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Impact of hemodialysis on quality of life and the role of nursing in hemodialysis units / Impacto de la hemodiálisis en la calidad de vida y rol de Enfermería en unidades de hemodiálisis

Carmen Centurión[1], Daiana Foco[1]

[1]Universidad Abierta Interamericana, Licenciatura en Enfermería. Rosario, Argentina.

ABSTRACT

The purpose of the study was to analyze Chronic Kidney Disease (CKD) and its treatment by hemodialysis (HD) as a public health problem, emphasizing the Health-Related Quality of Life (HRQoL) of patients and the role of nursing in the Hemodialysis Unit (HDU). The anatomical and physiological fundamentals of the kidney, the causes and clinical evolution of CKD, and the classification criteria according to glomerular filtration and albuminuria were described. In addition, epidemiological data from Argentina and results from previous studies that showed the growing impact of CKD and the widespread use of HD as a replacement therapy were reviewed. The article integrated findings from specific HRQoL measurement instruments that showed a predominant deterioration in the physical domain, accompanied by psychological impairment and social restrictions linked to loss of work role and dependence on the environment. It was also highlighted that HRQoL was modulated by psychosocial and cultural factors and by the organizational and environmental conditions of the HDUs. Finally, the study emphasized that nursing professionals played a central role, both in the technical management of treatment and in education, emotional support, and the design of individualized interventions aimed at improving patient adaptation. Overall, the study concluded that HRQoL should be considered a priority therapeutic goal in HD patient care.

Keywords: Chronic Kidney Disease; Hemodialysis; Health-Related Quality of Life; Nephrology Nursing; Nursing Care.

RESUMEN

El estudio tuvo como propósito analizar la Enfermedad Renal Crónica (ERC) y su tratamiento mediante hemodiálisis (HD) como problema de salud pública, poniendo énfasis en la Calidad de Vida Relacionada con la Salud (CVRS) de los pacientes y en el rol de Enfermería en la Unidad de Hemodiálisis (UHD). Se describieron los fundamentos anatómicos y fisiológicos del riñón, las causas y la evolución clínica de la ERC, así como los criterios de clasificación según filtrado glomerular y albuminuria. Además, se revisaron datos epidemiológicos de Argentina y resultados de estudios previos que evidenciaron el creciente impacto de la ERC y el uso extendido de la HD como tratamiento sustitutivo. El artículo integró hallazgos de instrumentos específicos de medición de CVRS que mostraron un deterioro predominante en el dominio físico, acompañado de afectación psicológica y de restricciones sociales vinculadas a la pérdida de rol laboral y a la dependencia del entorno. También se destacó que la CVRS estuvo modulada por factores psicosociales, culturales y por las condiciones organizativas y ambientales de las UHD. Finalmente, el trabajo subrayó que el profesional de Enfermería asumió un rol central, tanto en el manejo técnico del tratamiento como en la educación, el apoyo emocional y el diseño de intervenciones individualizadas orientadas a mejorar la adaptación del paciente. En conjunto, el estudio concluyó que la CVRS debió considerarse un objetivo terapéutico prioritario en la atención del paciente en HD.

Palabras clave: Enfermedad Renal Crónica; Hemodiálisis; Calidad de Vida Relacionada con la Salud; Enfermería Nefrológica; Cuidados de Enfermería.

INTRODUCTION

Chronic kidney disease (CKD) is a degenerative disease that constitutes a global health problem and results from the progressive and sustained deterioration of renal anatomy and function, altering the balance of metabolites in the internal environment to the point of becoming incompatible with life. Currently, hemodialysis (HD) is the most common renal replacement therapy, which involves a machine that mimics renal function by purifying the blood through extracorporeal circulation. This treatment consumes a significant number of hours per week of the patient's life, with a substantial impact on their health and on their social and productive lives. Therefore, over time, the treatment they receive affects their quality of life.

Interest in this issue arises from the fact that the author of this paper works professionally in a Hemodialysis Unit (HDU) located in a highly complex private center where nurses have begun to worry about the physical deterioration of patients and have become familiar with the concept of Health-Related Quality of Life (HRQoL) of patients with Chronic Kidney Disease (CKD) undergoing hemodialysis (HD) treatment. Therefore, in constructing a research problem, this initial interest was expanded with a review of the background.

A study conducted in Brazil aimed to examine the association between the quality of life of patients with chronic kidney disease and sociodemographic, clinical, depressive, and medication-adherence characteristics. They designed an exploratory, cross-sectional, and analytical study with a quantitative approach, involving 183 chronic kidney patients on HD. A sociodemographic and clinical questionnaire, the Kidney Disease and Quality of Life Short-Form (KDQOL-SF), the Beck Depression Inventory, and the Morisky Medication Adherence Scale were used to assess comorbidities, complications of kidney disease, and complications during and after HD.

It was found that 55,2 % were aged 60 or older, 63,4 % were men, 65,0 % lived with a partner, and 90,7 % were retired. In addition to CKD, 37,2 % had concomitant systemic arterial hypertension (SAH) and diabetes mellitus (DM); the rest had one or the other. Meanwhile, 60,7 % had symptoms of depression. The overall mean HRQoL score was 62,61. The worst scores were in the areas of employment status (19,40 %), limitations due to physical problems (22,54 %), and burden imposed by kidney disease (42,66 %). The average physical component was lower than the mental component (48,10 %). It was concluded that reduced HRQoL in this population is associated with depressive symptoms, complications, and low medication adherence, so actions aimed at addressing these factors can promote well-being.

DEVELOPMENT

Theoretical Framework

The social impact of kidney disease

The kidney, as described by Restrepo et al.[1], is a paired organ located retroperitoneally that projects dorsally at the level of the last thoracic vertebra and the first three lumbar vertebrae. However, the position of the pair is not exactly symmetrical, since the right kidney is displaced by the liver by a few centimeters. It is bean-shaped and measures, on average, 12 cm long, 6 cm wide, and 3 cm thick, weighing between 150 and 170 grams.

