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MINIREVIEWS

Accessibility and utilization of healthcare services among diabetic patients: Is diabetes a poor man's ailment?

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Abstract

Diabetes is a non-communicable ailment that has adverse effects on the individual's overall well-being and productivity in society. The main objective of this study was to examine the empirical literature concerning the association between diabetes and poverty and the accessibility and utilization of medical care services among diabetic patients. The diabetes literature was explored using a literature review approach. This review revealed that diabetes is an ailment that affects all individuals irrespective of socioeconomic status; however, its prevalence is high in low-income countries. Hence, despite the higher prevalence of diabetes in developing countries compared with developed countries, diabetes is not a poor man's ailment because it affects individuals of all incomes. While the number of diabetic patients that access and utilize diabetes medical care services has increased over the years, some personal and institutional factors still limit patients' access to the use of diabetes care. Also, there is a lacuna in the diabetes literature concerning the extent of utilization of available healthcare services by diabetic patients.

Key Words: Accessibility; Diabetes; Healthcare services; Patients; Poverty

Core Tip: Diabetic patients require more medical care services than patients without diabetes as a result of their high chances of comorbidities, poor glycemic control, and frequent hospitalization. Despite the promising upsurge in the number of diabetic patients seeking medical care services due to awareness, some personal and institutional factors continue to limit patients' chances of access to diabetes care. Furthermore, there is a lacuna in the diabetes literature concerning the extent of utilization of medical services available by individuals with diabetes.

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INTRODUCTION

Diabetes is a major emerging public health non-communicable disease that poses problems across nations[1,2]. Diabetes has been described as a non-communicable disease that occurs when the pancreas stops producing sufficient insulin or when the insulin produced is not effectively used in the body. The symptoms of diabetes include but are not limited to feeling very thirsty, frequent urination, blurred vision, tiredness, and weight loss. Individuals who are obese, physically inactive, and hypertensive have a high chance of getting diabetes[3-5].

The number of persons with diabetes increased from 108 million in 1980 to 422 million in 2014[6]. Diabetes prevalence in 2021 was 536.6 million people, and it is estimated to increase to 783.2 million in 2045[7]. Diabetes accounted for 1.5 million deaths in 2019, and 48% of all these deaths occurred before the age of 70 years[6]. Diabetes contributed to 460000 kidney disease deaths and increased blood glucose and contributed to 20% of cardiovascular deaths[8].

Even though diabetes is a global non-communicable disease, there is variability in adverse effects and mortality rates between nations. There is a 3% increase in age-standardized mortality rates from diabetes in high-income countries, while in low-income countries, the mortality rate increased to 13%[6]. This striking gap in the mortality rate between high-income countries and low-income countries may depict the devastating effects of poverty in terms of managing diabetic conditions. Low-income earners are characterized by inadequate housing, irregular medical care coverage, and food insecurity, making it extremely hard for the poor individual to manage their ailments[9]. This may equally imply that the low-income population would have a higher rate of diabetic complications since poverty can be impactful on the uncontrollable diabetes rate and complications.

Furthermore, accessibility and utilization of health care services have become the major factors that contribute to worsening health crises for individuals with diabetes. Access to state-of-art facilities in urban and rural areas has lagged due to the growing number of individuals with diabetes that require medical care services[10]. There is also a report concerning diabetic patients' inability to have access to syringes and glucose meters in some hospitals[11]. Accessibility to health care services such as insurance coverage has been found to play a significant role concerning preventive measures for diabetes crises. On the contrary, lack of insurance coverage has been linked to a lower use of preventive services[12]. This means that insurance coverage is essential for diabetic patients due to the high medical care required for the management of chronic symptoms.

