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Factors Influencing the Management of Type 2 Diabetes among Patients at the Nylon District Hospital in Douala, Cameroon

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Abstract *Type 2 diabetes mellitus (T2DM) is one of the leading chronic non-communicable diseases worldwide and constitutes a major public health problem in low- and middle-income countries. Poor therapeutic adherence, inadequate nutritional practices, limited communication, and socioeconomic constraints significantly affect the management of this condition. This study aimed to identify the factors influencing the management of type 2 diabetes among patients attending the Nylon District Hospital in Douala, Cameroon. A descriptive cross-sectional study was conducted from November 2024 to July 2025 among 200 patients diagnosed with T2DM. Data were collected using a structured questionnaire after informed consent and analyzed using Microsoft Excel, Epi Info, and RStudio software. Results revealed that males represented 62% of participants while patients aged above 60 years constituted 63% of respondents. About 34% of respondents regularly consumed alcohol, while 19% had never participated in any diabetes education program. Furthermore, 63% perceived healthcare personnel as inaccessible or aggressive, and 81% had previously interrupted treatment. Financial constraints, inadequate communication on diabetes, and poor adherence to dietary recommendations were among the major barriers identified. The findings suggest that improving therapeutic education, strengthening communication strategies, and facilitating access to medication could significantly improve the outcomes of diabetes management.*

Keywords *Communication, Cameroon, Nutrition, Type 2 Diabetes, Therapeutic Adherence.*

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Introduction

Type 2 diabetes mellitus (T2DM) is a chronic metabolic disorder characterized by persistent hyperglycemia resulting from insulin resistance and impaired insulin secretion by pancreatic β-cells [1, 2]. It is currently recognized as one of the most important non-communicable diseases worldwide because of its rapidly increasing prevalence, associated complications, and socioeconomic burden. According to the International Diabetes Federation (IDF), diabetes affects hundreds of millions of people globally, and approximately 90–95% of all diabetes cases are attributed to T2DM [3]. The World Health Organization (WHO) further reports that diabetes is among the leading causes of morbidity and mortality worldwide, contributing significantly to cardiovascular diseases, kidney failure, blindness, lower-limb amputations, and premature deaths [1]. The growing burden of diabetes is strongly associated with urbanization, population aging, sedentary lifestyles, obesity, and unhealthy dietary practices [4, 5].

Over the past decades, the prevalence of diabetes has increased considerably in low- and middle-income countries, particularly in sub-Saharan Africa where healthcare systems often face significant resource limitations [6, 7]. Africa is currently experiencing a rapid epidemiological transition characterized by increasing rates of obesity, physical inactivity, and unhealthy nutritional habits, all of which contribute to the rising incidence of T2DM [9]. The WHO Africa Regional Office estimates that the number of adults living with diabetes in Africa will continue to rise dramatically in the coming years if adequate preventive and management strategies are not implemented [11]. In addition, many cases remain undiagnosed, thereby exposing patients to severe complications before appropriate treatment is initiated [15].

Cameroon is equally affected by this growing epidemic. Diabetes has become a major public health challenge because of its impact on morbidity, mortality, and healthcare expenditure [6]. Previous studies conducted in Cameroon have reported increasing prevalence rates in both urban and rural settings, although urban populations remain disproportionately affected due to changes in lifestyle, dietary habits, reduced physical activity, and increased stress levels associated with modernization [13, 14]. The burden of diabetes in Cameroon is further aggravated by limited access to healthcare services, poor health-seeking behaviors, inadequate patient education, and the high cost of long-term treatment [12]. Consequently, many diabetic patients experience poor glycemic control and develop chronic complications such as cardiovascular diseases, neuropathy, nephropathy, retinopathy, and diabetic foot ulcers [10, 12].

Effective management of T2DM requires a comprehensive and multidisciplinary approach involving adherence to dietary recommendations, regular physical activity, blood glucose monitoring, medication compliance, and continuous therapeutic education [8, 16]. Diabetes self-management education and support programs play a critical role in empowering patients to make informed decisions regarding their health and improve therapeutic adherence [17, 18]. However, despite the availability of treatment guidelines and educational interventions, many diabetic patients continue to encounter numerous barriers to effective disease management. These barriers include financial difficulties, poor communication between healthcare providers and patients, inadequate family or social support, low levels of knowledge concerning the disease, and unhealthy lifestyle behaviors such as excessive alcohol consumption and poor dietary practices [16–18].