The primary function of the kidneys is to eliminate metabolic waste and regulate the body's hydration level. Kidney disease is any process that affects the kidney, causing functional loss over time. Chronic kidney disease (CKD), also known as chronic renal failure (CRF), is a slow deterioration process that develops over months or years and manifests clinically when the organ begins to lose functionality. The final stage of CKD is known as End-Stage Renal Disease (ESRD), when the body is no longer able to eliminate sufficient waste and excess fluid. The incidence of ESRD continues to rise, posing a particularly significant health, social, and economic problem. At this point, the only life-sustaining alternative is a kidney transplant. In the meantime, renal replacement therapy must be used to replace kidney function, such as dialysis.(2) A study confirm that CKD is a significant public health problem as a common conclusion of a constellation of pathologies that affect the kidney chronically and irreversibly. Clinically, it is defined as the existence of structural or functional renal impairment lasting more than three months, even without perceived deterioration of renal function, or with a glomerular filtration rate (GFR) < 60 ml/min/1,73 m2 as the sole expression of pathophysiology.

Hemodialysis (HD), a renal replacement therapy in CKD, uses a machine that mimics renal function by purifying the blood through extracorporeal circulation. Studies state that this treatment consumes a significant number of hours per week of the patient's life and has a significant impact on their social and productive lives. Therefore, as time goes by, the treatment they receive and its effects on their functional capacity and quality of life become the most important aspects for patients on hemodialysis. For this reason, as with other chronic incurable diseases, Merino-Martínez et al.(2) states that CKD should be treated by incorporating patients' perceptions of their quality of life into clinical objectives, given that HRQoL is a variable that must be taken into account when providing comprehensive care to these patients.

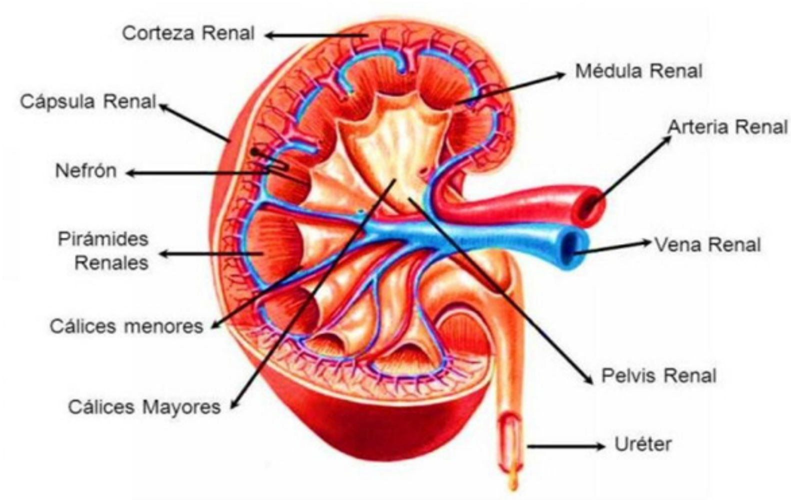
CKD has such an impact that the Argentine Society of Nephrology (SAN) reported, according to Télam digital, that more than 5 million Argentines, one in eight people, suffer from some degree of CKD, with prevalence increasing with age; such that 20 % of men and 25 % of women between the ages of 65 and 75, and half of those over 75, suffer from some degree of renal function impairment. According to the Argentine Registry of Chronic Dialysis and Transplantation, Argentina has approximately 10 000 transplant recipients and 30 000 people undergoing dialysis treatment. The leading causes of kidney deterioration are attributed to diabetes (DBT), high blood pressure (HBP), genetic predisposition, and inappropriate use of steroid anti-inflammatory drugs.

To better understand the clinical aspects of kidney disease and the rationale for replacement therapy, it was necessary to review kidney anatomy and physiology.

Kidney and nephron

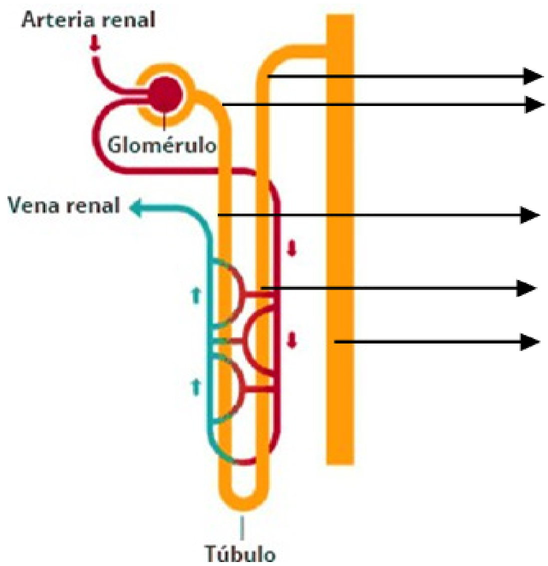
As described by Restrepo et al.(1), the kidney is a paired retroperitoneal organ with the hilum on the concave inner edge, where an artery enters and a vein and the urinary excretion pathway exit. The organ's vascular system begins with the renal artery and gives rise to a series of arteries that run through the parenchyma until a final arteriole (the afferent arteriole) forms 5 to 6 capillaries, grouped in a ball and constituting the glomerulus or glomerular tuft. The capillaries of each glomerulus coalesce to form a new efferent arteriole, which gives rise to a network of capillaries that form the venous system that drains the organ through the renal vein.

In a longitudinal section, Marieb[3] describes three easily distinguishable parts: the outer area of less intense color, the renal cortex, which surrounds a dark red area, and the renal medulla.



