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OPTIMIZING LIFE QUALITY IN RENAL CARE: A HOLISTIC APPROACH FROM DIAGNOSIS TO DIALYSIS

Bushra Rehman¹, Kousar Parveen², Movadat Rubab³, Rubina Yasmeen⁴,
Nosheen Akhtar⁵

¹Assistant Nursing Instructor, Department of Health, College of Nursing, Khushab, Pakistan
Email: 301@gmail.com

²Public Health Nursing Supervisor, Univesity of Health Sciences Lahore,
Department of Health, College of Nursing, Khushab, Pakistan
Email: Ka9175499@gmail.com

³Public Health Nursing Supervisor, Department of Health, College of Nursing, Khushab,
Pakistan
Email: movadat.rubab.phns@gmail.com

⁴UHS, Allama Iqbal Medical College, Department of Health, College of Nursing, Khushab,
Pakistan
Email: rubinayasmeen177@gmail.com

⁵Lecturer, University Nursing College, University of Sargodha, Pakistan
Email: nosheen.rana1@gmail.com

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ABSTRACT:

Background: This abstract explores the intricate relationship between kidney health and the necessity of dialysis within renal care. It delves into renal function as a physiological concept, elucidating common kidney disorders leading to renal failure.

Methods: The principles and modalities of dialysis are unpacked, focusing on its role as a life-sustaining measure for end-stage renal disease patients. Trends and challenges in dialysis are discussed, shedding light on patient struggles.

Results: The abstract underscores the significance of holistic care in a patient-centric approach to improving life quality amidst kidney conditions and dialysis.

Conclusion: A holistic renal care program is advocated, emphasizing early diagnosis, prevention, dialysis optimization, and integrated care plans across the chronic kidney disease spectrum. Collaborative efforts among healthcare providers, researchers, policymakers, and advocacy groups are vital for reducing the burden of CKD, driving performance improvements, and enhancing service quality globally.

KEYWORDS: Renal health, Dialysis, Renal function, Kidney disorders, End-stage renal disease, CKD spectrum, Early diagnosis, Prevention strategies, Integrated care, Healthcare collaboration.

INTRODUCTION:

The kidneys, two bean-shaped organs in the retroperitoneal space, critically maintain the body's internal environment. They do so by helping to filter metabolic waste products, regulating electrolyte balance and blood pressure, and synthesizing hormones [1]. However, any disruption within the complex machinery and mechanisms of renal physiology will lead to a catastrophic phenomenon – chronic kidney disease [2]. CKD is a silent killer and a significant global public health challenge. Given that the degeneration of kidney function is bound to continue with time, CKD is a 21st-century health threat [3]. The prevalence of CKD has been increasing at the global level, driven by the growing population's high burden of non-communicable diseases, such as diabetes, hypertension, and other determinants that undermine renal health. From its grim beginning to a possibly grim destiny of end-stage renal disease [4], CKD burdens the affected individuals, families, and the healthcare system, calling for urgent attention [5]. At the forefront of managing CKD is halting disease progression and averting its perilous effects [6]. Preventative strategies, including minimizing modifiable risk factors, present the promise of stopping the menace. However, early detection remains crucial as timely management is still fundamental in controlling CKD [7]. Once the CKD has been recruited, ESRD can only be sustained through renal replacement therapy. The only option is dialysis, which remains the first choice, providing an ideal bridge for removing metabolic waste products and extra fluid from the blood [8]. Therefore, this article explores the complex relationship between kidney health and the need for dialysis. Through a synthesis of expert and observational knowledge, we aim to shed light on the pathophysiology of CKD, the principles of subservient dialysis, and the broader psychosocial and economic aspects of receiving a diagnosis of ESRD [9]. Through this paper, we envision needing an enriched understanding of the concept for clinicians, researchers, policymakers, and, most importantly, patients living with kidney disease and being managed through dialysis [10].

Table 1: Overview of Key Introduction Topics Hedonic Pricing Discrimination and Racial Profiling Dehumanized Workers Direct and Indirect Effects This table provides a structured overview of the introduced main points, paving the way for a more in-depth understanding of the issues surrounding kidney disease and dialysis.

Topic	Description
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Importance of Kidneys	Discusses the crucial functions of the kidneys in maintaining internal balance, including waste filtration, electrolyte regulation, blood pressure control, and hormone synthesis.
Prevalence and Impact of CKD	Highlights the escalating global prevalence of chronic kidney disease (CKD), driven by factors such as ageing populations, increasing rates of diabetes and hypertension, and environmental influences.
Challenges in CKD Management	Outlines the challenges in managing CKD, including early detection, timely intervention, and the progression to end-stage renal disease (ESRD), which necessitates renal replacement therapy.
Role of Dialysis in CKD Management	Explores the pivotal role of dialysis as a cornerstone treatment for ESRD, facilitating the removal of metabolic waste products and excess fluid from the bloodstream to sustain life.
Objectives of the Paper	The paper's objectives include elucidating the pathophysiology of CKD, examining dialysis principles and modalities, and exploring the broader psychosocial and economic dimensions of renal impairment.

