EURASIAN EXPERIMENT JOURNAL OF BIOLOGICAL SCIENCES (EEJBS)
ISSN: 2992-4138 ©EEJBS Publications
Volume 6 Issue 1 2025

Hypertension and Kidney Disease in West Africa: Exploring the Link and Health Impacts

Omutindo Nyakayo A.

Faculty of Science and Technology Kampala International University Uganda

ABSTRACT

Hypertension and chronic kidney disease (CKD) are major public health concerns in West Africa, contributing significantly to morbidity and mortality. The bidirectional relationship between hypertension and kidney disease creates a vicious cycle that exacerbates health outcomes and places immense pressure on healthcare systems. This review explores the epidemiology, pathophysiological mechanisms, and socioeconomic determinants of hypertension and CKD in West Africa. It highlights the rising prevalence of both conditions, driven by urbanization, dietary changes, and limited access to healthcare services. The review examines the pathophysiological link between hypertension and CKD, emphasizing hypertensive nephropathy as a leading cause of kidney failure. Additionally, it discusses the impact of poverty, environmental factors, and healthcare infrastructure deficiencies on disease progression. Barriers to early diagnosis and effective management, including cultural beliefs and limited medical resources, are also addressed. The review evaluates current treatment strategies, including pharmacological approaches, renal replacement therapy, and the role of traditional medicine. Public health interventions and policy recommendations aimed at mitigating the burden of hypertension and CKD in the region are explored, with an emphasis on improving healthcare access, early detection, and community-based health education. By providing a comprehensive understanding of these interconnected conditions, this review contributes to developing targeted strategies to reduce disease burden and improve health outcomes in West Africa.

Keywords: Hypertension, Chronic Kidney Disease, West Africa, Hypertensive Nephropathy.

INTRODUCTION

Hypertension, often referred to as the "silent killer," is a major health concern worldwide, and its prevalence has been steadily increasing in many regions, including sub-Saharan Africa [1]. In West Africa, hypertension has emerged as a leading risk factor for various cardiovascular diseases, including chronic kidney disease (CKD). The coexistence of hypertension and kidney disease is a growing public health challenge in the region, as both conditions contribute significantly to morbidity and mortality [2]. Hypertensive nephropathy, a kidney disease induced by prolonged high blood pressure, is one of the most common causes of kidney failure in West Africa [3]. As the burden of hypertension continues to rise in the region, understanding the link between hypertension and kidney disease, as well as the impacts on health outcomes, has become increasingly important [4].

Chronic kidney disease is a progressive condition characterized by a gradual decline in kidney function, which, if left untreated, can lead to end-stage renal failure requiring dialysis or a kidney transplant. CKD has emerged as a global health burden, with a substantial impact on both individual patients and healthcare systems [5]. In many West African countries, where healthcare resources are limited and healthcare infrastructure is often insufficient, CKD remains underdiagnosed and undertreated. Furthermore, the bidirectional relationship between hypertension and kidney disease complicates the diagnosis and management of both conditions. Hypertension can contribute to kidney damage, while CKD can, in turn, exacerbate hypertension, leading to a vicious cycle that worsens health outcomes for individuals and places immense pressure on health systems [6].

In West Africa, the rising prevalence of hypertension and kidney disease is driven by various factors, including rapid urbanization, changing lifestyles, and socioeconomic disparities. A shift towards more sedentary lifestyles, poor dietary habits, and increased intake of salt and processed foods are significant contributors to the high rates of hypertension in the region [7]. Additionally, limited access to healthcare, especially in rural areas, and a lack of public awareness about the risks of hypertension and kidney disease further complicate the situation. Despite the increasing burden of these diseases, there is a lack of region-specific research and insufficient policies to address the challenges posed by hypertension and CKD in West Africa [8]. This review examines the relationship between hypertension and kidney disease in West Africa, focusing on epidemiological trends, pathophysiological mechanisms, and social determinants. It examines the prevalence and trends of hypertension and chronic kidney disease in various West African countries, investigates the pathophysiological mechanisms underlying the relationship, and explores socioeconomic and environmental determinants such as poverty, urbanization, dietary patterns, and access to clean water. The review also identifies barriers to early diagnosis and treatment of hypertension and CKD, including healthcare infrastructure, cultural beliefs, and limited diagnostic facilities. It discusses management and treatment strategies for hypertension and CKD, including pharmacological approaches, renal replacement therapy, and traditional medicine.