Diabetic patients require more use of medical care services than patients without diabetes as a result of their high chances of comorbidities, poor glycemic control, and frequent hospitalization[13]. Furthermore, healthcare facilities have been reported to be overstretched especially in low-income countries due to an upsurge in the number of individuals with diabetes[14]. This could imply that there is an insufficient medical care supply that hinders accessibility and utilization of health care services by individuals with diabetes. Hence, there is a need to examine the current diabetes literature to establish the nexus between diabetes and poverty as well as establish the accessibility and utilization of diabetes healthcare services among people with diabetes. In this article, we examined the accessibility and utilization of health care services among diabetic patients to establish whether a disparity in access and use of health care services by diabetic patients exists. Using the review approach, we further aimed at providing descriptive evidence of the nexus between poverty and diabetes.

METHODS

We conducted a preliminary search to review studies on the nexus between poverty and diabetes and the accessibility and utilization of healthcare services by diabetic patients in several databases. The Preferred Reporting Items for Systematic and Meta-Analysis guidelines for Scoping Review were followed in this study[15]. This review was registered with the Open Science Framework on April 19, 2023. The JBI framework was used to conduct this study[16].

Research questions

The questions that guided this study were: (1) What is the nexus between diabetes and poverty?; (2) What is the rate of accessibility of health care services by diabetic patients?; and (3) What is the rate of utilization of health care services by diabetic patients?

Literature search

A literature search was carried out in numerous electronic databases such as PubMed, Embase, *Reference Citation Analysis*, Elsevier Scopus, Medline, the Cochrane Library, and the Web of Science. The search terms and keywords were developed by the research team and an experienced digital librarian. Some of the keywords used included: "the association between poverty and diabetes," "the nexus between socioeconomic status and diabetes," "accessibility of healthcare services by diabetic patients," and "utilization of healthcare by diabetic patients." We used the date limit of 2000 to 2023 to search some databases that do not have controlled vocabulary terms or thesaurus. We also explored the reference list of the selected studies. When the full text was unavailable, we emailed the authors to gain access to the full article.

Eligibility of studies

This study included all qualitative and quantitative studies carried out between 2000 and 2023. Based on the review questions formulated to guide the study, studies that dealt with intervention programs and epidemiology outcomes for diabetic patients were excluded. Only articles covering diabetes and poverty, accessibility of healthcare services for diabetic patients, and utilization of healthcare services were included in the program. Peer-reviewed articles and a book of abstracts were included to facilitate uniform reports of the published literature. Non-peer-reviewed articles were not considered, such as anecdotal reports, opinion papers, or supplementary commentary. This enabled the researchers to conduct a broad assessment of the published literature to identify lacunas in existing research. We further limited our search to studies reported exclusively in English. Furthermore, studies that included participants aged 18 and above were selected.

Data collection

All the identified studies from the earlier search were subjected to title and abstract screening by one of the project reviewers, while a full review of potentially relevant articles was conducted by two reviewers. All the selected texts were reassessed against the key inclusion criteria, and Microsoft Excel was used to extract the relevant data. Whenever differences between the two reviewers were observed, they reached a consensus through discussion. At the end of the critical data review, data were extracted from all selected studies. These data included the authors' names, the year of publication, the objective of the study, the design of the study, and the results.

RESULTS

The search produced 59 records of articles in peer-reviewed journals. After these articles were screened by the researchers using the stipulated inclusion criteria, 36 articles were excluded. Based on the predetermined inclusion criteria, 23 articles were included. Empiricism was characteristic of all the studies selected for this study. According to the research questions that guided this study, the findings were summarized.

Nexus between diabetes and poverty

Diabetes is a non-communicable disease that affects both high-income and low-income earners. But over the years, most people erroneously perceived diabetes as an ailment that was associated with poverty. Available empirical studies in the diabetes literature have shown that there is a lack of consensus on whether diabetes is exclusive to low-income earners (Table 1)[9,17,19-25]. Structural poverty has been described as the major driver of health disparities and a source of diabetes[17]. In addition, the literature has revealed that an increase in the poverty rate leads to an increase in the incidence of diabetes[9] and that poverty is highly associated with diabetes. Hence, it is more prevalent in low-income populations[18].