Source: Latarjet et al.[4]
Figure 1. Longitudinal section of the kidney

The medulla has triangular regions called medullary or renal pyramids, with their bases on the cortex and their apices toward the hilum. A third area consists of the renal columns, projections of cortical tissue that separate the medullary pyramids. The apexes of the pyramids continuously drain the product of renal activity into cup-shaped structures that close over the apexes: the calyces. The calyces empty into the renal pelvis, which is a funnel-shaped cavity in the hilum.



Source: National Institute of Diabetes and Digestive and Kidney Diseases[5]
Figure 2. Diagram of the nephron

The renal pelvis decreases in diameter and continues as the ureter at the point where it leaves the hilum; urine then flows from the pelvis to the bladder, where it is stored until excretion through the urethra.[3] Restrepo et al.[1] distinguish two levels of calyces: the minor calyces, one for each renal papilla, and the major calyces, which are the confluence of the minor calyces prior to their fusion in the renal pelvis. On this anatomical basis, the kidney has a structural and functional unit called a nephron. It is estimated that there are approximately one million nephrons per kidney. It is essential to clarify, in this item, that the final number of nephrons is established during prenatal development, and no new nephrons can be generated after birth.

The nephron is made up of glomeruli, which are capillary structures that begin as afferent arterioles and emerge as efferent arterioles with the function of filtering blood in the renal cortex so that the filtrate passes through a tubule with different characteristics and functions in each of its sections. Thus, the tubular fraction of the nephron allows us to recognize a proximal convoluted tubule; a thin descending branch and a thick ascending branch in the form of a loop that penetrate the renal medulla; a distal convoluted tubule and a connecting tubule that empties the final product, urine, into a collecting tubule along with 5 or 6 other connecting tubes from as many other nephrons. If blood is primarily filtered in the glomeruli, the tubules allow ions and water that need to be recovered or selectively excreted to be reabsorbed when necessary. Thus, the nephrons are located in the renal cortex, along with the glomeruli and the proximal and distal convoluted tubules, while the loops of Henle (descending and ascending) and the collecting tubules occupy the medullary region.[1]

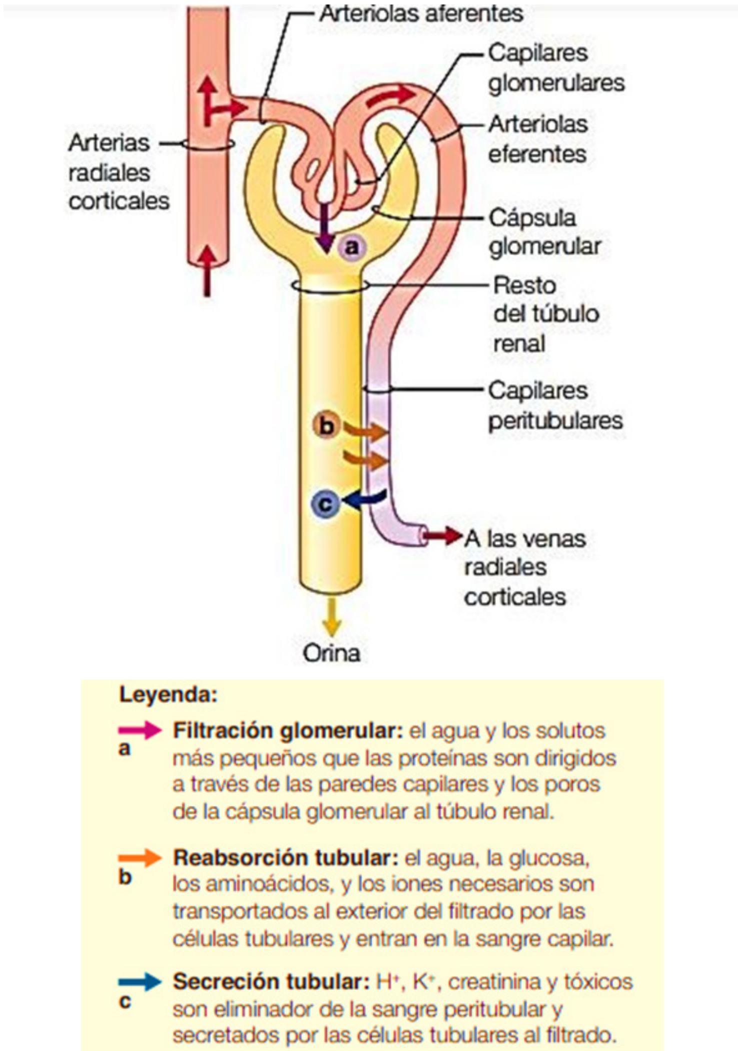
The fundamental role played by renal acid-base mechanisms in regulating the body's water and electrolyte balance results in the formation of urine and involves three basic processes: glomerular filtration, tubular reabsorption, and tubular secretion. The kidneys receive about 25 % of cardiac output, or slightly more than 1 liter of blood per minute, for a cardiac output of 5 liters per minute in a 70 kg individual. The glomerular filtration rate is approximately 125 ml/minute, or 180 liters per 24 hours.

The fraction of filterable plasma flow from the total renal blood flow is known as the filtration fraction or glomerular filtration rate (GFR). The tonicity of the glomerular arterioles regulates the GFR; vasoconstriction of the afferent arteriole reduces the hydrostatic pressure of the glomerulus, lowering the rate, while vasoconstriction of the efferent arteriole increases it by raising the pressure in the capillary.[1]

Among the waste products of glomerular filtration are substances that continue to be useful (such as water, glucose, amino acids, and ions), which are recovered from the filtrate and returned to the blood.

Tubular reabsorption begins in the proximal convoluted tubule, where the cells lining the interior of the tubules act as active and selective transporters of substances to the extracellular space, where peritubular capillaries drain into the renal vein. Substances such as glucose and amino acids are reabsorbed. In contrast, waste products from the catabolism of proteins, nucleic acids, and muscle tissue, such as urea, uric acid, and creatine, respectively, are commonly found concentrated in the urine. Ion reabsorption occurs in the distal convoluted tubule and depends on the kidney's need to regulate plasma pH.