The review assesses public health interventions and policy approaches aimed at preventing and managing hypertension and kidney disease in West Africa, and explores opportunities for improving healthcare delivery. The review provides a comprehensive understanding of the complex relationship between hypertension and kidney disease in West Africa and proposes recommendations for improving health outcomes. Research questions include understanding the current prevalence and trend of hypertension and chronic kidney disease in West Africa, understanding the pathophysiological interaction between the two conditions, identifying socioeconomic and environmental factors contributing to the high prevalence of hypertension and kidney disease, identifying barriers to early diagnosis and treatment, and assessing current management strategies and public health policies and interventions. The significance of this review lies in its potential to address a pressing public health issue in West Africa—hypertension and its impact on kidney disease. The region has witnessed significant demographic and lifestyle changes over the past few decades, including urbanization, dietary shifts, and increased sedentary behaviors, all of which have contributed to the rising prevalence of hypertension and CKD. These trends are compounded by social determinants of health, such as poverty, limited access to healthcare, and inadequate public health awareness. Given the limited resources in many West African countries, addressing the dual burden of hypertension and kidney disease requires a multifaceted approach that includes improved diagnostic capacity, better management strategies, and stronger public health policies. Understanding the bidirectional relationship between hypertension and kidney disease in West Africa is crucial for informing healthcare policies, improving prevention programs, and optimizing treatment protocols. This review will also highlight the specific challenges and opportunities in the region, offering insights into how public health interventions can be tailored to the unique needs of West African populations. Moreover, by exploring the socioeconomic and environmental factors contributing to the rise of these conditions, this review will contribute to the development of context-specific strategies for reducing the burden of hypertension and CKD in the region. Finally, the findings of this study will help raise awareness about the importance of early detection, prevention, and management of hypertension and kidney disease, both among healthcare professionals and the general public. With the growing burden of chronic diseases in West Africa, this review provides an opportunity to advocate for policy changes, investment in healthcare infrastructure, and the expansion of healthcare services to better address hypertension and CKD. By fostering a deeper understanding of these conditions and their interrelationship, this review can contribute to improving health outcomes, reducing the impact of kidney disease, and ultimately enhancing the quality of life for individuals living with hypertension and CKD in West Africa. In summary, this review aims to provide a comprehensive and region-specific analysis of hypertension and kidney disease in West Africa, with the ultimate goal of improving health outcomes, informing policy decisions, and enhancing public health interventions that address these pressing health issues.

Epidemiology of Hypertension and Kidney Disease in West Africa

Hypertension and chronic kidney disease (CKD) are major public health challenges in West Africa, affecting between 25% and 48% of adults [9]. These conditions contribute to high morbidity and mortality rates, placing an increasing burden on healthcare systems. Understanding the prevalence, trends, and demographic variations in these diseases is essential for developing effective prevention and management strategies. Hypertension affects between 25% and 48% of adults in the region, with variations depending on the country, age group, and urban versus rural settings. Countries like Nigeria, Ghana, Senegal, and

Côte d'Ivoire have reported alarmingly high rates of hypertension, often exceeding 30% in adult populations [10]. CKD prevalence ranges between 10% and 17%, with some studies reporting even higher figures in specific high-risk populations such as people with diabetes, hypertensive individuals, and those with a family history of kidney disease. Demographic and regional variations in disease burden also influence the prevalence and severity of these diseases. Age, gender differences, urban vs. rural disparities, and socioeconomic and ethnic variations all play a crucial role in hypertension and CKD prevalence. Urbanization, lifestyle changes, genetic factors, inadequate healthcare infrastructure, and economic constraints limit access to effective treatment. Addressing this growing epidemic requires multifaceted interventions, including improved healthcare access, better screening programs, public health education, and policies promoting healthier lifestyles. Strengthening healthcare systems and ensuring the affordability of essential medications and treatments are crucial steps in reducing the impact of hypertension and CKD in West Africa [11].

