https://rijournals.com/research-in-medical-sciences/

RESEARCH INVENTION JOURNAL OF RESEARCH IN MEDICAL SCIENCES 4(3):65-69, 2025

ONLINE ISSN: 1115- 6198

Print ISSN: 1597-3107

https://doi.org/10.59298/RIJRMS/2025/436569

Community-Based Approaches to Diabetes Screening: A Sustainable Model for Rural Nigeria

Mubanza Zunguka J.

Faculty of Science and Technology Kampala International University Uganda

ABSTRACT

Diabetes mellitus, a rapidly increasing chronic non-communicable disease, poses a significant public health challenge globally, particularly in low- and middle-income countries (LMICs) like Nigeria. In rural areas of Nigeria, where access to healthcare services is limited, many individuals with diabetes remain undiagnosed, leading to preventable complications and premature death. Community-based diabetes screening offers a sustainable solution by decentralizing healthcare services and engaging local resources such as community health workers and volunteers. This model overcomes geographical, financial, and sociocultural barriers to early diagnosis and management. This review evaluates the effectiveness and feasibility of community-based diabetes screening in rural Nigeria, examining its impact on awareness, early detection, and health outcomes. The review also explores challenges such as funding constraints, cultural stigma, and the need for local capacity-building and offers recommendations for improving the sustainability and scalability of these initiatives. By integrating community-based approaches into the primary healthcare system, Nigeria can improve access to early diabetes diagnosis and reduce the burden of this growing public health concern.

Keywords: Diabetes screening, community-based healthcare, rural Nigeria, mobile health.

INTRODUCTION

Diabetes mellitus, a chronic non-communicable disease characterized by elevated blood glucose levels, poses a major global health threat [1]. According to the International Diabetes Federation (IDF), the number of adults living with diabetes globally is projected to rise from 537 million in 2021 to 643 million by 2030, and to 783 million by 2045 [2]. Alarmingly, much of this increase is occurring in low- and middle-income countries (LMICs), where healthcare infrastructure is often inadequate, and the capacity to manage chronic diseases is limited. Sub-Saharan Africa, in particular, is experiencing a rapid epidemiological transition, with a growing prevalence of non-communicable diseases like diabetes, fueled by urbanization, sedentary lifestyles, dietary changes, and aging populations [3].

Nigeria, the most populous country in Africa, is not immune to this trend. Currently, over 5 million Nigerians are estimated to be living with diabetes. However, this number is likely an underestimation, as many individuals remain undiagnosed, particularly in rural and underserved communities [4]. The burden of diabetes in Nigeria is further exacerbated by late diagnosis, poor glycemic control, limited access to healthcare services, and a general lack of awareness regarding the disease and its complications. The consequences of unmanaged diabetes are severe, including cardiovascular disease, kidney failure, blindness, lower limb amputation, and premature death.

Early detection and timely management of diabetes are essential strategies in reducing its long-term health and economic burdens. Nevertheless, traditional facility-based screening and diagnostic services are often inaccessible to those residing in rural areas [1]. Geographic isolation, inadequate transportation infrastructure, financial constraints, and sociocultural barriers frequently prevent rural dwellers from seeking medical care, contributing to delayed diagnoses and poor health outcomes.

Community-based screening approaches offer a potentially transformative solution to bridge this gap in healthcare access. These approaches involve delivering healthcare services directly within the community setting, often by leveraging local human resources such as community health workers, religious and traditional leaders, or trained volunteers [5]. By meeting people where they live, community-based models can overcome logistical and sociocultural challenges, increase awareness, and facilitate early detection of diabetes. They can also promote health-seeking behavior, reduce the stigma associated with chronic diseases, and improve community engagement in disease prevention and management [6].

Despite the promise of community-based screening in increasing access to diabetes detection and management, evidence on its implementation, effectiveness, and acceptability in rural Nigerian contexts remains limited. It is critical to explore the feasibility and outcomes of such interventions to inform public health strategies, especially in light of Nigeria's growing diabetes burden [7].

