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Socioeconomic inequities and payment coping mechanisms used in the treatment of type 2 diabetes mellitus in Nigeria

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Abstract

Aim: Given the enormous economic burden of diabetes in Nigeria and in sub-Saharan Africa, the study was designed to determine how different population groups cope with payment for type 2 diabetes mellitus (DM).

Materials and Methods: A total of 292 exit interviews were conducted with patients who attended the outpatient diabetic clinic in a specialist public health facility in southeast Nigeria. The monthly expenditures and strategies that were used to cope with payments for diabetic treatment were determined. A socioeconomic status (SES) index was used to divide the respondents into SES quartiles (Q1 (poorest), Q2, Q3, Q4 (least poor)). The coping mechanisms were disaggregated by SES.

Results: The mean monthly expenditure for the treatment of diabetes was ₦56,245.11 ($356). Expenditures were mostly incurred through out-of-pocket payments. The most common coping strategy utilized was household savings (99.0%) followed by support from family members (85.3%). All SES groups used more than one payment coping method. Borrowing, skipping of appointments, and stopping children education were significantly significant ($P < 0.05$).

Conclusion: The mean monthly direct cost in the treatment of type 2 diabetes among the study group was high. There were SES inequities in the use of coping mechanisms, with the poorest SES group (Q1) being worse off than other groups. The financial risk protection mechanisms such as health insurance that will reduce the economic burden of type 2 diabetes on households and provide universal health coverage to people suffering from DM more especially to the disadvantaged group should be developed and implemented.

Key words: Inequities, payment coping, socioeconomic status, type 2 diabetes

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Introduction

The economic burden of healthcare expenditure on individuals challenged with chronic illness especially where prepayment system is absent is a growing concern.[1,2] This includes the direct cost of medical care and indirect cost from productivity losses due to patient's disability and time spent by family members accompanying patients to seek care.

Diabetes mellitus (DM) is a chronic illness and was the 7th leading cause of death in the United States in 2010.[3] In

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Africa, the estimated prevalence of diabetes is 1% in rural areas and up to 7% in urban sub-Sahara Africa although there is gross underreporting.[4] The prevalence in Nigeria is estimated to be in the range of 0.9–15%[5] and data from the World Health Organization suggests that Nigeria has the greatest number of people living with diabetes in Africa.[6] Type 2 diabetes is the most common type of DM accounting for about 90% of cases.[5] It was previously regarded as "adult onset" but now occurring much earlier among people in the younger population. This has far reaching implication for productivity and development as it increases the cost of DM indirectly.[7]

Diabetics in developing countries like Nigeria pay a large share of the healthcare costs out-of-pockets (OOPs) due to lack of financial risk protection mechanisms.[7] Diabetes exerts a heavy economic burden on individuals, national health system and society at large, and the burden borne depends on the differences in purchasing power, and social insurance policies of the countries they live in.[8] It affects the quality of life, not only of the patients and their immediate families but also the society.

High medical cost as seen in the treatment of diabetes poses a barrier to seeking healthcare,[8-11] and can be a major cause of indebtedness and impoverishment of households, since there is paucity of financial risk protection mechanisms in Nigeria. The National Health Insurance Scheme presently covers only people that are employed by the federal government (<5% of the population).[12] Others and even the enrollees of the health insurance scheme still depend on out-of-pocket spending ((OOPS) to cover their medical expenditures.

It has been observed that countries like Nigeria where patients must provide for their own healthcare, the impact of the out-of-pocket payment for care can be so high.[2,12-15] Aside from the high cost of drugs and other supplies, diabetics visit the health facilities more often than other patients[9,10] thus incurring increasing costs. These visits and the impact of OOPS pose challenges for diabetic care especially for the poor.

OOPs have severe consequences for health care access and utilization and are catastrophic, especially for the poorest households.[11] In Nigeria, private health expenditures account for 60–65% of total health expenditure and 95% of private.[13-15] It has been reported that every year, more than 150 million individuals in 44 million households face financial catastrophe as a direct result of paying for healthcare, and 100 million individuals are pushed into poverty by the need to pay for health care.[13] The incidence of catastrophic health expenditures has been reported by some studies in Nigeria.[14,15] Health expenditure has been defined as catastrophic when it is ≥40% of the annual household income remaining after subsistence needs have been met.[13-17] Catastrophic health expenditure depletes household income and contributes to the vicious cycle of poverty and disease. It forces poor households to reduce other basic expenses such as food, shelter, or their children's education.[18]

