



WESTERN NIGERIA JOURNAL OF MEDICAL SCIENCES (WNJMS)

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Publication Date: December 31, 2023; Vol. 6, Issue 2

DIABETES MELLITUS CARE IN NIGERIA: THE HEIGHTS AND THE HURDLES

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ABSTRACT

Introduction: Diabetes Mellitus (DM) is a metabolic disorder that affects millions of people all over the world. It causes irreversible damage to many organs in the body while running a silent course, thus most sufferers present late to the hospital with multiple complications that impose a huge economic burden for the restoration of health to a near-normal state. This review aims to identify the most prominent barriers (hurdles) against optimum diabetes care despite significant improvements in DM care in Nigeria and highlights evidence-based recommendations/policies that are yet to be adopted for the advancement of diabetes care in Nigeria.

Methods: A literature search was performed using google, google scholar, and academia to gather literature on the subject. Observations from various studies, review articles and reports from international bodies such as World Health Organisation (WHO) and International Diabetes Federation (IDF) were reviewed. 'Diabetes mellitus', 'prevalence', 'Nigeria', 'diabetes care', 'complications', 'burden', 'barriers', and 'health care schemes' were used as keywords for the search.

Results: Over the past decade, Nigeria has witnessed a 24% reduction in the death rate associated with DM, and there has been an increase in the number of specialists and researches in DM management, support groups, health care facilities and insurance programs. However, poverty is a major hindrance to DM care in Nigeria.

Conclusion: In spite of the advancements that have been made in promoting diabetes care in Nigeria, poverty remains a major barrier to accessing optimum diabetes care. Many other barriers that were highlighted years ago are persistent till now in this recently conducted research. Therefore, efforts should be directed towards eradicating the already established recurrent barriers to diabetes care delivery in Nigeria, by implementation of evidence-based recommendations made by experts over the years.

Keywords: diabetes care, complications, burden, barrier, health care schemes, Nigeria.

INTRODUCTION

Diabetes mellitus (DM) remains one of the leading causes of morbidity and premature death globally. It is a metabolic disorder that is marked by abnormal elevation in blood

sugar that is lethal to cellular health. This stems from the disordered metabolism of glucose, protein and fat due to insulin deficiency and/or resistance.

It is a disease of global concern with huge health and economic burden. In the year 2021, expenditure on diabetes management was estimated to be USD 966 billion globally and despite these expenses, deaths attributable to DM in the same year stood at a staggering figure of 6.7 million globally, translating to a record of a life lost to DM every 5 seconds.¹

The huge number of DM-attributable deaths is a multiple of the number of COVID-19-related deaths in 2020 estimated to be in excess of 3 million and for which it was declared a public health emergency.² Thus, DM pandemic is greater than a public health emergency! It has also been noted that diabetes kills more people than COVID-19, tuberculosis, HIV/AIDS and cancer altogether.³

Prevalence of DM is relentlessly increasing despite the number of mortalities already recorded. It is a burdensome disease that threatens family, social, economic and national stability all over the world. Currently, 1 in 10 adults (537 million) aged 20-79 years live with DM globally. Sadly, majority (81%) of the people already diagnosed with DM and 90% of adults with undiagnosed DM live in low- and middle-income countries.¹

Predictably an exponential rise of about 134% in DM prevalence rate would occur in the next two and half decades in Africa. Nigeria is one of the leading countries with highest number of people living with DM in Africa having over 3.6 million individuals already diagnosed and 12.5 million adults in the pre-diabetic stage.^{1, 4, 5}

Epidemiology of Diabetes Mellitus in Nigeria.