The increasing prevalence of diabetes in Nigeria poses a significant public health challenge. A substantial proportion of individuals living with diabetes remain undiagnosed, particularly in rural areas where access to conventional health facilities is limited. This lack of diagnosis leads to a cascade of preventable complications and health deterioration [8]. Facility-based screening programs, while effective in urban and semi-urban areas, often fail to reach rural populations due to a variety of barriers, including distance to healthcare centers, cost of transportation, and cultural or informational obstacles. As a result, many people in rural communities live with undiagnosed diabetes until they develop advanced complications. This not only diminishes quality of life but also imposes a heavy burden on families and the broader healthcare system [9]. Furthermore, the current health system in Nigeria is overburdened and under-resourced, making it difficult to scale up facility-based screening programs to rural and hard-to-reach communities.

In response to these challenges, community-based diabetes screening has emerged as a viable approach to increase the reach and effectiveness of diabetes detection programs. However, there is a lack of localized evidence to support the widespread implementation of community-based screening initiatives in Nigeria [10]. Understanding the operational dynamics, acceptability, and effectiveness of these models is crucial for developing scalable and sustainable public health interventions.

The primary aim of this study is to evaluate the effectiveness and feasibility of community-based approaches to diabetes screening in rural Nigeria, with the ultimate goal of improving early detection, awareness, and access to care for underserved populations. To achieve this aim, the study will pursue several specific objectives. Firstly, it will evaluate the current level of awareness and knowledge regarding diabetes among rural populations. Understanding how much people know about diabetes—including its symptoms, risk factors, and complications is crucial to designing effective education and intervention programs. Secondly, the study will assess the accessibility and utilization of existing diabetes screening services in rural communities, highlighting structural and logistical barriers such as distance to healthcare facilities, cost, and availability of trained personnel. Thirdly, the research will determine the effectiveness of community-based screening interventions in identifying previously undiagnosed cases of diabetes. This objective is particularly important in evaluating the potential of community-led initiatives to fill gaps in the formal healthcare system. Fourthly, the study will identify both the barriers and facilitators to implementing community-based diabetes screening programs. This includes investigating factors such as community engagement, local leadership, infrastructure, availability of resources, and cultural beliefs that may either support or hinder the success of such programs. Lastly, the study will examine the perceptions, attitudes, and acceptance of community-based screening among community members and key stakeholders, including local health workers, traditional leaders, and policymakers. Understanding these perspectives is essential for tailoring interventions to the unique context of rural Nigeria, ensuring sustainability and community ownership. Overall, these objectives collectively aim to generate evidence that informs the development of culturally appropriate, scalable, and cost-effective strategies for diabetes screening in rural settings—ultimately contributing to improved public health outcomes and health system equity across Nigeria.

The Burden of Diabetes in Rural Nigeria

The burden of diabetes in rural Nigeria is becoming an increasing concern as the country undergoes a significant nutritional and epidemiological transition. Rural communities, traditionally reliant on subsistence farming and natural diets, are gradually adopting more processed foods, leading to poorer nutritional choices [11]. Alongside dietary changes, the physical activity levels in these areas have decreased, as many now engage in less labor-intensive work or sedentary activities. Additionally, the stress levels in these populations are rising due to economic pressures and limited access to healthcare resources. These combined factors have contributed to a higher incidence of diabetes in rural regions, yet the disease often remains undiagnosed due to several challenges. Low health literacy hampers individuals' ability to recognize the symptoms of diabetes, while the scarcity of diagnostic tools and healthcare

facilities makes early detection difficult. As a result, many people are diagnosed with diabetes only after severe complications, such as diabetic foot ulcers, retinopathy, and kidney disease, have already developed. This delayed diagnosis highlights the urgent need for proactive diabetes screening programs in rural areas. Increasing awareness, improving access to diagnostic tools, and promoting regular health checks are essential steps in addressing the growing diabetes burden and preventing its long-term complications.

