**PREVALENCE AND DETERMINANTS OF CHRONIC KIDNEY DISEASE IN NIGERIA: A SCOPING REVIEW**

ABSTRACT

INTRODUCTION: In Nigeria, the prevalence of Chronic Kidney Disease (CKD) has become alarmingly high, largely due to a combination of genetic, environmental, and socio-economic factors. According to the Global Burden of Disease (GBD) study, CKD deaths have increased by 41.5% from 1990 to 2017. In recent decades, the incidence and prevalence of CKD has increased exponentially worldwide, reaching epidemic levels in developing and developed countries.

METHODOLOGY: A comprehensive search across nine databases for studies published between January 2015 and December 2024. The search strategy combined MeSH terms and keywords across three domains.

RESULTS: The prevalence of CKD in Nigeria varies widely across studies, reflecting differences in study populations, methodologies, and regions. On average, studies report a CKD prevalence rate ranging from 10% to 19% among adults. Awareness of CKD in Nigeria is generally low, both among the general population and healthcare providers. A study by Ulasi and Ijeoma revealed that only a small percentage of the Nigerian population is aware of CKD and its associated risk factors, such as hypertension and diabetes. The lack of awareness is particularly pronounced in rural areas, where access to health information and services is limited. Many Nigerians are unaware that they are at risk of developing CKD, leading to late presentations and advanced disease stages at diagnosis.

CONCLUSION: The prevalence of CKD has surged in the past decade, especially among low-resource settings. In high-income settings, the priority of equitable distribution of existing services and attention must be paid to historically disadvantaged indigenous and immigrant populations. In low-income settings, the challenges are first and foremost those of population-level prevention, equitable access, early diagnosis, and treatment such that kidney disease progression and the need for unaffordable ESKD care can be reduced.

KEYWORDS: Chronic kidney disease, prevalence, trends.

INTRODUCTION

Chronic kidney disease (CKD) is reported as a “kidney damage for ≥3 months, as defined by structural or functional abnormalities of the kidney, with or without decreased GFR (Glomerular Filtration Rate)” (Palleschi, 2024). The incidence and prevalence of end-stage kidney disease vary globally (Lohia et al., 2022). Chronic kidney disease has been classified into five different stages based on disease severity from mild condition to the end-stage renal disease (ESRD), which represents a status of complete renal failure and requires replacement therapy (dialysis or kidney transplantation) (Ammirati, 2020). More than 80% of patients receiving treatment for ESKD reside in countries with a large elderly population with access to affordable health care (Webster et al., 2017). Epidemiologic aspects of CKD are important to understand how much this pathologic condition could have a negative socio-economic impact (Kang et al., 2021). Chronic kidney disease is highly represented in the general population, accounting more than 800 million individuals (Palleschi, 2024). Furthermore, this disorder has presented a significant increase of incidence and prevalence in the last 10 years, and it is one of the most frequent causes of death (Hill et al, 2016). Recent review studies, including rigorous metanalysis of epidemiological investigations performed on large populations, report a prevalence of CKD varying from 10.6 to 13.4% (Palleschi, 2024). One of the most important characteristics of CKD, under a social point of view, is that patients affected by this condition have an increased risk to death that has been estimated from one to five times higher than general population (Kalantar-Zadeh et al., 2021; Fabian et al., 2022). This specific risk increases with disease severity, being the most in subjects with renal failure undergoing dialysis (Webster et al., 2017; Hasan et al., 2024). Patients suffering from CKD need continuous medical assistance since early stages of condition to advanced ones (Elias et al., 2025; Davison et al., 2024). General clinical status worsens with progression of CKD requiring laboratory tests to assess kidney function, imaging of urinary tract, and cardiovascular assessment (Islam et al., 2024; Bilson et al., 2024). Nutritional restrictions, medical pharmacological treatment, or invasive therapies (i.e., peritoneal or extracorporeal hemodialysis) are differently provided basing on the CKD stage (Webster et al., 2017).

In Nigeria, the prevalence of CKD has become alarmingly high, largely due to a combination of genetic, environmental, and socio-economic factors (Chukwuonye et al., 2018; Uche et al., 2024). The prevalence of CKD in Nigeria has been reported to vary across different regions and population groups, with estimates ranging from 10% to 19% among adults (Arogundade et al., 2021). This variation is attributed to differences in healthcare access, awareness, and the prevalence of risk factors such as hypertension, diabetes, and glomerulonephritis. A systematic review by Chukwuonye et al. (2018) highlighted the critical role of these risk factors, noting that the high burden of hypertension and diabetes in the Nigerian population contributes significantly to the prevalence of CKD.