Pathophysiological Link between Hypertension and Kidney Disease

Hypertension and chronic kidney disease (CKD) are closely interrelated, with each condition exacerbating the other in a vicious cycle. Hypertension is both a cause and a consequence of CKD, leading to progressive renal damage through several interconnected mechanisms [12]. Chronic hypertension damages the renal vasculature, glomeruli, and tubulointerstitial structures, eventually resulting in chronic kidney dysfunction. Kidney disease can worsen hypertension by impairing the regulation of fluid and electrolyte balance, renin-angiotensin-aldosterone system (RAAS) activity, and vascular tone. This bidirectional relationship makes hypertension one of the leading risk factors for CKD progression and end-stage renal disease (ESRD).

Hypertensive nephropathy, also known as hypertensive kidney disease, is the structural and functional damage to the kidneys caused by chronic high blood pressure. The mechanisms underlying hypertensive nephropathy include glomerular hypertension and hyperfiltration, vascular remodeling and ischemic injury, tubulointerstitial fibrosis and nephron loss, and sodium and volume overload. The interplay of endothelial dysfunction, inflammation, and oxidative stress is central to the development and progression of hypertensive nephropathy. Chronic hypertension leads to low-grade systemic inflammation, characterized by elevated levels of inflammatory cytokines, which stimulate macrophage infiltration, fibrotic changes, and tubular injury, accelerating CKD progression [13]. Genetic factors play a significant role in the susceptibility, progression, and severity of hypertensive nephropathy, particularly in West African populations. Key genetic markers have been identified that contribute to increased risk of kidney disease in individuals of African descent. Socioeconomic and environmental factors contribute to disparities in CKD progression among West African populations. Addressing these challenges requires early detection, aggressive blood pressure management, lifestyle modifications, and targeted therapeutic interventions to slow CKD progression and improve outcomes [14].

Socioeconomic and Environmental Determinants

The prevalence of hypertension and chronic kidney disease (CKD) in West Africa is significantly influenced by socioeconomic and environmental factors. Poverty, urbanization, dietary habits, lifestyle changes, and access to healthcare significantly impact disease incidence, progression, and outcomes [15]. Addressing these factors is crucial for effective prevention and management strategies in the region. Poverty and limited access to healthcare lead to delayed diagnosis and poor disease management, while urbanization and lifestyle changes contribute to an increased burden of non-communicable diseases. High salt intake, obesity, and dietary shifts further escalate hypertension and CKD risks. Access to clean water and proper sanitation is essential for preventing infections and exposure to nephrotoxic agents. Individuals in low-income communities are at high risk of recurrent urinary tract infections (UTIs), which can progress to pyelonephritis (kidney infections) and CKD. Waterborne infections like Schistosomiasis and other parasitic infections can cause chronic inflammation and kidney fibrosis, increasing CKD risk. Environmental toxins such as heavy metals and industrial waste from contaminated water and air can cause direct nephrotoxicity [16]. The epidemiology of hypertension and CKD in West Africa is deeply influenced by socioeconomic and environmental factors. Addressing these social determinants through policy interventions, public health campaigns, and improved healthcare infrastructure is essential to mitigate the burden of hypertension and kidney disease in the region.