Nigeria is a country in West Africa in the gulf of Guinea spanning an area of 923,770 km².⁶ It is the most populous nation in Africa with over 200 million people of various ethnic groups and has risen in world population

ranking from the 12th position in 1970 to the 6th position in 2022.⁷ It is a low-middle income country with a GDP of US\$ 2065.7 and a more than 33% unemployment rate.^{8, 9} DM currently affects more than 3.6 million people in Nigeria with a prevalence of 3.7% according to IDF estimation.¹ However, a pooled prevalence from a recent meta-analysis reported a prevalence of 5.77%.⁴

Overview of Diabetes Mellitus

Diabetes mellitus is a metabolic disorder that results from relative or absolute insulin deficiency leading to hyperglycaemia that has the potential to damage body vasculature with resultant multi-organ dysfunction. Thus it results in multi-systemic affectation with deleterious outcomes such as non-traumatic limb amputation, blindness and end-stage renal disease to mention a few. The commonest form of DM cases seen in Nigeria is Type 2 DM with about 95% occurrence.^(10,11) Others are T1DM, gestational DM, and other specific types of DM for example drug or chemical-induced diabetes mellitus.¹² Various risk factors for T2DM, being the most prevalent form, include a family history of DM, urban dwelling, unhealthy eating, older age, cigarette smoking, physical inactivity and obesity.^{4, 12}

Classic symptoms of DM include polyuria, polydipsia, and weight loss. Some have polyphagia in addition. However, it is worthy of note that an asymptomatic course of a variable length of years usually precedes the onset of symptoms in most patients. Hence patients commonly present with chronic complications as the first presentation or a combination of symptoms of hyperglycaemic emergencies with that of the precipitating factor(s). Chronic complications are grouped into macrovascular and microvascular complications. Acute complications can manifest with sudden life-threatening symptoms such as coma in hyperosmolar hyperglycaemic emergency, diabetic ketoacidosis or hypoglycaemia.

Management of DM is multidisciplinary, thus the services of many health professionals are required. These experts include

endocrinologists, diabetologists, diabetes educators, dieticians, physical fitness experts, diabetic nurses, pharmacists, podiatrists and other experts as needed for secondary complications.¹²

Definitive and ancillary investigations are conducted for proper diagnosis and evaluation of background complications. These include glycated haemoglobin (HbA_{1c}) and estimation of glomerular filtration rate among others. Medical nutrition therapy, exercise, lifestyle modifications and weight control are essential foundational steps in the management of DM. This is followed by pharmacotherapy with the use of various classes of oral anti-diabetic medications such as Biguanides, Sulphonylureas, thiazolidinediones, DPP4 inhibitors, SGLTIs, as well as injectables like liraglutide and insulin. Others are tailored towards specific comorbidity (e.g. hypertension and dyslipidaemia) complications and diabetes self-management education (DSME).¹²

Complications may be acute: hyperosmolar hyperglycaemic emergency, diabetic ketoacidosis and hypoglycaemia; and chronic complications grouped into microvascular (DM retinopathy, DM nephropathy, peripheral neuropathy) and macrovascular (coronary artery disease, peripheral arterial disease and cerebrovascular disease). Hyperglycaemic emergencies and diabetes mellitus foot syndrome (DMFS) among others are usually associated with high mortality in admitted patients.¹³ Agweye et al reported DM retinopathy as one of the leading causes of impairment in vision and blindness among Nigerians living with DM in the working age group.¹⁴ Diabetic kidney disease is the most common cause of end-stage renal disease globally and the 3rd leading cause of end-stage renal disease in Nigeria.¹⁵ Studies beyond the shores of Nigeria reported the maiming potential of chronic hyperglycaemia with majority (90%) of lower extremity amputations (LEA) being DM-related and mortality is recorded in up to 70% of amputees within 5 years of the operation.^{16, 17, 18}

Diabetes Mellitus care in Nigeria: The Heights

Though the prevalence of DM is exponentially increasing globally, in Nigeria, there was a remarkable reduction in the rate of increase in prevalence between 2011 and 2021 according to the IDF data report. From the year 2001, the number of people living with DM rose sharply from about 200 thousand to more than 3 million in 2011, that is, about 2.8 million increase in number of affected individuals within the space of 10 years. However, from the year 2011 to 2021 (another decade) only about 600,000 increase was witnessed. Thus prevalence rate reduced from 4.8% in the first decade to 3.7% in the second decade, and deaths attributable to DM dropped from about 63,000 in 2011 to 48,000 in 2021 translating to about a 24% reduction in the death rate.¹