Contrary to the above findings, empirical evidence has also shown that the incidence of diabetes was lower among low-income earners compared with higher-income earners, *i.e.* the incidence of diabetes is high among higher socioeconomic groups compared to lower socioeconomic groups[19,20]. Therefore, it may be safe to argue that diabetes is not a an ailment for low-income earners only. However, poverty contributes to the severity of diabetes since it either enhances patients' consumption of food that induces diabetes or limits the patient's access to the required medical care.

Rate of accessibility of health care services by diabetic patients

Accessibility of medical care is substantial for the management of diabetic patients irrespective of the individual's financial capability[10]. The inability to access medical care for diabetic patients has been linked to either institutional factors or individual problems. This scoping review produced seven empirical studies that investigated diabetic patients' access to medical care services as well as the limitations of the patient's access to medical care (Table 2)[10,11,26-30]. One of the studies showed that the number of participants that sought medical care increased 305% from 2006 to 2015[26]. Another study suggested that routine access to hemoglobin A1c testing can promote diabetes control as well as offer critical data to inform the population of the current level of diabetes complications[10].

Table 1 Empirical evidence concerning association between diabetes and poverty

Publication year	Objective(s)	Design	Data collection	Results	Ref.
2013	The study examined the association between neighborhood-level poverty and hospital admission rates for T2DM in Rhode Island	Longitudinal study	Rhode Island's hospital discharge data	The study found that poverty increased from 3% to 40%, and the associated diabetes admission rates increased from less than 2% to 30% per 1000 residents	[9]
2011	The study examined ''upstream'' influences (the social determinants of health) that contribute to ''downstream'' health disparities, focusing on variations in T2DM risk	Exploratory study	Mixed data collection of focus group and survey	The results showed that the most significant barriers to health and the source of T2DM disparities in the target population were structural. In other words, they were derived from the conditions within which individuals live, work, and play	[17]
2002	The study investigated the profile of diabetes and its complications	Comparative study	Medical diagnosis	The results revealed that the prevalence of diabetes and impaired glucose tolerance was substantially lower among the low-income group than in the high-income group	[19]
2012	The study assessed the relationship between SES and T2DM in India	Cross-sectional survey	Self-reporting diabetes status	The study revealed that individuals with the highest SES seem to be at extreme risk for T2DM	[20]
2012	The study sought to determine whether inequality of income was connected with diabetes prevalence and inequality of care under a national health insurance program in Asia	Cross-sectional survey	National Health Insurance Scheme	The study revealed that the prevalence of diabetes was higher in low-income earners compared to middle-income counterparts	[21]
2014	The study examined the role of neighborhood poverty and racial composition in predicting race differences in diabetes incidence	Cross-sectional survey	The National Health and Nutrition Examination Survey, medical examination and interview	The study found that poverty was positively associated with diabetes for both Black and White people. Residing in a poor neighborhood amplified the odds of having diabetes for Black and White people	[22]
2019	It evaluated socioeconomic disparities in undiagnosed, diagnosed, and total diabetes as well as lifestyle variables as contributing factors to diabetes disparities in South Africa	Cross-sectional study	South African National Health and Nutrition Examination Survey	As measured by self-reported clinical data, diabetes was more prevalent among higher socioeconomic groups in South Africa	[23]
2023	This study compared rural-urban differentials in prevalence and lifestyle factors associated with pre-diabetes and diabetes in the elderly in southwest China	Cross-sectional health interview and examination survey	Anthropometric measurements as well as blood pressure and fasting blood glucose measurements	The study revealed that the incidence of pre-diabetes and diabetes was higher among urban older adults compared to their rural contemporaries in southwest China	[24]
2023	The study examined the trends in income-related inequalities in diabetes prevalence and identified the contribution of determining factors	Estimation of income-related inequalities in diagnosed diabetes	National Health Interview Survey	The study revealed that diabetes was more prevalent in low-income populations	

SES: Socioeconomic status; T2DM: Type 2 diabetes mellitus.

Three other studies identified factors that hindered diabetic patients from accessing medical care services; these factors included inadequate medical facilities, high-cost medical services, insufficient preservative facilities, structural barriers, quantification of need, equitable distribution of insulin, unavailability of syringes and testing equipment, and over-crowded clinics[10,11,27]. Two other studies emphasized that diabetes control was associated with insurance coverage and some health care visits, while the accessibility of diabetes care, availability of diabetes services, quality of diabetes care, disease management tactics, basic facilities of the health system, and health education resources played substantial roles in providing diabetes care services to patients[28,29].

