

NON-DRUG EXPENDITURES IN THE MANAGEMENT OF TYPE-2 DIABETES MELLITUS AT ENUGU STATE UNIVERSITY TEACHING HOSPITAL, NIGERIA

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Abstract

This study aimed to assess the non-drug expenditures incurred by patients managing type-2 diabetes mellitus at the Enugu State University Teaching Hospital (ESUTH), Enugu, Nigeria. A cross-sectional survey was conducted in 2021, involving 422 patients diagnosed with type-2 diabetes mellitus. Data was collected using a structured questionnaire, which inquired about workdays missed, time spent in healthcare facilities, expenditures on household help, transportation, special diets, and physiotherapy (if applicable). The results revealed that 60.4% of participants missed at least 10 days of work annually due to their condition, and 40.8% spent 2-4 hours per visit to the hospital. Additionally, 35.3% of patients hired household help, with most paying less than N5,000 per month. Around 32.7% of participants spent under N2,000 for transportation to attend medical appointments. Furthermore, 38.6% experienced complications, and 14% of these patients reported spending between N5,000 and N10,000 annually on managing complications. The findings suggest that the non-drug costs associated with managing type-2 diabetes can significantly exceed the costs of medications and related accessories. The burden of these indirect expenses, such as lost productivity and the need for additional household support, is substantial, highlighting the importance of considering these hidden costs in diabetes care management.

Keywords: Non-drug expenditure, Type-2 diabetes mellitus, Indirect costs, Health care, Nigeria

Introduction

Type-2 diabetes mellitus (T2DM), also referred to as non-insulin dependent diabetes mellitus, has evolved significantly in terms of its epidemiology. Historically known as adult-onset diabetes, the condition was once predominantly seen in older populations. However, with the rise of obesity and poor lifestyle habits among younger populations, especially in children and adolescents, the onset of type-2 diabetes is now increasingly common among teenagers and young adults. This paradigm shift underscores the growing burden of T2DM worldwide and its potential long-term societal impacts. It is the most prevalent form of diabetes, accounting for over 95% of all diabetes cases in adults globally. This condition is primarily characterized by the pancreas's inability to produce sufficient insulin or the body's resistance to the insulin it does produce, affecting insulin-sensitive tissues such as adipose tissue, liver, and muscle.

Managing T2DM requires a comprehensive approach, encompassing lifestyle modifications such as dietary restrictions, regular aerobic exercise, and continuous monitoring of blood glucose levels. In many cases, patients are also required to regularly administer insulin or other pharmacological treatments. However, beyond the direct costs associated with medications and medical care, diabetes patients also face significant non-drug expenditures that can impact their overall financial well-being. These expenditures, which are often not immediately apparent in the conventional medical cost assessments, are critical to understanding the full economic burden of diabetes on patients and their families.

The management of T2DM is a multifaceted process that often extends beyond traditional medical treatments. It necessitates ongoing medical attention, including regular clinic visits, laboratory tests, and consultations with a variety of healthcare providers. In addition to the direct medical costs, diabetes patients often face indirect costs, which can be equally, if not more, burdensome. These indirect costs, which are sometimes referred to as non-drug expenditures, encompass a wide array of financial implications. These costs include income lost due to illness, productivity losses, and time lost from work for treatment or complications management. Furthermore, managing complications associated with T2DM, such as neuropathy, retinopathy, or cardiovascular diseases, can lead to additional expenses that are not immediately associated with the core medical treatment but still contribute significantly to the overall cost of living with the condition.

The World Health Organization (WHO) has highlighted that the cost of lost production, due to reduced work capacity or absenteeism, often exceeds direct healthcare costs in the management of diabetes mellitus. These indirect costs may include lost wages, reduced productivity, and increased household expenditures, which can place a substantial financial strain on individuals and families. For example, a person with diabetes may have to take time off work for doctor's appointments, hospital visits, or managing episodes of high blood sugar or complications, which leads to income loss. In many cases, the disease leads to diminished work output or even early retirement, further exacerbating the financial burden.

