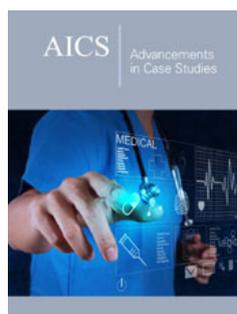


Inequality in Diabetes Management in Cameroon: A Review of the Major Causes, Consequences, and Strategic Solutions

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***Corresponding author:** Joseph Etah Oben, BSc Microbiology, Master in Public Health a Research Mentor, Africa Youth for Peace and Development, Free Town-Sierra Leone, P.O. Box 123, Free Town, Sierra-Leone, Cameroon

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Joseph Etah Oben*

BSc Microbiology, Master in Public Health a Research Mentor, Africa Youth for Peace and Development, Cameroon

Abstract

Background: Diabetes is a noncommunicable disease with a very high prevalence, morbidity and mortality rate worldwide, especially in lower- and middle-income countries like Cameroon. Diabetes remains a serious public health threat in Cameroon, exacerbated by inequality in its management within the country. Inequality in diabetes management plays a remarkable role in widening the health outcomes gap between diabetics, who have greater access to diabetes care resources and those with limited access.

Objective: The main objective of this narrative review is to determine the factors or causes of diabetes inequality in Cameroon and highlight opportunities and or approaches to reducing inequality in diabetes management.

Methodology: This study is a review of works that address diabetes management, including those that cover diabetes inequality and health systems and research gaps, to underscore the challenges and opportunities that can be exploited to achieve equity or at least reduce inequality in diabetes management in Cameroon. The study reviewed research articles, grey literature and corporate and organisational documents related to the objective of this work. Local, regional and international documents were examined from the Internet databases: Directory of Open Access Journals (DOAJ), Google, and Google Scholar. The keywords: inequality in diabetes management, diabetes management, health systems and research gaps in diabetes management were combined with Boolean operators AND and OR to pull up relevant works. Works were screened and included based on the inclusion criteria. Both thematic and content analyses were performed on the selected works.

Findings: The review found that: (a) socioeconomic and environmental determinants of health, (b) health systems and research gaps, (c) lack of trained health personnel, and (d) socio-political crises are responsible for the rising inequality in diabetes management.

Conclusion: The study highlights the need for strengthening and empowering the health system of Cameroon to address determinants of inequality in diabetes management through equity-oriented strategies and distribution economics in the management of diabetes in Cameroon.

Keywords: Inequality in diabetes management, diabetes management, health systems and research gaps, Cameroon, Sub-Saharan Africa

Introduction

Diabetes is a disease that results from the failure of the pancreas to produce enough insulin to absorb sugar in the blood. It also occurs when the cells of the body become resistant to insulin, resulting in the accumulation of sugar in the blood. Diabetes is one of the noncommunicable diseases that has a very high burden globally. The World Health Organisation (WHO) has declared diabetes as a global pandemic [1]. NCD Alliance [2] also notes that diabetes is a global pandemic with rising prevalence: 1 in every 9 people currently lives with diabetes and the prevalence will rise to 1 in every 8 people by 2050 if efforts are not made to improve diabetes management. Although this rising burden of diabetes is global, the burden is severer on Lower-and Middle-Income (LMICs) countries than on Higher-Income

Countries (HICs) due to unequal access to diabetes care, resulting from inequality in diabetes management. According to scientific evidence, the poor and marginalised in lower-and middle-income countries like Cameroon have a very low possibility of getting early diagnoses for diabetes, and also over 70 per cent of the people living with diabetes only know about their conditions when they have already experienced complications like heart disease, vision loss, and nerve damage [1,2]. Moreover, the World Health Organisation highlights that diabetes medication coverage in 2022 was the lowest in lower-and middle-income countries despite the high burden of the disease [1]. Similarly, International Diabetes Federation [3] reports that diabetes, specially type 2, is preventable through several ways, including regular screening. Given that there exists high inequality in diabetes care in lower-and middle-income countries, the likelihood of people living with diabetes to get early diagnoses is reduced. Moreover, most adults over 30 living with diabetes in 2022 in LMICs were not on diabetes medication [1-3]. GBD 2021 Diabetes Collaborators [4] reported that the burden of diabetes is severer in North Africa and the Middle East. They noted that most of the 1.31 billion people that will have diabetes by 2050 will be found in these regions if efforts are not made to enhance equity in diabetes management.