This may be related to increased advocacy of diabetic support groups, increased number of experts, an increasing number of point-of-care diagnostic facilities and DM medications. Also there has been an expansion of National Health Insurance Scheme (NHIS) branches, the development of a State-based Social Health Insurance Program (SSHIP) Group, Individual and Family Social Health Insurance Program, (GIFSHIP), and Strategies for Improving Diabetes Care in Nigeria (SIDCAIN) with the aim of reaching the grassroots with diabetes care training and provisions of needed materials.^{19,20,21,22} It is noteworthy that the NHIS, SSHIP and GIFSHIP are targeted towards ensuring universal health coverage for Nigerians in general and not limited to individuals living with DM.

Diabetes Association of Nigeria (DAN), a social support group for people living with DM was founded about forty years ago and this association has grown with new branches all over the 36 states of Nigeria.²³ It has greatly impacted the society at large through diabetic awareness programs and the provision of socioeconomic and medical needs of people living with diabetes throughout the country.

Professional and health organizations such as Endocrinology and Metabolism Society of Nigeria (EMSON), WHO and IDF have also intensified efforts towards curbing the DM pandemic globally and in Nigeria. Increased advocacy towards prevention of diabetes, early screening for DM, prompt diagnosis and treatment are always emphasized during the annual world diabetes day commemoration, especially through community outreaches and enlightenment programs with the members of DAN. The Endocrine and Metabolism Society of Nigeria has been involved in media advocacy and annual publishing of communiqué (usually written during the annual scientific conference and general meeting of the association) for health policies drafting.²⁴

The number of Endocrinologists involved in the management of DM was stated to be about 150 in the year 2012, and a more recent report stated a figure of less than 200.^{25, 26} The larger body of professionals might have contributed to better disease outcomes through expert management with a lower mortality rate recorded in 2021 compared to the years between 2001 and 2011. However, it should be noted that in recent times, the number of health care professionals has markedly reduced due to the trending brain drain precipitated by both push and pull factors.

Towards reducing the prevalence of DM, DAN launched a book titled National Guidelines for Diabetes Management in Nigeria in 2013.²⁷ The SIDCAIN study group was founded in 2008 to bridge the gap in knowledge among medical professionals and to increase advocacy for better DM management. World Diabetes Foundation has funded the training of many medical personnel and facilitated the building of many non-communicable disease clinics across Oyo and Ogun states through the SIDCAIN campaign.²² Another milestone in improving diabetes management is the development of the Group, Individual, Family, Social Health Insurance Program (GIFSHIP) in 2020 in which individuals that are outside the formal sector and are not covered in the NHIS can have equal access to healthcare.²¹ The

above-mentioned are notable milestones out of many in the history of diabetes care in Nigeria.

Diabetes Care in Nigeria -The Hurdles

In spite of many advancements made in various aspects of DM management, there are a lot of hurdles hampering optimum DM care among Nigerians. All the initiatives stated above tend to get submerged in the ocean of the burden of DM that confronts many individuals, families and the society at large. When the various health schemes and programs mentioned above are compared with the experience on the field of practice together with morbidity and mortality rates, we seem to be winning the war but losing the battle. Many lives are progressively being lost to preventable complications of DM.

There is an urgent need, therefore, to translate policy into practice by implementing every evidence-based recommendation that experts have given via communiqué or through other means. Several authors have conducted researches over decades on the matter of diabetes care in Nigeria and the same trends of barriers to diabetic care repeatedly featured in their findings. Hence, this means that many of the problems have remained unsolved or at best partially solved. Therefore, there should be a paradigm shift (for a while) from looking for barriers to diabetes care to focusing on implementing the recommendations for optimum diabetes care made so far by experts, and organizations such as WHO and IDF. Table 1 gives a synopsis of some articles on barriers to diabetes care in Nigeria.