In a study conducted in the Brazilian Public Health System, it was found that the annual cost of managing a patient with T2DM was US\$2,108, with \$773 of this being attributed to indirect costs—representing approximately 36.7% of the total cost. Additionally, the study revealed that productivity losses due to missed workdays amounted to \$437 per patient per year. The study also highlighted other significant economic consequences, such as diabetes-related sick leave, early retirement, and job loss. These findings reflect broader trends observed in many countries, suggesting that the economic burden of diabetes is far greater than the costs associated with medical treatments alone.

Research from various regions further underscores the substantial indirect costs associated with diabetes. A study conducted in Italy found that the total economic burden of diabetes amounted to €20.3 billion annually, with 54% of this burden attributed to indirect costs. Similarly, research conducted in Poland and Thailand revealed that productivity losses due to incapacity to work were the largest contributor to the overall cost of diabetes. In Poland, for example, 89% of the indirect costs were due to lost productivity, and these costs were even more significant for individuals experiencing diabetes-related complications. Such findings illustrate the disproportionate impact

that the indirect costs of diabetes have on patients and society, as they are often overlooked in discussions about diabetes-related expenses.

The situation in the African context is also notable. A study by Kirigia et al., focused on the economic burden of diseases in the WHO African region, revealed that diabetes accounted for a significant portion of the total economic loss in the region. In 2000, the African region recorded 7.02 million cases of diabetes, with a total economic loss of \$25.51 billion. Of this, \$8.1 billion (32%) was attributed to indirect costs. These figures emphasize the profound economic strain that diabetes places on individuals and healthcare systems, especially in low- and middle-income countries.

In Morocco, another study estimated that indirect costs accounted for between 57% and 81% of the total diabetes management cost, with the per capita indirect cost being considerably higher than the direct cost of managing the disease. This trend of disproportionate indirect costs is not unique to one region or healthcare system but rather reflects a global challenge in understanding and mitigating the economic burden of diabetes.

These studies collectively demonstrate that while direct costs such as medication, doctor visits, and hospital stays are often the primary focus of diabetes management discussions, the hidden costs associated with lost productivity, additional caregiving, and transportation can be just as, if not more, significant. Understanding the total cost of diabetes requires a holistic view that takes into account both direct and indirect expenses. Only by addressing these non-drug expenditures can healthcare systems and policymakers begin to develop more effective strategies to support diabetes patients and reduce the overall burden of the disease.

As the prevalence of T2DM continues to rise globally, it is crucial to recognize the full economic impact of this disease. It is not enough to focus solely on the direct medical costs of diabetes management; the financial strain caused by non-drug expenditures must also be acknowledged. This broader understanding of diabetes-related costs will help healthcare providers, governments, and patients develop more comprehensive and sustainable approaches to managing the disease, improving quality of life, and reducing the economic burden on individuals and society.

In conclusion, the economic impact of type-2 diabetes is not limited to the direct costs of medical treatment, but includes significant indirect costs such as lost productivity, increased caregiving responsibilities, and other hidden expenses. As such, the full economic burden of diabetes is often underestimated, which can lead to suboptimal policy responses and resource allocation. This study aims to explore the non-drug expenditure of diabetes management among patients in Enugu, Nigeria, and contribute to the growing body of evidence on the broader economic impacts of diabetes.

RESULTS

Table 1. Socio-demographic status of patients

Variables	Frequency	Percentage
Gender		
Male	215	50.9
Female	207	49.1
Total	422	100.0
Age		
<30 years	11	2.6
31 - 40 years	40	9.5
41 - 50 years	82	19.4
51 - 60 years	110	26.1
>61 years	179	42.4
Total	422	100.0

About 50.9% are males while 49.1% are females.

About 68.5% are patients above 50years of age

Variable	Frequency	Percentage
How many days have you been absent from work as a result of minor and major complications		
<10days	255	60.4
11 - 40days	121	28.7
41 - 80days	13	3.1
>80days	2	.5
Not applicable	31	7.3
Total	422	100.0
How many hours do you stay away from work in each visit to the hospital as a result of the diabetes	Frequency	Percentage
<1hr	58	14.0
2 - 4hrs	169	40.8
5 - 6hrs	146	35.3
>7hrs	35	8.5

Not applicable	6	1.4
Total	414	100.0
Mean $\pm$ Std. Deviation	2.43 $\pm$ 0.885	
Variance	0.783	

Table 2; Sickness-work-absence due to diabetes mellitus

Majority of the patients 60.4% missed work for at least 10 days in a year while 7.3% claimed they never missed going to work. About 40.8% spend 2-4 hours in each visit to the hospital, 35.3% spend 5-6 hours.