Barriers to Early Diagnosis and Treatment

Hypertension and chronic kidney disease (CKD) are significant public health issues in West Africa, but early diagnosis and treatment remain significant challenges [17]. Many individuals remain undiagnosed until the disease has advanced to an advanced stage, leading to increased morbidity and mortality. Barriers include limited access to healthcare, lack of diagnostic facilities, underdiagnosis, late presentation, and cultural beliefs that influence healthcare-seeking behaviors. Inadequate healthcare infrastructure, financial

barriers, urban-rural disparities, low awareness, underdiagnosis, late presentation, cultural beliefs, and cultural beliefs all contribute to delayed diagnosis and poor disease management. Inadequate healthcare infrastructure, particularly in rural areas, leads to a shortage of medical specialists, inadequate diagnostic equipment, and limited access to dialysis and transplant services. Financial barriers include out-of-pocket expenses, high costs of medications, and transportation costs. Urban-rural disparities also contribute to delayed diagnosis and treatment due to limited healthcare facilities, specialists, long travel distances, and poor health literacy. Underdiagnosis and late presentation of CKD often result from the asymptomatic nature of early CKD and hypertension, which often do not cause noticeable symptoms until severe complications develop [18]. Low awareness and poor screening practices, limited public health campaigns, lack of routine screening programs, and delayed referral systems further hinder early diagnosis and treatment. Cultural beliefs and healthcare-seeking behaviors also play a role in influencing healthcare access. Reliance on traditional and herbal medicine, fear and mistrust of Western medicine, gender and social norms, and religious beliefs can also affect healthcare access. To improve early diagnosis and treatment of hypertension and CKD in West Africa, several strategies should be implemented: strengthening healthcare infrastructure and accessibility, implementing widespread screening programs, raising public awareness and education, addressing cultural and behavioral barriers, and promoting healthy lifestyle habits. By addressing these challenges, West African countries can reduce the burden of hypertension and kidney disease and improve overall health outcomes [19].

Management and Treatment Strategies

Hypertension and kidney disease are interconnected conditions that require a multidisciplinary approach to management and treatment [20]. Effective strategies involve both pharmacological and non-pharmacological interventions, access to renal replacement therapy, and the integration of traditional medicine, particularly in regions like West Africa where healthcare resources may be limited. Non-pharmacological approaches include lifestyle modifications such as the DASH diet, reducing salt intake, limiting processed and fast foods, and engaging in regular exercise. Weight management, reducing alcohol and tobacco use, and stress management can help manage stress, which is a contributing factor to hypertension [21]. Pharmacological approaches include diuretics, angiotensin-converting enzyme inhibitors, calcium channel blockers, and beta-blockers. In West Africa, limited access to essential antihypertensive medications, poor medication adherence, and lack of routine blood pressure screening lead to late diagnosis and complications. Renal replacement therapy (RRT) becomes necessary when kidney function declines significantly due to CKD or acute kidney injury (AKI). Dialysis, hemodialysis, and peritoneal dialysis are the most common forms of RRT, but they face challenges due to high costs, insufficient infrastructure, and poor maintenance [22]. Traditional medicine plays a significant role in managing hypertension and kidney disease in West Africa, with herbal remedies being used for hypertension, kidney disease management, and detoxification practices [23]. However, challenges include lack of scientific validation, toxicity concerns, herb-drug interactions, and standardization issues. Efforts to integrate traditional medicine with modern healthcare include scientific validation of herbal medicines, regulatory frameworks for herbal practitioners, and encouraging collaboration between traditional healers and medical professionals. Public awareness campaigns and collaboration between traditional healers and medical professionals can also help improve access to these treatments.

Public Health Interventions and Policy Approaches

Hypertension and chronic kidney disease (CKD) are major public health concerns in West Africa, contributing to high morbidity and mortality rates. Addressing these conditions requires a comprehensive strategy that includes government-led initiatives, strengthening primary healthcare and screening programs, and leveraging international collaborations [24]. Governments in West Africa have implemented various policies and programs to combat non-communicable diseases (NCDs) like hypertension and CKD, aiming to improve disease prevention, early detection, and access to treatment. Key components include national health policies and strategies, public awareness campaigns, subsidization of essential medications and treatments, regulation of food and beverage industries, and enforcement of nutrition labeling and restrictions on unhealthy food advertisements. However, challenges in government initiatives include limited funding and infrastructure, weak enforcement of health policies, and healthcare worker shortages. To improve outcomes, governments must increase investment in healthcare, enhance policy implementation, and strengthen partnerships with non-governmental organizations (NGOs) and private sector players. Primary healthcare is the foundation of disease prevention and early intervention for hypertension and CKD. Strengthening PHC services ensures that communities receive timely diagnosis, treatment, and lifestyle guidance. Effective strategies include routine blood pressure and kidney function tests, school and workplace screenings, health education programs, digital health solutions, and training

