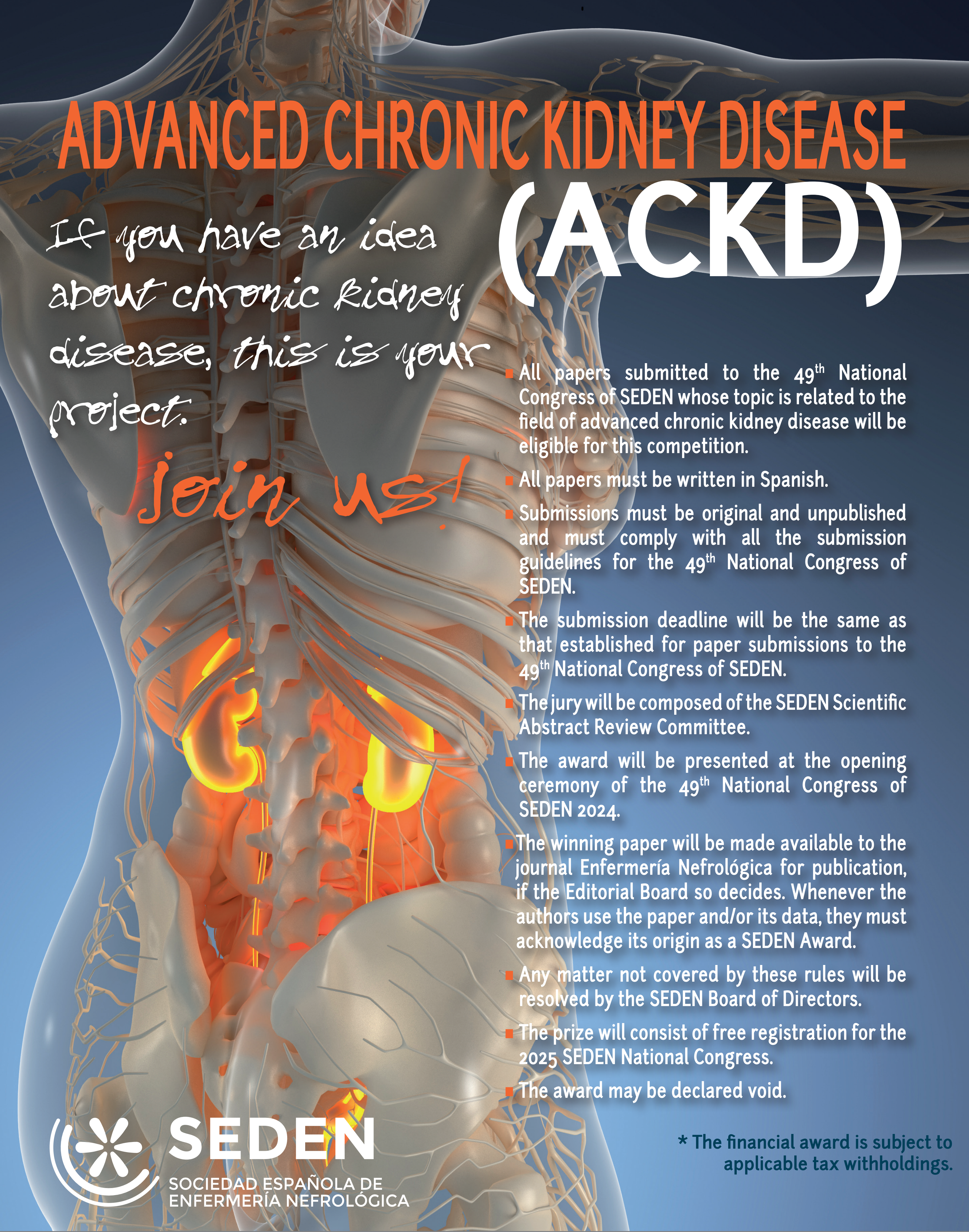

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A comparative study of resilience in haemodialysis and renal transplant patients

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ABSTRACT

Introduction: Patients with advanced chronic kidney disease (CKD) undergo renal function replacement methods such as haemodialysis and renal transplantation. Resilience is a protective factor that facilitates adaptation to adverse events that may arise during change.

Objectives: To compare resilience and its dimensions in two groups of patients with CKD according to their method of renal function replacement and by gender, regardless of the group to which they belong.

Material and Method: The study was a cross-sectional analytical study using the validated 25-item Connor-Davidson resilience scale. The variables were resilience levels and dimensions. Gender and age were also included.

Results: 88 patients from the Arnaldo Milián Castro University Hospital participated, of which 53 (52 %) were male, 44 receiving haemodialysis, and 44 with renal transplant. Haemodialysis patients showed higher mean values for resilience (M=79), persistence, tenacity, self-efficacy (M=26), and adaptability and support networks (M=17). In contrast, transplant patients excelled in control under pressure (M=22), power and purpose (M=15), and spirituality (M=9). By gender, males showed higher mean scores on all variables. The Man-Whitney U test yielded statistically significant differences in one group of variables for both forms of grouping.

Conclusions: This study's findings reveal significant differences in resilience and the factors that condition it in the haemodialysis and transplant groups and the groups by gender.

Keywords: psychological resilience; chronic kidney disease; haemodialysis; renal transplantation.

RESUMEN

Estudio comparativo de la resiliencia en pacientes de hemodiálisis y trasplante renal

Introducción: Los pacientes con enfermedad renal crónica (ERC) en fase avanzada se ven sometidos a métodos de sustitución de la función renal, como la hemodiálisis y el trasplante renal. La resiliencia constituye un factor protector que propicia la adaptación ante eventos adversos que pueden surgir durante el proceso de cambio.

Objetivos: Comparar la resiliencia y sus dimensiones en dos grupos de pacientes con ERC según su método de sustitución de la función renal y por género, independientemente del grupo de pertenencia.

Material y Método: El estudio fue transversal analítico y se utilizó la escala validada de resiliencia de Connor-Davidson de 25 ítem. Las variables fueron los niveles de la resiliencia y sus dimensiones. Se incluyeron, además, género y edad.

Resultados: Participaron 88 pacientes del hospital universitario Arnaldo Milián Castro, del total 53 (52 %) fueron del masculino, 44 recibiendo hemodiálisis y 44 con trasplante renal. Los pacientes de hemodiálisis mostraron valores medios superiores en cuanto a la resiliencia (M=79), persistencia, tenacidad y autoeficacia (M=26) y adaptabilidad y redes de apoyo (M=17); en tanto los de trasplante destacaron en control bajo presión (M=22); control y propósito (M=15) y espiritualidad (M=9). Por género, el masculino mostró promedios superiores en todas las variables. La prueba U de Man Whitney arrojó diferencias estadísticamente significativas en un grupo de variables para ambas formas de agrupación.

Conclusiones: Existen diferencias significativas de la resiliencia y los factores que la condicionan en los grupos de hemodiálisis y trasplante; así como en los grupos por género.

Palabras claves: resiliencia psicológica; enfermedad renal crónica; hemodiálisis; trasplante renal.

INTRODUCTION

Chronic kidney disease (CKD) has a significant global impact, with its incidence increasing exponentially, along with the financial burden of its management and the costs in terms of individual and societal health. According to the WHO, it is estimated that CKD affects 850 million people (more than 10% of the world's population), causes 2.4 million deaths annually, and is currently the eleventh leading cause of death worldwide[1].

In the face of renal function loss, medicine offers replacement alternatives through haemodialysis, peritoneal dialysis, and kidney transplantation. While these options represent hope for the patient, they also expose them to new challenges and complications at the physiological, physical, psychological, and social levels[2]. The process of assimilating new lifestyles for both patients and families is a genuine challenge, which has been studied at many levels.

As this constitutes a serious health problem, the systematic study of adaptive processes and reaffirmation of the self within the disease is a fundamental imperative. Multiple processes and personality traits play a relevant role, and their continued study would shed light on how best to direct psychological support to patients, and in many ways contribute to reordering their psychological framework[3].

In this context, resilience is presented in this study as a category of increasing importance, alongside the growing scientific debate that supports it. Resilience is understood as a dynamic process through which individuals demonstrate positive adaptation despite experiencing adverse situations[4].

It is now recognised that resilience is a multi-level phenomenon, operating across multiple systems and interacting among them[5], involving a variety of resources from the individual's socialisation environment. It thus constitutes a complex process influenced by contextual, personality, social, and socioeconomic factors.

Resilience, acknowledged for its importance, may act as a mediator in reducing negative emotional states through its dimensions: self-confidence, social competence, and social and family support[6].

As a dynamic process, the individual must be able, to some extent, to manage the resources of their own personality, as well as those offered by their environment, ranging from the social framework to factors such as family, community, health services, and others.

Based on these ideas, the present study aims to compare resilience and its dimensions in 2 groups of patients with CKD, according to their method of renal replacement therapy and by gender, regardless of group membership.

MATERIAL AND METHOD

Study design

This investigation constitutes an analytical cross-sectional study, in accordance with the criteria of Hernández et al[7].

Population and sample

Two groups of patients with chronic kidney disease were selected: one on haemodialysis, including 44 patients from the haemodialysis unit of *Arnaldo Milián Castro* provincial hospital from the daytime shifts of that service. The transplant group was also composed of 44 patients from the same institution. During inpatient admission, the study was explained, including how to respond, the importance of the study, and informed consent was obtained. The study period was the second semester of 2022 for both groups.

Sampling was intentional and non-probabilistic, with the following inclusion and exclusion criteria.

Inclusion criteria

1. Belonging to daytime shifts of the haemodialysis unit in the case of the haemodialysis group.
2. Being hospitalised in the case of transplant patients.
3. Providing informed consent.

Exclusion criteria

1. Presence of any psychiatric or neurological disorder that prevents understanding of the task.

Study variables and data collection

Data collection was conducted during the 2nd semester of 2022 using a printed self-administered questionnaire, allowing patients to respond independently before the information was entered into a database created with SPSS v26 software.

The established variables were resilience and its dimensions according to the Connor-Davidson Resilience Scale (CD-RISC)[8]. described in the measurement instrument section. Its dimensions are Persistence-tenacity-self-efficacy (PTS); Control under pressure (CUP); Adaptability and support networks (ASN); Control and purpose (CP); Spirituality (SP). All are continuous quantitative variables.

Additionally, gender (male and female), method of renal replacement (haemodialysis and transplantation), and age were included.

Measurement instrument

The Connor-Davidson Resilience Scale (CD-RISC)[8], widely used worldwide, measures multiple dimensions that encompass both personality-related and external factors. It consists of 25 items scored on a scale from 0="not at all" to 4="always." The construct comprises 5 factors or dimensions: persistence-tenacity-self-efficacy (items 10–12, 16, 17, 23–25), range 0–32; control under pressure (items 6, 7, 14, 15, 18–20), range 0–28; adaptability and support networks (items 1, 2, 4, 5, 8), range 0–20; control and purpose (items 13, 21, 22), range 0–12; and spirituality (items 3, 9), range 0–8. Total resilience ranges from 0–100. Item scores are summed, with higher scores in each dimension indicating greater resilience. This instrument has been validated for the Cuban population at *Universidad Central "Martha Abreu" de Las Villas* by the authors, achieving an internal consistency value of α=.906.

Statistical analysis

For statistical analysis, the SPSS v26 package was used. The tests applied for each group included the Shapiro-Wilk normality test, descriptive statistics for calculation of means (M), medians (ME), standard deviations (SD), and ranges (R). For the qualitative variable gender, frequency and percentage were obtained. Comparison of resilience, PTS, CUP, ASN, CP, and SP between the 2 groups as independent samples was conducted using the Mann-Whitney U test, and likewise between genders irrespective of group membership. Results were considered statistically significant when p≤.05.

Ethical considerations

Informed consent was obtained. The study was reviewed in its design by the institutional ethics committee and approved by the scientific council as part of a research project. Bioethical aspects related to human research were respected, including all elements referenced in the Declaration of Helsinki, confidentiality, autonomy, and equity.