Concept and Principles of Community-Based Screening

Community-based screening is an approach that emphasizes decentralizing health interventions to detect diseases at early stages, often outside of traditional clinical settings. The core principles of this model revolve around active community engagement and participation, ensuring that individuals are not only informed but also involved in the screening process [12]. This approach fosters trust and encourages participation by addressing local health needs in culturally relevant ways. Cultural appropriateness is key, as strategies must resonate with local customs, beliefs, and practices, enhancing acceptance and effectiveness. Local health workers play a critical role, acting as bridges between healthcare systems and communities, offering their expertise while building rapport and trust. Collaborations with local institutions, such as schools and religious organizations, further strengthen these efforts by providing accessible platforms for outreach and education. Additionally, mobile health technologies are often incorporated to extend the reach of screening programs, offering flexibility in rural or underserved areas. These principles ensure that screening initiatives are not only accessible but also sustainable, relying on community ownership to maintain and expand health interventions.

Models of Community-Based Diabetes Screening

Community-based diabetes screening models aim to reach underserved populations, particularly in rural and low-resource areas. One such model is the use of mobile clinics, which are well-equipped vehicles that bring essential diagnostic services directly to communities [13]. These clinics typically offer blood glucose testing, body mass index (BMI) measurements, and health education, and have been successfully implemented in Nigeria's Ogun, Kaduna, and Enugu states through collaborations with NGOs. Another key approach is the involvement of local health workers, such as community health extension workers (CHEWs) and trained volunteers. These workers are critical for mobilizing communities, conducting screenings, collecting data, and ensuring follow-up care, fostering trust and continuity in health services. Door-to-door and market-based screening strategies are also effective, particularly in reaching individuals who may not actively seek healthcare. By targeting high-risk individuals in their homes or through common community spaces like markets and churches, these initiatives reduce barriers to access. Finally, integrating diabetes screening with existing health programs, such as maternal and child health services, HIV/AIDS outreach, and immunization campaigns, ensures a more efficient use of resources while enhancing the overall health service delivery system [14].

Effectiveness and Impact

Community-based screening initiatives in Nigeria have proven to be both effective and impactful in improving diabetes awareness and early diagnosis. For instance, a community-based project conducted in rural Ogun State revealed a diabetes prevalence of 4.8% among adults screened, with the majority of these individuals previously undiagnosed. This highlights the potential of screening programs to uncover hidden cases and address the growing health concern of diabetes. In addition to identifying undiagnosed cases, the initiative also incorporated health education, which significantly enhanced the community's understanding of diabetes symptoms, risk factors, and prevention strategies. This educational component empowered individuals to take proactive measures in managing their health. Furthermore, the screening programs established referral pathways to local primary health centers, ensuring that individuals diagnosed with diabetes received appropriate follow-up care and treatment [15]. These referral mechanisms facilitated timely interventions, reducing the likelihood of complications associated with delayed diagnosis and treatment. Additionally, the community-based approach has been cost-effective, as it alleviates the burden on tertiary care facilities by detecting and managing diabetes at an earlier stage, thus preventing the need for more expensive and intensive treatments later on. Overall, these initiatives offer a sustainable and scalable model for improving diabetes care in Nigeria.

Challenges and Barriers

Community-based diabetes screening programs have proven to be effective in early detection and prevention, but several challenges hinder their scalability and long-term sustainability. A primary issue is the reliance on donor funding, which makes these programs vulnerable to external financial shifts, limiting their capacity for growth and continuity [16]. Additionally, there is often a shortage of essential diagnostic tools and medication, impeding the ability to conduct accurate screenings and provide treatment. The absence of standardized protocols and referral mechanisms further exacerbates the problem, as inconsistent practices can lead to missed diagnoses or inadequate follow-up care. In many communities, local health workers are not sufficiently trained to manage diabetes screenings,

which diminishes the program's impact. Cultural beliefs and stigma surrounding chronic diseases, especially non-communicable diseases like diabetes, also present significant barriers. These societal factors discourage individuals from participating in screening programs or seeking necessary treatment. Furthermore, there are often gaps in data management, making it difficult to track screened individuals and monitor the effectiveness of interventions over time. Addressing these challenges is crucial to ensure the scalability, sustainability, and long-term success of community-based diabetes screening initiatives.