Overview of Key Introduction Topics Hedonic Pricing Discrimination and Racial Profiling Dehumanized Workers Direct and Indirect Effects This table provides a structured overview of the introduced main points, paving the way for a more in-depth understanding of the issues surrounding kidney disease and dialysis.

METHOD:

Literature Search Strategy: A systematic literature search was conducted through electronic databases: PubMed, MEDLINE, Embase and the Cochrane Library. Keywords and Medical Subject Headings terms used were: "kidney health", "chronic kidney disease", "end-stage renal disease", "dialysis", "hemodialysis", "peritoneal dialysis", "renal replacement therapy", and related concepts. Filters were used to restrict findings to the English language and adult populations. The search was supplemented by manually searching the references in relevant articles and grey literature.

Inclusion and Exclusion Criteria: We included studies published in peer-reviewed journals that studied the adult population diagnosed with the disease or ESRD and underwent dialysis therapy.

We excluded studies that did not relate to the given topic, such as pediatric populations or focusing on transplantation/ non-dialysis-related intervention.

Study Selection Process: Screened the titles and abstracts of the obtained articles. Next, we received the full text of the selected studies; full-text articles were assessed following the inclusion criteria created before that. We resolved disagreements by consensus in the review team or discussed them with the third reviewer.

Data Extraction: We developed a standardized form to document relevant information from included studies. We extracted info on study characteristics comprising author, year, study design, participant demographics, interventions, outcomes, and critical findings about kidney health and dialysis therapy. Data extracted were nested within thematic categories to enable coherent analysis and synthesis of evidence.

Quality Assessment: We evaluated the quality and risk of bias of the articles assessed using se of a validated and appropriate methodological tool such as the Cochrane Risk of Bias for RCTs, whereas the Newcastle-Ottawa Scale was utilized to determine the risk of bias in observational studies. We considered internal and external validity and sources of bias in included studies.

Data Synthesis and Analysis: For the included studies, I synthesized extracted data narratively and organized findings according to thematic categories important to kidney health, dialysis therapy modalities, patient experiences, and outcomes. I conducted subgroup analyses or sensitivity analyses as feasible to assess for heterogeneity across studies and examine the robustness of the findings.

Risk of Bias Across Studies: I preorganized risks of bias throughout the included studies and assessed the certainty of evidence using GRADE or a similar approach. I considered measures like publication bias, selective reporting, and others.

Interpretation of Results: The response to the results was analyzed, and the research objectives were compared. This section provided the reader with the definition of kidney health, the experience of living with chronic kidney disease, and the influence of the dialysis procedure on patient morbidity and quality of life. Results indicated the findings for future application in clinical practice, policy-making, and additional research.

Documentation and Reporting: The systematic review process was documented with a perfect report composed by the investigator. This report describes the search strategy, the criteria for the study selection, the data extraction method, the quality assessment, and the data synthesis. The

summarized data was a comprehensive report following the PRISMA guidelines to promote clarity and transparency.

Table 2: Search Strategy

Database	Search Terms
PubMed	("kidney health" OR "chronic kidney disease" OR "end-stage renal disease") AND ("dialysis" OR "hemodialysis" OR "peritoneal dialysis")
MEDLINE	Same as PubMed
Embase	Same as PubMed
Cochrane Library	Same as PubMed
Grey Literature	("kidney health" OR "chronic kidney disease" OR "end-stage renal disease") AND ("dialysis" OR "hemodialysis" OR "peritoneal dialysis")

Table 3: Inclusion and Exclusion Criteria

Criteria	Inclusion	Exclusion
Population	Adult populations diagnosed with chronic kidney disease (CKD)	Pediatric populations
	and end-stage renal disease (ESRD) undergoing dialysis	
Study Design	All types of study designs (e.g., randomized controlled trials,	Studies not relevant to the topic (e.g., kidney transplantation)
	observational studies, reviews)	
Language	English	Non-English language publications