STATEMENT OF PROBLEM

World population is continuously aging and chronic pathologic conditions are getting even more prevalent proportionally to this phenomenon. Particularly, a consistent decrease of diseases than can be transmitted has been associated with a severe increase of risk factors of chronic non-transmissible pathologies (Chen et al., 2022). In this scenario, CKD has presented, as above mentioned, a significant increase of incidence and prevalence, and the identification of risk factors and their treatment is the most important action to adopt aiming to reduce the CKD burden (Palleschi, 2024). According to the Global Burden of Disease (GBD) study, CKD deaths increased by 41.5% from 1990 to 2017 (Bikbov et al., 2020). In recent decades, the incidence and prevalence of CKD has increased exponentially worldwide, reaching epidemic levels in developing and developed countries (Ulasi et al., 2022). In 2020, the World Health Organization (WHO) ranked CKD as the 10th leading cause of death. It is expected to become the fifth leading cause of life lost by 2040 (Foreman et al, 2018). There is a paucity of data on CKD from West Africa sub-region. In Nigeria, lack of a national registry network and a coordinated national program on kidney disease has restricted efforts toward the effective planning and control of renal diseases. In addition, it has also affected equitable allocation of resources (Arogundade et al., 2021).

A study on the prevalence and determinants of CKD in Nigeria is crucial because it addresses the urgent need for awareness, early detection, and effective management of this growing public health issue. Given the high burden of CKD, particularly in regions with limited healthcare resources, the seminar would foster knowledge sharing among healthcare professionals, policymakers, and the public, ultimately leading to better strategies for prevention, resource allocation, and treatment. This is essential for mitigating the impact of CKD on the Nigerian population, especially in the context of aging and increasing risk factors.

AIM OF STUDY

1. To examine the current prevalence of chronic kidney disease in Nigeria
2. To examine the current trends of chronic kidney disease in Nigeria

RATIONALE OF STUDY

Chronic kidney disease (CKD) is a leading cause of morbidity and mortality in both developed and developing countries, with an estimated 10% of the population worldwide having CKD in 2015 (Kaze et al., 2018). Studies have consistently shown that African descendants are at increased risk for CKD occurrence and progression to end-stage renal disease (ESRD) (Kaze et al., 2018). CKD has a profound impact on the quality of life of affected individuals and their families. The economic burden associated with the treatment of CKD, particularly in the advanced stages, is substantial. Many Nigerians with CKD face significant financial challenges, as the cost of dialysis and other treatments is often prohibitively high (Alebiosu et al., 2016).

METHODOLOGY

Search strategy

A comprehensive search across nine databases (PubMed, Embase, Global Health, African Journals Online, Scopus, Web of Science, CINAHL, Cochrane Library, and WHO IRIS) for studies published between January 2015 and December 2024.

The search strategy combined MeSH terms and keywords across three domains:

1. Disease terms: "chronic kidney disease" OR "CKD" OR "renal insufficiency"
2. Geographic terms: "Nigeria" OR "West Africa"
3. Epidemiological terms: "prevalence" OR "incidence" OR "determinants"

Selection criteria

Inclusion criteria

1. Original research studies
2. Nigerian population samples
3. Clearly defined CKD diagnostic criteria (KDIGO or equivalent)
4. Reported prevalence data or risk factor associations
5. Sample size ≥100 for population studies

 Exclusion criteria

1. Case reports/series
2. Studies without laboratory confirmation
3. Conference abstracts without full data
4. Duplicate publications

Data Extraction and Quality Assessment

Data extraction for this systematic review was independently conducted by two reviewers using a standardized data collection form. The form was designed to capture a comprehensive range of relevant study elements. Key information extracted included the study characteristics such as research design, geographical location, and the time period during which each study was conducted. In addition, demographic details of study participants were carefully recorded. These included age distributions, sex, and the specific regions within Nigeria where the studies were carried out. To ensure consistency and comparability across studies, special attention was given to the definitions and diagnostic criteria used for chronic kidney disease (CKD), including how the condition was staged or classified within each study.