All these studies highlight an unequal burden of diabetes and inequality in accessing diabetes care in lower-and middle-income countries like Cameroon. Scientists have revealed several factors responsible for the rising burden of diabetes in lower-and middle-income countries. Different socioeconomic and environmental factors, including lack of physical activity opportunities, lack of healthy diet possibilities, and also health system implementation and research gaps contribute to this rising burden of diabetes in lower-and middle-income countries. These factors demonstrate that the socioeconomic and health inequalities that exist in these lower-and middle-income countries exacerbate the burden of diabetes [1].

A body of scientific evidence has emerged to support the effect of socioeconomic inequality in increasing the burden of noncommunicable diseases such as diabetes in LMICs. For instance, poor diet results in poor health outcomes. Jiao [5] revealed that low quality diet is one of the ways through which socioeconomic factors of inequality can significantly contribute to the rising diabetes burden. Similarly, Kraft et al. [6] underscored the impact of socioeconomic inequality in the scarcity of resources for an individual's healthy development throughout life. The scientists emphasised that these inequality factors negatively affect healthy living and longevity, noting that socio-economic factors have severe negative consequences on a disease such as diabetes and have not been reduced within the past decade. Dieteren et al. [7] also highlighted socioeconomic inequalities in lifestyle risk-factors throughout lower-and middle-income countries. The scientists demonstrated that the prevalence of tobacco abuse and alcoholism is high in lower-and middle-income countries, including Chad, bordering Cameroon in the northern region, and Burundi, and the use of alcohol and tobacco is highly prevalent among the poor, a common phenomenon in Cameroon. Ndibi et al. [8] demonstrated that the consumption of alcohol in Cameroon is linked to chronic

noncommunicable diseases like diabetes; as type 2 diabetes, the most prevalent type of diabetes, is connected to lifestyle. Similarly, Magloire, Cameroon and Research Coordinator [9] revealed that tobacco use is linked to noncommunicable diseases like diabetes. They reported that an estimated 71,000 annual deaths occur in the country due to noncommunicable diseases. Of these deaths, about 34,000 are ascribable to tobacco use. Meanwhile, overweight individuals are common within people in the middle class. The high prevalence of these noncommunicable disease risk-factors suggests the rising burden of diabetes in Cameroon is ascribable to socioeconomic and environmental inequality factors [9].

Apart from these socioeconomic determinants of health inequality within lower- and middle-income countries, health system and diabetes research gaps also play significant roles in inequality in diabetes management in LMICs. Flood et al. [10] showed that the improvement of glycaemia in type 2 diabetes may be more effective through health system approaches. However, the scientists noted a limited number of studies from LMICs or rural areas. Similarly, Owolabi et al. [11] demonstrated the existence of gaps in diabetes guidelines from LMICs. The scholars noted that majority of the guidelines from LMICs were not contextualised, lacked clarity and dissemination plans, making the guidelines inadequate. Additionally, most diabetes guidelines from LMICs do not comply with the Institute of Medicine (IOM) standards. Only 12 percent of the guidelines from LMICs satisfied a minimum of the guidelines against 60 per cent of guidelines from higher-income countries [11]. In a similar study, Eseadi et al. [12] revealed that some institutional and individual factors are barriers to diabetics' access to care, and highlighted a gap in diabetes literature regarding the extent of utilisation of available diabetes healthcare services by diabetics.

Meanwhile, Walker et al. [13] highlighted worldwide inequality in diabetes, and presented evidence-based internationally recognised strategies of how inequality in diabetes can be addressed, particularly addressing structural inequality prevalent in LMICs.

James Martins [14] along with Martins IJ [15] highlighted that the global diabetes epidemic has placed an enormous burden on the health system capacity and political system. In many developing countries the lack of drugs, staff and medical physicians have exacerbated inequality in diabetes management. The global diabetes epidemic in Cameroon may be one of the factors that determines the inequality in diabetes management.