Utilization of health care services by diabetic patients

Empirical studies that investigated the utilization of health care by diabetic patients have been published (Table 3). One study revealed that the majority of individuals with diabetes utilized the service of general practitioners, emergency room services, and specialist services[14]. The choice of these healthcare services was affected by the knowledge possessed by diabetic patients, which affected their utilization of these services[31]. Older adults with diabetes have been found to utilize emergency services and some outpatient visit services more than younger individuals[32]. A study conducted by Shalev *et al*[33] revealed that gender influences the utilization of health care services as females use more health care

Table 2 Accessibility of healthcare services among diabetic patients

Publication year	Objective(s)	Design	Data collection	Results	Ref.
2018	The study examined diabetic patients' access to hemoglobin A1c testing in rural Africa	Review	-	The study proposed that routine access to hemoglobin A1c testing would allow for close monitoring of diabetes control as well as provide critical data informing the population level of diabetes complications. The study equally revealed that the major limitation for rural patients' access to health care included high-cost medical services and a lack of preservative facilities	[10]
2005	The study assessed the barriers to care for patients with insulin-requiring diabetes	Rapid assessment protocol	Interviews, discussions, and site visits	The study revealed that several factors limited patients' access to diabetes care, which included inadequate supply, the problem of quantification of need, equitable distribution of insulin, and unavailability of syringes and testing equipment	[11]
2019	This study analyzed the diabetes-related information routine in Kwazulu Natal	Descriptive survey	Data from the District Health information system of South Africa	The study revealed that the number of diabetic patients seeking medical care increased 305% between 2006 to 2015, while the number of defaulters has decreased since 2012	[26]
2015	The study investigated females' experience with diabetes care in Soweto, a township of Johannesburg	Qualitative study	Interview	The study revealed that females identified structural barriers such as overcrowded clinics and poor access to medicines as hindering treatment adherence	[27]
2012	This study examined the association between access to health care and diabetes control	Correlational research	National Health and Nutrition Examination Survey, current health insurance coverage	The study revealed that lack of access to health care was linked with severe diabetic ailments. Diabetes control was associated with insurance coverage and some healthcare visits	[28]
2022	The study examined diabetes care factors and assessed their relative importance	Cross-sectional study	Survey questionnaire	The study revealed that accessibility of diabetes care, availability of diabetes services, quality of diabetes care, diabetes management strategies, a health system's basic amenities, and health education resources played a significant role in providing diabetes care services	[29]
2019	The study aimed to comprehend the factors that affected the utilization of DRSS and follow-up to inform health promotion strategies and improve the uptake of these services	Qualitative study	Focus group discussion	The study found that several factors affected patient uptake of diabetic retinopathy screening services, which included a lack of knowledge of both conditions and the need for screening, economic reasons, institutional factors, long waiting times at eye clinics, and fear of discomfort among others	[30]

DRSS: Diabetic Retinopathy Severity Scale.

services and have a high morbidity rate compared to males. Shalev *et al*[33] and Aro *et al*[34] affirmed that patients that are affected by diabetes utilized medical care more compared with their counterparts. Two studies identified factors that limited diabetic patients' utilization of health care services, which included a lack of finance and transportation that hindered the utilization of health care among diabetic patients[35-37].

DISCUSSION

This review investigated the association between diabetes and poverty. Comprehending the empirical evidence in the diabetes literature linking diabetes and poverty is crucial to guide future researchers as well as intervention programs and policies needed to manage the adverse effects of diabetes on patients. This discussion is organized based on the research questions that guided the study.