A normality test was applied to the data in each group according to the method of renal replacement therapy, to determine whether they followed a normal distribution. The conclusion was that the data did not follow a normal distribution.

Table 1 illustrates that the transplant group had slightly lower medians in resilience, PTS, and ASN, while CUP and CP showed slightly higher medians. A significant finding was that the range of resilience in the transplant group was higher than in the haemodialysis group, indicating considerable dispersion. In all cases, except ASN, the differences were statistically significant **(table 2)**.

Table 1. Descriptive Variables by Group According to Method of Renal Replacement Therapy.

	Transplant		Haemodialysis	
	Median	**Range**	**Median**	**Range**
Resilience	72	80	82	65
PTA	24	24	27	28
CUP	24	28	20	22
ARA	16	20	18	16
CP	16	20	12	10
SPI	11	12	8	6

PTA: Persistence, Tenacity, and Self-Efficacy; **CUP:** Control Under Pressure; **ARA**: Adaptability and Support Networks; **CP:** Control and Purpose; **SPI:** Spirituality.

Table 2. Mann-Whitney U test for variables by group.

	Groups Compared	Mann-Whitney U	Asymptotic Significance (2-tailed), P Value
Resilience	Transplant vs Haemodialysis	553 500	.001
PTA	Transplant vs Haemodialysis	548 000	<.001
CUP	Transplant vs Haemodialysis	650 000	.008
ARA	Transplant vs Haemodialysis	855 000	.342
CP	Transplant vs Haemodialysis	417 000	<.001
SPI	Transplant vs Haemodialysis	397 500	<.001

PTA: Persistence, Tenacity, and Self-Efficacy; **CUP:** Control Under Pressure; **ARA**: Adaptability and Support Networks; **CP:** Control and Purpose; **SPI:** Spirituality.

RESULTS

The groups were formed as follows: the transplant group included 44 members, of whom 24 (54.5%) were male, with a mean age of M=44.11±11.2 years. The haemodialysis group also included 44 patients, of whom 29 (65.9%) were male, with a mean age of M=50.02±11.3 years.

By gender distribution, the 88 patients included 35 women (39.8%) and 53 men (52%). The mean age among women was M=44±11.5 years, while among men it was M=49±11.4 years.

Table 3 illustrates the behaviour of the variables by gender, regardless of group membership. It shows that men had significantly higher resilience than women, with lower dispersion. Overall, men scored higher across all variables, with resilience, PTS, and ASN being statistically significant **(table 4)**.

Table 3. Descriptive variables by sex, independent of method of renal replacement therapy.

	Female		Male	
	Median	Range	Median	Range
Resilience	70	79	81	34
PTA	23	28	26	9
CUP	21	31	22	9
ARA	15	19	18	9
CP	12	20	12	3
SPI	8	12	8	2

PTA: Persistence, Tenacity, and Self-Efficacy; **CUP:** Control Under Pressure; **ARA**: Adaptability and Support Networks; **CP:** Control and Purpose; **SPI:** Spirituality.

Table 4. Mann-Whitney U test for variables by sex.

	Sex	Mann-Whitney U	Asymptotic Significance (2-tailed), P Value
Resilience	Women vs Men	560 500	0.002
PTA	Women vs Men	632 500	0.012
CUP	Women vs Men	786 500	0.228
ARA	Women vs Men	630 500	0.011
CP	Women vs Men	766 000	0.159
SPI	Women vs Men	855 532	0.532

PTA: Persistence, Tenacity, and Self-Efficacy; **CUP:** Control Under Pressure; **ARA**: Adaptability and Support Networks; **CP:** Control and Purpose; **SPI:** Spirituality.

DISCUSSION

Statistically significant differences were found between groups in resilience, PTS, CUP, CP, and SP, with ASN being the only exception. As observed, haemodialysis patients obtained higher mean scores in resilience, PTS, and ASN, although the latter was not statistically significant.

It proved difficult to find references in the scientific literature comparing resilience in CKD patients according to their method of renal replacement, although such studies exist. In Japan, Kukihara et al[9], reported mean resilience values of 82.42 points in haemodialysis patients. Similarly, another study relating anxiety, Islamic beliefs, and resilience in haemodialysis patients found an average resilience of 82 points[10], practically identical to the previous finding and similar to those presented in this investigation.

Transplant patients, by contrast, scored higher in CUP, CP, and SP. Regarding spirituality, it is known that religion often serves as a foundation that reinforces spirituality and provides adjustments based on psychological meaning. Niebla et al[11] reported that CKD patients adopt strategies related to religion. The same authors also emphasised the instrumental role that social and family factors play in the wellbeing of these patients, noting that having a support network can help them address challenges or crises[11].

CUP is linked to stress situations, common in patients on haemodialysis or with kidney transplants. Indeed, many authors relate resilience to stress[12,13]. According to Qiu et al[14], resilience can be defined as an individual's competence and strength to successfully face stressful situations. In a multicentre study in Spain, García-Martínez et al[15] found that resilience was one of the most important predictors of perceived stress.

When comparing by gender, statistically significant differences were observed in resilience, PTS, and ASN, while the other dimensions of resilience showed no major differences. In all cases, men had higher median scores, which also applied to age, with a higher mean. Once again, persistence, tenacity, and self-efficacy, as well as support networks, emerged as the most relevant factors in explaining differences in resilience levels. In a systematic review, González-Flores et al[16] found that psychological factors, social support, and coping are essential for resilience. Similarly, Kukihara et al[9]. demonstrated through modelling that family functioning is significantly associated with resilience. This corroborates that resilience extends beyond individual traits, giving an important role to the socialisation system, as shown in this study.

García-Martínez et al[15] in agreement with this work, found higher resilience in men (71.42 vs 67.15, p=0.291), although the difference was not statistically significant. Conversely, Hayati et al[8] reported mean values of 83 and 82 respectively, in favour of women, with a non-significant p value of 0.764. In any case, gender intersects with sociocultural factors specific to each region, which must not be overlooked.

It should be noted that although the physiological advantages of kidney transplantation over haemodialysis are well established, this does not necessarily extend to psychological domains, underscoring the importance of monitoring resilience as a crucial construct. Londoño[17] reported that in transplant patients, concerns about graft viability increase over time and are greater with worsening physical evaluations.

This study has limitations regarding the number of demographic variables considered and the sample size. Nonetheless, at regional level it is novel, as it addresses a scarcely studied topic. It represents a scientific approach that may inform future intervention strategies and further research, particularly concerning the psychological preparation of CKD patients beginning haemodialysis or awaiting kidney transplantation.

In the case of the transplant group, it should be noted that participants were hospitalised, a condition that may affect resilience. Therefore, it is advisable in future research to include patients outside hospitalisation periods.

It is also suggested that future studies further compare different groups according to renal replacement method, including peritoneal dialysis, and incorporate new variables potentially related to resilience in CKD patients.

In conclusion, it is essential to explore not only resilience levels but also their behaviour across different subgroups, whether by renal replacement method or gender. The resilience process involves both personality and social environment, meaning that the set of variables fostering resilience may differ substantially among individuals and contexts. This specificity must be addressed scientifically.

Each method of renal replacement poses particular challenges. This study showed greater resilience among haemodialysis patients, even though transplantation generally provides greater independence.

Gender and its associated social roles must also be considered, as they are important variables in explaining resilience among patients undergoing renal replacement therapy.

Conflicts of interest

None declared.

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Nursing care of the patient with chronic kidney disease in primary health care

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ABSTRACT

Introduction: Advanced chronic kidney disease is a significant public health problem; it reduces the life expectancy and quality of life of those who suffer from it, affects many people, and represents a burden for the health system.
Nurses, in their role as educators, must carry out actions to prevent the disease. It is interesting to learn about their experiences in the care of renal patients in primary health care, as this is where the progression of the disease is prevented.

Objective: To describe the experience of nursing professionals in primary health care in the care of patients with chronic kidney disease.

Materials and Method: Qualitative study, with a sample of 10 nurses working in different primary health care centres in Copiapó (Chile). A semi-structured interview and data analysis were conducted using open coding in the Atlas Ti program.

Results: Four categories emerged: factors related to quality of care, nursing care management, multidisciplinary care, and conditioning elements for nursing care. Significant limitations for the care of the renal patient were evidenced: lack of time and specific consultations for follow-up, limited professional training in the subject, and socio-economic factors of the patient that influence care.

Conclusions: Including specific care for renal patients in primary care and training nurses are essential tools for improving the care of patients with advanced chronic kidney disease.

Keywords: nursing; nursing care; CKD; quality of life and primary health care.

RESUMEN

Cuidado de enfermería del paciente con enfermedad renal crónica en atención primaria de salud

Introducción: La enfermedad renal crónica avanzada es un importante problema de salud pública, disminuye las expectativas y calidad de vida de quienes lo padecen, afecta gran número de personas y representa una carga para el sistema sanitario.
Los enfermeros, en su rol educador, deben realizar acciones de prevención de la enfermedad, resultando interesante conocer sus experiencias en el cuidado de los pacientes renales en atención primaria de salud, siendo aquí donde se hace prevención del avance de la enfermedad.

Objetivo: Describir la experiencia vivida por los profesionales de enfermería en el cuidado de pacientes con enfermedad renal crónica en atención primaria de salud.

Material y Método: Estudio cualitativo, cuya muestra fue de 10 enfermeros que trabajaban en distintos centros de atención primaria de Copiapó (Chile). Se realizó una entrevista semiestructurada y análisis de datos mediante codificación abierta en el programa Atlas Ti.

Resultados: Surgieron 4 categorías: factores relacionados con la calidad de la atención, gestión del cuidado de enfermería, cuidado multidisciplinario y elementos condicionantes para la atención de enfermería. Se evidenciaron importantes limitaciones para el cuidado del paciente renal, falta de tiempo y consultas específicas para seguimiento, formación profesional limitada en el tema y factores socio- económicos del paciente que influyen en el cuidado.

Conclusiones: La inclusión de cuidados específicos para el paciente renal en atención primaria y la capacitación del profesional de enfermería, surgen como importantes herramientas para mejorar el cuidado de los pacientes con enfermedad renal crónica avanzada.

Palabras claves: enfermería; atención de enfermería; insuficiencia renal crónica; calidad de vida, atención primaria de salud.

INTRODUCTION

Chronic kidney disease (CKD) is a public health problem that reduces life expectancy and represents a burden for the health care system.

Over the past 30 years, it has become one of the leading causes of mortality and years of healthy life lost (YHLL) in all Latin American countries. In Chile, CKD advanced from the 14th to the 4th cause of death and from the 27th to the 9th cause of YHLL between 1990 and 2019[1].

In 2022, a characterisation study of CKD patients in Chile reported that 54% of patients initiated renal replacement therapy (RRT) without prior preventive management, while those who received preventive management could delay entry into RRT by up to 10 years[2].

Nationwide, as part of a strategy for screening and early diagnosis of CKD, since 2014 Chile has included monitoring with blood tests to evaluate kidney function and damage in individuals enrolled in the Cardiovascular Health Programme (PSCV) in primary health care (PHC)[3].

Recently, there has been an increase in the number of CKD stage 5 patients requiring dialysis. The haemodialysis registry of the Chilean Society of Nephrology indicated that as of August 31st 2023, there were 25,158 patients on haemodialysis in Chile[4], including 367 patients in the Atacama region[5].

CKD in Chile is covered under the Explicit Health Guarantees (GES), which ensures care both at early stages and during dialysis. Initial diagnosis, management, and possible referral according to established clinical practice guidelines are the responsibility of PHC[6].

The mission of the health care team is to provide patients with the tools to facilitate self-care in chronic illness. The role of PHC nurses is therefore essential in promoting and preventing CKD while managing the comorbidities that trigger it[7].

The nursing role is regulated by the Chilean Health Code, Article 113, which states that "the professional services of the nurse comprise care management in relation to the promotion, maintenance, and restoration of health; the prevention of diseases or injuries; and the execution of actions derived from medical diagnosis and treatment, with the duty to ensure the best administration of health care resources for the patient"[8].