The commonalities among these studies are that they all highlight diabetes inequality in LMICs, underscore socioeconomic and environmental determinants of inequality, and health system and research gaps in diabetes management as major contributors to diabetes inequality. Little attention is paid to addressing these factors that contribute to heightening inequality in diabetes management in LMICs like Cameroon. Whereas, reducing inequality in diabetes management would result in the reduction and prevention of diabetes complications among patients, hence healthier health outcomes among diabetics. Thus, this paper seeks to:

1. Critically examine literature on diabetes inequality, including diabetes research gaps and diabetes management from national, regional and global sources to determine factors responsible for diabetes inequality in LMICs.
2. Highlight opportunities and strategies in addressing diabetes inequality in a LMIC like Cameroon.

This paper contributes to literature on inequality in diabetes management in LMICs, as it provides an in-depth contextual analysis of diabetes management in Cameroon. It highlights key mechanisms, including poor governance as well as socioeconomic determinants and sociopolitical crises that collectively contribute to unequal access to diabetes care services and resources. Most importantly, this work brings attention to the often-ignored inequality in diabetes management in LMICs like Cameroon and the silent suffering the vulnerable diabetics experience in these resource-poor and unstable settings.

As a key message, inequality in diabetes management in Cameroon is deeply rooted and structurally driven. It is exacerbated by poor governance and health system policies, inadequate equity considerations in diabetes management, limited research in diabetes, poor data and health information systems, avoidable socioeconomic disparities and ongoing sociopolitical crises. Addressing these inequalities requires sustainable equity-oriented approaches that strengthen governance, reduce socioeconomic vulnerabilities, and respond to sociopolitical crises through coordinated, cross-sectoral action, including government, local, regional, and international collaborators. The reduced number of untreated diabetics over the next 10 years may assist with a reduced inequality in diabetes management.

Methods

The study adopted the narrative review approach of works that address the management of diabetes, including those that cover diabetes inequality and diabetes and health systems research gaps, to highlight opportunities and enumerate challenges in reducing inequality in diabetes management in LMICs [16].

Research questions

The questions that guided this study were: (a) Why is there inequality in diabetes management in LMICs? (b) What are the opportunities that can be exploited to address the inequalities in diabetes management in LMICs? and (c) What are the challenges that hinder the advancement of diabetes management equity in LMICs?

Search strategy

Author researched articles and grey literature for this work in databases, including Google, Google Scholar, and Directory of Open Access Journals (DOAJ). The study examined sources from Cameroon, Africa, and internationally. The keywords: diabetes management, inequality in diabetes management, health systems and research gaps in diabetes were combined with Boolean operators, AND and OR, to page up relevant works. Author screened and included works, in the last decade from 2016 to present, based

on the inclusion criteria. Author performed both thematic and content analyses on the works.

Eligible studies

Included studies: Author included works in English in the review: research papers, grey literature, and articles that covered diabetes management, inequality in diabetes management, and health systems and diabetes research gaps from 2016 to present in the study. The study included corporate and organisational documents that covered diabetes management, diabetes inequality and health systems and diabetes research gaps with no specific date limit.

Excluded studies: Works that did not meet the eligibility criteria were excluded.

Data extraction

The study captured these data points from selected studies: the author, year, characteristics, objectives, findings, and conclusion.

Quality assessment

Author conducted a preliminary quality assessment based on study titles and abstract screening to include eligible research studies and grey literature, including theses, corporate and organisational documents. In the second stage of the quality assessment process, author screened articles and grey literature for relevance, credibility, reliability and validity, and currency.

Synthesis of findings

The study used narrative synthesis to synthesise all findings from studies reviewed.

Findings

Understanding inequality in diabetes management in Cameroon

Diabetes management involves the use of medications, and diabetes education to improve diabetics' health outcomes. Diabetes patient management ensures that diabetics are strengthened and empowered with skills and knowledge to self-manage diabetes. Diabetes self-management education and support (DSMES) is a holistic approach that assists all diabetics to cope daily with confidence. Diabetes management also ensures that diabetes patients lead healthier and productive lives, as it results in the reduction of glycaemia. Reduced glycaemia in diabetes patients indicates the reduction and prevention of diabetes complications [18,19].