The commonest hurdle to optimal diabetes care identified in this review is poverty. The grave effect of worsening poverty level among Nigerians has been recognized by the World Bank and noted in a recent report. According to the report 4 in 10 Nigerians live below the poverty line and only 17% of Nigerian workers have jobs that keep them above the poverty line. Nigeria has a GDP of US\$ 2065.7 and more than 33% unemployment rate.^{4,5} Therefore, as a patient living with DM spends between 20,000 to 150,000 monthly to stay alive, optimum

diabetes care would ultimately be beyond the reach of most people in Nigeria.^{3, 39}

Table 1. Synopsis of some articles on barriers to diabetes care in Nigeria

AUTHOR	LOCATION	BARRIERS/LIMITATION TO DIABETES CARE	SUMMARY OF RECOMMENDATIONS
Olufemi Adetola Fasanmade et al. Diabetes Care in Nigeria. <i>Annals of global health</i> , 2016; 81(6); pg 821-829 .	Review Article	Limited tools: diagnostic and therapeutic, funds, personnel and defective health care system structure	Universal health coverage. Diabetes prevention programs. Community screening programs. ⁽²⁸⁾
Michael OA, et al. Prevalence, Pattern and Determinants of Myths and Misconceptions among Patients with Diabetes Mellitus in South West Nigeria. <i>Ann Med Health Sci Res</i> . 2018;8:62-67	Hospital-based study	Misconceptions and myths	Patients' education to improve outcome. ⁽²⁹⁾
Onyeonoro et al. Urban–Rural Differences in Health-Care-Seeking Pattern of Residents of Abia State, Nigeria, and the Implication in the Control of NCDs. <i>Health Services Insights</i> 2016;9 29–36 doi:10.4137/HSI.S31865.	Community-based study	Literacy level, income, health care workers' attitude , limited services, distance, incessant strikes, weak health system, and out of pocket payments.	Increase health sector funding. ⁽³⁰⁾
Idongesit L. Jackson et al. Medication Adherence in Type 2 Diabetes Patients in Nigeria. <i>DIABETES TECHNOLOGY & THERAPEUTICS</i> Volume 17, Number 6, 2015 ^a Mary Ann Liebert, Inc. DOI: 10.1089/dia.2014.0279	Hospital-based	Expensive medications, limited access to care, complexity of diabetes treatment regimen, poor patient–provider communication, and depression.	Improved patient-provider communication. ⁽³¹⁾
T H Raimi et al. Diabetes education: strategy for improving diabetes care in Nigeria. <i>African Journal of Diabetes Medicine</i> . Vol 22 No 1 May 2014. Pg 8-11		Shortage of Diabetes Educators, and other key professionals at the primary health centers. Limited infrastructure, expensive investigations	Strengthening of the primary health care. Diabetes self-management education at the primary care level. Presentation of diabetes education to groups and individuals in a culturally acceptable manner. Mass and print media print for advocacy on DM. ⁽³²⁾
Emos E Tella et al, Prevalence, Contributing Factors and Management Strategies (Self-Management Education) of Type 2 Diabetes Patients in Nigeria: A Review . <i>Int J Diabetes Clin Res</i> 2021, 8:148 Volume 8 Issue 3 DOI: 10.23937/2377-3634/1410148	Review article	Low level of knowledge and awareness, affordability of diabetes care lack of psychosocial support, depression.	Community-based DSME, family-based DSME and health facility-based DSME. ⁽³³⁾

