



Impact and contributors to cost of managing long term conditions in a university hospital in Nigeria

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KEYWORDS

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ABSTRACT

Background

Burden of long term non-communicable conditions in low and middle income countries are on the increase and poor access to care leaves poorer patients highly disadvantaged. This study assessed the contributors to cost and financial implications for patients being managed for hypertension and/or diabetes in a tertiary hospital in Nigeria.

Method

A descriptive cross-sectional study of 168 patients with long term conditions randomly selected from the medical clinics of a tertiary hospital. Data collection was done using a pre-tested, instrument. Disposable income as a measure of socio-economic status (SES) index was used to stratified patients into quartiles. Contributors to cost of care, prevalence of catastrophic health expenditures (CHE) and risk of being impoverished as a result of cost of care were assessed. Statistical tests were used to explore relationships between the various variables.

Results

Costs of drugs and imaging techniques accounted for 56.79% and 31.62% respectively of the total average monthly cost of care. Majority (95.8%) of these patients relied on payment at the point of access, while only 4.2% were enrolled in pre-paid scheme. Overall, 72.6% of the respondents were exposed to CHE while 48.2% were likely to be impoverished due to the cost of managing their health condition.

Conclusion

Study found a high prevalence of catastrophic health expenditure and near absence of financial risk protection for patients with long term conditions. We recommend implementation of measures that would provide financial risk protection and improve access to care for patients with long term conditions.

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INTRODUCTION

The first wealth of a nation is its health and there is empirical evidence that this significantly enhances its economic development, and vice versa.¹ While the debate about possible link between economic growth and support from the various sectors is ongoing, it has become clear that maintaining and improving the health of populations is both a component and determinant of economic development of any country as only healthy adults can work, earn income, and contribute meaningfully to society.² Similarly, people who are ill and therefore not able to work are usually thrown into poverty or their poverty situation worsens^{2,4}. Quality healthcare delivery system with guarantee of universal access to the populace, can cause a positive

impact in the economic wellbeing of the people and indeed the entire society but there appears to be little respite for the vast majority of the Nigerian population who cannot access the health services they need because of high cost and other impediments at the point of access.¹

The global increase in public expenditure on health had prompted many countries to explore appropriate financing mechanisms that would guarantee access to health service for their population.¹ It is reported that about 100 million people are impoverished globally each year as a result of high expenditures on health, a challenge that had prompted many health systems to also devise means of protecting their population against high financial cost of illness.⁵

Africa faces an urgent but 'neglected epidemic' of long term non-communicable diseases as stroke, hypertension, diabetic mellitus, and cancers now cause as great a number of adult medical admissions and deaths like communicable diseases such as HIV/AIDS or tuberculosis.⁶⁻⁹ Also non-communicable diseases as previously seen, are no longer diseases of the wealthy as they now hamper the economies of the poorest populations even more than infectious diseases.¹⁰ Beside their high prevalence, these currently constitute major public health concern due to the high economic and social burden associated with them.^{11,12} In sub-Saharan Africa for example, hypertension is the most significant risk factor for cardiovascular disease while diabetes as at 2010 affected over 12 million people with both conditions contributing significantly to the mortality statistics in the region.¹⁰⁻¹²

Despite their increasing burden in sub-Saharan Africa, only a few health systems are organized to meet the needs of patients with long term conditions, particularly patients with limited resources to seek regular care^{13,14}.¹⁴ Furthermore, the current state of many publicly financed health services in the region have accentuated the economic and social burden associated with these conditions as cost recovery measures in these systems necessitate resort to payment at the point of access to services and thus, limit access by the poor.¹⁵⁻¹⁷ This is a dominant pattern in Nigeria,¹⁸⁻¹⁹ and some dire consequences of this on the wellbeing of the populace had been reported in the literature.²⁰⁻²²

Most of the previous works on this subject are focused on economic burden of managing long term conditions with less emphasis on the contributors to the tangible cost or the patients' views about payment for managing their long term conditions. This study is aimed at bridging this research gap using patients with long term single or

multi-morbidity in a tertiary hospital in Nigeria. Findings from this study will add to the advocacy for improved financing and provision of healthcare services especially for the target group in Nigeria.