healthcare workers. International collaborations play a crucial role in strengthening kidney disease prevention, research, and treatment in West Africa. These collaborations involve global health organizations, non-profits, research institutions, and donor agencies. The World Health Organization (WHO) supports West African governments in implementing hypertension and CKD control strategies, while international NGOs and foundations provide training for African nephrologists and support kidney disease research. However, challenges in international collaborations include dependency on external funding, fragmentation of efforts, and limited government ownership [25]. To maximize impact, West African governments must align international collaborations with national healthcare priorities, ensure sustainability, and enhance local capacity building.

CONCLUSION

Hypertension and chronic kidney disease (CKD) are significant health issues in West African populations, influenced by genetic predisposition, lifestyle changes, urbanization, and socioeconomic disparities. The relationship between these conditions worsens health outcomes, necessitating early detection and effective management. However, many West African countries lack adequate healthcare infrastructure, limiting access to screening, diagnosis, and treatment. Public health interventions and policy approaches are crucial in addressing these challenges. Government initiatives, strengthening primary healthcare systems, and enhancing community-based screening programs are essential steps. International collaborations can further support capacity-building efforts, research, and resource mobilization. A multifaceted approach is needed, combining preventive strategies, early detection, and improved treatment access. Lifestyle modifications, such as healthier diets, increased physical activity, and reduced salt intake, should be promoted through public awareness campaigns. Expanding access to affordable medications, promoting routine screening for at-risk individuals, and integrating traditional medicine with modern healthcare practices can bridge existing care gaps. Addressing hypertension and CKD requires sustained commitment from governments, healthcare professionals, researchers, and communities.

REFERENCES

1. Daugherty, A.M.: Hypertension-related risk for dementia: A summary review with future directions. Seminars in Cell & Developmental Biology. 116, 82–89 (2021). https://doi.org/10.1016/j.semcdb.2021.03.002
2. Akena, D., Kiguba, R., Muwhezi, W.W., Kwesiga, B., Kigozi, G., Lukwata, H., Nakasujja, N.: The prevalence and factors associated with mental disorders in a community setting in central Uganda. PLoS One. 18, e0285091 (2023). https://doi.org/10.1371/journal.pone.0285091
3. Ajayi, S.O., Ekrikpo, U.E., Ekanem, A.M., Raji, Y.R., Ogah, O.S., Ojji, D.B., Okpechi-Samuel, U.S., Ndlovu, K.C.Z., Bello, A.K., Okpechi, I.G.: Prevalence of Chronic Kidney Disease as a Marker of Hypertension Target Organ Damage in Africa: A Systematic Review and Meta-Analysis. Int J Hypertens. 2021, 7243523 (2021). https://doi.org/10.1155/2021/7243523
4. Mills, K.T., Stefanescu, A., He, J.: The global epidemiology of hypertension. Nat Rev Nephrol. 16, 223–237 (2020). https://doi.org/10.1038/s41581-019-0244-2
5. Adonu C. C, Ugwu O. P. C, Bawa A, Ossai E. C, Nwaka A.C (2013). Intrinsic blood coagulation studies in patients suffering from both diabetes and hypertension.Int*Journal of Pharmaceutical Medicine and Bio Science, 2 (2), 36-45.*
6. Veronica, L.A., Bosco, M.J.: Literature Review of the Prevalence of Hypertension at Gulu University, Gulu City, Acholi Subregion, Northern Uganda. World Journal of Cardiovascular Diseases. 14, 588–602 (2024). https://doi.org/10.4236/wjcd.2024.149051
7. Batubo, N.P., Moore, J.B., Zulyniak, M.A.: Dietary factors and hypertension risk in West Africa: a systematic review and meta-analysis of observational studies. J Hypertens. 41, 1376–1388 (2023). https://doi.org/10.1097/HJH.0000000000003499
8. Ulasi, I.I., Awobusuyi, O., Nayak, S., Ramachandran, R., Musso, C.G., Depine, S.A., Aroca-Martinez, G., Solarin, A.U., Onuigbo, M., Luyckx, V.A., Ijoma, C.K.: Chronic Kidney Disease Burden in Low-Resource Settings: Regional Perspectives. Seminars in Nephrology. 42, 151336 (2022). https://doi.org/10.1016/j.semnephrol.2023.151336
9. Abd ElHafeez, S., Bolignano, D., D'Arrigo, G., Dounousi, E., Tripepi, G., Zoccali, C.: Prevalence and burden of chronic kidney disease among the general population and high-risk groups in Africa: a systematic review. BMJ Open. 8, e015069 (2018). https://doi.org/10.1136/bmjopen-2016-015069
10. Dai, B., Addai-Dansoh, S., Nutakor, J.A., Osei-Kwakye, J., Larnyo, E., Oppong, S., Boahemaa, P.Y., Arboh, F.: The prevalence of hypertension and its associated risk factors among older adults in Ghana. Front Cardiovasc Med. 9, 990616 (2022). https://doi.org/10.3389/fcvm.2022.990616