Ogbera AO et al. Diabetes mellitus in Nigeria: The past, present and future. World J Diabetes. 2014 Dec 15;5(6):905-11. doi: 10.4239/wjd.v5.i6.905. PMID: 25512795; PMCID: PMC4265879.	Review article	Inadequate health budgetary allocation , funding, sub-optimal patient education, shortage of experts, DM educators, podiatrists, limitation of funds with out-of-pocket-payment	DM prevention campaigns, good government funding, joint efforts between healthcare providers, the pharmaceutical industries, policy makers and National agency for food and drug administration for regular medication supply. ⁽³⁴⁾
S. Chinenye et al. Socio-cultural aspects of diabetes mellitus in Nigeria. Journal of Social Health and Diabetes 2013; 01(01): 015-021	Review article	Medication phobia, social stigma, its chronic 'incurability' , incapability to undertake responsibilities at home or at work.	Education and psycho-social support highlighted by the DAWN study, integrating our socio-cultural heritage. ⁽³⁵⁾
Ejiofor Ugwu et al,. Barriers to Diabetes Care in a Developing Country: Exploratory Evidence from Diabetes Healthcare Providers. Journal of Advances in Medicine and Medical Research 2020. 32(10): 72-83	Nationwide descriptive survey using self-administered questionnaire .	Poverty, low diabetes awareness, Shortage of diabetologists. Poor GPs' knowledge of diabetes care Poor patients' knowledge of DSME. Dysfunctional PHC Shortage of diabetes care support staff Unregulated alternative medicine practices False religious and cultural beliefs Poor social infrastructure Inadequate healthcare facilities Health sector instability Poor access to healthcare Poor healthworkers remuneration.	Increase health insurance coverage, Increase Healthcare Funding, Increase diabetes awareness, Incorporate diabetes screening in routine clinical care, Subsidize diabetes medications, Encourage private sector collaboration, Train general practitioners, Ban media advertisement by alternative medicine practitioners, Support local research in diabetes treatment, Ban media advertisement by faith healing centers, Declare diabetes a national emergency, Train native doctors on diabetes care. ⁽³⁶⁾
S Chinenye et al. State of Diabetes Care in Nigeria: A Review. The Nigerian Health Journal, Vol. 11, No 4, October - December, 2011pg 103-104.	Community-based study	Poor DM awareness, Late detection and diagnosis.	Risk assessment and early diagnosis, access to low cost medicines, self-care education, integrating diabetes into communicable diseases program, Improve the training, continuing education and support of health professionals, Integrate training of health work force, covering diabetes and related NCDs and infectious diseases, Create shared record keeping systems to coordinate care over time and across caregivers. Extend health services to all areas of the country, Programmes for detection and management of the complications of diabetes, Access to treatment, rehabilitation and social support for people who develop disabilities, Ensure all public policy sectors (education, transport, housing) protect and promote health. Strengthen multi-stakeholder partnerships to prevent diabetes. ⁽³⁷⁾

R N Oputa et al. Diabetes in Nigeria – a translational medicine approach. African Journal of Diabetes Medicine. 2015 pg 9	Review Article	Shortage of professionals, limited facilities, Poor DM awareness.	National survey every 5 years to determine the burden and pattern of diabetes. Diabetes education in schools (with emphasis on nutrition, exercise, and healthy lifestyle).3. National plan for good diet, avoiding smoking and excess alcohol. Checking of blood glucose yearly from age 30 years. Checking blood pressure yearly from age 25 years. Checking serum cholesterol profile yearly from 35 years. Eye examination every 5 years. Compulsory and free primary education nationally. An increase of health insurance coverage from the current less than 5%, to 50% in the next 5 years. ⁽³⁸⁾
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Another common hurdle to DM care in Nigeria is shortage of professionals such as endocrinologists, diabetologists, dieticians, diabetes educators and so on.²⁸ The dearth of professionals has resulted in quacks illegally taking up the management of unsuspecting DM patients, thus wrecking irreparable havoc which can be as grave as premature death.^{28,36}

Inadequate diagnostic and therapeutic tools have limited the practice of evidence-based medicine and advanced care in our setting. This often manifests in the classification of DM patients into Type 1 or Type 2 DM especially where patient presents a mixed picture that clinical impression cannot appropriately fix. Where fairly adequate provision for healthcare services have been made, utilization of these facilities are limited by low literacy level and poor diabetes education with erroneous presentation to quacks.³⁶ Cultural beliefs and myths about diabetes are still in existent in some parts of Nigeria. Among such beliefs is viewing obesity as a symbol of affluence both in children and adults.

