ORIGINAL ARTICLE

Economic burden of obstetric fistula among patients in the National Obstetric Fistula Centre, Nigeria

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ABSTRACT

Background: Obstetric fistula (OF) continues to be a major health problem in developing countries such as Nigeria. It is a communication between the vagina and bladder/rectum following prolonged obstructed labor that leads to urine/and fecal leakage per vaginam. There is a paucity of information on cost of accessing care by women with OF. **Objective:** The study was to evaluate the cost implications of accessing care and treatment among women with OF in the National Obstetric Fistula Centre, Ningi Bauchi, state. **Materials and Methods:** A prevalence-based cost-of-illness approach was employed in this study to estimate the cost of fistula treatment from the patients' perspective. Data on costs of health-care utilization of services rendered to the patients in the facility and indirect costs were estimated. The data were analyzed with the Statistical Package for the Social Sciences (SPSS V21). **Results:** A total of 75 women participated in the study. The total costs incurred by all the 75 patients amounted to Nigerian Naira (NGN) 8211640.00 (USD 26923.41). The average cost of accessing care for fistula per patient was NGN109488.50 (USD 358.98). Direct cost accounted for 5751740.00 (USD 18858.16), whereas the indirect cost was 2785600.00 (USD9133.11). There was a significant difference in cost of care between patients that were teenagers compared to those who were not ($P = 0.04$) and the type of treatment ($P < 0.001$). **Conclusions:** The cost of illness of OF is high in the studied area, and the patients are from the low socioeconomic background. Both the direct and indirect costs were high relative to the national minimum wage in Nigeria. The age of the patients and the type of treatment received by the patient accounted for the differences in cost of illness between the patients.

Keywords: Cost-of-illness, direct cost, economic burden, fistula

INTRODUCTION

Obstetric fistula (OF) is now commonly found in developing countries; it is a disease in which poverty plays a significant role in its causation and access to its treatment. Poverty and other social issues conspire to make OF patients unique. The social consequences for the OF patients are very severe.[1] Researchers have documented that OF leaves a woman physically, emotionally, financially, and socially traumatized.[2-4]

The disease is more prevalent in the rural areas, and most patients have to travel to urban areas to access hospital care with its attendant economic implications.[5] About 12,000 new cases of OF are said to occur yearly in Nigeria, and it would be important to explore

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the economic cost of OF on the affected women and their families economic burden this scourge places on individuals and families affected.

With the increased awareness through radio and other forms of electronic media, more patients are now aware of modern medical facilities where to get treatment. This brings about the risk of catastrophic health expenditures from out-of-pocket expenses due to the rudimentary health-care financing system in the country. There is a paucity of data generally on the economic cost of OF and its implications for the patients.

Economic burden analyses of diseases are complementary to clinical or epidemiological approaches to disease burden assessment and have the potential to address a number of policy issues concerning the consequences of disease condition or injury.[6] Some of these questions relate to the microeconomic level of households or government such as the impact of ill-health on a household's income population can help inform decision makers about the overall magnitude of economic losses and their distribution across a number of key drivers or categories of costs.

The main objective of the study is to evaluate the cost implications of accessing OF treatment and care among women with OF in the National Obstetric Fistula Centre Ningi, Nigeria. Studies have indicated poverty to be a serious issue in OF.[7,8] In developing countries, out-of-pocket health expenditure pushes millions of people into poverty every year because more than three-quarters of the financial burden of health care is met by households.[9] It has been reported that most women were of low socioeconomic status, and most of them came from distant rural areas to the city for treatment.[10]

How these women cope with the financial demands of our health system in the course of their seeking for care is important in order to provide a complete picture of the journey they undertake in accessing treatment for their condition. This would enable policymakers at various levels to utilize such information for their planning purposes and subsequently reduce the out-of-pocket spending's associated with the treatment of this stigmatized condition.

SUBJECTS AND METHODS

Study area

Ningi town is in Bauchi state, Nigeria. It is geographically located in the Sudan savannah region between latitude 11.04° North and longitude 9.34° East in the central part of Bauchi state Nigeria.

The study was carried out at the National Obstetric Fistula Centre in the town in northern Nigeria. The hospital is one of the three regionally designated federal health facilities that provides specialist health-care services to women suffering from OF. The facility has a capacity of 69 beds, with 5 doctors, a pharmacist, 11 nurses, and 2 laboratory scientists. The health workers in the facility are appropriately trained to provide relevant fistula care services. There are >1000 outpatient visits to the facility and about 200 surgeries per annum.

Study design

A prevalence-based cost-of-illness approach was employed in this study to estimate the cost of fistula treatment from the patient's perspective. The patients were prospectively recruited at admission and the costs of all services rendered to them in the facility were estimated at the end of their treatment. Consequently, direct medical and nonmedical costs of the treatment were collected and also indirect costs such as loss of productivity. These were obtained through interview of patients, caregivers, and review of patients' medical records. This is in line with previous costing studies for the treatment of diseases. The data on hospital costs of services rendered for the treatment of fistula were collected from medical records, nursing services, kitchen services, and pharmacy for patients treated.