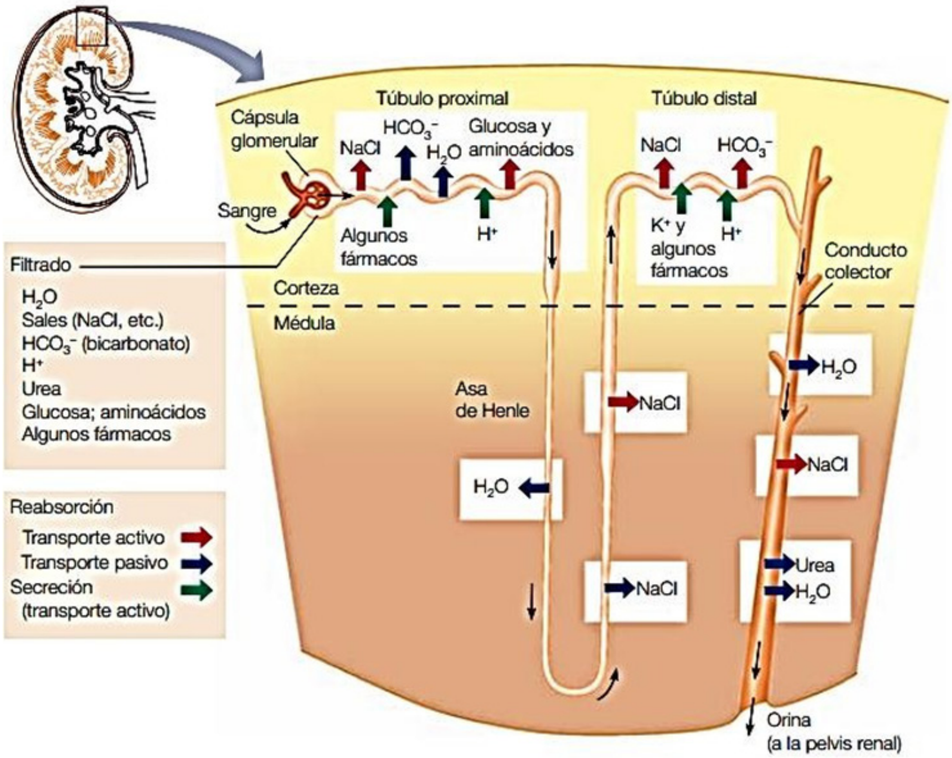
Tubular secretion works in the opposite direction to reabsorption, and substances such as hydrogen and potassium ions, creatinine, and medications pass from the peritubular capillaries or from the tubular cells themselves into the filtrate to be eliminated in the urine.[3]



Source: Marieb, E.[3]

Figure 3. Basic processes in urine formation

Finally, the kidney performs endocrine functions through three hormones: renin, active vitamin D, and erythropoietin. According to Restrepo et al.[1], the wall of the afferent arteriole contains a group of muscle cells. These juxtaglomerular cells secrete renin and are the only proven site of its synthesis. These juxtaglomerular cells are in close contact with specialized epithelial cells in the final portion of the ascending limb of Henle's loop, which are capable of monitoring the sodium chloride content in the tubular lumen. Decreases in sodium chloride in the distal tubular segments indicate possible hypotension or intravascular fluid deficit, leading to renin release from the afferent arterioles into the systemic circulation. The renin substrate allows the synthesis of angiotensin, which has a vasoconstrictive action, stimulates the reabsorption of sodium and chloride, and stimulates the release of aldosterone from the adrenal gland, which enables the recovery of sodium and water in the collecting tubule to restore blood volume and stabilize systemic blood pressure. In addition to its endocrine function through the renin-angiotensin-aldosterone system, the kidney participates in vitamin D synthesis by stimulating intestinal absorption, by renal reabsorption of calcium and phosphorus, and by inhibiting parathyroid hormone secretion, which regulates the removal of bone calcium. Another hormone produced almost exclusively by the kidney is erythropoietin (EPO), which binds to membrane receptors on erythrocyte progenitor cells to promote their maturation.



Source: Marieb, E.[3]

Figure 4. Movement of substances in the nephron according to filtration, excretion, and secretion

Clinical aspects of kidney disease

According to Malkina[6], the causes of kidney disease can originate in many diseases that can damage the kidneys, producing an acute event known as acute renal failure (ARF), which will progress to CKD if not satisfactorily resolved within the following three months. Therefore, it must be considered that any cause capable of causing ARF can cause chronic kidney disease. In the West, the most common causes of CKD are diabetes mellitus and high blood pressure, which damage the small blood vessels in the renal parenchyma. Other causes of chronic kidney disease include urinary tract obstructions; polycystic kidney disease; glomerulonephritis and autoimmune disorders where antibodies attack the renal vasculature and renal ducts, as occurs in systemic lupus erythematosus and scleroderma; infectious and lithiasic processes; retrograde urine flow to the kidneys (reflux nephropathy); and chemicals and medications such as some analgesic and oncological drugs. The clinical presentation of nephropathy is expressed through symptoms related to fluid retention and inadequate fluid management, with the presence of bodily swelling and obvious edema in the lower limbs, difficulty breathing, and nocturnal urination. On the other hand, this insufficient management of fluid levels is compounded by an imbalance in water and electrolyte levels and the retention of metabolic waste, causing confusion, itching, fatigue, muscle spasms and cramps, loss of appetite, and nausea.

The severity of CKD can be classified by GFR or albuminuria, according to a study because proteinuria—the presence of protein in urine—is a prognostic factor for CKD progression. The classification shows five categories or grades based on GFR and three categories of albuminuria. GF deficiency is characteristic of grades 3, 4, and 5, with no other symptoms needed to diagnose CKD, unlike in grades 1 and 2.