Payment of high medical fees may affect a household's other expenditure decisions and in extreme cases may trigger the use of payment coping mechanisms which are short term strategies used to cope with healthcare costs.[19] Such strategies include selling assets, borrowing, perceived cost-saving behaviors, like skipping appointment, skipping doses of drugs to make it last longer or the use of treatment from cheaper alternatives at the expense of good quality.[19]

The choice of a coping strategy differs in different context among households in the face of the economic burden of illness and will depend on a household's asset base.[19] While such strategies may meet the short-term goal of paying for treatment and minimizing costs, financing healthcare with payment coping mechanism leads to sacrificing of necessary consumptions to pay for healthcare thus pushing the household into deeper poverty.[19,20] In Nigeria, the various coping strategies utilized by households include distress sale of asset, reduced intake of food to conserve funds, interruption of education of children, informal and formal borrowing, charitable support from churches, gifts from friends, neighbors, taking up other pieces of job, and begging on the streets;[21] other strategies include installment payment, borrowing, reimbursement, off front payment, and in-kind payment.[12]

This paper presents new information about households' payment coping strategies for diabetes in Nigeria. It also explores how these strategies differ among various socioeconomic groups.

This information will be useful for policymakers in the development of strategies that will assist households in coping with treatment costs due to diabetes and achieve universal health coverage (UHC).

Materials and Methods

The survey was undertaken at a federal specialist hospital in Umuahia Abia state southeast Nigeria. Being a tertiary health institution, it has facilities for training, research, and clinical practice. It has both inpatient and outpatients' diabetic clinic which runs daily from Monday to Friday by different consultants. From the medical records department, an average of 1363 diabetics received care from the center in 2013 out of which 163 were admitted and managed as inpatients while 1200 came as outpatients. The estimated 1224 outpatients were the target population. An adequate sample size of 292 patients was determined based on a power of 80% and 95% confidence level. All diagnosed type 2 diabetics aged between 31 and 65 years attending the outpatient diabetic clinic in the health facility were eligible to be included in the sampling frame. The patients

who met the study criteria and were willing to participate in the study were consecutively recruited as they attended the clinic until the required number was reached.

Ethical approval was obtained for the study from the Ethics Review Board of the institution. Each respondent gave a signed informed consent and was assured that all information given would be handled confidentially. The participants were informed that participation is voluntary, and they could withdraw from the study anytime they felt uncomfortable.

A total of 292 exit interviews were undertaken using a semi-structured questionnaire. Information was collected on the amount of money spent on diabetic treatment (direct costs). The direct medical costs included the cost of drugs, diagnostics, cost incurred for visiting and receiving treatment within and outside the health facility, and other costs incurred, as a result, of the treatment attributed to diabetes. Data were collected before the commencement of clinic each day. Information was also collected on household asset ownership, type of living accommodation, and per capita monthly food expenditure to enable classification of respondents into socioeconomic groups.

Data analysis

Data on personal profile and costs were analyzed using frequencies, percentages, and means. Payment coping mechanisms were summarized in percentages by households and socioeconomic status (SES) and significance testing across the SES groups were carried out using Chi-square tests and equity ratio calculation. The variables for the coping mechanisms include skipping appointment to reduce costs, use of household savings, community-based support, interruption of children's education, selling of household assets, sale of land, borrowing, donations from friends and relatives, health insurance, and government support (waiver). Principal components analysis was used to generate SES index based on per capita food expenditure and household asset ownership. The SES index was divided into quartiles: Q1 = poorest; Q2 = very poor; Q3 = poor; and Q4 = least poor. The relationship of each coping mechanism with SES was computed, and Chi-square for trend determined. Furthermore, equity ratios (Q1/Q4) were calculated for payment coping strategies.

Results

Table 1 shows that most of the respondents were females 156 (53.4%) and the mean age was 54.1 (9.24) years. The majority were married 231 (79.1%), 120 (41.3%) had completed secondary education while 92 (31.5%) were self-employed. The participants were equally distributed across four socioeconomic quartiles.

Table 2 shows the summary of costs incurred in treating type 2 diabetes. The total mean cost was ₦56,245.11 ($356) per person. Expenditures were incurred on direct medical cost (cost at the facility + cost outside facility and direct nonmedical cost (cost of transportation etc.).