The nursing role warrants special attention in the care of patients with kidney disease, as nurses participate in the detection of risk factors and the prevention of disease progression through promotion and prevention strategies[9-10].

In 2018, a study conducted in Atacama, Chile, among diabetic patients on haemodialysis, reported inadequate professional management during pre-dialysis stages, suggesting the need to strengthen the educational role of nurses[11]. As PHC is the setting par excellence for preventive and health promotion activities and given that no other regional studies to date have addressed nursing care of CKD patients in PHC, the present investigation aims to explore this phenomenon through the lived experiences of nurses, describing their perspectives on caring for CKD patients in primary health care.

MATERIAL AND METHOD

Design

We conducted a qualitative, descriptive, and exploratory study among nurses providing health care in different family health centres (CESFAM) within PHC in the city of Copiapó, during the period November–December 2022.

Study setting

The study was conducted in 7 CESFAM in the Atacama Region, all of which belong to the Municipal Health Department of the city of Copiapó, Atacama, Chile.

Population and sample

The population consisted of 39 nurses working in different CESFAM facilities in Copiapó. A non-probabilistic convenience sampling method was applied until data saturation was reached. The final sample included a total 10 nurses from different CESFAM who met the inclusion and exclusion criteria.

Inclusion and exclusion criteria

Two inclusion criteria were established: (1) nurses with experience in the direct care of patients with kidney disease within the Cardiovascular Programme; (2) voluntary participation confirmed by signing informed consent.

The exclusion criterion was (1) health care professionals other than nurses working in the CESFAM.

Data collection procedure

A formal request was made by the Nursing Department Universidad de Atacama to the Municipal Health Department of Copiapó to invite nurses from CESFAM in the city to participate in the study. Subsequently, on-site visits were made to each CESFAM to meet the nurses, explain the study objectives in detail, and invite them to participate voluntarily. Those who agreed scheduled a day, time, and place for the interview.

Interviews were conducted by 5 nursing students from the Universidad de Atacama over 2 months (November–December 2022). Meetings took place within each CESFAM to provide a safe, comfortable, and confidential environment, encouraging participants to share their experiences openly. Participants were informed of the study and signed informed consent. Each interview was recorded and later transcribed.

Data collection instrument

Data were collected using a semi-structured interview consisting of 8 guiding questions designed to elicit the personal experiences of each nurse in relation to the study objective **(table 1)**.

Table 1. Semi-structured interview guide.

How do you identify a patient with possible risk of kidney disease or kidney damage?
Could you describe the care you provide to patients at risk of chronic kidney disease (CKD) and to those with CKD?
What does the education provided to patients at risk of CKD consist of?
What are the limitations of the cardiovascular program in the timely detection of patients with CKD?
What difficulties interfere with patient self-care?
How do you evaluate the follow-up of patients referred to secondary care?
Could you identify the strengths of the Ministry guidelines regarding the health care of patients with CKD?
Have you needed to provide emotional support to a patient with CKD? If so, could you describe the experience?

Data analysis

Interviews were recorded, transcribed manually, and organised into independent files, each assigned an alphanumeric code to ensure anonymity, with access restricted to the research team. A total of 4 students and 2 academics with qualitative research experience conducted individual critical readings of the transcripts. An open coding process was then applied using Atlas.ti software, followed by grouping of similar codes according to study objectives. Categories and subcategories were constructed inductively based on these groupings. Initially, 10 codes were identified, which were later consolidated into 4 categories **(table 2)**.

Ethical approval

The study was approved by *Universidad de Atacama* Ethics Committee and by the Municipal Health Department of Copiapó. Informed consent was obtained from each participating nurse. Anonymity and confidentiality of participants were ensured at all times.

RESULTS

A total of 10 nurses were interviewed, who identified important elements related to the care of renal patients. Four categories emerged: (1) factors related to quality of care; (2) nursing care management; (3) multidisciplinary care; and (4) conditioning elements influencing nursing care.

Category 1: Factors related to quality of care

Nurses identified factors associated with the quality of care provided to renal patients. Among these was the absence of established guidelines and protocols in PHC for the management of patients with kidney damage, since this condition is regarded as a consequence of diabetes mellitus and hypertension. Other factors mentioned included poor connectivity, shortage of professionals, and limited training specific to CKD management.

a) Subcategory: Limitations in health care provision

One of the greatest limitations highlighted was the short time allocated for cardiovascular check-ups.

"The limitation is the consultation times they give us; I think this is very important because they are reduced too much, so you only do something quickly and cannot do it with quality. It's as if they prefer quantity over quality." (E9)

Participants also reported coverage problems and connection issues with the CESFAM computer servers, staff shortages, limited access to medicines, restricted slots for laboratory tests, and insufficient appointment availability. These factors directly affected continuity of care.

"The lack of staff, the lack of consultation rooms, this system. You are seeing a patient and suddenly the system crashes, everything stops because RAYÉN went down." (E4)

"There aren't enough slots for lab tests, or for sample collection; there aren't enough appointments for nurses, nutritionists, or doctors." (E5)

Another limitation mentioned was the shortage of nephrologists in Copiapó, meaning patients were seen late even when referred. A further concern was inadequate training for foreign doctors working in PHC regarding Chilean Ministry of Health guidelines.

"There's a shortage of nephrologists. They receive patients very late because even if you refer them, there are so many patients that they can't keep up…" (E9)

Table 2. Study categories, definitions, and subcategories.

Category	Definition	Subcategories
Factors related to quality of care	Health services that enable positive outcomes in relation to gaps identified by health professionals, recognising new tools and/or improvements that help meet and optimise the demand for care.	Limitations in health services
		Improvements in health care
		Professional satisfaction
Nursing care management	Actions that provide care according to individuals' needs to improve health not only physically but also biopsychosocially and emotionally, promoting self-care and fostering user autonomy.	Emotional support
		Nursing care
		Influence of regulations on care
Multidisciplinary care	Care and activities provided by health professionals throughout the life course, aimed at promoting health and prevention, maintaining continuity through a care plan with a multidisciplinary approach.	Multidisciplinary team
		Continuity of care
Conditioning elements for nursing care	Interpersonal or environmental elements that influence the user's biopsychosocial state, which may facilitate or hinder understanding and improvement of health status.	User self-care
		Intrinsic and extrinsic factors influencing user care

"When doctors are trained in Chile, they are familiar with ministry guidelines, how the GES works, and so on. But with foreign doctors it's an issue—they are not familiar with the guidelines, the flowcharts, or even how the GES system itself works." (E6)

b) Subcategory: Improvements in health care provision

Nurses recognised the need to strengthen knowledge about CKD among both health care professionals and patients, noting that training opportunities are scarce.

"Continuous training, perhaps forming a team focused on chronic kidney disease, maybe having a protocol for when to refer with abnormal lab results. At present we don't have anything fixed for that. And it's not only for doctors—nurses, nutritionists, and nursing assistants in the cardiovascular programme should also know when to refer or when to alert for early referral." (E2)

Other improvements suggested included reorganising human resources to better address CKD through specialised programmes or teams providing a biopsychosocial approach.

"In primary care we could form an accompaniment team, maintaining a database of patients with chronic kidney disease." (E5)

"I think there could be a programme in primary care for renal patients; I would design a programme for those in stage 1 or 2." (E2)

"Group workshops where patients meet, share their experiences, discuss how they manage their treatment and adherence." (E1)

c) Subcategory: Professional satisfaction

Some nurses expressed a sense of undervaluation of their professional role and insecurity due to insufficient training in CKD care.

"We don't really have tools or updates on chronic kidney disease. I think it has been very neglected, yet it's increasing. It would be important to update us and perhaps provide another approach for these patients." (E2)

Conversely, participants reported positive feelings of professional satisfaction derived from strong patient–provider relationships, which foster trust and facilitate health education.

"In general, patients react positively because they are long-term patients, we've built a lot of trust. They are seen by the same professionals, so there's already a bond and that helps us a lot in patient education." (E8)

Category 2: Nursing care management

This category highlighted the influence of health regulations and the biopsychosocial model of care in CKD management.
a) Subcategory: Emotional support

Nurses described providing emotional support through active listening and effective communication.

"No one had sat with him to explain why all that had happened. I took the time because I had a free slot, so I stayed with him to explain everything. The gentleman actually cried out of gratitude—no one had ever explained anything to him before." (E5)

They also emphasised the importance of support from psychologists and social workers to deliver holistic care.

"I've provided emotional support and fortunately we have a good psychology team. They supported me in how to approach the patient, how to help them accept that this is a therapeutic process that will help them." (E2)

"At that moment we give the patient the time they need to express their problem or emotion, but there's also support from other professionals who intervene." (E7)

b) Subcategory: Nursing care

The importance of a comprehensive assessment was highlighted as the foundation for personalised nursing care.

"You need to cover all the patient's needs to provide appropriate care. Considering their needs allows me to deliver much more effective education." (E2)

c) Subcategory: Influence of regulations on care

Nurses acknowledged that ministerial guidelines for cardiovascular patients are used for CKD management in PHC, since CKD is seen as a complication of cardiovascular disease.

"CKD is not directly addressed in PHC; it feels like an add-on to the cardiovascular programme. It's not even listed in our forms as a cardiovascular programme disease. It's a neglected issue—we are too focused on other chronic diseases, and I think this one needs reinforcing, but with the whole team, not just doctors." (E1)

This led to limited specific nursing care for CKD patients, often restricted to referrals for tests.

"I think the strengths lie in the fact that the guidelines are mostly in place in primary care; it is quite well outlined what you need to apply and what is done. The required tests are available—for example, the ACR test, which is very expensive and, in practice, almost never carried out because of its high cost. Nevertheless, there are good screening tests that allow you to detect problems in time." (E9)

Category 3: Multidisciplinary care

This category underscored the benefits of multidisciplinary care, which enables more comprehensive and specialised management according to patients' needs.

a) Subcategory: Multidisciplinary team

Care delivered by a team of health professionals according to identified needs was strongly linked to optimal and high-quality care.

"If there are risk factors like malnutrition, then the nutritionist is included; if there are pharmacological problems, the pharmacist is included; if there are mental health issues, the psychologist is involved. It depends on the needs, but basically, it's doctor and nurse." (E2)

b) Subcategory: Continuity of care

Participants emphasised the need for continuous care across different levels of the health system. Although continuity was seen in the cardiovascular programme at the primary level, this was often lost when patients were referred to secondary care.

"In the cardiovascular programme we have continuity of care—the patients know they will be seen regularly by different professionals throughout the year." (E2)

"We don't really have counter-referrals; I don't know of any mechanism that ensures feedback from secondary care." (E2)

The lack of communication between primary and secondary care was perceived as a barrier, making it difficult to reinforce or complement specialist recommendations.

"There's no feedback, so sometimes you don't know. You ask patients to bring the notes from the nephrologist about medications, fluid restrictions, all those things—but often they don't." (E9)

Category 4: Conditioning elements influencing nursing care

Nurses recognised several factors influencing how patients receive care, with socioeconomic conditions being especially relevant. They also highlighted the role of patient self-care as key to improved health and quality of life.

a) Subcategory: Patient self-care

Patients who assumed responsibility for their own care and actively participated in it were able to prevent health deterioration, as perceived through follow-up.

"Some patients are very compliant, very disciplined, and it shows in their exams and blood pressure." (E9)

"There are patients who maintain their adherence, their treatment, their attendance to check-ups, although others are in denial—most of them, actually." (E7)

Conversely, patients with poor self-care showed resistance to change and a negative attitude toward professional recommendations, accelerating disease progression.

"Some patients or their families say, 'We know we need to change,' but they won't do it because they don't want to. We explain and encourage, but sometimes they simply don't accept it." (E9)

b) Subcategory: Intrinsic and extrinsic factors influencing care

Several factors were identified as influencing the care of patients with CKD, among which economic hardship was the most frequently cited, being associated with poor nutrition due to the limited access patients have to foods considered healthy.