11. Odu, J., Osi, K., Nguyen, L., Goldstein, A., Appel, L.J., Matsushita, K., Ojji, D., Orji, I.A., Alex-Okoh, M., Odoh, D., Toma, M.M., Elemuwa, C.O., Lamorde, S., Baraya, H., Dewan, M.T., Chijioke, O., Moran, A.E., Agogo, E., Thomas, M.P.: On-demand mobile hypertension training for primary health care workers in Nigeria: a pilot study. BMC Health Serv Res. 24, 444 (2024). https://doi.org/10.1186/s12913-024-10693-x
12. Kubiak, R.W., Sveum, E.M., Faustin, Z., Muwonge, T., Zaidi, H.A., Kambugu, A., Masereka, S., Kasozi, J., Bassett, I.V., O'Laughlin, K.N.: Prevalence and risk factors for hypertension and diabetes among those screened in a refugee settlement in Uganda. Conflict and Health. 15, 53 (2021). https://doi.org/10.1186/s13031-021-00388-z
13. Shin, J., Konlan, K.D., Mensah, E.: Health promotion interventions for the control of hypertension in Africa, a systematic scoping review from 2011 to 2021. PLoS One. 16, e0260411 (2021). https://doi.org/10.1371/journal.pone.0260411
14. Lankenau, B.H., Stefan, M.D.: Public Health, NCDs, Health Promotion, and Business Partnering: Benefits, Concerns, Remedies, and Moving Towards Creative Partnering. In: McQueen, D.V. (ed.) Global Handbook on Noncommunicable Diseases and Health Promotion. pp. 345–363. Springer, New York, NY (2013)
15. Stott, L., Murphy, D.F.: An Inclusive Approach to Partnerships for the SDGs: Using a Relationship Lens to Explore the Potential for Transformational Collaboration. Sustainability. 12, 7905 (2020). https://doi.org/10.3390/su12197905
16. Uduak E U, Netete B. V, Timbuak J. A, Ibegbu A. O, Musa S. A, Hamman W. O (2014). Dermatoglyphics and Cheiloscopy Pattern in Hypertensive Patients; A Study in Ahmadu Bello University Teaching Hospital, Zaria, Nigeria and Environs. *International Journal of Scientific and Research Publications, 4, (5), 1-5.*
17. Turana, Y., Tengkawan, J., Chia, Y.C., Shin, J., Chen, C., Park, S., Tsoi, K., Buranakitjaroen, P., Soenarta, A.A., Siddique, S., Cheng, H., Tay, J.C., Teo, B.W., Wang, T., Kario, K.: Mental health problems and hypertension in the elderly: Review from the HOPE Asia Network. J Clin Hypertens (Greenwich). 23, 504–512 (2020). https://doi.org/10.1111/jch.14121
18. Chu, B., Marwaha, K., Sanvictores, T., Awosika, A.O., Ayers, D.: Physiology, Stress Reaction. In: StatPearls. StatPearls Publishing, Treasure Island (FL) (2025)