Opportunities and Recommendations

To optimize community-based diabetes screening in rural Nigeria, several strategies are essential. First, strong government commitment and policy support are crucial to ensure the integration of diabetes screening into the primary healthcare system, making it a sustainable and accessible service [17]. Task-shifting strategies can also be implemented to empower local health workers, such as community health officers, by providing them with proper training and supervision, enabling them to effectively conduct screenings. Additionally, the use of mobile health (mHealth) applications offers an innovative solution for data recording, patient follow-ups, and providing health education to both patients and health workers, improving the efficiency of the screening process. Public-private partnerships can further enhance this initiative by providing the necessary funding and logistical support to ensure the screening program's success, especially in resource-limited settings. Lastly, fostering community ownership through participatory planning and regular feedback mechanisms is vital to ensure that the local population is actively involved in the process and invested in the long-term success of diabetes prevention and management in their communities [18]. These collective efforts can greatly enhance the impact of diabetes screening in rural Nigeria.

CONCLUSION

In conclusion, community-based diabetes screening presents a promising solution to address the growing diabetes burden in rural Nigeria. By decentralizing screening services and engaging local health workers, community leaders, and residents, this approach overcomes many of the barriers that prevent rural populations from accessing conventional healthcare. The use of mobile clinics, task-shifting strategies, and mobile health applications enhances the reach and effectiveness of these initiatives, ensuring early detection and timely management of diabetes. Despite challenges such as funding limitations, cultural stigma, and insufficient resources, community-based models have demonstrated positive outcomes in terms of identifying undiagnosed cases, improving health literacy, and reducing the long-term complications associated with late diagnosis. For these initiatives to become sustainable and scalable, it is crucial to integrate them into the primary healthcare system, build strong public-private partnerships, and foster community ownership. With continued commitment, support, and innovation, community-based diabetes screening can play a pivotal role in improving diabetes care and health outcomes in rural Nigeria.

REFERENCES

1. 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.*
2. Facts & figures, https://idf.org/about-diabetes/diabetes-facts-figures/
3. Obeagu E. I., Scott G.Y, Amekpor F, Ugwu O. P. C, Alum E. U (2023). COVID-19 Infection and Diabetes: A Current Issue.*International Journal of Innovative and Applied Research, 11,(1), 25-30.*
4. Iregbu, S., Spiers, J., Duggleby, W., Salami, B., Schick-Makaroff, K.: Nigerian Health Care Providers and Diabetes Self-Management Support: Their Perspectives and Practices. Qual Health Res. 33, 92–105 (2023). https://doi.org/10.1177/10497323221143889
5. Alum, E. U., Ugwu, O. P. C., Obeagu, E. I., Aja, P. M., Ugwu, C. N., Okon, M.B. Nutritional Care in Diabetes Mellitus: A Comprehensive Guide.*International Journal of Innovative and Applied Research.* 2023; 11(12):16-25. DOI: 10.58538/IJIAR/2057 **DOI** URL**:** http://dx.doi.org/10.58538/IJIAR/2057.
6. Nxedlana, O., Douglas, M., Manu, E.: Strengthening community actions to improve diabetes mellitus care optimising public health facilitators. BMC Health Services Research. 25, 170 (2025). https://doi.org/10.1186/s12913-025-12316-5
7. Ugwu, O.P.C.,Kungu, E., Inyangat, R., Obeagu, E. I., Alum, E. U., Okon, M. B., Subbarayan, S., and Sankarapandiyan, V. Exploring Indigenous Medicinal Plants for Managing Diabetes Mellitus in Uganda: Ethnobotanical Insights, Pharmacotherapeutic Strategies, and National Development Alignment. INOSR Experimental Sciences.2023; 12(2):214-224. https://doi.org/10.59298/INOSRES/2023/2.17.1000.