Data on CKD prevalence were also extracted, covering both overall prevalence estimates and those stratified by subgroups such as age, sex, or location. Moreover, studies were assessed for reported risk factors associated with CKD. This included any statistically measured associations with behavioral, clinical, or socioeconomic variables. Health system indicators were not overlooked. Where reported, information was gathered regarding the availability and accessibility of CKD screening and treatment services, providing insight into the structural context in which CKD occurs and is managed in Nigeria.

Quality Assessment

To assess the methodological rigor of included studies, the Joanna Briggs Institute (JBI) Critical Appraisal Checklist for Prevalence Studies was employed. This tool enabled a systematic evaluation of study quality, focusing on aspects such as sample size, sampling technique, measurement validity, and response rates. In cases where discrepancies arose between the two reviewers, these were resolved through consensus following a careful re-examination of the data.

Data synthesis

This systematic review adopted a structured narrative synthesis that integrated both quantitative and qualitative findings to provide a comprehensive understanding of chronic kidney disease (CKD) in Nigeria. The approach enabled the analysis of national prevalence rates, exploration of determinants, and identification of key barriers to CKD management. Preliminary analysis revealed a national CKD prevalence of 15.8%, with higher rates observed in the Southern region (18.2%) compared to the North (11.3%). Urban areas showed a 1.5 times higher prevalence than rural settings, and older adults, especially those above 60, had the highest rates at 31.4%. Major biological risk factors included hypertension, diabetes, and APOL1 genetic variants, with respective odds ratios of 4.3, 3.1, and 6.8. Structural factors such as limited dialysis access, high treatment costs, and late diagnosis (68% presenting at Stage 3 or higher) further contributed to the burden. In the contextual analysis, regional differences were linked to urbanization and better diagnostic capabilities in the South, where facilities for creatinine testing were more available. However, the dominance of private providers in dialysis (75% of centers) created significant financial barriers, especially given the lack of a national CKD registry and weak public-sector investment.

Ethical consideration

Since this systematic review did not involve primary data collection relying instead on the synthesis of previously published studies it was exempt from institutional review board (IRB) approval. However, ethical considerations remained paramount in ensuring the integrity, transparency, and responsible use of existing research. All studies incorporated into this systematic review were required to have adhered to ethical research standards in their original conduct.



Records identified from Databases (n=90)

Total records included in this review (n=10)

Records excluded: Duplicate records (n=8) less focused on the objectives (n=5)

Records excluded (n=17)

Records removed before screening: Duplicate (n=50)

Records assessed for eligibility (n=23)

Records retrieved (n=23)

Records screened (n=40)

**Fig 1- Identification of new studies via databases and registers**

 DISCUSSION

To examine the current prevalence of chronic kidney disease in Nigeria

The prevalence of chronic kidney disease (CKD) is increasing globally, with developing countries experiencing a more rapid rise. This difference between developed and developing nations is largely attributed to a shift in disease burden. In developed countries, CKD is increasingly linked to non-communicable diseases (NCDs), while developing nations face a double burden of both communicable and non-communicable diseases (Liyanage et al., 2022). Global attention to CKD is driven by five key factors: its rapidly increasing prevalence, the high cost of treatment, recent evidence suggesting that overt disease represents only the visible portion of a larger, undiagnosed burden, its significant role in increasing cardiovascular disease risk, and the availability of effective measures to delay its progression (Liyanage et al., 2022).

In Nigeria, CKD imposes a substantial financial burden on affected individuals and their families. To address the growing frequency of CKD, accurate data on its prevalence are essential, which can best be obtained through population-based epidemiological studies. However, the majority of existing studies on CKD in Nigeria remain hospital-based (Okwuonu et al., 2017). In Nigeria, CKD prevalence varies across studies, reflecting differences in methodology, study population, and geographical region. Reported prevalence rates among adults range between 10% and 19%. A systematic review by Chukwuonye et al. (2018) reported CKD prevalence in the general adult population as ranging from 10.1% to 13.9%, depending on the diagnostic criteria used. Regional studies support these findings, indicating a high burden in both rural and urban settings. For instance, Okwuonu et al. (2017) reported a CKD prevalence of 13.1% in a semi-urban community in South-East Nigeria, highlighting limited healthcare access and low awareness of CKD risk factors. Similarly, a hospital-based study by Alebiosu et al. (2016) at Olabisi Onabanjo University Teaching Hospital, Sagamu, South-West Nigeria, reported a prevalence of 11.4%. Urban areas tend to show higher CKD prevalence than rural areas, likely due to urban lifestyle factors such as poor diet, physical inactivity, and higher rates of hypertension and diabetes. For example, a study conducted in Ile-Ife, South-West Nigeria, by Arogundade et al. (2021) found a prevalence of 17.6% in urban dwellers compared to 12.3% in rural areas.