METHODS

Study area

The study was conducted at the University of Port Harcourt Teaching Hospital (UPTH). The institution was established in 1985 and currently serves as the third level referral centre for Rivers State and environs. The study population included adult patients being managed on outpatient basis at the hospital's medical clinic for either hypertension or diabetes mellitus, or both conditions. From available hospital records, these two conditions were the most prevalent long term non-communicable conditions managed in this setting.

Sampling

A minimum sample size was calculated using the formula for cross sectional study:²³

$$N = Z\alpha^2 P(1-P)/d^2$$

Where n = sample size; $Z\alpha$ = standard deviation at 95% confidence level = 1.96; d = precision in proportion of 5% (0.05); P = crude prevalence of hypertension reported to be 11.2% among Nigeria adult population (26). An upward adjustment of 10% to account for non-response and inappropriate entries, gave a sample size of 168 patients for this study. Systematic sampling with sampling fraction of 1:2 was used to recruit the required patients from the sample frame of those that present at the clinic on days when the research team visited and were issued serial numbers by the clerical officers. The number of each of the two conditions included was proportionate to the previous month's attendance of patients with these conditions from the clinic's records.

Data Collection

Included in this study, were adult patient having hypertension and/or diabetes. Each eligible and recruited patient in this study was given full information about the study and their involvement before their consents were obtained. A pre-tested semi-structured, interviewer assisted questionnaire was used for data collection. Each patient was approached in the waiting area, rapport created and details of the research including their involvement was relayed to them. Those that gave their consents were followed through and given necessary assistance by a member of the research team for the entire duration of their visit to the hospital. The research team member collected the relevant information through the period they were in the facility for care until they left the hospital.

Data collected included their health conditions, demographic and socio-economic characteristics, and inventory of incurred cost on their long term conditions over the last one month and in the course of the current visit. For confidentiality, no personal identifiable information like name, phone number, address or date of birth was collected from these respondents. Current visit cost included their expenditures on transportation, medical record, nursing, laboratory, radiological, drugs and other cost obtainable in this practice setting. Entries were verified by payment receipts obtained from the hospital. Ethics clearance for this study was obtained from the ethics committee of the University of Port Harcourt Teaching Hospital, Port Harcourt.

Data Analysis

The data was analyzed using the Statistical Package for Social Sciences (SPSS) version 20.0 and presented in the form of tables and charts. Our definition of respondents' socio-economic index (SES) was based on respondents' income from all

sources. This was preferred over asset ownership and average monthly food expenditure as SES index is meant to capture inequality among respondents²⁴ and income appeared to be a more stable quantifiable indicator in this setting. Similarly, economic burden of care was assessed by tendency toward catastrophic health expenditure, using a threshold of 40% of non-subsistent income of the respondents,²⁰ and the risk of being impoverished arose where an individual spent more than 50% of non-food expenditure monthly on health.²⁵ The income from all sources was used to divide the respondents into quartiles - Q1 (most poor); Q2 (very poor); Q3 (poor) and Q4 (less poor). For international comparability of our findings, official conversion of the US dollar was 155 naira. Statistical inferences were drawn from results of chi-square test for trend with significant associations reported for p-value < 0.05.

RESULTS

The mean age of the study participants was 55.9 ± 10.7 years and ranged from 22 to 82 years. The median household size was 6 and ranged from 1 to 17. Their social demographic characteristics presented in Table I showed that more of the respondents were females (57.7%), married (78.6%) and had completed higher education (41.7%).

More respondents were in the lower socio-economic groups but the possession of a mobile phone and television was almost universal (95.8% & 91.7% respectively).

From Table II, more of these patients had hypertension (55.4%) with 17.9% being managed for hypertension and diabetes while 16.7% of them had other long term co-morbidities in addition to hypertension and/or diabetes. About half (49.4%) of them had been living with these conditions for over 5 years while over half (59.5%) admitted that

Table I: Socio-demographic characteristics of study participants (n = 168)

Characteristics	Frequency (%)
Sex	
Male	71 (42.3)
Female	97 (57.7)
Marital status	
Single	5 (3.0)
Married	132 (78.6)
Divorced/Widowed	31 (18.4)
Education	
No formal education	11 (6.5)
Primary	37 (22.0)
Secondary	50 (29.8)
Tertiary	70 (41.7)
Occupation	
Unemployed	49 (29.2)
Self employed	55 (32.7)
Employed – private	13 (7.7)
Employed – public	51 (30.4)
Socio-economic status	
Q1 (most poor)	44 (26.2)
Q2 (very poor)	51 (30.4)
Q3 (poor)	35 (20.8)
Q4 (less poor)	38 (22.6)
Assets	
Mobile phone	161 (95.8)
Radio	146 (86.9)
Television	154 (91.7)
Fridge	147 (87.5)
Car	70 (41.7)
House	101 (60.1)