In many healthcare settings within sub-Saharan Africa, diabetes management is also hindered by irregular availability of

medications, insufficient healthcare infrastructure, and limited access to trained healthcare professionals [7, 10]. Poor adherence to treatment and follow-up appointments remains a major concern because it contributes significantly to disease progression and the occurrence of complications. Furthermore, misconceptions regarding diabetes and reliance on alternative treatment methods may negatively influence adherence to prescribed therapies and medical recommendations [4, 5].

Given the increasing prevalence of T2DM and the numerous challenges encountered by diabetic patients in Cameroon, there is a need to better understand the determinants influencing disease management in healthcare facilities. Identifying these factors is essential for developing effective interventions aimed at improving therapeutic adherence, reducing complications, and enhancing the quality of life of diabetic patients. It is within this context that the present study was conducted at the Nylon District Hospital in Douala to investigate the factors influencing the management of type 2 diabetes among patients attending this health facility.

The general objective of this study was to identify the determinants influencing the management of type 2 diabetes among diabetic patients. Specifically, the study sought to identify nutritional determinants influencing T2DM management, determine communication-related determinants influencing T2DM management, identify socioeconomic determinants influencing T2DM management, and determine medication-related determinants influencing T2DM management.

Methodology

Study Design

A descriptive cross-sectional study with a quantitative approach was conducted among patients diagnosed with type 2 diabetes mellitus (T2DM).

Study Site

The study was carried out at the Nylon District Hospital located in Douala, the economic capital of Cameroon. Douala is a highly urbanized city characterized by rapid population growth, sedentary lifestyles, and increasing prevalence of non-communicable diseases, including diabetes. The Nylon District Hospital is one of the major public healthcare facilities in the city and provides outpatient and inpatient healthcare services to a large and diverse population. The hospital includes consultation units, laboratory services, and chronic disease follow-up services where diabetic patients receive regular medical care and therapeutic monitoring.

Study Period

The study was conducted over a period of nine months, from November 2024 to July 2025. This duration allowed adequate time for participant recruitment, data collection, verification of questionnaires, data entry, and statistical analysis.

Study Population

The study population consisted of patients diagnosed with type 2 diabetes mellitus attending the Nylon District Hospital during the study period. Participants were recruited from the diabetic consultation and follow-up units of the hospital. Both male and female patients were included in the study regardless of their socioeconomic background or duration of illness.

Inclusion Criteria

Participants were included in the study if they met the following criteria:

1. Patients who were diagnosed with type 2 diabetes mellitus by a healthcare professional.
2. Patients who attended the Nylon District Hospital during the study period.

3. Patients who voluntarily agreed to participate in the study and signed an informed consent form.

Exclusion Criteria

The study excluded:

1. Patients who were diagnosed with type 2 diabetes mellitus but were severely ill and unable to respond to the questionnaire.
2. Patients who refused to provide informed consent.

Sample Size and Sampling Technique

A total of 200 diabetic patients participated in the study. Participants were recruited using a convenience sampling technique based on their availability and willingness to participate during consultation visits at the hospital. This sampling method was considered suitable because it facilitated access to diabetic patients attending routine follow-up services.

Data Collection Procedure

Data were collected using a structured questionnaire developed according to the objectives of the study and relevant literature on diabetes management. The questionnaire was divided into several sections covering sociodemographic characteristics, nutritional practices, alcohol consumption, communication and educational factors, socioeconomic determinants, medication adherence, and treatment interruption.

Before data collection, participants were informed about the purpose and significance of the study. After obtaining informed consent, the questionnaires were administered directly to respondents in either French or English depending on the participants' preferences and level of understanding. Assistance was provided to participants who experienced difficulties in reading or interpreting certain questions.

The questionnaire was pretested among a small group of diabetic patients outside the study population to assess clarity, relevance, and comprehension of the questions. Necessary corrections and adjustments were made before the final administration of the tool.

Study Variables

The dependent variable of the study was the management of type 2 diabetes mellitus. Independent variables included sociodemographic characteristics, dietary habits, alcohol consumption, participation in educational programs, communication channels, perception of healthcare personnel, cost of treatment, source of financing, duration of illness, and therapeutic adherence.

Data Management and Statistical Analysis

Completed questionnaires were checked daily for completeness and consistency before data entry. Data were coded and entered into Microsoft Excel before being exported to Epi Info and RStudio software for statistical analysis.