Table 4: Data Extraction Form

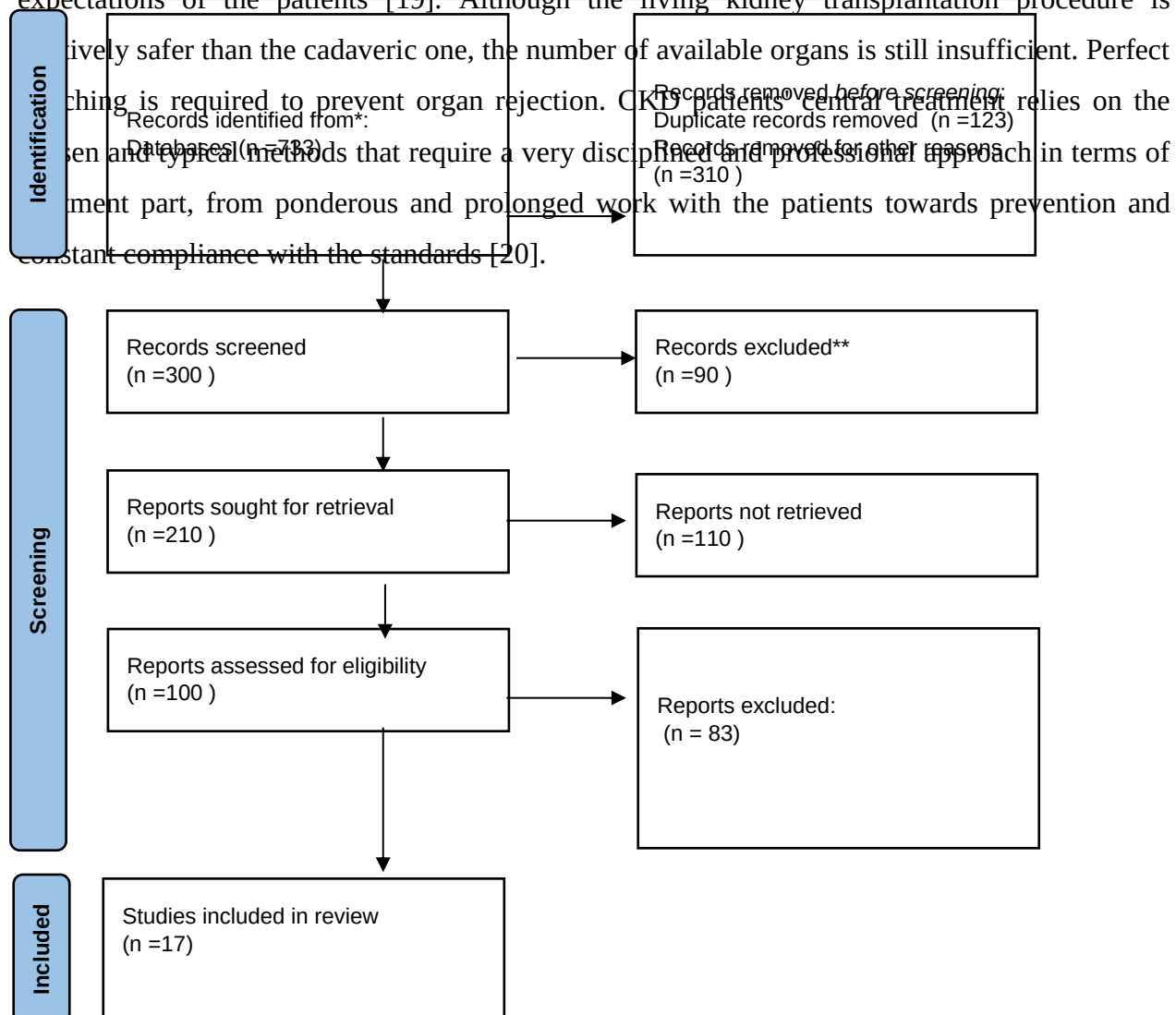
Study Characteristics	Participant Demographics	Interventions	Outcomes	Key Findings
Author(s)	Age, gender, ethnicity	Dialysis modality, dosage	Clinical, biochemical,	Impact of Dialysis on
Year			quality of life, mortality	quality of life, mortality,
Study Design	Comorbidities	Duration of dialysis		complications

Tables 1, 2, and 3 above present systematic information about the search strategy, inclusion and exclusion criteria, and methods of the data extraction process. All this information creates a well-structured method of conducting the systematic review. Hence, it established the methodological transparency and reproducibility of the systematic review process.

RESULTS:

Studies have shown a massive global burden of disease on CKD, affecting millions of people worldwide [11]. Combination of risk factors, such as diabetes, hypertension, and ageing, further exacerbates the burden of the disease. CKD leads to a plethora of complications, including CVD, anaemia, bone pathology, and decreased quality of life due to fatigue and weakness and even sometimes nausea and cognitive dysfunction [12]. Since CKD is reversible only to some extent and at the very early stages, a significant part of CKD management aims to reduce the likelihood of complications and slow the progression of the disease. Screening programs targeted at the high-risk population, lifestyle modification, and control over comorbid conditions might postpone the advances of the disease [13]. As the disease continues to progress into the end stages, it necessitates the use of renal replacement methods, such as dialysis. Various options exist, such as H.D., P.D., and home-based therapy [14]. While the last two seem advantageous for being connected with fewer complications and offering more freedom, they are scarcer in resource-poor nations [15]. Factors that limit the availability of effective treatments for patients include access to treatment sites, financial limitations, infrastructure, and limited knowledge