"We are dealing with a population facing severe economic precariousness, so it is complex to tell them, 'you should eat fish several times a week'. The first step is to understand the patient's needs and, based on that, provide education." (E2)

Another element mentioned as conditioning health was the educational level of users, since low literacy prevents adequate health education of the population.

"We need to assess whether patients are illiterate. We have encountered many people who cannot read, and if they cannot read, how are they supposed to take their medications?" (E2)

Age was also highlighted by professionals, who emphasised the importance of support networks for older adults during treatment.

"The patient's age, their physical condition, their psychological condition. And another very important factor is the support network available to the patient, whether family or otherwise." (E8)

At the same time, it was noted that working-age adults also experience difficulties related to their employment, which contributes to non-adherence to recommendations and missed health appointments.

"Patients of working age are often not given permission [by employers], so they miss appointments or show poor adherence to treatment." (E10)

DISCUSSION

A study conducted in Spain in 2021 described the patient with CKD on haemodialysis as "a being who experiences fear, sadness, hopelessness, moments of anger, pain and suffering due to the loss of autonomy, and insecurity from living in constant anguish at the proximity of death." Individuals with CKD undergo various changes throughout the course of the disease[12]. For this reason, nurses accompany and provide emotional support to patients during this process[13]. This was also evident in the present study, in which nurses described care actions delivered as part of the emotional support provided to users, citing active listening and effective communication as facilitators of care and acceptance of the disease. Regarding other aspects of care delivery in PHC, multidisciplinary work with users emerged as a positive element, with the involvement of other professionals—such as psychologists and social workers—considered a strong complement to comprehensive care.

A second study, based on Merle Mishel's theory and entitled "Uncertainty in the face of chronic kidney disease," reported that renal patients often lack sufficient knowledge about the disease and how it may change their lives, generating fear and distress. Consequently, nurses are the primary agents in guiding patients so they can manage the condition as effectively as possible[14], once again underscoring the importance of nursing staff, who accompany patients as they first come to terms with their new health status[15]. Another study from Peru noted that "the nursing intervention on the patient's level of knowledge produced significant changes, with greater understanding of how to characterise CKD, recognition of signs and symptoms, complications, treatment, and self-care measures,"[16] highlighting the impact of nursing interventions on self-care and quality of life[17,18]. In the present study, although emotional support is mentioned as an important component of CKD care in PHC and as intrinsic to a comprehensive nursing approach, a gap remains regarding education that could be provided to patients about their disease and self-care[19]. This is explained in part by lack of time for CKD-specific consultations—since CKD is not a standalone service—resource shortages (including staffing), and limited CKD-specific training for professionals[20]. Participants reported lacking specific training that would allow them to feel confident about the care delivered. Moreover, their role in CKD care tended to be limited to referrals for monitoring tests which, while useful for tracking disease progression, leaves a gap in the essential nursing role of patient education. Related to this, a 2020 study from Chile sought to understand how health care professionals in a dialysis unit perceived educational processes. Among its findings were patient-related factors that hinder teaching, including age, health status, educational level, and lack of family support[21]. Similar findings emerged in the present study, in which professionals identified user-related factors—particularly socioeconomic and educational level—directly associated with favourable adherence to recommendations. The same Chilean study also identified system-related barriers to patient education, such as lack of time, insufficient physical space, and limited state support[21]. Likewise, the present study found constraints on nursing care delivery: CKD was addressed as a complication of cardiovascular disease rather than as renal care per se, which professionals viewed as a limitation because they lacked sufficient time for CKD-focused consultations—again reflecting insufficient institutional support.

In Chile in 2018, a study entitled "Characterisation of diabetic patients on haemodialysis in the Atacama region" reported inadequate professional management during pre-dialysis stages, including failure to refer patients to a nephrologist in a timely manner, thereby contributing to progressive harm[11]. The same study suggested strengthening the educational role of nurses, linking this to poor treatment adherence[11]. Comparable results were found in a study from Spain, which emphasised the importance of early identification of renal damage in primary care[22]. The present investigation complements those findings by describing how nursing care is delivered to renal patients prior to renal replacement therapy; however, the results indicate it is imperative to enhance patient education, with emphasis on preventing disease progression.

Study limitations include the sample size and the specificity of the population selected, given their particular experience with the phenomenon of interest. Consequently, the largely descriptive results do not allow for generalisation.

Based on insights from nurses' experiences caring for CKD patients in PHC, it is urgent to strengthen health promotion and prevention, as well as early detection and follow-up, as key measures to avoid deterioration in patients' health, reductions in quality of life, and increased expenditure on disease-related resources and treatments. In light of these findings, although guarantees for the care of renal patients exist, gaps remain in PHC. It is therefore suggested to establish a CKD-specific health check, which would improve follow-up and reinforce nursing's educational role in prevention and health promotion. Another important measure would be the allocation of resources for professional staffing, infrastructure, and professional training—actions aimed at improving quality of life and preventing complications associated with disease progression.

To date, there is limited evidence on nursing care for people with early-stage CKD, as most published studies focus on patients receiving haemodialysis. This invites further investigation and the implementation of action-research studies to generate strategies that improve the care of these patients in PHC.

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Conflicts of interest

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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.

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Adherence to immunotherapy and its relationship with clinical variables in young adult kidney transplant recipients

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ABSTRACT

Introduction: Adherence to immunotherapy decreases rejection and graft loss, so it is necessary to identify clinical variables related to adherence in adult renal transplant recipients to optimise renal graft survival.

Objetive: To assess the prevalence of adherence to immunotherapy and its relationship with clinical variables in young adult kidney transplant recipients in a tertiary hospital.

Material and Method: Descriptive cross-sectional observational study. A non-probabilistic convenience sample was taken from 45 adult kidney transplant recipients. Sociodemographic and clinical variables, anxiety, and depression were studied. The Basel Assessment of Adherence to Immunosuppressive Medications Scale was used to assess adherence.

Results: The mean age of the participants was 33.7±9.4 years. The majority were men (66.7%). The prevalence of non-adherence was 75.5%; an association was observed between adherence and the reason for hospital admission and anxiety. Non-adherent adults showed problems such as forgetting to take the immunosuppressant and delay of at least 2 hours in taking the medication.

Conclusions: The prevalence of non-adherence to immunotherapy was higher than reported in previous studies, so continued intervention is needed to improve adherence to immunosuppressive therapy recommendations.

Keywords: compliance and adherence to treatment; anxiety; depression; transplantation; nursing.

RESUMEN

Adherencia a inmunoterapia y su relación con variables clínicas en adultos jóvenes trasplantados renales

Introducción: La adherencia a la inmunoterapia permite disminuir la incidencia de rechazo y pérdida del injerto, por lo que es necesario identificar las variables clínicas relacionadas con la adherencia de adultos trasplantados renales a fin de optimizar la supervivencia del injerto renal.

Objetivo: Evaluar la prevalencia de adherencia a la inmunoterapia y su relación con variables clínicas en adultos jóvenes trasplantados renales de un hospital de tercer nivel.

Material y Método: Estudio observacional descriptivo de corte transversal. Se ha realizado un muestreo no probabilístico por conveniencia que incluyó a 45 adultos trasplantados renales. Se estudiaron variables sociodemográficas y clínicas, ansiedad y depresión. Para evaluar adherencia se aplicó el cuestionario Basel Assessment of Adherence to Immunosuppressive Medications Scale.

Resultados: La edad media de los participantes fue de 33,7±9,4 años, la mayoría fueron hombres (66,7%). La prevalencia de no adherencia fue del 75,5%; se observó asociación entre la adherencia con el motivo de ingreso hospitalario y la ansiedad. Los adultos no adherentes mostraron problemas como el olvido de la toma del inmunosupresor y retraso de al menos 2 horas en la ingesta del medicamento.

Conclusiones: La prevalencia de no adherencia a la inmunoterapia fue alta, superior a la reportada en estudios previos, por lo que es necesaria la intervención continua para mejorar el apego a las recomendaciones de la terapia inmunosupresora.

Palabras clave: cumplimiento y adherencia al tratamiento; ansiedad; depresión; trasplante; enfermería.

INTRODUCTION

IKidney transplantation is the therapy of choice for patients with chronic kidney disease (CKD), offering them improved quality of life. However, the number of kidneys available for transplantation is limited; therefore, it is of vital importance that, once transplantation has been performed, graft survival is optimised and patients demonstrate adherence to a strict regimen of immunosuppressive drugs[1,2].

Non-adherence to immunotherapy is associated with an increased risk of acute and chronic rejection, graft loss, and higher mortality[3]. In kidney transplant recipients, the reported prevalence of non-adherence ranges from 15% to 50%[3-6]. According to the World Health Organization, five risk factors related to non-adherence have been identified: sociodemographic, psychological, kidney disease–related, immunotherapy-related, and patient-related factors[3-7].

These factors should be examined periodically to detect the risk of non-compliance early and addressed through an integrative approach that conceives adherence as a dynamic process in which the patient plays an active role[7]. Therefore, the aim of the present study was to evaluate the prevalence of adherence to immunotherapy and its relationship with clinical variables in young adult kidney transplant recipients at a tertiary-level hospital in Mexico. The findings will contribute to the development of interventions aimed at promoting adherence and self-care in young adult kidney transplant recipients.

MATERIALS AND METHODS

We conducted an observational, descriptive, cross-sectional study. Adult kidney transplant recipients who were admitted to a tertiary referral center in 2023 were included. The sample size was calculated using EPIDAT 3.1 software, based on a population of 84 patients, a precision of 10%, a 95% level of confidence, and an expected non-adherence proportion of 50%;5 a sample of 45 adults was estimated. Non-probabilistic convenience sampling was performed, including those who met the inclusion criteria: adults of both sexes aged 18–60 years; a history of kidney transplantation for more than 6 months; and agreement to participate in the study. Exclusion criteria were adults with previously diagnosed psychiatric disorders and those who declined to participate.

Sociodemographic variables (age, sex, educational level, and occupation) and laboratory parameters (creatinine, urea, blood urea nitrogen, serum tacrolimus level, and serum ciclosporin level) were collected. Clinical variables studied included the aetiology of CKD, time since transplantation, immunosuppressive treatment, anxiety, and depression, among others. Adherence to immunosuppressive therapy was also recorded. Adherence is present when a patient's behaviour matches the recommendation agreed upon by the prescriber and involves collaboration between the patient and the health care professional. Non-adherence is defined as a deviation from the prescribed medication regimen[3].

The Beck Depression Inventory, adapted for the Mexican population by Jurado et al[8], and applied in renal patients on dialysis[9], was used. Depression categories were as follows: (1) minimal depression, 0–9 points; (2) mild depression, 10–16 points; (3) moderate depression, 17–29 points; and (4) severe depression, 30–63 points[10]. The Beck Anxiety Inventory, validated in the Mexican population by Robles et al,8 was also used. Anxiety categories were as follows: 0–5 points, minimal anxiety; 6–15 points, mild anxiety; 16–30 points, moderate anxiety; and 31–63 points, severe anxiety[11]. Both questionnaires are self-administered, consist of 21 items, and use a Likert-type scale[8].

To assess adherence, the Basel Assessment of Adherence to Immunosuppressive Medications Scale (BAASIS) was used. This self-report questionnaire consists of 5 items with a Likert-type scale (0=never, 1=once a month, 2=every 2 weeks, 3=every week, 4=more than once a week, and 5=every day). Individuals who selected "never" were considered adherent (score=4), whereas those selecting any other option were considered non-adherent (score≥5)[12,13].

Table 1. Sociodemographic characteristics of participants.

Characteristic	n	%
Sex		
Male	28	66.7
Female	14	33.3
Education		
Primary	7	16.7
Secondary	18	42.9
High school	9	21.4
University	8	19.0
Occupation		
Employed	15	35.7
Unemployed	4	9.5
Homemaker	11	26.2
Other**	12	28.6

* Presented as mean and standard deviation.
** Includes farmer and merchant.