2, where the presence of renal damage must be demonstrated, such as through radiological imaging, the presence of unusual sediments in urine, or histological visualization in a biopsy study. Grade 5 is severe nephropathy compatible with dialysis therapy. Proteinuria is a modifiable factor that is used to infer prognosis and guide clinical decisions. The presence of proteinuria acts as a renal toxin, producing inflammatory and fibrotic processes that lead to nephron loss. Quantification is performed with a 24-hour urine collection study, which is considered an excellent standard, and the determination is made using the albumin (or total protein) to creatinine ratio measured in the same sample, which reveals a fairly accurate correlation of protein elimination over 24 hours.

Estadios	Descripción	FG ml / min / 1,73 m^2
1	Daño renal con FG normal o hiperfiliación	≥ 90
2	Daño renal con leve ↓FG	60-89
3	Moderado ↓FG	30-59
4	Avanzado ↓FG	15-29
5	Fallo renal	< 15 o D

Figure 5. Stages or grades of CKD according to GFR

	Orina 24 h mg/24 h	Muestra aislada Alb/Cr mg/g	Muestra aislada Prot/Cr mg/mg
Normal	<30	<30	<0,15 ≅ <150 mg/24h
Microalbuminuria	30-300	30-300	<0,15[a]
Macroalbuminuria	>300	>300	> 0,3

Figure 6. Stages or grades of CKD according to albuminuria

In the statement by a author, classifications based on FG and albuminuria are periodically updated to standardize the definition and magnitude of kidney problems with prior specification of CKD, reaffirming that they are central tools in the diagnosis and subsequent management of the disease.

Regarding the contribution of complementary studies to the diagnosis of nephropathies, Malkina[6] argues that blood tests are also essential because they reveal altered values that can confirm decreased renal activity, such as increased concentrations of urea and creatinine, which are usually filtered by the kidneys, acidification of plasma pH, or increased potassium to dangerous levels. On the other hand, ultrasounds can reveal alterations in kidney tissue or rule out lithiasis. The removal of a tissue sample (kidney biopsy) is the most accurate test, but it is only recommended when ultrasound findings reveal that the kidneys are small and sclerotic. The need to urinate several times during the night (nocturia) can be a symptom of mild to moderate kidney dysfunction and indicates that the kidney is having difficulty concentrating urine and reducing its volume, as occurs typically during the night. The progression of the disease is linked to an increase in circulating metabolic waste, which can cause decreased mental agility, general weakness and fatigue, loss of appetite, difficulty breathing, nausea, vomiting, and an unpleasant taste in the mouth. Patients lose weight and become more vulnerable to infections. In severe kidney failure, the damage extends to muscles and nerves, causing tingling in the extremities, loss of sensation, muscle weakness, cramps, and pain. Some cases progress to encephalopathy, showing confusion, lethargy, and seizures. Heart failure causes difficulty breathing and shortness of breath, while edema and fluid retention accompany the entire process. The skin becomes yellowish due to bile deposits, and urea sediments may form a white powder (uremic frost). As already mentioned, kidney function tends to worsen over time, and the rate of progression depends on factors associated with the patient and their underlying disease. Treatment aims to control processes that worsen kidney function, supported by dietary and medication measures, with the aim of halting or slowing deterioration while establishing separate treatments for comorbidities and complications. End-stage renal failure or end-stage renal disease can be made compatible with life through long-term dialysis or kidney transplantation, both of which reduce symptoms and prolong life expectancy.

Hemodialysis

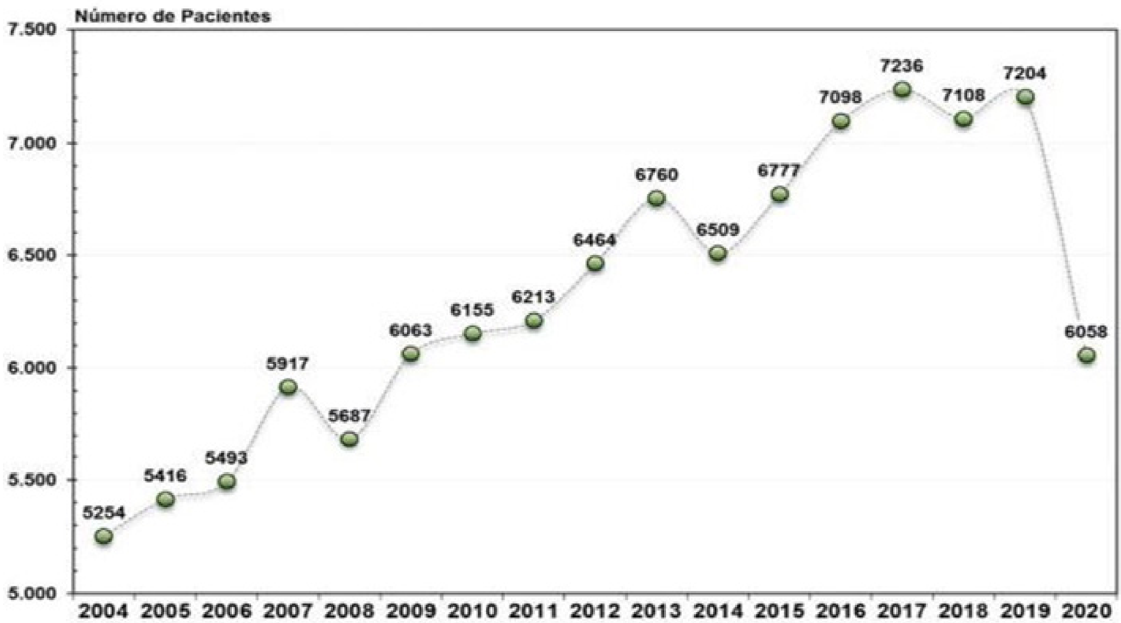
Renal replacement therapy (RRT) for advanced CKD, according to a study includes peritoneal dialysis (PD), HD, kidney transplantation (cadaveric and living donor), and conservative treatment. Hemodialysis (HD) is defined by Rivera-Vázquez et al.[7] as a replacement therapy in which a machine mimics kidney function by purifying the blood via extracorporeal circulation. During hemodialysis, blood is fed into an artificial kidney, or dialyzer, which is divided into two chambers separated by a membrane that allows exchange between the patient's blood (on one side of the membrane) and a solution that removes waste products. The dialysis machine pumps blood through the filter and returns it to the body.