Descriptive statistical analyses were performed. Frequencies and percentages were calculated for categorical variables and presented using tables and figures. The findings were interpreted according to the objectives of the study and compared with existing literature on diabetes management.

Ethical Considerations

Ethical principles were strictly respected throughout the study. Administrative authorization to conduct the study was obtained from the relevant hospital authorities before data collection commenced. Participation in the study was entirely voluntary, and informed consent was obtained from all participants prior to enrollment.

Confidentiality and anonymity were ensured by not recording participants' names or personal identifiers on the questionnaires. Participants were informed that the information collected would be used strictly for academic and scientific purposes. Respondents also had the right to withdraw from the study at any

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stage without any consequences for their medical care or follow-up services.

Results

Sociodemographic Characteristics

Table 1 shows the distribution of participants according to sex. There were 125 (62%) male respondents and 75 (38%) female respondents, giving a male predominance among the study population.

Figure 1 shows the distribution of respondents according to age group. The majority of respondents were aged above 60 years, representing 63% of the study population, followed by those aged 51–60 years (30%), while respondents aged 40–50 years represented only 7%.

Table 1. Distribution of Participants According to Sex

Sex	Frequency (n=200)	Percentage (%)
Male	125	62
Female	75	38
Total	**200**	**100**

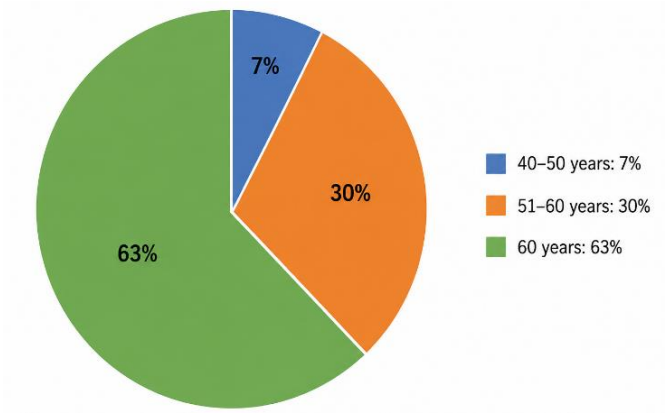

Figure 1. Distribution of Participants According to Age Group

Nutritional Factors Influencing T2DM Management

Table 2 shows the distribution of respondents according to their usual feeding habits. There were 65 (32.5%) respondents who mainly consumed couscous, 60 (30%) who consumed mixed diets, and 54 (27%) who regularly consumed rice. Only 21 (10.5%) respondents reported regular consumption of plantain and vegetables.

Table 2. Distribution of Respondents According to Usual Feeding Habits

Feeding Habit	Frequency	Percentage (%)
Couscous	65	32.5
Rice	54	27
Mixed Diet	60	30
Plantain and vegetables	21	10.5
Total	**200**	**100**

Table 3 shows the distribution of respondents according to alcohol consumption. There were 68 (34%) respondents who reported regular alcohol consumption, whereas 132 (66%) indicated that they did not consume alcohol regularly.

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Table 3. Distribution of Respondents According to Alcohol Consumption

Alcohol Consumption	Frequency	Percentage (%)
Yes	68	34
No	132	66
Total	**200**	**100**

Figure 2 presents respondents according to snacking habits between meals. More than half of the respondents (55%) reported regular snacking between meals, while 45% indicated that they did not snack regularly.

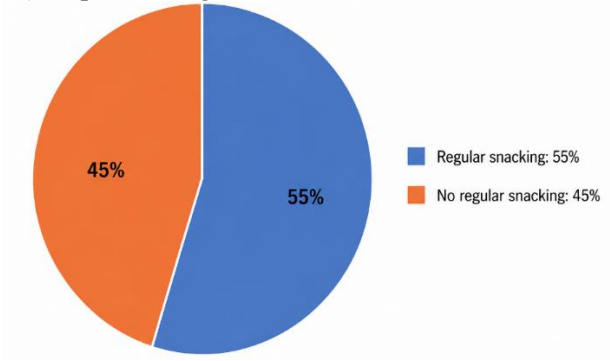

Figure 2. Respondents According to Snacking Habits between Meals

Communication and Educational Factors

Table 4 shows the participation of respondents in educational programs related to type 2 diabetes. There were 162 (81%) respondents who had previously participated in diabetes education programs, while 38 (19%) had never participated in any educational session concerning diabetes management.