Table 1: Sociodemographic characteristics of respondents (*n*=292)

Variable	*F* (%)
Sex, *n* (%)	
Female	156 (53.4)
Male	136 (46.6)
Age (years): Mean (SD)	54.11 (9.24)
Marital status, *n* (%)	
Married	231 (79.1)
Single	16 (5.5)
Divorced	1 (0.3)
Widow	41 (14.0)
Widower	3 (1.0)
Highest educational attainment, *n* (%)	
No formal education	28 (9.6)
Primary	76 (26.0)
Secondary	120 (41.3)
University/college/polytechnic	68 (23.3)
Main occupation, *n* (%)	
Unemployed	10 (3.4)
Civil servant	73 (25.0)
Private employed	16 (5.5)
Self-employed	92 (31.5)
Retired	57 (19.5)
Farming	21 (7.2)
Housewife	23 (7.9)
Total	292 (100)

SD=Standard deviation

Table 2: Direct cost of DM per month reflecting unit costs (*n*=292)

Cost units in ₦ (US$)	Mean (X)	SD
Folder	20 (0.13)	25 (0.16)
Drugs (medicaments)	7702 (49)	6922 (44)
Laboratory tests/investigations	4932 (31)	5628 (36)
Consultation fees	257 (2)	499 (3)
Insurance premium/ co-payment	887 (6)	3351 (21)
Transport	999 (6.3)	3073 (19)
Diabetic diet	28,524 (181)	16,070 (102)
Self-monitoring of glucose	3128 (20)	5984 (38)
Insulin syringe/disposables	959 (6.1)	2575 (16)
Extra house helper	1884 (1.2)	4749 (30)
Physiotherapy	253 (2)	2872 (18)
Dressings	399 (3)	1925 (12)
Cost incurred elsewhere same period on DM	3409 (22)	12,797 (81)
Cost of DM related diseases	2894 (18)	5934 (38)
Total	₦56, 245 ($356)	28,907 (183)

158 Naira=1 USD. Central Bank of Nigeria exchange rate when the study was done. DM=Diabetes mellitus; SD=Standard deviation; USD=United States Dollar

The use of savings was the most common method of payment and coping with diabetes treatment (99.0%) followed by support from family members (85.3%). The sale of land (9%), health insurance (9%), and government support (waiver) (2%) were the least coping strategies used [Table 3].

Table 4 shows the disaggregation of coping strategies by SES. It shows that interruption of children's education, skipping appointments, borrowing, and community-based support were statistically significant and occurred most among the poorest households.

Discussion

The mean monthly direct cost of ₦56,245.11 ($356) in this study is higher than ₦17,976 ($114) reported by Amoo and Ogunlesi[22] Kiriga *et al*.[9] ₦34,397.20 ($218) in their various studies but lower than ₦180,581 ($1143) reported by Ogbera *et al*.,[23] on the mean monthly direct cost of diabetic foot ulcer in southeast Nigeria. Such high expenditure could make the diabetics to cut down consumption of basic needs like food to meet up with payment for DM care or skip appointments as long as they feel well but report back when complications set in.

The high ranking of diet among other cost units may be related to the numerous advertisements on media on what to eat to reduce the incidence of DM by naturalistic, traditional medicine, and herbalists. This finding differs from previous studies where the cost of medication ranked highest followed by investigations.[22,23] However, these previous studies were carried out among inpatients.

To meet the cost of illness, poor households resort to coping strategies that are potentially risky for their future welfare.[17] In this study, payments for diabetes were found to be made mostly through OOPS and the respondents utilized different strategies to cope with the treatment expenditures. The use of savings was the most coping strategy utilized, and all SES groups equally utilized it. This is likely to increase the economic burden of diabetes, especially on the poorest SES group. The findings on payment coping strategies for diabetes are similar to findings in previous studies where individuals fell back on savings earmarked for other needs to cope with healthcare payments.[19-21] Incomes and savings have been reported as popular payment coping mechanisms in Zambia, Cote d'voire, Chad, and an average of 40% of West African countries cope with healthcare payment through them.[19] However, using money saved for other basic items like food as payment coping mechanisms could jeopardize the health of patients and further push them into poverty[19-21] because total expenditure is inflated and necessary consumption is temporarily sacrificed to pay for healthcare.

Stopping children's education was found to be significant and occurred more in the poorest households. Withdrawing children from school is a risky payment coping mechanism because it reduces their human capital and pushes the households into deeper poverty.[16,18] Interrupting children's education could be related to the inability to pay fees and healthcare costs simultaneously.