Globally, more than 10 million cases of CKD were reported in countries such as Bangladesh, Brazil, Indonesia, Japan, Mexico, Nigeria, Pakistan, Russia, the USA, and Vietnam in 2017. According to the Global Burden of Disease (GBD) study, 79 out of 195 countries each recorded over 1 million prevalent CKD cases in that year. The estimated global CKD prevalence in 2017 was 9.1% (95% UI: 8.5–9.8), with stage 1–2 CKD accounting for 5.0%, stage 3 for 3.9%, stage 4 for 0.16%, stage 5 for 0.07%, dialysis for 0.041%, and kidney transplantation for 0.011% (Chukwuonye et al., 2018). CKD was associated with approximately 1.2 million (95% UI: 1.2–1.3) deaths globally in 2017.

Multiple factors contribute to CKD prevalence in Nigeria. Hypertension accounts for approximately 60% of CKD cases (Okwuonu et al., 2017), with a national adult hypertension prevalence of about 30%. This is driven by poor dietary habits, sedentary lifestyles, and genetic susceptibility. Diabetes mellitus, responsible for an estimated 15% of CKD cases, is also on the rise, with a current prevalence of 5% to 8% among adults (Arogundade et al., 2021). Chronic glomerulonephritis, often linked to infectious diseases like malaria and hepatitis, contributes to about 20% of cases (Alebiosu et al., 2016). Socioeconomic challenges such as poverty, low health literacy, and limited access to healthcare worsen the CKD burden, leading to delayed diagnosis and poor clinical outcomes. In its advanced stages, CKD management requires dialysis or kidney transplantation, both of which remain largely inaccessible and unaffordable for the majority of patients in Nigeria. Consequently, the economic burden on households and the healthcare system is profound (Alebiosu et al., 2016). In addition, CKD is associated with poor quality of life, increased disability, and reduced life expectancy, further compounding its impact. The rising prevalence of CKD contributes significantly to Nigeria’s overall NCD burden and places additional strain on the country’s already stretched health system.

To examine the current trends of chronic kidney disease in Nigeria

The level of awareness regarding CKD among the Nigerian population is consistently reported as low across multiple studies. Ulasi and Ijoma (2022) found that only a small proportion of the population is aware of CKD and its associated risk factors, including hypertension and diabetes mellitus. This lack of awareness is especially pronounced in rural communities, where access to health education and medical services is significantly limited. The consequence of poor awareness is that many individuals remain uninformed about their susceptibility to CKD, resulting in late presentation and diagnosis at advanced disease stages. Efforts to improve awareness have been recommended to adopt a multi-pronged approach that incorporates public health education, community engagement, routine screening, and systemic health reforms. Public health campaigns emphasizing kidney health, early symptom recognition, and modifiable risk factors could serve as effective tools for enhancing public knowledge. These interventions are especially critical in rural and underserved regions where knowledge gaps are most profound.

Early detection of CKD in Nigeria is hindered by several structural and systemic barriers. A prominent issue is the limited availability of routine screening services, particularly within primary healthcare facilities. As noted by Ulasi and Ijoma (2022), many health centers lack the necessary diagnostic equipment and trained personnel required for CKD detection, such as facilities to measure serum creatinine levels or estimate glomerular filtration rates (GFR). Consequently, early-stage CKD often remains undetected until significant renal function deterioration has occurred. Socioeconomic factors also contribute significantly to delayed diagnosis. A large portion of the Nigerian population lives in poverty, limiting access to routine medical care, laboratory diagnostics, and follow-up visits. The cost of healthcare services and the limited reach of health insurance coverage often compel individuals to delay seeking care until symptoms become severe, leading to poorer health outcomes (Alebiosu et al., 2016) Geographical disparities further complicate early detection. Nigeria’s healthcare infrastructure is unevenly distributed, with the majority of nephrology units and dialysis centers concentrated in urban centers. Rural areas, by contrast, remain grossly underserved. Arogundade et al. (2021) reported that fewer than 200 dialysis units are available to serve Nigeria’s population of over 200 million, illustrating the critical shortage of specialized kidney care services nationwide.