Table II: Characteristics of long term conditions among participants (n = 168)

Characteristics	Frequency (%)
Long term condition	
Diabetes	45 (26.8)
Hypertension	93 (55.4)
Both	30 (17.9)
Duration of illness	
< 6 months	10 (6.0)
6 – 12 months	10 (6.0)
1 – 3 years	25 (14.9)
3 – 5 years	40 (23.8)
>5 years	83 (49.4)
Frequency of follow-up visits	
Weekly	7 (4.2)
Fortnightly	25 (14.9)
Monthly	100 (59.5)
More than a month	36 (21.5)
Existence of other long term conditions	28 (16.7)

Table III: Monthly income and expenditure pattern of participants (n = 168)

Aspect	Mean (range)
Monthly income	
Primary	71,870 (0 – 380,000)
All sources	118,030 (0 – 563,000)
Monthly expenditure	
Food	53,251 (0 – 250,000)
Non-food	30,367 (0 – 200,000)
Long term condition	24,558 (380 – 168,000)
Exp on health condition	
Transportation	1240 (80 – 15,000)
Registration	361 (0 – 1200)
Laboratory	1,007 (0 – 15,000)
Image techniques	7, 117 (0 – 85,000)
Drugs	12,781 (380 – 68,000)

Table IV: Cost burden and patients' perspectives to cost of care (n = 168)

Views	Frequency (%)
Source of funds	
Own money	147 (87.5)
National insurance	7 (4.2)
Support from others	14 (8.3)
Adverse economic conditions	
CHE	122 (72.6)
Likely impoverished	81 (48.2)
Ease of payment	
Comfortable	48 (26.8)
With difficulty	85 (50.6)
With great difficulty	38 (22.6)
Satisfied with cost of...	
Transportation	82 (48.8)
Registration	89 (53.0)
Laboratory	96 (57.2)
Imaging techniques	55 (32.7)
Drugs	67 (39.9)
Overall cost	62 (36.9)

Table V: Patients' factors and risk of being impoverished due to cost of healthcare

Variables (risk of being impoverished)	Percentage	χ^2	p – value
Sex		1	0.1
Male	(40.8)		
Female	(53.6)		
Marital status		1	0.1*
Single	(80.0)		
Divorced/Widowed	(54.8)		
Married	(45.5)		
Education		1	14.4*
No formal education	(72.7)		
Primary	(59.5)		
Secondary	(62.0)		
Tertiary	(28.6)		
Occupation		1	22.5*
Unemployed	(69.4)		
Self -employed	(56.4)		
Employed – private	(23.1)		
Employed – public	(25.5)		
Socio -economic status		1	61.8*
Q1 - most poor	(88.6)		
Q2 – very poor	(58.8)		
Q3 – poor	(25.7)		
Q4 – less poor	(7.9)		
Payment Method		1	0.071**
Pre -payment	(14.3)		
Post -payment	(49.7)		

*linear by linear chi-square test, **Fisher's exact test

they currently visit the (40.8)health facility for care of their conditions once every month.

From Table III, the average monthly income from all sources was ₦118,030. On the average, respondents spent more money on food (₦53,251)

Table VI: Relationship between payment method and other patients' factors

Variables	Payment Pre-Payment	Method Post-Payment	df	X²	p-Value
Sex			1		0.13**
Male	1(1.4)	70(98.6)			
Female	6(6.2)	91(93.8)			
Marital status			1	0.01*	0.98
Single	0 (0.0)	5 (100)			
Divorced/widowed	1 (3.2)	30 (96.8)			
Married	6 (4.5)	126 (95.5)			
Education			1	2.08*	0.15
No formal education	0 (0.0)	11 (100.0)			
Primary	0 (0.0)	37 (100.0)			
Secondary	3 (6.0)	47 (94.0)			
Tertiary	4 (5.7)	66 (94.3)			
Occupation			1	10.90 [†]	0.00
Unemployed	0 (0.0)	49 (100.0)			
Self-employed	0 (0.0)	55 (100.0)			
Employed- private	1 (7.7)	12 (92.3)			
Employed- public	6 (11.8)	45 (88.2)			
Socio-economic status			1	2.16*	0.14
Q1- most poor	1 (2.3)	43 (97.7)			
Q2- very poor	0 (0.0)	51 (100.0)			
Q3- poor	4 (11.4)	31 (88.6)			
Q4- less poor	2 (5.3)	36 (94.7)			

*Linear by linear chi-square test, **Fisher's exact test

than they did on non-food (₦ 30,367) and management of their conditions (₦ 24,558).