Table 3: Payment coping strategies

Strategies*	*n* (%)
Savings	291 (99.0)
Family members' support	249 (85.3)
Donation from friends	161 (55.1)
Borrowing	54 (18.5)
Skipped appointments	41 (14.0)
Use of alternative health remedies	24 (8.2)
Interruption of children's education	20 (6.8)
Community-based support	13 (4.5)
Selling household mobile assets	16 (5.5)
Sale of land	9 (3.1)
Health insurance	9 (3.1)
Government support (waiver)	2 (1.0)

*Multiple responses were allowed

Table 4: Socioeconomic differences in payment coping mechanisms

Coping strategies	*n*	Poorest *n* (%)	Very poor *n* (%)	Poor *n* (%)	Least poor *n* (%)	Chi-square (*P*)	Equity ratio (Q1:Q4)
Savings	291	74 (100)	73 (100)	72 (98.6)	72 (98.6)	3.780 (0.286)	1.03
Family support	249	64 (86.5)	68 (93.2)	59 (80.8)	58 (80.6)	6.122 (0.106)	1.10
Donations from friends/relatives	161	47 (63.5)	40 (54.8)	40 (54.8)	34 (47.2)	3.929 (0.269)	1.38
Borrowing	54	20 (27.0)	13 (17.8)	15 (20.5)	6 (8.3)	8.733 (0.033)*	3.33
Skipped appointments	41	18 (24.3)	10 (13.7)	9 (5.6)	4 (5.0)	10.973 (0.012)*	4.5
Alternative treatment	24	7 (9.5)	4 (5.5)	9 (5.6)	4 (5.6)	3.189 (0.363)	1.75
Stopped children education	20	13 (17.6)	3 (4.1)	2 (2.7)	2 (2.8)	17.986 (0.000)*	6.5
Community support	13	7 (9.5)	0 (0.0)	4 (5.5)	2 (2.8)	8.419 (0.038)*	3.5
Selling household assets	10	6 (8.1)	4 (5.5)	2 (2.7)	4 (5.6)	2.046 (0.563)	1.5
Sale of land	9	4 (5.4)	2 (2.7)	2 (2.7)	1 (1.4)	2.085 (0.555)	4.0
Government support	2	0 (0.0)	0 (0)	1 (1.4)	1 (1.4)	2.042 (0.564)	N/A

**P* value significant at 0.05 level. Q1=Poorest; Q4=Least poor; N/A=Not available

Borrowing as a coping mechanism was also significant in this study. Borrowing often attracts a high rate of interest on the loan, especially when they borrow from professional money lenders.[19] About 30% of households in West Africa finance out of pocket spending through borrowing;[19] however, wealthier households are less likely to borrow or sell assets.

Skipping appointment to save/evade cost was also found to be significant. This is one of the risky behaviors or cost prevention strategies adopted by patients as means of coping with their ill health. Skipping appointment has been reported by other studies in West African countries as a coping mechanism;[19] however, such patients could go down with acute complications of DM, which has the high cost burden.

Community-based support was statistically significant. This support which may be in cash or kind boosts the patients' income to provide for diabetic supplies. This implies that African extended family system and other social groups like age grades if properly organized and harnessed could form dependable cushion in times of ill health. Since these supports may not be consistently sustaining, there is need for government to provide financial protection mechanism targeted at diabetics.

About 3% of the respondents used health insurance while 2% had government support in form of a waiver. Lack or low coverage of any financial risk protection at the point of accessing treatment leaves households vulnerable. This places a significant financial burden on diabetics and their families. This finding agrees with a previous study,[19] where formal health insurance was reported to be rare in developing countries and that many households lack access to formal credit and savings. The use of exemptions and waivers which are pro-poor have not been able to protect the poor.[12]

This study has some limitations. One limitation is that it relied on recall for the estimation of direct costs incurred at the point of service and outside the health facility. The estimates may not be accurate. Second, only the direct cost of diabetic treatment was assessed in this study because most indirect data are difficult to quantify in monetary terms. However, we hope that future studies would be encouraged to estimate the indirect cost. Moreover, the study would have benefited from additional qualitative approach in exploring the impact of coping with payments. This will form the basis for further research.

Conclusion

There were high direct costs connected with the treatment of type 2 diabetes.

This study provides evidence that effort to protect the poor is critical from the adverse impact of OOPs and that positive measures to improve household's SES are necessary. Interventions that will reduce the burden of diabetes treatment expenditures on all households are advocated within the context of UHC so as to decrease the economic burden of diabetes on households.

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Conflicts of interest
There are no conflicts of interest.

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