RECOMMENDATIONS

It is high time we started crossing the hurdles to diabetes care in Nigeria through

implementation of earlier recommendations. According to an earlier report, the suggestions on 3 major long-term reforms to alleviate poverty among Nigerians should be considered. Firstly, macroeconomic reforms, secondly, policies targeting productivity of farm and non-farm household enterprises and thirdly improving access to basic amenities for example electricity, water, and sanitation and maximizing the benefits inherent in technological advancement.³⁹

Many patients who live very close to easily accessible tertiary hospitals with a good number of professionals do not present in the hospital due to paucity of funds. Thus, in this instance, good hospital, professionals, and good roads are available but they are still denied access to care due to lack of funds.

Thus emphasis on preventive program is the best choice or major solution in stemming the tide of DM prevalence in our society. This will include every activity that will help individuals to take informed decision against practices that promote development of DM. There should be scheduled advocacy and awareness training programmes on DM for pre-diabetes health care providers and people in the community. This can be done using 2 approaches; general and specific. General

advocacy will be aimed at the society at large and can be achieved through the use of media such as Radio, Television, newspapers, advertisement on social handles, use of billboards (as was done for smoking cessation), posters in the hospital, local government secretariats, markets and other public places. Emphasis will be laid on risk factors for DM especially family history, unhealthy lifestyle and obesity, classic symptoms of DM, and appropriate channels to seek health and counsel.

Specific advocacy in indigenous languages will target individuals and groups at the grassroots through outreaches to each local government area. Education on risk factors and symptoms of DM, health seeking behavior, demystifying the myths surrounding DM, and orthodox medicine, screening people at risk of DM, appropriate management of the newly diagnosed, and encouraging the already diagnosed on regular drug and clinic compliance.

The cheap cost of prevention should be clearly stated and compared with the magnitude of financial loss inherent in the treatment of the disease and its complications. Steps in achieving behavioral change should be taught with the health benefits attached while treading tactfully on 'sacred' cultural beliefs and practices (e.g. a fattening room in Calabar) that are dangerous to health with the aim of promoting modifications that are health promoting.⁴⁰

This task can be achieved better through capacity building of community health extension workers. The primary health care should also be revived in every segment for consistent enlightenment programs, and health care delivery. Adequate workforce (diabetes educators, nutritionists, podiatrists, nurses, doctors, among others), point-of-care diagnostic facilities and essential medicines should be available. Access to health care should be made easy through provision of health centres within walking distance, good access roads, reduced pre-consultation waiting time and minimizing cost implications by expanding and strengthening

NHIS, SSHP and other health schemes as well as increasing the annual national health budget as stated in the Abuja declaration for longevity in 2001.⁴¹ Diabetes care in Nigeria can also be enhanced through the use of telecommunication as reported by Olamoyegun et al in a recent research. This technological tool has the potential of improving drug adherence and providing prompt care or clarifications as needed by the patients especially those living in distant areas from care facilities.⁴²

CONCLUSION

DM is established in our clime already, and it is worrisome to try to catch a glimpse of where the current trend in prevalence will take us in the near future, hence the preventive way is the path to follow as we start running with full implementation of the extensive recommendations so far made by experts to end the vicious cycle. This will serve as a projectile against the impoverishing, maiming and life-shortening canker named DM and help to build a stockade against its onslaught in the near future.

Acknowledgement: Gratitude to Professors P.O. Akinwusi and C.O. Alebiosu for their painstaking review of the manuscript and encouragement through the process of this write-up.

Conflict of Interest: The authors declare that there is no conflict of interest concerning this work.

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