Table III also gave the income and general expenditure estimates of the respondents with higher mean expenditure related to the costs of drugs (₦ 12, 781) and imaging techniques (₦ 7, 117). Table IV showed that most of the patients that had to pay at the point of access to care, do so with their own money while a few gets assistance from others to pay for their health care. A further minority of these respondents (4.2%) are currently under the National Health Insurance Scheme.

A few (26.8%) of the patients reported that they were comfortable coping with paying for their health care while the rest expressed varying degree of difficulties trying to meet up with the obligation of paying for their care. Furthermore, much less people

were satisfied with the cost of drugs (39.9%) and radiological investigations (32.7%) required for the management of their conditions than they did towards other contributors to the cost of care. The proportion of those that were satisfied with the overall cost of care was low (36.9%). Also in Table IV, the prevalence of catastrophic health expenditure resulting from the isolated cost of managing either or both conditions was 72.6% while 48.2% were at risk of being impoverished as a result of the cost of managing their long term condition. Table V explored some socio-economic risk factors for being impoverished as a result of managing either or both of these conditions and it revealed lower levels of education and socioeconomic status as well as being unemployed or self-employed were strong predictors for being impoverished while sex and marital status were not.

The odds of being impoverished using post-payment method instead of pre-payment was 5.93 (95% CI: 0.7 – 50.3) but this was not statistically significant in this study ($p = 0.071$)

Table VI explored possible relationship between payment methods and some patients' factors. It revealed that the likelihood for the patient to use pre-payment as a method of payment for the cost of care depended on the patient's type of occupation. Patients employed either in the private or public sectors were significantly more likely to use pre-payment method than those that were either unemployed or self-employed.

DISCUSSION

The results of this study shows more of the respondents being female, married, having tertiary education and belonging to the lower wealth quartiles. Less than a fifth had other long term conditions beside hypertension and diabetes. The modal clinic follow-up visits for these conditions was monthly. Wide inequality was observed in the income and expenditure patterns in this study and this typify the wide inequity within the general society.²⁷

Study found that cost of drugs took up about 52.0% of the average care expenditure of the respondents while cost of image techniques contributed about 29.0% of the average total monthly cost of managing these conditions. This means that even with the fee waiver being granted for consultation in many public health institutions in Nigeria, most of the patients still have to bear the brunt of paying for drugs, image diagnostics and other laboratory investigations which could lead to negative economic impact on the poorer ones. Cost of drugs for managing other long term non communicable conditions have also been reported in other studies.

For example, in the study among epileptic patients managed in Enugu, South-East Nigeria, drug cost took up over 80% of the monthly cost of care among adults.²⁸ This along with our study present a contrast to the findings among children being treated for epilepsy in Ibadan, South-West Nigeria where the drug cost took up 21.8% of the mean total annual cost of care.²⁹ Nonetheless, with the cost of drugs contributing significantly to the cost of care for those with long term conditions, policies that will affect the reduction of the cost of drugs will go a long way in tackling the financial burden of care on the patient. Policies may aim at reducing the cost of these pharmaceuticals include government's encouragement of their local production, granting import waivers for those not produced locally and improving efficiency in the distribution chain.³⁰⁻³¹

Findings also indicated that most care seekers (95.8%) have to pay for their healthcare at the point of access to care with majority doing so from personal income sources like savings and assets while the rest sourced this fund from friends and relatives. The high prevalence of this payment practice is due to the near absence of suitable pre-payment alternatives. User fees paid at the point of access to health care has been universally recognized to be very retrogressive and many developed health systems have moved away from such practice to pre-paid methods such as social insurance or tax-based models.³² From this study, a significant determinant for using a pre-payment mechanism was the employment status of the care seeker and this is possibly because the existing National Health Insurance Scheme has succeeded more in enrolling civil servants working for the federal government. Similar to a previous report,³³ this study showed that only 4.2% of the respondents were under this scheme. Furthermore, the study revealed that while the risk of being impoverished is markedly reduced,