Diabetes is an emerging health problem both in low-income and middle-income countries. Despite the higher prevalence of diabetes in developing countries than in developed countries, diabetes affects both high-income and low-income earners[38]. Empirical evidence has revealed that there is more diabetes in high-income earners compared with low-income earners[19,20]. This could be attributed to environmental dispositions concerning what the high-income earners are bound to consume as well as the lack of knowledge and awareness of the major cause of various kinds of diabetes. The root contributing factor to the incidence of diabetes among high-income earners is an individual's physical inactivity.

However, other empirical studies in the diabetes literature associated diabetes with poverty because it requires long-term medical care and services that are capital intensive mostly in developing countries, and individuals with diabetes have chances of developing other ailments such as kidney problems and cardiovascular disease[39]. This means that individual poverty is a contributing factor that increases the prevalence of diabetes while some of the causative factors are

Table 3 Utilization of healthcare services among diabetic patients

Publication year	Objective(s)	Design	Data collection	Results	Ref.
2020	The purpose of this study was to investigate the service needs and healthcare utilization among people with T2DM	Cross-sectional study	Self-report questionnaire	The study revealed that diabetic patients utilized outpatient visits, special visits, general practitioner visits, emergency room, and hospitalization	[14]
2021	The study investigated the impact of diabetes comorbidities on the health care use and cost of a cohort of elderly patients with diabetes and high care needs based on real-world data	Descriptive survey	National Health Datasets	The results showed that high-need elderly patients accessed emergency care and several outpatient visits	[32]
2005	This study described differences in healthcare utilization and indicators of patients with diabetes based on gender	Survey	Computerized medical record	The study revealed that females with diabetes use more healthcare services and have a higher morbidity rate than their male counterparts	[33]
2022	This study compared the utilization of primary healthcare services by elderly patients with and without T2DM	Survey study	Electronic patient records, health-related quality of life, self-rated health	Patients with diabetes utilized primary healthcare more than those without diabetes	[34]
2022	This study evaluated whether social determinants were associated with an increased risk of proliferative diabetic retinopathy	Survey study	National Institutes of Health *All of Us* Research Program data repository	This study revealed that patients affirmed that financial concerns and lack of access to transportation were the major reasons for delaying or avoiding access to health care	[35]
2022	The study examined the costs sustained by patients with IDDM who received hospital inpatient/observation/emergency department care (Higher care) for diabetes-related events with those who did not receive such care to identify a target group for treatment in a subsequent study	Institutional review	Documented institutional data	It was found in the study that 8.4% of IDDM patients received higher care yet incurred 20% in medical costs and nearly 40% in diabetic-related spending	[36]
2017	A study was conducted in Bangladesh to determine diabetes-related knowledge and factors affecting healthcare services utilization among patients with T2DM	Analytical study	Interviewer and semi-structured questionnaires	Among patients with T2DM, the study found that patients had average knowledge of diabetes management, which might affect the use of healthcare services	[37]

IDDM: Insulin-dependent diabetes mellitus; T2DM: Type 2 diabetes mellitus.

unhealthy diet and physical inactivity. Furthermore, residing in poor neighborhoods has been found to increase the odds of having diabetes irrespective of race[22]. This implies that poor neighborhoods could predispose residents to unhealthy diets that contribute to a high chance of developing diabetes. Furthermore, empirical evidence has established that an increase in poverty leads to a corresponding increase in diabetes rate[9]. Poverty may compel individuals to consume unhealthy foods that can predispose them to diabetic conditions. However, just like other non-communicable diseases, diabetes can affect individuals irrespective of race and socioeconomic status, and its incidence is rising worldwide as a result of lifestyle factors like lack of physical inactivity and unhealthy diets.

Increased accessibility to health care is extremely important for diabetic patients because diabetes requires long-term management. Diabetic patients need unlimited access to medical care services to avert complications or crises and maintain a good quality of life. This requires frequent access and availability of a team of medical experts and pharmacists as well as the service of a diabetic care team[40]. The diabetes literature has shown that between 2006 to 2015, the number of diabetic patients that were seeking medical care increased 305%[26]. This indicates that patients with diabetes are willing and eager to access the medical care services provided by the government and non-governmental organizations.