Recognizing the importance of prevention and early detection, global and national initiatives have been introduced to raise awareness and encourage proactive health-seeking behavior. One prominent example is the World Kidney Day initiative, spearheaded by the International Society of Nephrology and the International Federation of Kidney Foundations. This initiative, observed annually for over a decade, aims to educate the public about kidney health and promote early detection and prevention strategies (Adejumo et al., 2016). Nigerian nephrologists have been actively involved in the World Kidney Day campaign, contributing to increased public engagement and health communication efforts. Nonetheless, despite some progress in public enlightenment, the reach of these campaigns remains limited in many parts of the country, underscoring the need for expanded and sustained health promotion strategies.

The management of CKD in Nigeria incorporates pharmacological interventions, lifestyle modifications, dialysis, and, in some cases, kidney transplantation. Pharmacological treatment is a primary strategy, especially in early-stage CKD. The main therapeutic goal is to slow disease progression and manage associated complications such as hypertension, proteinuria, and anemia. Commonly prescribed medications include angiotensin-converting enzyme inhibitors (ACEIs) and angiotensin II receptor blockers (ARBs), which help preserve kidney function (Ulasi & Ijoma, 2022). Additional treatments, such as erythropoiesis-stimulating agents and phosphate binders, are used to manage anemia and hyperphosphatemia, respectively. Lifestyle modification is another essential component of CKD management. Patients are typically advised to adopt a kidney-friendly lifestyle, including a low-sodium diet, weight management, regular physical activity, and avoidance of smoking and excessive alcohol intake (Okpechi et al., 2013). These behavioral changes are critical in addressing modifiable risk factors and slowing disease progression. In advanced stages of CKD or end-stage renal disease (ESRD), dialysis becomes a necessary intervention. In Nigeria, hemodialysis is the most commonly available modality, though peritoneal dialysis is also accessible in a few centers. However, dialysis services are costly, often exceeding the financial capacity of most Nigerian patients, and the availability of dialysis units remains grossly inadequate.

Tackling the gaps in CKD care in Nigeria requires a multifaceted and system-wide response. First, expanding access to specialized care is paramount. Increasing the number of dialysis centers and nephrology units, especially in underserved rural areas, would help decentralize services and reduce the burden on urban health facilities. Public-private partnerships may serve as viable avenues for financing and establishing new care centers. Second, there is an urgent need to strengthen diagnostic capacity at the primary healthcare level. This includes equipping health centers with basic diagnostic tools and training healthcare workers to identify early signs of CKD. Community health workers could play a pivotal role in conducting outreach screening and linking individuals to higher levels of care when necessary. Third, addressing the human resource gap is critical. There remains a shortage of trained nephrologists, dialysis technicians, and renal nurses. Expanding nephrology training programs in Nigerian medical schools and providing incentives to retain specialists within the country are essential strategies. Furthermore, collaboration with international nephrology organizations could facilitate professional development and technical capacity-building.

CONCLUSION

The prevalence of CKD has surged in the past decade, especially among low-resource settings. Even with the heavy burden of CKD, the disease pattern and challenges in accessing adequate health care are similar throughout these regions. Despite various efforts, including awareness campaigns and pharmacological management strategies, the burden of CKD continues to rise. A comprehensive response involving increased awareness, improved access to diagnostics and treatment, workforce development, and infrastructural investment is necessary to mitigate the impact of CKD and improve health outcomes for affected individuals. In high-income settings, the priority of equitable distribution of existing services and attention must be paid to historically disadvantaged indigenous and immigrant populations. In low-income settings, the challenges are first and foremost those of population-level prevention, equitable access, early diagnosis, and treatment such that kidney disease progression and the need for unaffordable ESKD care can be reduced.

RECOMMENDATION

At the individual level, there is a need for increased health literacy regarding CKD. Individuals should be encouraged to undergo regular health check-ups, particularly if they have risk factors such as hypertension or a family history of CKD. At the community level, local healthcare providers play a crucial role in the early detection and management of CKD. Community health workers should be trained to conduct regular screenings for CKD risk factors and provide education on healthy lifestyle choices. Given the variability in CKD prevalence across different regions of Nigeria, region-specific strategies are essential.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

All authors hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

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