it is not eliminated even among those under this prepayment scheme (OR 5.93, $p = 0.071$). A cursory investigation into the coverage and benefit package of this scheme would be important as it appears that the current package may not be offering full financial protection to its enrollees. Furthermore, the fact that majority of these patients like previous report³⁴ pay for their health care at the point of access, explain further the high prevalence of those with risk of catastrophic health expenditure (CHE) and this could invariably influence the prospect of poorer people seeking care while preventing those that did from receiving appropriate care.³⁵ Options suggested for reducing the practice of payment at the point of access include healthcare funding from public sources, paying family doctors incentives to reduce the payment by patients, provision of free drugs for long term conditions at health facilities as well as broadening the scope and coverage of the current social insurance scheme.³¹⁻³³

The reported proportion of individuals at risk of catastrophic health expenditure following care for their long term conditions was much higher than what was observed for a communicable health condition.³⁶ Beside the criterion adopted in its determination,^{20,25} the high prevalence is worrisome as about 70% of the Nigerian population live below the \$1 per day extreme poverty line,³⁶ A similar study on hypertensive patients reported a lower proportion of patients' income spent on care.³⁷ This lower proportion was also reported among children with chronic heart disease³⁸ but similar proportion of household income was reported to have been expended on care for children treated with epilepsy,^{28,29} CHE resulting from management of long term conditions have also been reported in other settings³⁹⁻⁴¹ and evidence shows the risk increases with the with the number of long term co-morbidity.⁴² The occurrence of CHE have been report to force

poorer households to resort to selling their movable household items and other valuables to pay for formal healthcare or patronize traditional healers.^{22,43} Financial barriers to accessing formal health care by the poorest of the poor thus undermines the principle of equity which many health system seek to promote. However, interesting experiences from countries where payment at the point of access have been successfully abolished provide some encouragement that it can be done even in this practice setting.^{32,44}

Most patients (73.2%) admitted facing some difficulties in meeting up with the financial requirement for the care of their long term condition. This situation is not strange as a previous study among patients treated for diabetes showed that 56% of them reported that they cope with difficulty or great difficulty with paying for their care, while a third had to depend on relations for payment.⁴⁵ A finding in this study is that 48.2% of the respondents were exposed to the risk of being impoverished as a result of the cost of care. Possible predictors of this risk included lower level of education, being unemployed or self-employed and belonging to the lower income quartiles. That attainment of tertiary education lowered the risk of impoverishment could depict education as both a measure of intellectual training and an indicator of socio-economic status. While intellectual training from higher educational attainment gives individuals' access to the right information that would improve their personal health, higher socio-economic status bequeaths on them the power to acquire wealth, which invariably will enable them pay for the cost of care for their condition. The findings in this study also showed that those employed in the public and private sectors have better financial risk protection and were less likely to be impoverished as a result of their long term condition. Similarly,

patients in 'most poor' category of the socio-economic ladder had the highest (88.6%) risk of being impoverished, suggesting they are most vulnerable to the adverse effects of payment at the point of access. Previous study in South Africa had also shown highly vulnerable households having deficient regular consultation.³⁹ while the 2013 demographic and health survey in Nigeria also identified education and wealth among factors that could cause impediments of access to healthcare.⁴⁶

STUDY LIMITATIONS

While efforts were made to verify expenditure claims of respondent during their visit to the hospital, assuring the veracity of their expenditure claims on these conditions one and three prior to this visit was difficult as retrieval of these information were subject to recall bias. Also cost of medications included amount spent on prescription and non-prescription medications purchased solely for the management of their long term conditions and this could have influence the cost of drugs reported in this study.

CONCLUSION

There is high prevalence of catastrophic health expenditure among patients with long term non-communicable health conditions and this study found near absence of financial risk protection for them and the vulnerability among those insured. Payment at the point of access to health care accounted for the reported high prevalence of catastrophic health expenditure and posed some form of difficulty to most of the patients with long term conditions. Furthermore, the high contributions of the cost of pharmaceuticals and image techniques to the entire cost of care, calls for proactive measures to support local production, maintenance and improvement in the efficiency of their distribution chain among others. This is hoped

to reduce the overall cost of care and improve access for people receiving care for long term conditions. The study recommends that the current National Health Insurance Scheme be expanded in scope and coverage so as to give full financial protection for those living with long term conditions in Nigeria.

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