Despite the promising upsurge in the number of diabetic patients seeking medical care services due to awareness, some personal and institutional factors often limit the patient's chances of access to diabetes care. Some studies have identified several factors that limit diabetic patients' access to medical care services. Piyasena *et al*[30] identified a lack of knowledge of the diabetic condition and the need for screening, financial burden, institutional factors, long waiting times at eye clinics, and fear of discomfort as the factors that hindered patient uptake of diabetes retinopathy screening services. Other studies emphasized the high cost of medical services, lack of preventative facilities, the problem of quantification of needs, limited distribution of insulin, overcrowded clinics, and lack of testing instruments for earlier detection of diabetes [10,11,27].

The majority of these identified factors that hinder patient accessibility to diabetes care services are human factors that can be resolved by government and non-governmental organizations by prioritizing the management of diabetes. To enhance the accessibility of health care services by diabetic patients, policies and intervention programs should be formulated and geared towards eliminating these existing factors that hinder diabetic patient access to health care services. As noted by Itumalla *et al*[29], government and non-governmental organizations should focus on improving the quality of diabetes care services, basic amenities of health services, and health awareness program services to facilitate the provision of efficient medical care services to diabetic patients[23].

The utilization of healthcare services can help to manage and sustain diabetic patients' healthcare-related problems as well as curtail the complications of diabetes. The utilization of health care services portrays how diabetic patients value the effectiveness of the current diabetes medical care services. This current study found in the diabetes literature that few studies have been carried out concerning the utilization of diabetic medical care services across the globe despite the upsurge in the incidence of diabetes.

Some empirical studies have identified some aspects of medical care services utilized by diabetic patients. Diabetic patients have been found to utilize outpatient visits, special visits, general practitioner visits, emergency room, and hospitalization[14,34]. This means that diabetic patients value the kinds of medical care services provided by these specialists; however, studies did not disclose the extent of utilization of these services by diabetic patients. More studies need to be conducted concerning how patients follow the recommended guidelines of taking their drugs, value routine check-up services, and abstain from consumption of edibles that escalate diabetes crises.

A study revealed that 8.4% of diabetic patients received higher care but incurred 20% of medical expenses and nearly 40% of diabetes-related expenses[36]. This finding implies that 91.6% of diabetic patients utilize low-care or no-care diabetes medical care. This finding revealed that diabetes medical care services are expensive for middle-income and low-income earners who are within the 91.6% of individuals with diabetes that could utilize low or no professional medical care services. Thus, more empirical studies are needed concerning the utilization of medical care services among individuals with diabetes.

CONCLUSION

Diabetes affects all individuals regardless of social class. Therefore, diabetes is not a disease particular to low-income earners. In the diabetes literature, the prevalence of diabetes among high-income earners has been associated with physical inactivity, while the prevalence of diabetes among low-income earners has been attributed to consumption of unhealthy diets as well as insufficient funds to manage the adverse effects of diabetes ailments. Access to medical care services is crucial to the management of diabetes. The available literature has shown that the number of patients seeking access to medical care services has increased over the years; however, several factors have been identified in the literature that hinder patient accessibility to the available medical care services. When medical care services are not accessible by the patients, the primary objectives of providing such services are marred. Hence, the after-effect is that the health condition of diabetic patients will deteriorate, especially in patients who are low-income earners in developing countries.

Utilization of medical care services is the major objective of all medical services; this review has documented that diabetic patients utilize some of these medical care services even though the percentage of individuals that utilize these services is very low. Diabetes medical care services are insufficient in developing countries where there are many individuals with diabetes. More scoping studies need to be conducted concerning different categories of patients with diabetes and their health, behavioral, and environmental implications. Future studies should widen the scope of their review concerning all ages and include publications in different languages to capture more empirical findings.

FOOTNOTES

Author contributions: Eseadi C, Amedu AN, Ilechukwu CL, Ossai VO, and Ngwu MO conceived the study; Eseadi C, Ilechukwu CL, Ossai VO, Ngwu MO, and Amedu AN designed the study, conducted the literature review, and were responsible for the analysis, drafting, editing, and approval of the final version of this manuscript.

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