Descriptive statistics were performed, and clinical variables were compared according to adherence using the Mann-Whitney U and chi-square tests. A p value <0.05 was considered statistically significant. SPSS version[21] was used.

The study protocol was approved by the center Research and Ethics Committees. According to the Regulations of the General Health Law on Health Research, Article 17, it was considered a study with minimal risk[14].

RESULTS

A total of 45 young adult kidney transplant recipients participated, with a mean age of 33.7±9.4 years; most were men (66.7%). Sociodemographic characteristics are shown in **table 1**.

According to BAASIS results, the prevalence of non-adherence was 75.5%. No relationship was observed between the analytical parameters studied and adherence to immunotherapy **(table 2)**.

Table 3. Association between adherence to immunotherapy and clinical variables of participants.

Parameter	Adherence (n=11) mean±SD	Non-adherence (n=34) mean±SD	P Value
Time since diagnosis (y)*	9.1±4.3	8.6±3.0	0.764
Time since transplantation (y)*	6.3±4.2	4.5±2.9	0.257
Aetiology of kidney disease			
Unknown	8 (72.7)	27 (79.4)	0.887
Diabetes mellitus	1 (9.1)	2 (5.9)	
Other**	2 (18.2)	5 (14.7)	
Comorbidities			
Diabetes mellitus	2 (18.2)	5 (14.7)	0.896
Systemic arterial hypertension	5 (45.5)	14 (41.2)	
None	4 (36.4)	15 (44.1)	
Type of kidney donor			
Living related	4 (36.4)	10 (29.4)	0.790
Living unrelated	0 (0.0)	1 (3.0)	
Deceased	7 (63.6)	23 (67.6)	
Immunosuppressive treatment			
Tacrolimus–mycophenolate mofetil–prednisone	5 (45.5)	16 (47.1)	0.203
Cyclosporine–mycophenolate mofetil–prednisone	5 (45.5)	18 (52.9)	
Cyclosporine–azathioprine –prednisone	1 (9.1)	0 (0.0)	
Reason for admission			
• Biopsy	8 (72.7)	10 (29.4)	0.027
• Graft dysfunction/rejection	3 (27.3)	16 (47.1)	
• Other***	0 (0.0)	8 (23.5)	

Table 3, illustrates the association between adherence to immunotherapy and clinical variables. Adherence was associated with the reason for admission, as most non-adherent adults were admitted for graft dysfunction or rejection (47.1%). Adherence was also associated with anxiety: most non-adherent adults exhibited minimal (53%) or mild (44.1%) anxiety **(figure 1)**. No association was found between adherence and depression **(figure 2)**.

Regarding BAASIS responses **(table 4)**, in the non-adherent group, most adults reported forgetting to take their medication at least once per month (p=0.003). For the item concerning delaying intake of immunosuppressants by at least 2 hours, all participants in the adherent group reported never delaying, whereas most in the non-adherent group reported delaying at least once per month (p=0.002). In the final self-evaluation item regarding performance in taking immunosuppressants, the adherent group reported higher scores compared with the non-adherent group (p<0.001).

DISCUSSION

In our study, kidney transplant recipients were young adults, mostly men, with an unknown aetiology of kidney disease and grafts from deceased donors, consistent with profiles described nationally[15,16] and internationally[17].

The prevalence of non-adherence to immunotherapy in our sample was higher than in former studies. Massey et al. reported a prevalence of 65% in young adult kidney transplant recipients[18], whereas other studies reported prevalences of 5.9%[17] and 23.3% in older recipients. This is consistent with the literature describing age as one of the factors associated with non-adherence[9].

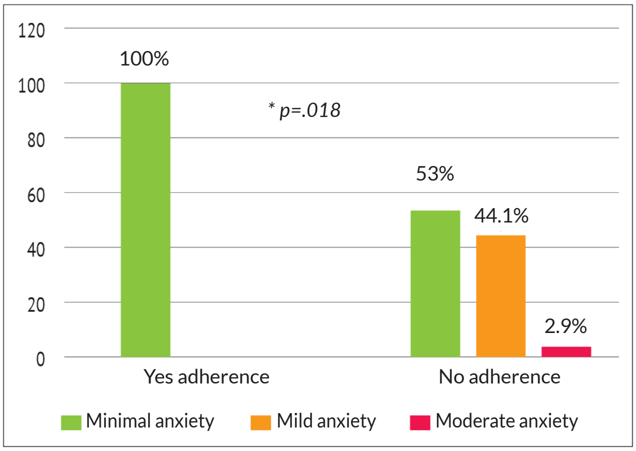
Table 2. Association between adherence to immunotherapy and analytical parameters.

Parameter	Adherence (n=11) mean±SD	Non-adherence (n=34) mean±SD	P Value
Creatinine (mg/dL)	1.9±0.4	2.1±0.8	0.363
Urea (mg/dL)	62.7±21.1	67.0±25.1	0.629
Blood urea nitrogen (BUN, mg/dL)	29.4±9.8	30.9±10.8	0.687
Serum tacrolimus level (ng/mL)	7.3±1.3	7.9±2.1	0.551
Serum cyclosporine level (ng/mL)	142.2±41.5	195.6±70.5	0.254

Table 4. Frequency of Responses to BAASIS Questionnaire Items.

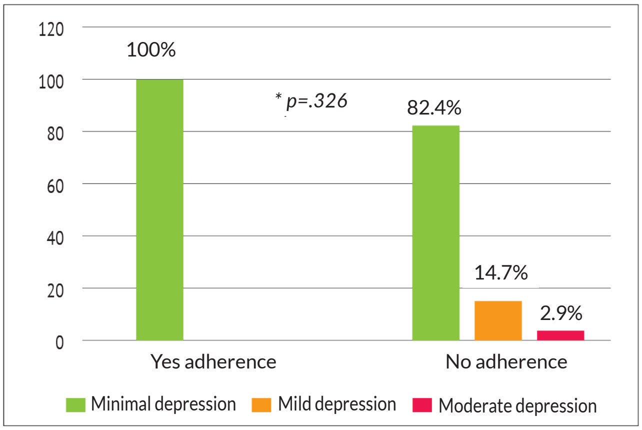
BAASIS Items	Adherence (n=11) mean±SD	Non-adherence (n=34) mean±SD	P Value
a. How often did you forget to take your immunosuppressive drugs?			0.003
Never	11 (100.0)	12 (35.3)	
Once a month	0 (0.0)	18 (52.9)	
Every 2 weeks	0 (0.0)	3 (8.8)	
Every week	0 (0.0)	1 (2.9)	
More than once a week	0 (0.0)	0 (0.0)	
Every day	0 (0.0)	0 (0.0)	
b. How often did you forget several consecutive doses of your immunosuppressive drugs?			
Never	11 (100.0)	26 (76.5)	0.207
Once a month	0 (0.0)	7 (20.6)	
Every 2 weeks	0 (0.0)	0 (0.0)	
Every week	0 (0.0)	1 (2.9)	
More than once a week	0 (0.0)	0 (0.0)	
Every day	0 (0.0)	0 (0.0)	
c. How often did you delay taking your immunosuppressive medications by at least 2 hours?			
Never	11 (100.0)	13 (38.2)	0.002
Once a month	0 (0.0)	14 (41.2)	
Every 2 weeks	0 (0.0)	0 (0.0)	
Every week	0 (0.0)	7 (20.6)	
More than once a week	0 (0.0)	0 (0.0)	
Every day	0 (0.0)	0 (0.0)	
d. Have you reduced the dose of your immunosuppressive drugs?			
• Never	11 (100.0)	34 (100.0)	Not calculated
• Once a month	0 (0.0)	0 (0.0)	
• Every 2 weeks	0 (0.0)	0 (0.0)	
• Every week	0 (0.0)	0 (0.0)	
• More than once a week	0 (0.0)	0 (0.0)	
• Every day	0 (0.0)	0 (0.0)	
e. How well have you managed taking your anti-rejection drus? (minimum: 0, maximum: 100)*	95.8±6.6	86.5±5.9	<0.001

* Data expressed as mean ± standard deviation.



* Hypothesis test: chi-square

Figure 1. Association between adherence to immunotherapy and the presence of anxiety.



* Hypothesis test: chi-square

Figure 2. Association between adherence to immunotherapy and the presence of depression.

Consequently, adolescents and young adults have the highest rate of graft rejection[20], consistent with our findings, as most non-adherent participants were admitted for graft dysfunction or rejection.

Regarding immunosuppressive therapy, monotherapy has been suggested as a strategy to improve adherence in clinical practice, given the complexity of current regimens[21]. In our study, no relationship between immunosuppressive treatment and adherence was observed. However, when BAASIS item responses were compared, most non-adherent adults reported forgetting doses and delaying intake by at least 2 hours. As a result, this group scored lower in the self-evaluation of performance, consistent with Lalic et al[19]. Notably, although non-adherence prevalence was high, self-perceived adherence was good, revealing a discrepancy already reported by other authors[18].

Although the prevalence of anxiety and depression in our study was low, these disorders have been described as possible side effects of immunosuppressants. Therefore, early detection and preventive measures are recommended to improve mental health in transplant recipients[22].

Other authors recommend assessing patients' beliefs regarding immunotherapy[23] and implementing cost-effective educational programmes[24]. For example, Kim et al. developed multimedia educational materials to increase patient interest and motivation, addressing limitations of existing programmes[25], while Predreira et al. developed a standardised care plan for clinical practice[26]. However, multidisciplinary work remains essential to achieve better outcomes[17].

A limitation of our study was its cross-sectional design, as adherence is a dynamic process and a behaviour that may change over time[4]. Furthermore, it is advisable to evaluate the various factors that may influence adherence in young adult recipients.

From our results, we observed that the prevalence of non-adherence to immunotherapy was higher than that reported in other contexts, underscoring the need for continuous interventions to improve adherence to immunosuppressive therapy. Special attention should be given not only to taking the medication but also to the timing of intake, as these were the areas with the greatest non-compliance in non-adherent adults. It is possible that these patients are unaware of the degree of precision required in immunotherapy to prevent rejection episodes.

Conflicts of interest

None declared.

Funding

None declared.

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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.
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Influence of pre-marking on post-peritoneal dialysis catheter placement complications

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ABSTRACT

Introduction: Good peritoneal access is essential for performing peritoneal dialysis (PD). Our PD unit uses a technique for pre-surgical marking of the peritoneal catheter. The study aimed to evaluate the influence of pre-surgical marking on complications related to post-PD catheter placement.

Materials and Method: This is a cohort study. We included patients over 18 who underwent peritoneal catheter placement in 2018, corresponding to the cohort without marking, and in 2022, corresponding to the cohort with marking. The variables analysed were age, sex, complications, and solutions to complications. Using logistic regression, we calculated the Odds Ratio (OR) of complications for the labelled group and its 95% confidence interval.

Results: 107 patients were analysed. The mean age was 65.6±12.2 years, and 73.8% were male. Of the 56 patients without tagging, 33 suffered complications compared to 18 in the cohort with tagging. OR 0.36 (95% CI 0.16 to 0.79). 38.9% of complications had resolution in the tagging group vs 24.2% in the non-tagging group.

Conclusions: Patients with pre-surgical marking have a 64% lower risk of complications. This effect does not lose magnitude when adjusted for age and sex (OR 0.39 (95% CI 0.17-0.86). Complications in the marked cohort were resolved more frequently than in the unmarked cohort. We conclude that pre-marking the catheter reduces post-surgical complications.

Keywords: preoperative care; postoperative complications; catheters; peritoneal dialysis.

RESUMEN

Influencia del marcaje previo en las complicaciones post colocación del catéter de diálisis peritoneal

Introducción: Un buen acceso peritoneal es imprescindible para la realización de la Diálisis Peritoneal, pudiendo constituir la técnica de marcaje prequirúrgico un punto clave en la aparición de complicaciones.
El objetivo de nuestro estudio fue evaluar la influencia del marcaje pre-quirúrgico en las complicaciones post-colocación del catéter de diálisis peritoneal.