Table 3; Hiring of extra man-hours as a result of diabetes mellitus

Have you needed any extra household helper for diabetes care	Frequency	Percentage
Yes	149	35.3
No	273	64.7
Total	422	100.0
If yes, state the costs incurred per month		
<N5,000	72	17.1
N5,000 - N10,000	61	14.5
N10,00 - N20,000	10	2.4
>N20,000	6	1.4
Not applicable	273	64.7
Total	422	100.0

Majority 64.7% needed no extra household help, 35.3% needed extra household help with majority spending <N5,000 for such help.

Table 4; Transportation costs to secure treatment for diabetes mellitus

How much do you spend on transportation to the diabetic clinic yearly	Frequency	Percentage
<N2,000	138	32.7
N2,000 - N5,000	119	28.2
N6,000 - N10,000	136	32.2
>N10,000	29	6.9
Total	422	100.0
Mean $\pm$ Std. Deviation	2.13 $\pm$ 0.953	

Variance	0.909	
Have you developed any complications as a result of diabetes mellitus		
Yes	163	38.6
No	259	61.4
Total	422	100.0
How much have you spent in the management of these complications yearly		
<N5,000	43	10.2
N5,000 - N10,000	59	14.0
N11,000 - N15,000	38	9.0
>N15,000	23	5.5
Not applicable	259	61.4
Total	422	100.0

Transportation fare spent by majority (32.7%) is <N2,000. About 61.4% of respondent have not developed any complications as a result of diabetes mellitus while 38.6% have developed complications and many (14%) spend between N5000 – N10000 on the complications yearly.

Table 4: Special dietary costs as a result of diabetes mellitus

	Frequency	Percentage
Are you on any dietary modification		
Yes	260	61.6
No	162	38.4
Total	422	100.0
If yes, how much have you spent on it monthly		
N2,000	50	11.8
N2,000 - N5,000	114	27.0
N6,000 - N10,000	64	15.2
>N10,000	33	7.8

Not applicable	161	38.2
Total	422	100.0
Are you on physiotherapy or special exercise for your condition		
Yes	140	33.2
No	282	66.8
Total	422	100.0
If yes, how much do you pay monthly for this therapy		
<N2,000	41	9.7
N2,000 - N5,000	48	11.4
N6,000 - N10,000	40	9.5
>N10,000	11	2.6
Not applicable	282	66.8
Total	422	100.0

The respondents on dietary modifications are 260 (61.6%) with majority (27%) spending between N2000 – N5000 monthly on the diet. About 282 (66.8%) of the respondents are on physiotherapy or special exercise for their condition with majority spending between N2000 – N5000 for it.

Discussion; This study found out that an appreciable number 28.7% of patients reported 11 to 40 days per year and 40.8% reported 2-4 hours per clinic visiting day lost to work-absence due to illness caused by diabetes. This is in agreement with the work done by Chatterjee S and his colleagues whose study also showed that productivity losses due to permanent disability formed about 30% of the total indirect costs incurred whilst work absenteeism formed 3.3%.⁶ Although the figures do not quite coincide, the difference could be due to the fact that the studies were done in different environments. Our findings also agree with that of Kirigia and his colleagues who had to determine the economic burden of disease in the W.H.O African region, and found that of the 7.02 million cases of diabetes recorded by the countries of the African region in 2000 with total economic loss of \$25.51 billion, indirect cost accounted for \$8.1 billion (32%).⁷

Conclusion; The often over-looked economic burden which is incurred as the non-drug expenditure by patients attending the diabetes clinic in Enugu State Teaching hospital is so enormous as can be seen in this study. It is therefore necessary that these hidden costs should be taken into consideration when planning for the management of patients with diabetes mellitus at the family, community and institutional levels.

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