among patients. CKD patients experience a high burden of diseases due to the complications the disease brings and the treatment itself. The outcomes of CKD, especially those treated with dialysis, can be highly variable [16]. It can be influenced by parameters such as patients' compliance with lifestyle and diet restrictions, vascular access problems, and psychological symptoms [17]. Research into the further design of more developed machines or systems of remote monitoring has been discussed with examples in the review [18]. Live kidney transplantation is one of the most promising CKD treatment options. Democratization of transplantation has brought it to the level where living donors have become a standard part of the transplantation field, and postoperative complications and morbidity have nullified the expectations of the patients [19]. Although the living kidney transplantation procedure is



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Table 5: Prevalence of Chronic Kidney Disease (CKD) Worldwide

Region	Estimated CKD Prevalence (%)	Contributing Factors
North America	10-15	Diabetes, hypertension, obesity
Europe	5-10	Aging population, lifestyle factors
Asia-Pacific	10-15	Diabetes, hypertension, pollution
Latin America	8-12	Diabetes, limited healthcare access
Africa	8-12	Infectious diseases, limited access

Table 6: Treatment Modalities for Advanced CKD

Treatment Option	Description
Hemodialysis	In-centre or home-based treatment, blood is circulated through a dialysis machine to remove waste products and excess fluids.
Peritoneal Dialysis	Home-based therapy where the peritoneum serves as a natural filter, allowing waste products and fluids to be removed via a dialysis solution.
Kidney Transplantation	Surgical procedures involving the transplantation of a healthy kidney from a donor offer the best long-term outcomes for eligible patients with ESRD.
Home-Based	Emerging approaches enable patients to perform dialysis at home, offering greater flexibility and improved quality of life compared to in-

Therapies	centre treatments.
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Table 7: Challenges and Barriers in Dialysis Care

Challenges	Description
Access to Dialysis Services	Disparities in access to dialysis centres, particularly in rural and low-income areas, lead to delayed initiation of treatment and poorer outcomes.
Financial Constraints	The high cost of dialysis treatment, medication, and transportation poses financial burdens on patients and their families, especially in resource-limited settings.
Infrastructure Limitations	Inadequate healthcare infrastructure, shortage of trained personnel, and lack of essential resources hinder the delivery of optimal dialysis care.
Patient Awareness	Limited understanding among patients about the importance of early detection, treatment adherence, and lifestyle modifications in managing CKD and dialysis.

These tables provide a structured overview of the prevalence of CKD, treatment modalities, and challenges in dialysis care, enhancing the presentation of information on renal realities.

DISCUSSION:

The findings presented in the preceding sections provided insights into various facets of renal health, the management of chronic kidney disease, and the numerous challenges experienced by persons taking the dialysis journey. With the insights discussed in this section, suggestions on the implications for stakeholders in addressing the findings are also presented. The insights explored in this paper highlight the growing burden of chronic kidney disease worldwide; approaches seeking to address this public health problem must be more proactive. An example involves screening targeted populations more for early detection of the condition, which will allow timely treatment to prevent the development of end-stage renal disease. Healthy lifestyles such as physical activities, proper dieting, and optimal management of diabetes and hypertension elimination might also be emphasized to prevent disease development and worsening. However, from the perspectives of treatment modalities in the section above, there is a need to advise on

the best method because each has advantages and limitations. However, before I do that, I need to state that the model of care also needs to be more patient-centred during treatment. However, the patient may also be treated at home, provided that the logistical barriers of care, such as patient education, are resolved. Lastly, the following discussions reveal obstacles and challenges in accessing and utilizing dialysis services, which suggests multiple systemic issues that must be addressed to optimize patient care and enhance health equity. Several strategies could be adopted to eliminate most of these barriers to dialysis. These include increased access to dialysis services through reduced cost and infrastructure transformation. High insurance coverage and subsidies are essential to improve patient care and enhance health equity. Collaboration between stakeholders will also be vital, which might mean forming new partnerships. The future of dialysis seems promising according to the anticipated technological advancements, especially in service delivery. External technologies will likely bridge the disparity experienced in dialysis care. Expansion of kidney transplant facilities and organ procurement is expected to reach more people, according to Unit 4, Lesson M: session of this course.

CONCLUSION:

In conclusion, the complexity of kidney health and the dialysis journey means that the approach to this issue should be diverse and all-encompassing, including early detection, personalized treatment options, patient orientation, and overcoming all systemic barriers. Most of these issues can be addressed only on a larger scale. At the same time, innovation should become the fundamental core of our progress as a medical society, helping us provide better access to kidney health services and a better quality of life to adults with CKD and ESRD.

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