Material y Método: Estudio de cohortes; incluimos a los pacientes mayores de 18 años a quienes se les colocó un catéter peritoneal en 2018 (cohorte sin marcaje) y en 2022 (cohorte con marcaje). Las variables analizadas fueron: edad, sexo, complicaciones y evolución de estas. Realizamos un análisis multivariante mediante regresión logística, calculando la Odds Ratio (OR) y el intervalo de confianza 95% de aparición de complicaciones.

Resultados: Se analizaron 107 pacientes, 73,8% hombres y una edad media de 65,6±12,2 años. De los 56 pacientes sin marcaje, 33 sufrieron complicaciones, frente a 18 de los 51 en la cohorte con marcaje. La OR de complicaciones ajustada por edad y sexo del grupo marcaje frente a no marcaje fue 0,39, IC 95%:0,17-0,86. El 38,9% de las complicaciones fueron resueltas en el grupo de marcaje frente al 24,2% en el grupo sin marcaje (p=0,548).

Conclusiones: La técnica de marcaje previo del catéter de diálisis peritoneal se asocia a una reducción de las complicaciones postquirúrgicas en estos pacientes.

Palabras Clave: cuidados preoperatorios; complicaciones postquirúrgicas; catéteres; diálisis peritoneal.

INTRODUCTION

Access to the peritoneal cavity is key in the process of peritoneal dialysis and will determine the success of the technique. Correct placement of the peritoneal catheter is of vital importance to ensure a safe and comfortable access for the patient, preventing complications and enabling effective therapy[1-3].

The heterogeneity in patients' body size and abdominal features, including skin folds, scars, and dermatological conditions, underscores the need to individualise catheter placement according to each patient's characteristics and postural variations (supine, sitting)[4]. The generalised practice of using the umbilicus as the sole intraoperative reference may result in excessively deep positioning of the catheter, leading to pressure discomfort and pain at the end of drainage, flow dysfunction, symptoms related to constipation, and urinary retention[1,5,6].

Equally relevant is the choice of catheter exit site, as guidelines of the Spanish Society of Nephrology highlight its importance in reducing infectious complications[7]. The exit site should be accessible for the patient, avoiding areas prone to infection, and the catheter should not be subjected to pressure along the subcutaneous tunnel traversing the abdominal wall[1,5,6,8]. For this reason, the location of the exit site should be evaluated with the patient in the supine, standing, and sitting positions[1]. In our unit, to favour the achievement of successful peritoneal access and in full compliance with recommendations of the International Society for Peritoneal Dialysis (ISPD)[1], prior to surgical implantation of the peritoneal catheter, the nursing staff performs a marking technique of the desired exit site through palpation and identification of anatomical landmarks **(figure 1)**[9].

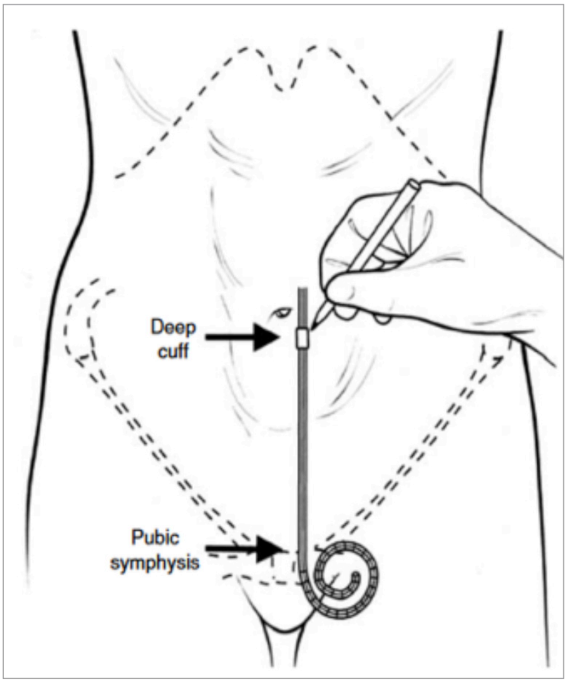


Figure 1. Schematic illustration showing the method used to select the catheter insertion site and deep cuff location in order to achieve proper pelvic positioning of the catheter tip. *Crabtree JH. Selected best demonstrated practices in peritoneal dialysis access. Kidney International Supplements. November 2006; (103): S27–S37. Figure 9, p. S34.*

The marking technique is as follows: with the patient in supine position, using the pubic symphysis as a reference, the catheter coil is placed below it. At the level of the first bead, the site of the surgical incision (paraumbilical area) is marked, and approximately 2–3 fingerbreadths below the 2nd bead, the mark for the catheter exit site is placed. Markings are made bilaterally on both sides of the abdomen. The marking is also assessed with the patient sitting and standing, avoiding folds or scars, making sure that the exit site is accessible to the patient,8 making the necessary changes to guarantee correct catheter placement in the operating room, always subject to the surgeon's final decision.

Although studies exist comparing possible complications related to implantation technique[8, 10-12], the current scientific literature does not provide evidence comparing the use of preoperative catheter marking with no marking. For this reason, we considered it appropriate to carry out this study, whose objective was to evaluate the influence of marking on complications after peritoneal dialysis catheter placement.

MATERIALS AND METHODS

This was a historical cohort study conducted at a single centre. We included all patients over 18 years of age who underwent peritoneal catheter placement in 2018 (cohort without marking) and in 2022 (cohort with marking). We excluded patients with abdominal anatomical particularities preventing marking, patients who refused marking, and those in whom catheter placement was performed simultaneously with another surgical procedure. The marking technique employed was as described: in supine position, using the pubic symphysis as reference, the catheter coil was placed below it. At the level of the first bead, the surgical incision site (paraumbilical area) was marked, and 2–3 fingerbreadths below the second bead, the catheter exit site was marked. Bilateral markings were performed on both sides of the abdomen. The marking was assessed with the patient sitting and standing **(figure 1)**[9]. The implanted catheter was a Swan-Neck (high flow), curved-neck Fresenius® catheter with 2 cuffs and coiled tip. All catheters were implanted by the General Surgery Department of Hospital Universitario Central de Asturias (Asturias, Spain).

Variables analysed included age at time of catheter implantation, sex, catheter placement technique (laparoscopy or laparotomy), complications (catheter displacement, leakage, haematoma, exit site close to surgical wound, intestinal perforation, and seroma), and treatment of complications (alpha manoeuvre, catheter exchange, laparoscopic repositioning, or catheter removal).

Statistical analysis: age was described as mean ± standard deviation. Categorical variables were expressed as absolute and relative frequencies (percentages). Comparisons were drawn using the chi-square exact test. Crude odds ratios (ORs) of complications for the marking group were estimated with 95% confidence intervals (CI) using logistic regression, with complication occurrence as the dependent variable and marking as the independent variable. A multivariate logistic regression model including age and sex as covariates was used to obtain the adjusted OR for complications in the marking group. A p value < 0.05 was considered statistically significant. R statistical software, version 4.3.0 (21-04-2023), was used.

The study fully complied with ethical research principles and Spanish Law 3/2018 of 5 December on Personal Data Protection and Digital Rights Guarantee. Ethical approval was obtained from the Asturias Ethics Committee (Cod CEImPA 14.4.2023).

RESULTS

A total of 107 patients were analysed: 56 patients (52.34%) without catheter marking (2018) and 51 (47.66%) with marking (2022). Of these, 73.8% (n=79) were men, with an overall mean age of 65.6±12.2 years **(table 1)**.

Among the 56 patients without marking, 33 (60%) developed complications, compared with 18 of the 51 (35.3%) in the marking cohort. The OR for complications in the marking group vs the non-marking group was 0.36 (95%CI, 0.16–0.79), corresponding to a 64% lower risk of complications after catheter placement **(figure 2)**.

The effect of marking adjusted for age and sex yielded an OR of 0.38 (95%CI, 0.17–0.83; p=0.02) **(figure 3)**, indicating that, controlling for age and sex, patients with marking had a 62% lower risk of complications following catheter placement.

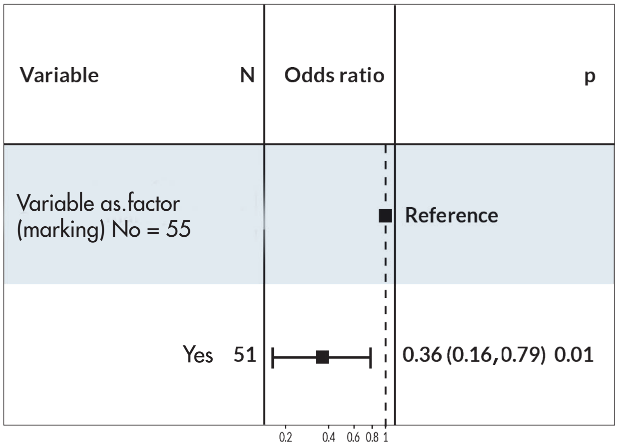
Among patients with complications, 38.9% were resolved in the marking group vs 24.2% in the non-marking group (p=0.548). The OR for unresolved complications in the marking group was 0.50 (95%CI, 0.14–1.75).

Of the 7 displaced catheters in the marking cohort, 2 (28.6%) were repositioned with alpha manoeuvres, 3 (42.9%) were exchanged, 1 (14.3%) was repositioned laparoscopically, and

Table 1. Characteristics of the 2 cohorts.

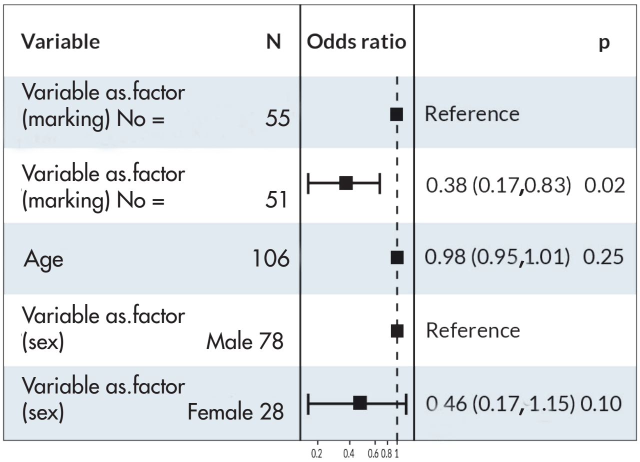
Variable	No (n=56)	Yes (n=51)	Total (n=107)	P Value
Sex				
Men	42 (75.0)	37 (72.5)	79 (73.8)	
Women	14 (25.0)	14 (27.5)	28 (26.2)	
Age				
Mean (SD)	64.3 (11.5)	67.0 (12.8)	65.6 (12.2)	
Median [Min; Max]	65.5 [45.0; 85.0]	69.0 [20.0; 88.0]	68.0 [20.0; 88.0]	
Complications				
No	22 (40.0)	33 (64.7)	55 (51.9)	0.0394
Yes	33 (60.0)	18 (35.3)	51 (48.1)	
Types of complications				
No	22 (40.0)	33 (64.7)	55 (51.9)	
Displacement	8 (14.5)	7 (13.7)	15 (14.2)	0.388
Other	8 (14.5)	3 (5.9)	11 (10.4)	
Haematoma	5 (9.1)	1 (2.0)	6 (5.7)	
Exit-site (OS)	2 (3.6)	0 (0.0)	2 (1.9)	
Seroma	10 (18.2)	5 (9.8)	15 (14.2)	
Leakage	0 (0.0)	2 (3.9)	2 (1.9)	

SD: standard deviation; **Min, Max:** minimum, maximum; **OS:** exit site.



Variable	N	Odds ratio		p
Variable as.factor (marking) No	55		Reference	
Yes	51		0.36 (0.16,0.79)	0.01

Figure 2. Logistic regression analysis: impact of marking on the occurrence of complications.