Table 4. Participation in Educational Programs on Type 2 Diabetes

Participation in Diabetes Education	Frequency	Percentage (%)
Yes	162	81
No	38	19
Total	**200**	**100**

Figure 3 shows the preferred communication channels for obtaining information on diabetes management. Healthcare personnel constituted the principal source of information for 45% of respondents, followed by radio/television (20%), family members (18%), and social media platforms (17%).

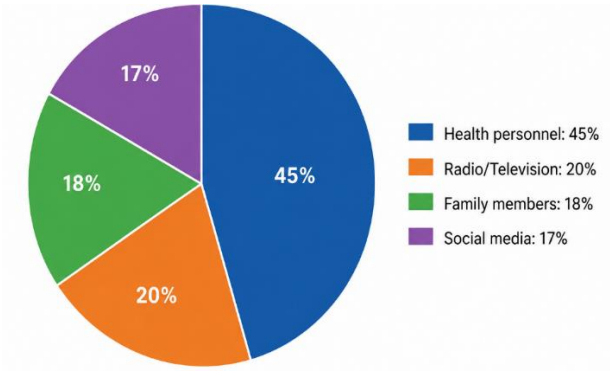

Figure 3. Preferred Communication Channels for Diabetes Information

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Table 5 shows respondents' perception of healthcare personnel. There were 126 (63%) respondents who perceived healthcare workers as inaccessible or aggressive, whereas only 74 (37%) considered healthcare personnel accessible and supportive.

Table 5. Respondents' Perception of Healthcare Personnel

Perception	Frequency	Percentage (%)
Accessible and supportive	74	37
Inaccessible/aggressive	126	63
Total	**200**	**100**

Socioeconomic Factors

Table 6 shows respondents' perception regarding the cost of diabetes treatment. The majority of respondents, 148 (74%), considered treatment expensive, while only 52 (26%) perceived treatment costs as affordable.

Table 6. Respondents According to Perceived Cost of Treatment

Perception of Cost	Frequency	Percentage (%)
Affordable	52	26
Expensive	148	74
Total	**200**	**100**

Figure 4 presents the different sources of financing for diabetes treatment. Personal income constituted the main source of treatment financing for 52% of respondents, followed by family support (30%), loans or other means (10%), and health insurance coverage (8%).

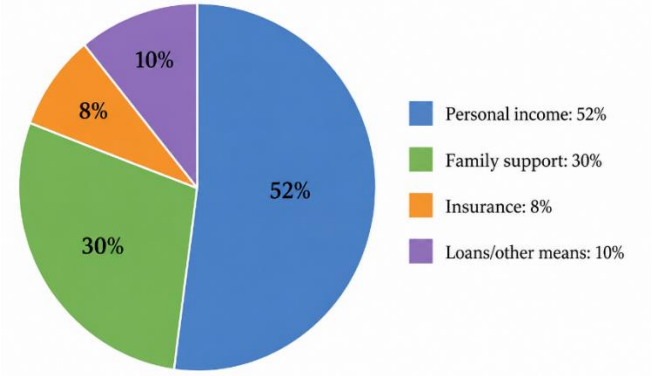

Figure 4. Sources of Financing for Treatment

Medication and Therapeutic Adherence

Table 7 shows the duration of diabetes among respondents. There were 120 (60%) respondents who had been living with diabetes for more than two years, while 52 (26%) had been diabetic for one to two years and 28 (14%) for less than one year.

Table 7. Duration of Diabetes among Respondents

Duration of Illness	Frequency	Percentage (%)
Less than 1 year	28	14
1–2 years	52	26
More than 2 years	120	60
Total	**200**	**100**

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Table 8 shows the interruption of treatment among respondents. A very high proportion of respondents, 162 (81%), reported having interrupted treatment at least once, while only 38 (19%) had never interrupted treatment.

Table 8. Interruption of Treatment among Respondents

Treatment Interruption	Frequency	Percentage (%)
Yes	162	81
No	38	19
Total	**200**	**100**

Figure 5 shows the duration of treatment interruption among respondents who had previously interrupted therapy. Among these participants, 40.7% interrupted treatment for approximately one month, 34% for two to three months, and 25.3% for more than three months.