In LMICs, diabetes management faces many challenges. These challenges result from health system gaps and lack of political will to provide adequate care infrastructure for people living with diabetes, lack of qualified personnel to provide diabetes education and counselling support to diabetics, lack of resources for diabetes care, and also limited access of diabetics to diabetes care facilities. As explained by UNOCHA [20], restricted access to healthcare services in Cameroon is quite prevalent in places affected by sociopolitical crises because people living in crises affected areas face insecurity

that limits their access to diabetes care services. This suggests diabetes patients in crises affected zones live with poorly managed or untreated diabetes and experience very poor health outcomes as a result of diabetes complications [19]. Scientific evidence shows that with the increased burden of diabetes in LMICs, the management of cases has become very difficult, worsening inequality in diabetes management and requiring digital solutions to enhance care [20]. LMICs lack resources for basic care needs of diabetics. Scaling up digital solutions to address diabetic care needs also presents overwhelming challenges for most LMICs [20]. In a similar study, Karachaliou, Simatos and Simatou [21] underscored challenges in the development of diabetes prevention and care models in LMICs due to the lack of health performance data and poorly equipped clinics providing care to diabetes patients. In the same light, Abdul-Rahman et al. [22] revealed that although Africa bears the highest burden of noncommunicable diseases like diabetes, the maintenance of medical data within health systems on the continent is low.

Studies consistently reveal that there is a lack of qualified health personnel in healthcare systems within the Sub-Saharan Africa region to provide skilled care to diabetes patients to avert its associated complications at the different levels of healthcare systems on the continent [23]. The case of Cameroon is no different. Like most Sub-Saharan African countries, Cameroon is unable to cope with the burden of diabetes and its complications. International Diabetes Federation [24] reported that over 500 adults live with diabetes in Cameroon and majority lack adequate care.

Ateudjieu et al. [25] revealed that the health system of Cameroon is unprepared to provide adequate care to diabetics, as it lacks organisation, trained personnel and resources. The scientists assessed the availability and readiness of diabetes healthcare services in the West Region of Cameroon and highlighted that of 608 health facilities existing in the West Region of Cameroon, only 100 had trained personnel on diabetes management, diabetic medication and resources, and laboratory equipment. The scientists also underscored the absence of diabetes management guidelines [25].

Diabetes and health systems research gaps

A body of evidence has highlighted diabetes and health system research gaps have been contributing factors to inequality in diabetes management in Sub-Saharan African countries such as Cameroon. Zimmermann et al. [26] demonstrated the lack of systematic reviews on qualitative studies about the experiences of type 2 diabetes patients in the Sub-Saharan African region of the world. They conducted a scoping review with data from 8 countries, including Cameroon. They reported that after screening studies in their scoping review, 21 were selected for analyses in NVivo 10. Of the 21, majority of the studies selected were from Ghana (5) and South Africa (5); highlighting a knowledge gap on diabetes research in Cameroon [26]. In a related study on anti-diabetic medication adherence and associated factors, Aminde et al. [27] reported the absence of data on medication adherence of diabetes patients in

Cameroon. Furthermore, Addo et al. [28] noted that while the burden of noncommunicable diseases like diabetes in Africa is increasing on an alarming rate, scientific evidence to inform management, assess health outcomes, and risk factors is lacking. The scientists recommended the establishment of funding schemes and capacity building of researchers in the area of noncommunicable diseases, while supporting early-careers researchers interested in conducting research on noncommunicable diseases such as diabetes. Atun et al. [23] highlighted that the real burden of diabetes, microvascular, and macrovascular complications, and other cardiovascular risk factors in Sub-Saharan African countries such as Cameroon is not known. In a related study, Abdul-Rahman et al. [22] demonstrated that Africa provides only about 1 per cent of research output globally although the burden of noncommunicable diseases such as diabetes is the largest in Africa. This is ascribable to low healthcare data maintenance, and limited research on noncommunicable diseases such as diabetes.