Variable	N	Odds ratio		p
Variable as.factor (marking) No =	55		Reference	
Variable as.factor (marking) No =	51		0.38 (0.17,0.83)	0.02
Age	106		0.98 (0.95,1.01)	0.25
Variable as.factor (sex) Male	78		Reference	
Variable as.factor (sex) Female	28		0 46 (0.17,1.15)	0.10

Figure 3. Logistic regression adjusted for age and sex.

1 (14.3%) was removed. Of the 8 displaced catheters in the non-marking cohort, 3 (37.5%) were repositioned with alpha manoeuvres, 3 (37.5%) with bowel movements, and 2 (25%) laparoscopically.

DISCUSSION

Our results show fewer complications in patients with marking: 38.9% vs 24.2%. Patients with marking had an OR of 0.36 (95%CI, 0.16–0.79), corresponding to a 64% lower risk of complications after catheter placement (statistically significant). This effect retained its magnitude when adjusted for age and sex, with an OR of 0.38 (95%CI, 0.17–0.83), also statistically significant.

These findings seem to reinforce ISPD guidelines for creating and maintaining optimal peritoneal dialysis access[1], which recommend the pubic symphysis as a reliable reference for ideal catheter tip placement at the upper part of the true pelvis, avoiding the misleading reference of the umbilicus.

Peppelenbosh et al[11]. considered different implantation techniques and mentioned preoperative marking prior to laparoscopic catheter implantation using the pubic symphysis as a reference, but only assessed exit site location in the supine position. Their work compared complications resulting from surgical techniques employed.

Further research should compare different marking techniques, such as that used by Díaz-Rosales et al.[13], who, for percutaneous peritoneal catheter placement, used the umbilical scar and rectus abdominis borders as references. These authors also noted that marking should be performed preoperatively with the patient standing and clothed to mark belt line positioning.

Wong et al.[14] in a 2014 study, although not aiming to compare catheter placement techniques, demonstrated that up to 30% of patients studied (n=46) did not undergo abdominal wall evaluation or preoperative marking. They reported catheter-related complications in 19 patients (41%), without specifying whether these occurred exclusively in patients without marking or in the total cohort.

A limitation of our work is that we did not analyse surgical techniques (open laparotomy vs laparoscopy), which may have influenced our results. However, the use of laparoscopy was limited in both 2018 and 2022, suggesting minimal effect. Surgeon experience may also affect complication rates; however, surgeons participated in catheter placement in both cohorts, likely reducing this potential confounding effect[12].

Our findings suggest that preoperative peritoneal catheter marking reduces the risk of postoperative complications by 64%. Furthermore, complications were more often resolved in the marking cohort: 38.9% vs 24.2% in the non-marking group. While not statistically significant, this difference is clinically relevant. Altogether, these results highlight the need to implement this simple, low-cost technique to advance towards optimal placement of peritoneal dialysis catheters.

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Conflicts of interest

None declared.

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Designing strategies for comprehensive care for a patient with a language barrier on haemodialysis treatment: a case report

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ABSTRACT

Case description: A 58-year-old woman recently arrived in our country as a refugee from Ukraine due to the war. In her country of origin, she was diagnosed with lupus nephropathy with advanced chronic renal disease and was oriented toward haemodialysis. When the war started, she was waiting for an arteriovenous fistula to be made. She went to the emergency department for assessment, and it was decided to begin renal replacement therapy due to the progression of her disease. The patient only speaks Ukrainian, presenting a significant language barrier hindering the health care process.

Description of the care plan: The patient is assessed according to Marjory Gordon's functional patterns. Nursing diagnoses are identified following NANDA (North American Nursing Diagnosis Association) terminology. NOC (Nursing Outcomes Classification) objectives and NIC (Nursing Interventions Classification) interventions are proposed.

Evaluation of the plan: The care plan is evaluated after the interventions have been carried out (infographics, using Google translate), analysing the indicators associated with each NOC objective and their evolution during the period the patient is monitored.

Conclusions: IIn this clinical case, applying the Nursing Care Process and designing strategies to reduce communication difficulties resulted in overcoming the language barrier, making it possible to identify the patient's needs. This allowed us to resolve her doubts about her treatment and address the other health problems detected.

Keywords: nursing care plans; nursing care; language barrier; communication; haemodialysis.

RESUMEN

Diseño de estrategias para la atención integral en una paciente con barrera idiomática en tratamiento con hemodiálisis: a propósito de un caso

Descripción caso: Mujer de 58 años, recién llegada a nuestro país como refugiada desde Ucrania a raíz del conflicto bélico. En su país de origen es diagnosticada de nefropatía lúpica con enfermedad renal crónica avanzada orientada a hemodiálisis. Cuando comienza la guerra, está pendiente de realización de fístula arteriovenosa. Acude a urgencias para su valoración y se decide inicio de tratamiento renal sustitutivo por la progresión de su enfermedad. La paciente sólo habla ucraniano, presentando una importante barrera idiomática que dificulta todo el proceso de atención sanitaria.

Descripción del plan de cuidados: Se realiza una valoración de la paciente según los patrones funcionales de Marjory Gordon, se identifican los Diagnósticos de enfermería siguiendo terminología NANDA (North American Nursing Diagnosis Association), se plantean objetivos NOC (Nursing Outcomes Classification) e intervenciones NIC (Nursing Interventions Classification).

Evaluación del plan: La evaluación del plan de cuidados se lleva a cabo tras la realización de las intervenciones (infografías, uso Google translate), analizando los indicadores asociados a cada objetivo NOC y su evolución durante el periodo en el que se realiza el seguimiento de la paciente.

Conclusiones: En este caso clínico, la aplicación del Proceso de Atención de Enfermería y el diseño de estrategias para reducir las dificultades de comunicación dieron como resultado la superación de la barrera idiomática, haciendo posible la identificación de las necesidades que la paciente presentaba. De esta forma, se logró la resolución de las dudas que planteaba sobre su tratamiento, así como el abordaje del resto de problemas de salud detectados.

Palabras clave: planes de atención de enfermería; cuidados de enfermería; barrera del idioma; comunicación; hemodiálisis.

1. INTRODUCTION

In recent years, there has been an increase in the immigrant population in our country and, consequently, a rise in the demand for health services from this group[1].

Within this population, certain nationalities present greater challenges in health care delivery due to having a less widely spoken native language. This condition often leads to difficulties in mutual understanding between health care professionals and patients, creating a communication barrier that impacts the quality of care[1].

Communication problems that may have a significant impact on the quality of health care are diverse[2]. First, the lack of understanding between patients and health care professionals can lead to confusion and misinterpretation regarding treatment and care instructions. This may result in inappropriate disease management, poor treatment adherence, and other issues relevant to health care.

Furthermore, the difficulty patients face in accurately expressing symptoms can lead to a lack of essential information for an adequate diagnosis and treatment.

Finally, the mistrust and frustration arising from ineffective communication between patients and health care professionals can negatively affect the overall health care relationship. This can hinder patient cooperation and, ultimately, reduce satisfaction with care.

Given the growing number of situations involving language barriers, the active participation of nursing professionals is increasingly required to ensure equitable, high-quality health care for all patients, regardless of language or background[3].

To address the challenge of improving the quality of health care for immigrant patients facing communication barriers, several measures may be implemented[4,5]. Firstly, it is essential to provide interpretation services in the health care setting. These services facilitate communication between health professionals and patients, ensuring mutual understanding. In situations where interpretation services are unavailable, information and communication technology (ICT) tools, such as Google Translate, may be useful for meeting basic communication needs.

Another important measure is the acquisition of language skills by health care professionals. Training in commonly spoken languages can significantly improve communication with a substantial proportion of the immigrant population, thereby enhancing quality of care.

Additionally, providing multilingual materials and resources—such as infographics and documents in different languages—represents an effective strategy to overcome linguistic barriers and ensure high-quality care that is both accessible and comprehensible to all patients, regardless of cultural or linguistic background.

In summary, it is essential to address communication barriers in health care by implementing measures that improve the quality of care. The aim of this study is to describe, analyse, and present the conclusions drawn from applying an individualised care plan to a haemodialysis patient presenting with communication barriers.

2. CASE PRESENTATION

A 58-year-old woman attended the emergency department on March 15th 2022, having recently arrived in our country as a refugee from Ukraine due to the armed conflict. She had been diagnosed in her country of origin with lupus nephropathy and advanced chronic kidney disease (CKD) requiring haemodialysis, pending arteriovenous fistula creation when the war began.

She presented with a significant language barrier. Communication during health care delivery was mediated through a relative.

Examination: Blood pressure 135/80 mmHg; heart rate 100 beats per minute (bpm); oxygen saturation 96%; afebrile. Conscious and oriented, normohydrated, eupnoeic at rest, acceptable general condition. Rhythmic heart sounds, no murmurs. Vesicular breath sounds preserved, no added noises. Lower limbs without oedema or signs of venous thrombosis.

Additional tests: Relevant laboratory data: creatinine 6.55 mg/dL; urea 190 mg/dL; pH 7.4; bicarbonate 22.7 mmol/L.

Clinical course: The patient was admitted due to disease progression requiring initiation of renal replacement therapy with haemodialysis. On March 17th 2022, a right internal jugular tunnelled central venous catheter was inserted.

On March 22nd 2022, she received her first haemodialysis session in the Haemodialysis Unit of *Hospital Universitario La Paz* (Madrid, Spain).

Main diagnosis: Stage 5 chronic kidney disease secondary to advanced lupus nephritis with initiation of renal replacement therapy.

On March 24th 2022, she began treatment in the chronic haemodialysis unit, where the nursing staff identified the language barrier as a problem for health care delivery.

3. NURSING ASSESSMENT ACCORDING TO MARJORY GORDON'S FUNCTIONAL HEALTH PATTERNS

An initial assessment was performed following Marjory Gordon's functional health patterns[6] to determine which parameters were altered.

3.1 Health Perception – Health Management

The patient reported no known drug or food allergies, and no intolerances. She stated that her vaccination schedule was complete according to her country of origin, except for influenza and COVID-19 vaccines.

She reported never having smoked and not habitually consuming alcohol.

She expressed difficulty adapting to Spain after being forced to leave her country due to the armed conflict. She currently reported feeling better since starting haemodialysis, though she expressed doubts about her treatment.

She was aware that her lifestyle would need to change, as CKD particularly affects metabolic and nutritional status, requiring dietary modifications.

3.2 Nutritional – Metabolic

Weight: 57 kg.
Height: 162 cm.
Body mass index (BMI): 21.7 kg/m^2.

She reported a good appetite with no difficulties in chewing or digestion.

She reported no food intolerances. Since being diagnosed with CKD and starting haemodialysis, she expressed doubts about which foods she can or cannot eat.

Regarding fluid intake, she knew it was restricted to 1.5 L/day. She maintained good personal hygiene with skin, nails, and mucosa intact. She also maintained good oral hygiene and did not use dental prostheses.

Norton scale: 20, with no risk of pressure ulcer development. At the time of assessment, her body temperature was 36.7 °C.

3.3 Elimination

She was fully continent and maintained a residual urine output of 1200 mL/day. Bowel pattern: no incontinence or constipation.

3.4 Activity – Exercise

Systolic blood pressure: 152 mmHg.
Diastolic blood pressure: 85 mmHg.
Heart rate: 82 bpm.
Baseline oxygen saturation: 99%.

Barthel Index: 100 (fully independent). She did not require help with self-care and had no physical barriers preventing exercise. She reported walking as her main physical activity.

3.5 Sleep – Rest

She reported usually sleeping 8 hours per night. Sleep was restorative, as she typically felt rested upon waking. She required no assistance to sleep.

3.6 Cognitive – Perceptual

The patient was alert and oriented in the three spheres (time, space, person). Glasgow Coma Scale: 15/15.

No cognitive or perceptual alterations were noted; however, communication was impaired due to the language barrier. The nursing assessment was conducted using the Google Translate application on mobile devices.

She had a visual impairment requiring corrective glasses.

3.7 Self-perception – Self-concept

She reported that the language barrier was hindering her adaptation but displayed a positive attitude.