19. Mohamed F. Y. M, Selim T, Hussein H M, Hassan A A A, Said A A, Said M S, Abdirahman K M, Saadaq A. H., Ishak A. A., Mohamed AM A. (2024). Exploring the prevalence, clinical spectrum, and determinants of uncontrolled hypertension in the emergency department: Insights from a hospital-based study in Somalia. *Current Problems in Cardiology, 102589. https://doi.org/10.1016/j.cpcardiol.2024.102589.*
20. Pugh, D., Gallacher, P.J., Dhaun, N.: Management of Hypertension in Chronic Kidney Disease. Drugs. 79, 365–379 (2019). https://doi.org/10.1007/s40265-019-1064-1
21. Charchar, F.J., Prestes, P.R., Mills, C., Ching, S.M., Neupane, D., Marques, F.Z., Sharman, J.E., Vogt, L., Burrell, L.M., Korostovtseva, L., Zec, M., Patil, M., Schultz, M.G., Wallen, M.P., Renna, N.F., Islam, S.M.S., Hiremath, S., Gyeltshen, T., Chia, Y.-C., Gupta, A., Schutte, A.E., Klein, B., Borghi, C., Browning, C.J., Czesnikiewicz-Guzik, M., Lee, H.-Y., Itoh, H., Miura, K., Brunström, M., Campbell, N.R.C., Akinnibossun, O.A., Veerabhadrappa, P., Wainford, R.D., Kruger, R., Thomas, S.A., Komori, T., Ralapanawa, U., Cornelissen, V.A., Kapil, V., Li, Y., Zhang, Y., Jafar, T.H., Khan, N., Williams, B., Stergiou, G., Tomaszewski, M.: Lifestyle management of hypertension: International Society of Hypertension position paper endorsed by the World Hypertension League and European Society of Hypertension. J Hypertens. 42, 23–49 (2024). https://doi.org/10.1097/HJH.0000000000003563
22. Sahithya, V., Sivanantham, P., Anandraj, J., Parameswaran, S., Sekhar Kar, S.: Economic cost of hemodialysis and peritoneal dialysis under public–private partnership in a public tertiary care centre of Puducherry, India. Expert Review of Pharmacoeconomics & Outcomes Research. 1–7. https://doi.org/10.1080/14737167.2024.2439515
23. Boy, H.I.A., Rutilla, A.J.H., Santos, K.A., Ty, A.M.T., Yu, A.I., Mahboob, T., Tangpoong, J., Nissapatorn, V.: Recommended Medicinal Plants as Source of Natural Products: A Review. Digital Chinese Medicine. 1, 131–142 (2018). https://doi.org/10.1016/S2589-3777(19)30018-7
24. Mosadeghrad, A.M., Isfahani, P., Eslambolchi, L., Zahmatkesh, M., Afshari, M.: Strategies to strengthen a climate-resilient health system: a scoping review. Globalization and Health. 19, 62 (2023). https://doi.org/10.1186/s12992-023-00965-2

25. Aja, P. M., Nwuguru, M. E., Okorie, U. C., Alum, E. U. and Offor, C. E. Effect of Decoction Extract of *Whitfieldialateritia* on Lipid Profiles in Hypercholesterolemic Albino Rats. *Global Veterinaria*, 2015; 14(3): 448-452. DOI: 10.5829/idosi.gv.2015.14.03.93130.

CITE AS: Omutindo Nyakayo A. (2025). Hypertension and Kidney Disease in West Africa: Exploring the Link and Health Impacts. EURASIAN EXPERIMENT JOURNAL OF BIOLOGICAL SCIENCES, 6(1):65-71