

Preventing Chronic Kidney Disease: The Role of Community-Based Interventions

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Abstract

Chronic Kidney Disease (CKD) is a growing public health crisis, driven by the increasing prevalence of metabolic disease. Without timely detection and intervention, CKD can progress to end stage kidney disease, leading to significant morbidity and mortality. In line with the theme of World Kidney Day (WKD) 2025, "Are Your Kidneys OK? Detect Early, Protect Kidney Health," this article explores community-based interventions as a key strategy in preventing CKD. Awareness campaigns, early screening programmes, and integration of kidney care with primary health care are essential for mitigating CKD risk. Policymakers, healthcare professionals, and community organizations must collaborate to implement sustainable strategies that promote kidney health and reduce CKD-related burden.

Keywords: Chronic kidney disease, community-based interventions, health education, lifestyle, kidney screening, preventive medicine

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Introduction

Chronic Kidney Disease (CKD) impacts millions globally, with Asia and Africa experiencing a concerning increase in cases attributed to genetic factors, environmental influences, and socioeconomic challenges.¹ Timely diagnosis is essential for halting the advancement of CKD; however, a significant number of cases remain undetected due to insufficient awareness and limited access to healthcare. The World Kidney Day (WKD) 2025 theme highlights the significance of early screening and preventive measures in safeguarding kidney health. This article emphasizes the importance of community-driven initiatives in tackling CKD and showcases approaches to enhance awareness, diagnosis, and management at the

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local level.

The Burden of CKD

CKD, a growing concern, is frequently identified in advanced stages when treatment options are limited and expensive. The rising prevalence of diabetes, hypertension, and obesity, which are the primary contributors to kidney disease, exacerbates the significant impact of CKD in this area.¹ A lack of awareness among the public and primary care providers leads to delayed diagnosis and treatment. Inequities in healthcare access, especially in rural and disadvantaged regions, hinder early screening and therapeutic interventions.² Environmental and occupational hazards, such as exposure to toxins, heat stress, and certain herbo-mineral products, also play a role in the progression of CKD.³

Community-Based Interventions for CKD Prevention

Community-Based Interventions (CBIs) are health initiatives that involve local populations in disease prevention and management through education, screening, and lifestyle modifications.⁴ These initiatives play a crucial role in preventing CKD in this region, as access to healthcare can be limited for many individuals. By utilizing community networks, CBIs can enhance awareness, enable early detection, and encourage kidney-friendly lifestyle practices. The following strategies highlight key CBIs.

Awareness Campaigns and Health Education

Public health campaigns are crucial for raising awareness about the risk factors, symptoms, and prevention of CKD. Strategies include community workshops and health fairs, which involve local communities in interactive discussions about kidney health.⁵ Digital and media campaigns utilize social media, radio, and television to disseminate CKD awareness messages to a broader audience. Additionally, school and workplace programmes focus on educating students and employees about preventive healthcare approaches.

Screening Programmes

The early identification of CKD through specific screening efforts can greatly slow its progression.⁶ Community-based screening programmes should target high-risk groups, including individuals with diabetes, hypertension, obesity, cardiovascular issues, and those with a family history of

CKD. Mobile screening units should be utilized to provide portable diagnostic services in remote and underserved regions. It is also essential to integrate CKD screening with existing health initiatives, incorporating it into maternal health, human immunodeficiency virus (HIV), and non-communicable disease programmes. Early identification and management of kidney disease during pregnancy is crucial for optimal maternal and foetal outcomes. Regular monitoring of kidney function through blood pressure, urine albumin-creatinine ratio (uACR) and serum creatinine evaluation can facilitate early diagnosis.

Lifestyle Modifications and Behavioural Interventions

Promoting healthy lifestyle choices can help prevent the onset of CKD and slow its progression.⁷ These include reduction of salt consumption, balanced nutrition, and proper hydration. Physical activity programmes that organize community fitness activities can help tackle obesity and metabolic issues. Additionally, smoking cessation initiatives highlight the detrimental effects of tobacco on kidney health. Collaboration with local healthcare professionals and non-governmental organizations can improve adoption of healthier habits.

Integration with Primary Healthcare

Sensitizing and strengthening primary healthcare is essential for the prevention of CKD.⁸ Important steps include training frontline health workers, informing community health workers about CKD risk evaluation and treatment, making kidney function tests a standard procedure in primary care, integrating CKD testing into routine check-ups and establishing referral pathways for advanced care.

Water and Sanitation Initiatives

Infectious diseases, including water- and food-borne infections increase the risk of kidney disease.⁹ Preventive strategies include enhancing water filtration and purification systems. There is a need for hygiene and sanitation promotion, as safe sanitation practices, including appropriate waste disposal and hand hygiene, can help decrease the rate of infections associated with kidney disease. Additionally, vector control and environmental management are necessary; establishing community-driven programmes for mosquito and vector control, such as effective drainage systems, waste management, and eco-friendly insecticides, can aid in preventing infections like malaria and leptospirosis, which can lead to kidney damage.