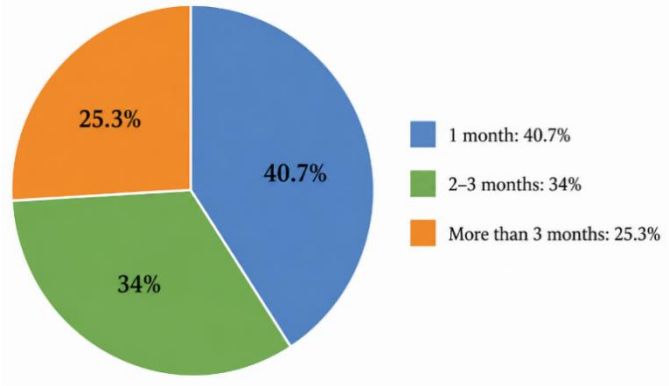

Figure 5. Duration of Treatment Interruption

Discussion

The present study identified several determinants influencing the management of type 2 diabetes mellitus (T2DM) among patients attending the Nylon District Hospital in Douala. The findings highlight the multifactorial nature of diabetes management, involving sociodemographic, nutritional, communication-related, socioeconomic, and therapeutic adherence factors. These determinants collectively contribute to poor glycemic control and increase the risk of diabetes-related complications.

The predominance of male participants (62%) observed in this study may reflect gender differences in healthcare utilization, lifestyle behaviors, and exposure to diabetes risk factors. Similar findings have been reported in studies conducted in sub-Saharan Africa where men were more represented among diabetic patients due to sedentary lifestyles, unhealthy dietary habits, and reduced physical activity [4, 7]. In addition, the majority of respondents were aged above 60 years, confirming that T2DM is more common among older adults. Aging is associated with progressive insulin resistance, reduced pancreatic β-cell function, and increased accumulation of cardiovascular and metabolic risk factors [2, 15]. Comparable observations have been reported by the International Diabetes Federation and WHO, which indicate that the prevalence of T2DM increases significantly with advancing age [1, 3].

Nutritional practices emerged as important determinants of diabetes management in this study. Most respondents consumed carbohydrate-rich foods such as couscous and rice, while only a small proportion regularly consumed fruits and vegetables. Poor dietary habits remain one of the major contributors to poor glycemic control and progression of diabetes complications [8]. Previous studies have demonstrated that diets rich in refined

carbohydrates and low in fiber increase the risk of obesity, hyperglycemia, and cardiovascular complications among diabetic patients [4 ,9]. Furthermore, frequent snacking and poor meal planning may contribute to fluctuations in blood glucose levels, thereby complicating disease management. The findings therefore underscore the importance of reinforcing nutritional counseling and individualized dietary education among diabetic patients.

Alcohol consumption was also relatively high among participants, with approximately one-third of respondents reporting regular alcohol intake. Excessive alcohol consumption has been associated with poor metabolic control, impaired judgment regarding treatment adherence, and increased risk of hypoglycemia or hyperglycemia [8, 10]. Similar studies conducted in Africa have reported that alcohol consumption negatively affects diabetes self-management and contributes to poor therapeutic outcomes [5, 9]. Lifestyle modification, including reduction of alcohol intake, remains a fundamental component of diabetes management and prevention of long-term complications.

Communication and therapeutic education were identified as significant factors influencing diabetes management. Although most respondents had previously participated in educational sessions, nearly one-fifth had never received structured diabetes education. Therapeutic education is essential in enabling diabetic patients to understand their disease, adhere to medications, adopt healthy lifestyles, and recognize warning signs of complications [17, 18]. WHO reports on adherence to long-term therapies emphasize that patient education significantly improves treatment compliance and disease outcomes [16]. Inadequate communication between healthcare professionals and patients may therefore contribute to poor self-care practices and reduced adherence to medical recommendations.

An important finding of this study was that many respondents perceived healthcare personnel as inaccessible or aggressive. Poor patient-provider relationships may discourage patients from attending follow-up consultations and openly discussing their challenges related to disease management. Effective communication between healthcare providers and patients is essential for building trust, encouraging adherence, and improving patient satisfaction [17, 18]. Studies have shown that supportive healthcare environments positively influence diabetes self-management behaviors and improve long-term therapeutic outcomes [16]. The negative perceptions reported in this study therefore suggest the need for improved patient-centered care and communication skills among healthcare providers.