A dialysis center or unit is a healthcare facility, either in or outside a hospital, that provides dialysis treatment to patients. The HDU is a unit that provides multidisciplinary care in a specific space with structural and organizational requirements that allow it to operate safely, efficiently, and with high quality. Patients with advanced chronic kidney disease require continuous dialysis and are included in the CKD program.

The 14th Report of the Argentine Chronic Dialysis Registry[8] summarizes information from Argentina over the last 17 years and positions the country well to compile an updated document that tracks the variables of most significant interest. Ninety-nine percent of Argentina's chronic dialysis centers participate in this effort, reporting computerized data to the National Procurement and Transplant Information System of the Argentine Republic (SINTRA), which is part of the National Central Coordinating Institute for Ablation and Implantation (INCUCAI). The HDC patient registry includes the prevalent population as the total number of HDC patients during a calendar year or part thereof, including those who were readmitted during that year; and, separately, the incident population that received HDC for the first time in their lives. Incidence or prevalence rates are expressed per million inhabitants. It should be noted that in 2020, there was a significant reduction in the incidence rates of HDC and kidney transplantation due to the significant increase in mortality among patients with CKD as a result of the SARS-CoV-2 pandemic.

The collected information includes patient-related variables and variables related to the treatment performed in the first and last HDUs. Patient identities are coded, and a large amount of information is collected, such as nationality, date of birth, date of first HDC in life, CKD etiology, etiology confirmed or not by biopsy, survival at the end of the year on HDC, date of death, number of HDUs used by the patient during the year, comorbidity at admission, anthropometric and biochemical variables at admission, social and economic variables at admission, clinical-biochemical parameters in dialysis treatment, and vascular accesses. HD units, an environmental domain that will influence the patient's HRQoL, are also coded. Information such as the patient's province of residence, the type of HDC funding, the patient's dialysis modality at that center, the date of first HDC and discharge from that center, the primary and secondary causes of discharge, and the number of days of treatment at that center are collected.

As of December 31, 2020, the crude rate of HDC patients was 648 per million inhabitants (patients per million inhabitants), equivalent to 29,423 patients, representing the first historical decline in patients since 2004.



Source: Marinovich et al.[8]

Figure 7. Incidence of HDC in Argentina as of December 31 of each year

During 2020, 6058 new patients were admitted to HDC, representing a crude rate of 134 ppm, which is 1626 fewer patients than expected. In fact, between 2019 and 2020, a 2,9 % decrease in the number of patients was calculated, and the authors of the aforementioned report infer that the decrease is linked to COVID deaths and predict that the trend may continue in 2021. The Northwest, Cuyo, and Northern Patagonia regions have higher rates than the provinces in the Central, Northeast, and Southern Patagonia regions. The province of Santa Fe, along with its counterparts on the coast and in northwestern Argentina, is in Argentina's low HDC prevalence zone and is one of the seven provinces with consecutive year-on-year decreases in the rate between 2013 and 2020. HD is the most common practice, accounting for 92,39 % of the population in DC, Argentina.

The average age of incidents in 2020 was 59 years, the lowest in the last 13 years, due to a decrease in the percentage of patients over 65 years of age. The incidence rates for men and women continue to show disparity (151 versus 95 ppm, respectively). In terms of etiologies, diabetic nephropathy is the leading cause of admission, followed by nephroangiosclerosis. Almost all etiologies showed a decrease in admissions except for Lupus Nephropathy. The primary dialysis modality is HD in 93,2 % of patients, while peritoneal dialysis grew from 2,7 % to 6,8 % of the total in the last 13 years.

Regarding the correlation between certain variables at admission and mortality/survival, it has been proven that well-planned admission to HDC reduces the risk of death. Planned admission shows better clinical and biochemical conditions, and the reference data indicate a higher hematocrit level, higher GFR, albuminemia below 3,5 g/dL, and hepatitis B immunization. Regardless of the condition at admission, these variables change as treatment progresses and lose their deficit characteristics, becoming adequate or acceptable, especially during the first 3 to 6 months. The Autonomous City of Buenos Aires (CABA, Federal Capital) has the best values for all variables.

The average duration of replacement therapy among prevalent patients increased significantly from 2004 (50,3 months) to 2020 (59,2 months), reaching a historic high. Marinovich et al.(8) speculate that this is a consequence of the increase in kidney transplants, which increases the possibility of leaving HDC and prolongs the duration of replacement therapy, even if it is necessary to return to it due to transplant failure.

In summary, the number of HDC patients in Argentina increased by 37 % between 2005 (26 976 patients) and 2020 (36 949), with 9973 more patients on dialysis than 16 years ago. Increasing age and diabetic nephropathy are factors associated with significantly higher mortality; males have always had higher crude mortality than females, and the gap continues to widen. Of this total, survival after 1 year of treatment is 78,7 %, after 5 years 40,2 %, and after 16 years 4,4 %, with a median survival of 45,3 months. The first 90 days of treatment represent the highest vulnerability and mortality, with 8,1 % (8464 patients) of the population starting CD dying during this period.