Discussion

Socio-economic determinants of health

Socio-economic determinants are central in driving health inequality in diabetes management in lower-and middle-income countries such as Cameroon. The World Health Organization [29] emphasises that the conditions in which people are born, raised, work and age affect health inequality. Although these unjust determinants are preventable, they are highly prevalent in lower-and middle-income countries. Social determinants have a greater ability to influence health outcomes than genetic or access to healthcare. Consequently, individuals who lack social protection, quality housing, employment opportunities and education are far more vulnerable to illness and premature death. Zakariaou Njoumeme et al. [30] highlighted disparities in healthcare access in Cameroon persist and account for health outcomes far below expectations with the targets of the Millenium Development Goals. Diabetes patients in Cameroon face stigmatisation and discrimination from family, friends, health personnel, and even the state. These have been shown to have a negative impact on the health outcomes of people living with diabetes. Awah P [31] highlighted that these behaviours towards diabetics are expressed through: limited state commitment in diabetes care, job insecurity, conjugal rejections by intimate partner, and limited socialisation. A clear indication that living with and managing diabetes in Cameroon is complicated, as diabetics are treated as those who do not traditionally fit in society. That is, diabetics in Cameroon do not benefit from the social protection which they merit. Rather, their health conditions make them more vulnerable to illness and preventable death.

Health-system capacity

Inequality in diabetes management in Cameroon manifests through several ways. Within the health system, there is inequality in the distribution of diabetes resources, a lack of trained personnel to manage diabetes, and a lack of diabetes management resources in available healthcare services. These highlight inadequate care provided to diabetes patients who have access to diabetes care

centres in Cameroon. This in turn leads to negative health outcomes in diabetes patients, as they are poorly managed. The lack of diabetes care centres and limited diabetes care resources indicate the inability of the country to cope with diabetes. As explained by Silver Bahendeka [20], the lack of basic care needs for diabetics attending diabetic clinics in a LMIC such as Cameroon highlights the health system is unprepared to tackle the rising burden of the disease. Moreover, the health system of Cameroon like that of most LMICs lacks medical data and there is limited diabetes research. This is a clear indication of limited knowledge or understanding of new trends in diabetes management, as decision making in the management of diabetes is not backed by new scientific evidence in diabetes. These findings are suggestive of the inadequacies that exist in the management of diabetes in Cameroon, exacerbating inequality in the course of management of diabetes [25,28].

Research and data gaps

While Africa has the highest burden of noncommunicable diseases, including diabetes, research output on noncommunicable diseases from Africa is very low. The case of Cameroon is no different. Kanmounye et al. [32] noted lack of research team and difficulties obtaining ethical clearance as significant barriers to research in Cameroon. Meanwhile, grant availability is an important determinant of involvement in research.

The impact of sociopolitical crises

An interesting finding that emerged in the literature is sociopolitical crises. Scientific evidence revealed the role of sociopolitical crises in worsening morbidity and mortality among diabetes patients due to heightened insecurity in the crises affected zones that limits access of diabetes patients to diabetes care centres, or healthcare services in general [19]. Addressing sociopolitical crises is necessary through government, local, and international partners to reduce insecurity and increase access to healthcare services, including diabetes care services and resources [1,19,33].

Conclusion

The study examined national, regional, and international sources on diabetes and health system research gaps, diabetes management, and inequality in diabetes management. This narrative review revealed insights into the understanding of the factors or challenges and opportunities to addressing inequalities in diabetes management in LMICs like Cameroon.

The study then seeks to reaffirm the need for empowering the health system of Cameroon. This involves internationally recognised equity-oriented and distribution-economics strategies to improve governance, address socioeconomic and environmental vulnerabilities, and respond to sociopolitical crises. Additionally, investing in the training and retraining of health personnel is essential to close the health system and research gaps. Cross-sectoral, coordinated approaches involving the government, local, regional and international partners are necessary for this to be achieved.

Recommendations for tackling inequality in diabetes management in Cameroon

Inequality in diabetes management is a profound issue in most Sub-Saharan African countries, including Cameroon. The prevalence of this phenomenon accounts for the increasing burden of the disease in the country and this warrants sustainable solutions, including:

- (a) Encouraging community screening programmes for members of the community.
- (b) Periodic training for health personnel.
- (c) Integration of digital approaches in medical data and information systems within the country.
- (d) Integration of equity and distribution economics in diabetes management in Cameroon.
- (e) Fair governance prioritising the needs of the marginalised and vulnerable populations.
- (f) Conforming with internationally recognised medical data and health information maintenance standards.
- (g) Funding research and development on noncommunicable diseases such as diabetes.

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