Regarding her CKD, she seemed adapted to haemodialysis and expressed interest in kidney transplantation.

3.8 Role – Relationships

She reported living with her sister.

3.9 Sexuality

No alterations reported.

3.10 Coping – Stress Tolerance

She reported that the start of the hospitalisation process was complicated due to the language barrier. She now appeared calmer and more relaxed, attempting to communicate with the nursing staff through Google Translate on her mobile device.

3.11 Values – Beliefs

She reported no beliefs interfering with her care or health status.

4. NURSING DIAGNOSES

The following nursing diagnoses were formulated based on the assessment, where certain altered patterns were identified.

For the diagnoses, the P.E.S. format (problem, aetiology/related factors, and signs/symptoms or defining characteristics) and the NANDA taxonomy were used[7].

Nursing diagnoses:

1. Impaired verbal communication [050101] r/t individuals with communication barriers as evidenced by inability to speak the caregiver's language.
2. Excess fluid volume [00026] r/t excessive fluid intake aeb blood pressure changes, anasarca, dyspnoea, and oedema.
3. Risk of constipation [00015] r/t inadequate dietary habits.

5. PRIORITISATION AND CARE PLAN

5.1 Prioritisation

Of the above diagnoses, "Impaired verbal communication (00051) r/t individuals with communication barriers as evidenced by inability to speak the caregiver's language" was selected as the priority diagnosis, as communication between nursing staff and the patient is essential to address the other nursing diagnoses.

5.2 Care Plan

Following identification of the diagnoses/problems, a care plan was designed, planning the appropriate NOC outcomes and NIC interventions for each.

Table 1 details the proposed NOC nursing objectives for each diagnosis with associated indicators, and the NIC nursing interventions with the corresponding activities.

6. EVALUATION OF THE CARE PLAN

The care plan was evaluated after implementation of the interventions, analysing the progress observed in the indicators associated with each NOC objective during the month of patient follow-up.

The main achievements observed following implementation of the individualised care plan included:

Table 1. Care plan for the identified nursing diagnoses.

NURSING DIAGNOSIS: RISK OF CONSTIPATION [00015]	
NOC	INDICATORS
[0501] Bowel elimination.	**[050101]** Elimination pattern.
[1902] Risk control.	**[190220]** Identifies risk factors. **[190208]** Modifies lifestyle to reduce risk.
NIC	ACTIVITIES
[0430] Bowel control.	– Record problems with bowel function, bowel routine, and previous use of laxatives. – Teach the patient specific foods that help achieve an adequate bowel rhythm.
[0450] Constipation/impaction management.	– Monitor for signs and symptoms of constipation. – Monitor for signs and symptoms of faecal impaction. – Explain to the patient the aetiology of the problem and the rationale for interventions.
NURSING DIAGNOSIS: EXCESS FLUID VOLUME [00026]	
NOC	INDICATORS
[0601] Fluid balance.	**[060101]** Blood pressure. **[060107]** Balanced daily intake and output. **[060112]** Peripheral oedema. **[060123]** Muscle cramps.
[0603] Severity of fluid overload.	**[060308]** Generalised oedema. **[060317]** Increased blood pressure. **[060318]** Weight gain.

NIC	ACTIVITIES
[4120] Fluid management.	– Observe for signs of fluid overload/retention (crackles, increased central venous pressure or blood pressure, pulmonary capillary wedge pressure, oedema, jugular venous distension, ascites), as appropriate. – Monitor changes in patient weight before and after dialysis, if applicable. – Monitor fluid intake.
[2100] Haemodialysis therapy.	– Observe for signs of fluid overload/retention (as above), as appropriate. – Monitor changes in patient weight before and after dialysis, if applicable.

NURSING DIAGNOSIS: IMPAIRED VERBAL COMMUNICATION [00051]

NOC	INDICATORS
[0903] Communication: expressive.	**[90305]** Uses drawings and illustrations. **[90307]** Uses non-verbal language. **[90310]** Uses alternative communication devices.
[0904] Communication: receptive.	**[90403]** Interpretation of drawings and illustrations. **[90405]** Interpretation of non-verbal language. **[90408]** Use of augmentative communication devices.

NIC	ACTIVITIES
[5515] Improve access to health information.	- Communicate taking into account appropriateness according to culture, age, and sex. - Obtain interpreter services if necessary. - Provide essential written and oral information to the patient in their native language. - Use multiple communication tools (eg, computers, pictograms). - Encourage the use of effective strategies to cope with barriers to accessing health information (eg, being persistent when asking for help, bringing a written list of questions to each visit, seeking assistance from family members or friends when obtaining health information).

- Resolution of doubts related to diet and fluid intake, improving interdialytic weight gain.
- Reduced concern regarding episodes of permanent venous catheter dysfunction.
- Increased confidence due to having the means to communicate with nursing staff.

The results are shown in **table 2**.

The **next table** details the specific scales used for evaluation of each indicator as defined in the NANDA-NIC-NOC Consult (NNNConsult).

Table 2. Evaluation of the care plan.

NANDA Diagnosis	NOC Objective	Indicators	Evaluation Scale	Initial Value	Final Value
[00015] Risk of constipation	NOC **[0501]** Bowel elimination.	**[050101]** Elimination pattern.	Scale 1	5	5
	NOC **[1902]** Risk control.	**[190220]** Identifies risk factors.	Scale 13	5	5
		[190208] Modifies lifestyle to reduce risk.	Scale 13	5	5

NANDA Diagnosis	NOC Objective	Indicators	Evaluation Scale	Initial Value	Final Value
[00026] Excess fluid volume.	NOC **[0601]** Fluid balance.	**[060101]** Blood pressure.	Scale 1	5	5
		[060107] Balanced daily intake and output.	Scale 1	4	5
		[060112] Peripheral oedema.	Scale 14	5	5
		[060112] Muscle cramps.	Scale 14	5	5
	NOC **[0603]** Severity of fluid overload.	**[060308]** Generalised oedema.	Scale 14	5	5
		[060317] Increased blood pressure.	Scale 14	5	5
		[060318] Weight gain.	Scale 14	3	5
[00051] Impaired verbal communication.	NOC **[0903]** Communication: expressive.	**[90305]** Uses drawings and illustrations.	Scale 1	3	5
		[90307] Uses non-verbal language.	Scale 1	3	5
		[90310] Uses alternative communication devices.	Scale 1	1	5
	NOC **[0904]** Communication: receptive.	**[90403]** Interpretation of drawings and illustrations.	Scale 1	5	5
		[90405] Interpretation of non-verbal language.	Scale 1	5	5
		[90408] Use of an augmentative communication device.	Scale 1	3	–

Table. Specific scales used for the evaluation of each indicator (Defined according to NANDA NIC NOC Consult [NNN Consult]).

INDICATORS	SCALES	
[050101], [060101], [060107], [90305], [90307], [90310], [90403], [90405], [90408]	**SCALE 1** 1. SEVERELY COMPROMISED 2. SUBSTANTIALLY COMPROMISED	3. MODERATELY COMPROMISED 4. MILDLY COMPROMISED 5. NOT COMPROMISED
[190220], [190208]	**SCALE 13** 1. NEVER DEMONSTRATED 2. RARELY DEMONSTRATED	3. SOMETIMES DEMONSTRATED 4. FREQUENTLY DEMONSTRATED 5. ALWAYS DEMONSTRATED
[060112], [060123], [060308], [060317], [060318]	**SCALE 14** 1. SEVERE 2. SUBSTANTIAL	3. MODERATE 4. MILD 5. NONE

7. DISCUSSION

In health care, the inability to communicate effectively with a foreign patient acquires particular significance.

However, the translation services offered by health care centres remain scarce in the face of growing demand associated with the increasing immigrant population.

When treating a foreign patient, health care professionals seek alternative ways to communicate, attempting various solutions in the absence of interpreter services.

A study published in *Panacea* investigating how communication is carried out between staff of the Canary Islands Health Service and foreign patients revealed that staff employed a range of methods: relying on bilingual colleagues or relatives (95%), using non-verbal language or basic knowledge of English (92%), attempting communication in English (51%), employing the Wong-Baker facial scale (5%), and using automatic translation systems such as Google Translate (6%)[8].

Meanwhile, advances in new technologies with the development of tools such as *Doctor Speaker*, *Tradassan*, and *Hipot* cnv provide health care staff with communication instruments. Yet, the question arises: are these tools reliable?

Several studies[8-11] have examined the reliability and usefulness of medical translation applications, such as the research published in the *Journal of the American Medical Association (JAMA)* on Google Translate[9]. The study concluded that automatic translation for medical instructions has significant limitations in both methodology and evaluation. The translation quality of such tools is questionable, undermining the validity of the results.

Another study, published in *The Journal of Medical Internet Research (JMIR)*, also aimed to assess iPad-compatible language translation applications to determine their suitability for everyday conversations in health care environments.10 The study concluded that no application should replace professional interpreters, underscoring the need for further research in this field.

The case report presented here illustrates how, in situations where language barriers exist, tools such as Google Translate and the creation of infographics may be used to facilitate communication and patient education regarding treatment.

However, in line with previous studies, it was noted that despite their usefulness, these tools sometimes led to confusion and misunderstandings with the patient. This highlights the importance of further research into the effective integration of translation technologies in health care, in collaboration with professional interpreters, to improve care and communication with patients facing linguistic barriers.

The use of the NANDA, NOC, and NIC taxonomies in applying the nursing process enables nursing professionals to employ a common language in the development of the nursing scientific method. This facilitates nursing care that is dynamic, deliberate, conscious, structured, and systematised.

In this case, the identification of the language barrier affecting professional–patient mutual understanding, and the subsequent design of strategies to reduce communication difficulties, enabled resolution of treatment-related doubts and facilitated the management of the other health problems identified.

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ENFERMERÍA NEFROLÓGICA

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.

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Long articles with qualitative or quantitative methodologies must contain: a structured summary (maximum 250 words in English and in the original language), introduction, objetive, 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).

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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.

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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, objetives, 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 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 objetives.

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 objetives 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"*:

Firanek 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 Edtiors (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, objetive, method, results and conclusions.	Maximum length: 3,500 words. Structure: introduction, objetive, method, results, discussion and conclusions.	Maximum 6.	Maximum recommended 6.	Maximum 35.
Long articles Qualitative Methodology.	250 words. Structure: introduction, objetive, method, results and conclusions.	Maximum length: 5,000 words. Structure: introduction, objetive, method, results, discussion and conclusions.	Maximum 6.	Maximum recommended 6.	Maximum 35.
Brief articles.	250 words. Structure: introduction, objetive, method, results and conclusions.	Maximum length: 2,500 words. Structure: introduction, objetive, method, results, discussion and conclusions.	Maximum 3.	Maximum recommended 6.	Maximum 15.
Reviews.	250 words. Structure: introduction, objetive, methodology, results and conclusions.	Maximum length: 3,800 words. structure: introduction, objetive, 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, objetive 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 pública 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 metasíntesis 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 compresión 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, Ruíz-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»:

Firanek 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.

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

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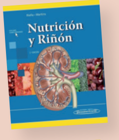

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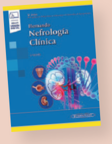

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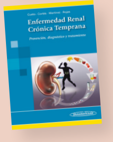

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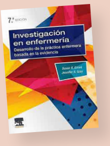

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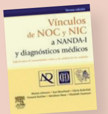

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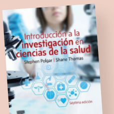

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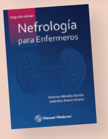

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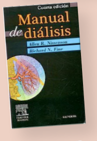

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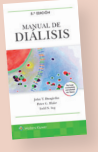

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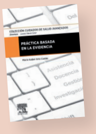

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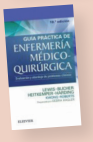

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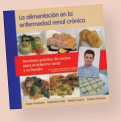

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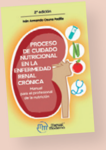

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