Health-Related Quality of Life

The inclusion of the concept of patients' quality of life is an innovation in the traditional view, which has focused exclusively on curing disease and alleviating pain, in the context of seeking physical, spiritual, emotional, mental, and social well-being for individuals. The World Health Organization (WHO) definition of quality of life is cited by Rivera-Vázquez et al.[7] as the way in which people perceive their lives in relation to their goals, expectations, and concerns, and which places them in a position in life in the context of the culture and system of norms and values with which they interact. This self-perception is permeated by physical health, psychological state, degree of autonomy and independence, and social relationships. In relation to this approach to quality of life, Merino-Martínez et al.(2) state that this expanded vision has promoted the incorporation of concepts such as Health-Related Quality of Life (HRQoL). HRQoL can therefore be defined as a person's subjective assessment of the impact of disease and treatment on their functionality and well-being in the environmental, physical, psychological, and social domains.

Regarding the criteria for defining HRQoL, it is not easy to unify them, given that several definitions address the concept's multidimensionality and the various factors involved. In this regard, Cevallos-Tapia et al.(9) cite various authors who have contributed to the debate; for example highlights the conceptual complexity of the subjective and intimate nature of perception and compares it with the feeling described as well-being or happiness. He states that, in plain terms, a good quality of life can be interpreted as feeling good and living comfortably. For their part, a study expand the conceptualization by incorporating a dynamic, broad, and polysemic characterization of the concept and its variations, taking into account not only individual perception but also semantic, cultural, and application differences. While a studies note that this subjectivity not only makes it challenging to frame HRQoL variables but has also led to discrepancies in their assessment. A necessary contribution indicates that measurements can vary widely across cultures. HRQoL measurements, which are indisputably necessary in healthcare practice, include therapeutic indices (which reveal the presence and severity of the disease), health status measures (which establish clinical differences between patients with the same pathology), and the patient's subjective perception of their clinical status and health situation. As can be seen, components are incorporated that do not depend directly on the pathology and that affect the degree of patient satisfaction or dissatisfaction, such as: the way in which the service is provided, its accessibility and cost, the attitude of the professional team, and the environmental domain in relation to the UCH. Thus, there are differences between what the patient expresses and the medical conclusions, and both must be considered for a comprehensive assessment of the situation. Although the final word is medical, patients' opinions are not excluded.

Rivera-Vázquez et al.(7) state that initiating HDC treatment triggers a crisis in which the patient must make an effort to adapt and redesign their life in light of the limitations imposed by their illness. Based on the concepts expressed in Dorothea Orem's Triple Theory of Self-Care, people have physical, psychological, interpersonal, and social aspects of health that interact with each other and with environmental conditions that directly influence their state of life. Illness situations can limit patients' autonomy in self-care to varying degrees, generating a deficit in fulfilling these self-care requirements, which must be assessed and measured so that nursing activities include actions to address the deficits identified.

Merino-Martínez et al.(2) indicate that the use of HRQoL measures is essential in chronic processes because, although scientific and technical advances offer tools to improve HRQoL, there are still differences in the quality of life of chronic patients compared to the general population. There is agreement on the importance of psychosocial domains as fundamental and determining variables of HRQoL, where depression is a predictor of HRQoL deterioration, affecting the domains of physical, social, and mental health function. HD patients undergo sudden changes in their lifestyle in a short period of time due to the disease and the treatment itself. They may develop anxiety and depression disorders that increase the risk of morbidity and mortality.

To advance in the areas most affected by HRQoL in HD patients, Rivera-Vázquezet al.(7) propose three central domains: physical-environmental, psychological, and social. The first domain evaluates symptoms, physical functioning, and disability; the psychological domain includes satisfaction, perceived well-being, anxiety, depression, and self-esteem; and the social domain assesses interpersonal relationships, daily life, and occupational rehabilitation. Specifically, patients with CKD and HDC experience physical symptoms, including a sense of general weakness and various disease-related symptoms. In contrast, the psychological domain depends on the patient's thoughts and feelings, while the social domain focuses on the patient's new perception of themselves and their environment.

An expansion of these affected areas is provided in Merino-Martínez et al.[(2)], who, based on the Kidney Disease-Specific Quality of Life (KDQOL) scales, observe the following as the most affected dimensions: employment status, burden of kidney disease, sexual function, and sleep. In addition, there would be a better quality of life regarding the patient's cognitive abilities and social relationships, the UHD staff's attitude, and the patient's satisfaction with the progress of their treatment. These levels of satisfaction coincide with the healthcare team's assessments of the degree of kindness, interest, and support they provide. When Rivera-Vázquez et al.[(7)] analyzed the results of the WHOQOL-BREF test to evaluate the average scores and quality of life of patients, they found that the domain most affected in patients with chronic kidney disease is the physical domain, and the best preserved is the social domain. They also confirmed that patients' cognitive and social tools yield very disparate results, even in very similar clinical and treatment situations.

Considering the statements by Merino-Martínez et al.[(2)] based on a review of specific results for kidney disease provided by the KDQOL and similar tools expressed in the review by Rivera-Vázquez et al.[(7)] applying the WHOQOL-BREF, it can be said that HRQoL is conditioned by physical limitations, which, although they allow daily activities to be carried out, will condition productive or work activity in the first instance and progressively limit self-care and domestic activities. Thus, HRQoL is closely related to age and the length of HD treatment, with increasing dependence and comorbidity over time.

The purpose of HD replacement therapy is to assist kidney patients in achieving the best possible quality of life during the transition to transplantation or death. According to Partida Ponce et al.[(10)], this activity involves a professional team, the patient, and their family, with nursing coordinating all actions to achieve a comprehensive, interdisciplinary approach to the problem. Nursing in the HDU has the competence to identify patient needs and organize care during replacement therapy with quality, warmth, and effectiveness.