Reducing Exposure to Heavy Metals, Pesticides, and Agricultural Toxins

Environmental contaminants have been connected to CKD in developing countries.³ Community-oriented strategies include fostering organic farming to support sustainable practices that minimize the use of chemical pesticides and fertilizers. This encompasses the monitoring of water and soil quality by conducting routine assessments to uncover and address contamination. Moreover, increasing public awareness about exposure to toxins is essential, informing farmers and consumers about the hazards associated with heavy metal contamination and pesticide use.

Addressing Heat Stress as a CKD Risk Factor

Climate change has intensified kidney injuries related to heat stress, especially among labourers.³ Preventive actions consist of hydration awareness initiatives that inform outdoor workers about proper fluid consumption and how to identify symptoms of heat stress. Additionally, providing cooling centres and shade structures involves creating rest zones for agricultural and construction workers. Occupational safety policies must be put in place to safeguard workers from extreme heat exposure.

The Hub and Spoke Model

To effectively address CKD, we propose implementing a hub and spoke model to facilitate a decentralized and scalable approach to screening and early intervention. This model as depicted in Figure, creates central "hub" healthcare centres equipped with advanced diagnostic tools, which are complemented by several "spoke" outreach locations in rural and underserved regions. These spokes, managed by trained community health workers, perform initial screening and refer high-risk individuals to hub centres for further assessment and management.

Decentralization of CKD screening and management is

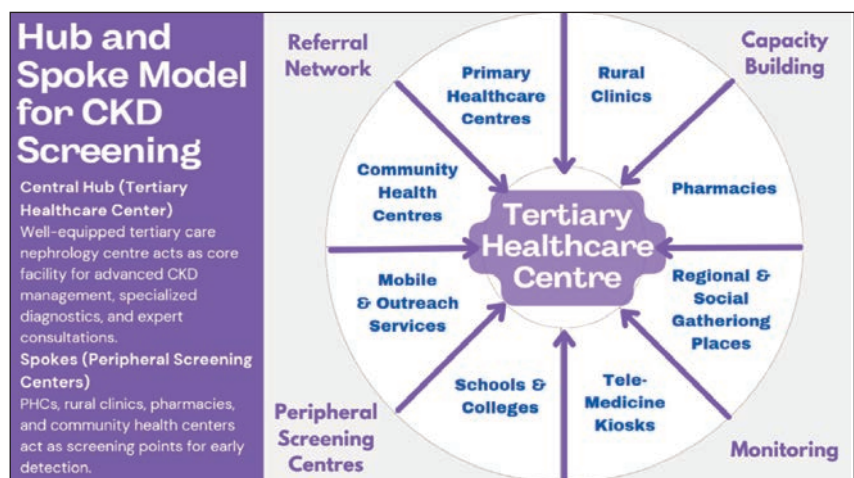


Figure: Hub and Spoke Model for Decentralised CKD Screening.

crucial to reach high-risk populations. Governments must invest in strengthening healthcare infrastructure and quality, ensuring that kidney health services are accessible in primary health centres and mobile health clinics. This would facilitate routine CKD testing and timely referrals without overburdening tertiary care hospitals.

Sustainable funding for community health programmes should be prioritized. Resources should be allocated for CKD awareness, screening, and education programmes. Public-private partnerships can help mobilize additional funds, ensuring the long-term viability of these initiatives.

Integration of CKD screening into existing primary healthcare services is necessary for early detection. Screening should be routinely conducted in programmes focussed on maternal health (obstetric clinics), diabetes, hypertension, obesity, and cardiovascular disease. Training primary care physicians and community health workers in CKD detection will strengthen early intervention efforts and ensure timely management.

Regulatory measures to control environmental risk factors must be enforced. Heavy metals, pesticides, agricultural toxins and unregulated herbo-mineral products are significant contributors to kidney disease. Promoting organic farming, regulating harmful chemical use, and educating farmers about safe agricultural practices can reduce nephrotoxic exposure and prevent CKD.

Workplace interventions to mitigate heat stress-related kidney injury should be implemented, particularly for agricultural and industrial workers. Employers should ensure adequate hydration stations, shaded rest areas, and protective work schedules to reduce heat-related kidney damage among labourers exposed to extreme temperatures.

Community-driven health education programmes must be scaled up to increase awareness about CKD risk factors, early symptoms, and preventive measures. Collaborating with local influencers, religious leaders, and grassroots organizations can help disseminate key messages and encourage behavioural change in high-risk populations.

Conclusion

To prevent CKD, a proactive strategy focussing on increased awareness and community-based screening and management is essential. The "hub and spoke" model can improve CKD screening and management by linking primary healthcare facilities with specialized centres, ensuring that specialized expertise is available to high-risk patients. It is important to address environmental issues such as exposure to heavy metals, pesticides, and heat stress through sustainable farming practices and environmental modulation. By incorporating CKD care into current health initiatives, resources can be utilized more efficiently, leading to better health outcomes. A united effort from policymakers, professionals and the public, is crucial to minimize CKD burden, and protect kidney health.

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