Socioeconomic constraints were also a major obstacle to the effective management of diabetes among participants in this study. Most respondents considered diabetes treatment to be expensive, and many relied on their personal income or family support to pay for it. Diabetes management involves ongoing costs related to medication, laboratory testing, transportation, regular clinical follow-up and dietary changes, which can be difficult for many patients in low-resource settings [6, 11]. Financial difficulties are widely recognized as important factors contributing to poor adherence and treatment discontinuation among diabetic patients in Sub-Saharan Africa [9]. In Cameroon, the growing burden of diabetes and its complications is placing considerable pressure on patients and health systems, especially in urban populations where the prevalence of diabetes continues to rise [13, 14]. Moreover, the lack of universal health coverage and limited health insurance systems further exacerbate this burden in Cameroon and many other developing countries, exposing patients to catastrophic health-care costs and limiting their access to continuous care [12, 14]. Similar observations were reported by Ekoe and Zimmet, who pointed out that socioeconomic inequalities

significantly affect the course of diabetes and access to health services in low- and middle-income countries [15]. According to the World Health Organization, low adherence to long-term treatments among patients with chronic diseases is strongly associated with financial barriers, inadequate care systems, and limited therapeutic education [16]. Therapeutic education and patient empowerment are therefore recommended as essential strategies to improve self-management, treatment adherence and long-term glycaemic control in diabetic patients [17, 18]. Moreover, the International Diabetes Federation estimates that the global burden of diabetes continues to rise rapidly, particularly in developing countries where health resources remain insufficient to ensure adequate management of chronic diseases [19].

A very high proportion of participants (81%) reported treatment discontinuation, indicating low adherence among diabetic patients. Non-adherence to medication is a leading cause of poor glycemic control and is associated with an increased risk of complications such as neuropathy, nephropathy, retinopathy, cardiovascular disease and diabetic foot ulcers [10, 12]. Similar results have been reported in previous studies where financial constraints, insufficient therapeutic education, forgetfulness, poor communication, and a deficient patient-caregiver relationship contributed significantly to treatment discontinuation [4, 16]. In Cameroon and other sub-Saharan African countries, poor adherence to diabetes treatment remains a major public health problem, contributing to increased morbidity, mortality, and healthcare costs [13, 14]. Powers et al. emphasized that therapeutic education of the diabetic patient plays a crucial role in improving adherence and empowering patients to actively participate in managing their disease [17]. Similarly, Funnell and Anderson have reported that patient empowerment and effective communication between healthcare professionals and patients significantly improve treatment outcomes and long-term adherence in people with diabetes [18]. Poor adherence can ultimately lead to higher hospitalization rates, decreased quality of life, worsening chronic complications, and higher mortality in diabetic patients [19].

Overall, the findings of this study emphasize the urgent need for comprehensive interventions aimed at improving diabetes management in Cameroon. Strengthening therapeutic education programs, improving communication between healthcare providers and patients, subsidizing diabetes treatment, and promoting healthy lifestyles could significantly improve adherence and glycemic control. Public health authorities should also reinforce diabetes awareness campaigns and strengthen healthcare systems to ensure accessible and affordable diabetes care for affected populations.

Conclusion

Type 2 diabetes mellitus remains a major public health challenge in Cameroon. The management of this disease is influenced by several nutritional, socioeconomic, communication-related, and therapeutic factors. Poor dietary practices, alcohol consumption, inadequate communication, high treatment costs, and poor therapeutic adherence were identified as the main barriers to effective management. Strengthening diabetes education programs, improving patient-provider communication, subsidizing treatment costs, and promoting healthy lifestyles could significantly improve disease outcomes and reduce diabetes-related complications.

The findings of this study therefore highlight the need for healthcare personnel to strengthen therapeutic education, communication, and regular patient follow-up, while patients should adhere to dietary recommendations, treatment schedules, and actively participate in diabetes education programs, alongside increased efforts by health authorities to improve the accessibility and affordability of diabetic care,

reinforce screening services, and organize public awareness campaigns on diabetes prevention and management.

Conflict of Interest

The authors declare no conflict of interest.

Ethical Approval

Ethical approval for this study was obtained from the Ethics Committee of the University of Douala, Cameroon. Written informed consent was obtained from all participants before data collection.

Author Contributions

Fankep Dihewou Alphonse Bertin: Conceptualization, Data Collection, Methodology, Formal Analysis, and Project Administration. Christina Mbongueh Mohnchimbare: Original Draft Preparation. Asiati Mbabazi: Review and Editing. Henri Lucien Kamga Fouamno: Supervision.

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Data Availability

The datasets generated and/or analyzed during the current study are available from the corresponding author upon reasonable request.

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