Rivera-Vázquez et al.[(7)] state that the role of nursing allows for the planning of individualized interventions based on frequent assessment of the parameters of functional capacity and knowledge of the patient's illness, so that the patient has alternatives to meet their needs and seek to improve their HRQoL in the face of a chronic and progressive disease requiring invasive and continuous treatment that impacts their lifestyle and habits. In this way, Partida Ponce et al.[(10)] reveal that the role of nursing professionals in HDU is complex, as it involves taking on different roles that include disciplinary specialization, expertise in the technological management of devices, the ability to educate the patient, and the ability to be a guide and emotional facilitator for the patient and their family environment.

Actividades de cuidado durante el procedimiento de hemodiálisis	Pre	Se incluyen en cada fase actividades dependientes, independientes e interdependientes. 13 actividades en el Pre, 15 actividades en el Trans, y nueve actividades en el Post. El total de 37 actividades diferentes que debe realizar la enfermera durante la hemodiálisis se concentran en las funciones de valoración física y emocional del paciente, cuidados físicos y emocionales al enfermo, preparación, monitoreo y cuidados de la máquina de hemodiálisis.
	Trans	
	Post	
Actividades administrativas	• Elaboración diaria de la bitácora de máquinas y planta de tratamiento de agua. Reporte del funcionamiento y/o fallas en los monitores y realizar respectivo reporte en caso necesario. • Revisión de los expedientes, resultados actualizados de serología de panel viral, indicaciones médicas. • Registros en hojas de enfermería • Realizar los reportes a trabajo social si así se requiere. • Programación semanal de pacientes. • Registro de la productividad diaria. • Elaborar solicitar de medicamentos para el servicio. • Elaborar el cronograma de actividades. • Elaborar semanalmente las actividades. • Elaborar solicitud, registro, e inventario de material de hemodiálisis (insumos kits, dializador, líneas sanguíneas, bicarbonato entre otros). • Elaborar reporte mensual productividad. • Registro de complicaciones y seguimiento a estudios de laboratorio solicitados.	
Actividades educativas	• Programación del curso inicial de hemodiálisis teórico – práctico a las enfermeras de nuevo ingreso así como a las enfermeras de servicio social. • Brindar orientación y capacitación a los/las estudiantes de enfermería. • Brindar orientación específica a los pacientes y/o familiares en situaciones que así lo ameriten. • Programar sesiones académicas en servicio para el personal de enfermería sobre un tema: como Anticoagulación en hemodiálisis, Manejo de accesos vasculares etc.	

Source: Partida Ponce et al.[10]

Figure 8. Suggested activities for the nursing role in the HDU

In summary, it is clear that HDC impacts patients' HRQoL by exposing them to different sources of anxiety, such as dependence on a machine, a particular physical space, and medical equipment; dietary prescriptions; adherence to a multi-drug treatment; and difficulty in reorganizing the present and envisioning the future.[11] The biochemical changes that occur as the disease progresses and the length of time spent on HD produce apparent weakness and fragility, reflected in the physical domain, with an appearance of aging even in young people. This situation has led to CKD being associated with advanced age and the aging process.[12] The psycho-emotional domain is one of the most significant indicators for measuring HRQoL due to its influence, and its imbalance is attributed to the onset of stress, anxiety disorders, and depression. In addition, this domain is essential for maintaining adaptation to the HD process; many patients who manage to maintain this balance adapt to their new living conditions while maintaining acceptable HRQoL. In the social domain, deterioration is evident and inevitable, directly related to the time demands of HD and the consequent wear and tear it causes; it will progressively be limited to the support of the close circle of family and friends. This domain affects the patient's economic situation due to limited access to stable paid work, and the problem can be addressed through solidarity actions by the state or organizations.[9]

CONCLUSIONS

The review carried out allowed us to understand that Chronic Kidney Disease (CKD) and its treatment with hemodialysis (HD) constitute a health phenomenon of enormous complexity, whose impact transcends the clinical sphere into the psychological, social, and economic domains. Throughout the analysis, it was demonstrated that CKD progresses silently and irreversibly, and that its advanced stage requires highly demanding replacement therapies, among which hemodialysis continues to be the predominant option in many countries, including Argentina. This prolonged, invasive, and restrictive treatment has a direct impact on the patient's daily life, affecting their autonomy, functionality, and subjective perception of well-being.

The studies reviewed, particularly those that apply specific instruments such as the KDQOL-SF or the WHOQOL-BREF, agree that the Health-Related Quality of Life (HRQoL) of HD patients is impaired in multiple dimensions. The physical domain emerges as the most affected due to persistent symptoms, progressive wear and tear associated with treatment, and accumulated functional limitations. At the same time, the psychological domain shows significant impairment, especially in relation to anxiety, depression, and the perception of overload that accompanies chronic processes. The social domain, although better preserved in comparative terms, also shows restrictions stemming from the loss of work and productive roles, isolation, and an increasing dependence on the immediate environment.

The evidence analyzed highlights that HRQoL is not determined solely by the clinical severity of the disease, but also by psychosocial, cultural, and environmental factors, as well as by the organization and care environment of hemodialysis units (HDUs). In this regard, it was observed that nursing plays a strategic role: it not only performs technical procedures but also provides the emotional, educational, and social support that patients require to maintain acceptable levels of adaptation and well-being.

Finally, the review allows us to affirm that HRQoL should be incorporated as a central therapeutic objective and not an accessory one. Improving it involves designing comprehensive interventions that address depressive factors, difficulties in adhering to treatment, comorbidities, and environmental obstacles present in the HDU. Person-centered care, continuing education, and strengthening the therapeutic bond emerge as indispensable strategies for optimizing the patient experience and promoting healthier coping in the context of an irreversible disease and prolonged treatment.

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Conceptualization: Carmen Centurión, Daiana Foco.
Data curation: Carmen Centurión, Daiana Foco.
Formal analysis: Carmen Centurión, Daiana Foco.
Drafting - original draft: Carmen Centurión, Daiana Foco.
Writing - proofreading and editing: Carmen Centurión, Daiana Foco.