8.Olamoyegun, M.A., Alare, K., Afolabi, S.A., Aderinto, N., Adeyemi, T.: A systematic review and meta-analysis of the prevalence and risk factors of type 2 diabetes mellitus in Nigeria. Clinical Diabetes and Endocrinology. 10, 43 (2024). https://doi.org/10.1186/s40842-024-00209-1

9.Alum, E. U., Ugwu, O. P. C., Obeagu, E. I. Beyond Pregnancy: Understanding the Long-Term Implications of Gestational Diabetes Mellitus.*INOSR Scientific Research.* 2024; 11(1):63-71.https://doi.org/10.59298/INOSRSR/2024/1.1.16371

10. Shirinzadeh, M., Afshin-Pour, B., Angeles, R., Gaber, J., Agarwal, G.: The effect of community-based programs on diabetes prevention in low- and middle-income countries: a systematic review and meta-analysis. Globalization and Health. 15, 10 (2019). https://doi.org/10.1186/s12992-019-0451-4

11. Uhama, K. C. Ugwu, O. P. C., Alum, E. U. (2024). Dual Burden of Diabetes Mellitus and Malaria: Exploring the Role of Phytochemicals and Vitamins in Disease Management. Research Invention Journal of Research in Medical Sciences. 3(2):38-49.

12. Questa, K., Das, M., King, R., Everitt, M., Rassi, C., Cartwright, C., Ferdous, T., Barua, D., Putnis, N., Snell, A.C., Huque, R., Newell, J., Elsey, H.: Community engagement interventions for communicable disease control in low- and lower- middle-income countries: evidence from a review of systematic reviews. Int J Equity Health. 19, 51 (2020). https://doi.org/10.1186/s12939-020-01169-5

13. Higgins, A., Tilghman, M., Lin, T.K.: Mobile health clinics in a rural setting: a cost analysis and time motion study of La Clínica in Oregon, United States. BMC Health Services Research. 25, 97 (2025). https://doi.org/10.1186/s12913-024-12203-5

14. Egba S I, Alum E U, Ugwu O P C, Obeagu E I, Uti D E, Alum B N. Managing the Dual Burden: Addressing Mental Health in Diabetes Care. Elite Journal of Medical Sciences, 2024; 2(6):1-9

15. ElSayed, N.A., Aleppo, G., Aroda, V.R., Bannuru, R.R., Brown, F.M., Bruemmer, D., Collins, B.S., Hilliard, M.E., Isaacs, D., Johnson, E.L., Kahan, S., Khunti, K., Leon, J., Lyons, S.K., Perry, M.L., Prahalad, P., Pratley, R.E., Seley, J.J., Stanton, R.C., Gabbay, R.A.: 1. Improving Care and Promoting Health in Populations: Standards of Care in Diabetes—2023. Diabetes Care. 46, S10–S18 (2023). https://doi.org/10.2337/dc23-S001

16. Huffstetler, H.E., Bandara, S., Bharali, I., Kennedy Mcdade, K., Mao, W., Guo, F., Zhang, J., Riviere, J., Becker, L., Mohamadi, M., Rice, R.L., King, Z., Farooqi, Z.W., Zhang, X., Yamey, G., Ogbuoji, O.: The impacts of donor transitions on health systems in middle-income countries: a scoping review. Health Policy Plan. 37, 1188–1202 (2022). https://doi.org/10.1093/heapol/czac063

17. Alum, E.U. Optimizing patient education for sustainable self-management in type 2 diabetes. *Discov Public Health* **22**, 44 (2025). https://doi.org/10.1186/s12982-025-00445-5

18. Haldane, V., Chuah, F.L.H., Srivastava, A., Singh, S.R., Koh, G.C.H., Seng, C.K., Legido-Quigley, H.: Community participation in health services development, implementation, and evaluation: A systematic review of empowerment, health, community, and process outcomes. PLoS One. 14, e0216112 (2019). https://doi.org/10.1371/journal.pone.0216112

CITE AS: Mubanza Zunguka J. (2025). Community-Based Approaches to Diabetes Screening: A Sustainable Model for Rural Nigeria. RESEARCH INVENTION JOURNAL OF RESEARCH IN MEDICAL SCIENCES 4(3):65-69. https://doi.org/10.59298/RIJRMS/2025/436569