Inclusion criteria

i. Women diagnosed with OF and treated in the center
ii. Treated women whose last follow-up visit was between December 2017 and February 2018
iii. Women who were treated and gave consent to participate in the study.

Exclusion criteria

i. Women with fistula that were treated elsewhere but presented to our clinic
ii. Women treated for fistula who did not give consent for participation
iii. Women with fistula awaiting treatment at the center
iv. Women who presented to the center with problems that were not fistula related.

To determine the sample size, with the power of 80% (0.8), confidence interval of 95%, and 0.05 as the absolute sampling errors that can be tolerated, the formula for cross-sectional study was used.

$n = z^2\ pq/d^2$[11]

Where

n = the desired sample size,

z = the standard normal deviation at 95% confidence interval = 1.96

p = the proportion in the target population estimated to have a OF = 4% = 0.04

$q = 1.0 - P = 0.96$

d = degree of accuracy desired, usually set at 0.05

Therefore, $n = 1.96 \times 1.96 \times 0.04 \times 0.96/0.05 \times 0.05$

$n = 59$ the minimum sample required is 59 patients

A purposive sampling method was adopted, and consecutive patients who satisfied the inclusion criteria and gave their consent were recruited till the required sample size was achieved. To make up for nonresponse, 75 patients were recruited for the study out of 79 patients approached to participate in the study.

Data collection

A data form was used to collect data on patients' expenditure for card, laboratory investigations, drugs, transportation, feeding and hospitalization, and about monetary loss due to absence from work. Interview of the selected patients and attending caregivers was also conducted, in addition to review of available patient records in the hospital. Direct medical and nonmedical costs for treatment were determined for all admissions and clinic visits by summing the costs of various relevant components of care for the patient for each admission/clinic visit.

Since the study is from the patient perspectives (only costs incurred by patients and their families), any expenses due to various comorbidities of fistula (other diseases that the patient presented with) were included in the analysis. Consequently, any expense related to various comorbidities of fistula (diseases that the patient presented with and related to the fistula) was included

Data collected were managed and analyzed using the Statistical Package for the Social Sciences (SPSS) version 21 (SPSS Inc., Chicago, IL, USA). The mean, median, and standard deviations were used to summarize quantitative data, whereas categorical data were presented as frequency tables and graphs. All costs were calculated in Nigerian Naira (NGN) and converted to United States Dollar (USD) for comparison. $P < 0.05$ was defined as statistically significant.

Ethical approval was obtained from the ethics committee of the hospital with number NOFCN/CS/EC/002 dated November 1, 2017 for the conduct of the study, and consent was obtained from individual patients at the point of enrollment in accordance with the ethics guidelines for both the study and publication of research findings.

The direct cost refers to those both medical and nonmedical costs incurred as a result of medical management of OF consisting of the expenditure for laboratory investigations, drugs, surgery, transportation, food, and lodging while coming to visit the hospital or on admission.

The indirect costs refer to those costs incurred not as a result of medical management of the disease but rather of other incurred losses such as lost wages and costs resulting from the need for homecare that was otherwise not be incurred (daily income loss of the caregivers who accompanied the patients to the hospital).

Monetary units used were generated based on the estimated daily income of different occupations obtained in a previous survey with modification based on regional income differences.[12] The daily income of the various occupations include: unemployed, housewife, student, NGN 200 (USD 0.7), petty trader, commercial tricyclist, and labourer were assigned NGN 600 (USD 2.0) income per day, based on the minimum wage civil servants in Nigeria of NGN 18,500 (USD 60.7); senior civil servants and commercial vehicle driver, NGN 2316.6 (USD 7.6), employed in the private sector; self-employed professional NGN 3128.4 (USD 10.3); medium and big businesses NGN 7781.4 (USD 25.5) income per day. One US dollar was officially equivalent to 305 Naira during the period of study.

RESULTS

Sociodemographic characteristics

A total of 79 patients were approached to participate in the study, three declined. Of the 76 that were enrolled for the study, one had incomplete information. Therefore, 75 participants had their complete data giving a response rate of 95%. The median age of the

75 patients was 21 years with interquartile range of 12 years. The minimum age was 15 years and the oldest patient was 60 years. The age distribution and other characteristics of these patients are shown in Table 1.

Costs components

Total costs

The total costs incurred by all the 75 patients amounted to NGN 8211640.00 (USD 26923.41). The average cost of accessing care for fistula per patient was NGN109488.50 (USD 358.98). The highest cost incurred by a patient was NGN235300.00 (USD 771.48), whereas NGN14070.00 (USD 46.13) was the least amount paid by a patient. Of the total cost of illness, direct cost accounted for 5751740.00 (USD 18858.16), whereas the indirect cost was 2785600.00 (USD 9133.11)[Figure 2].

Table 1: Sociodemographic characteristics of 75 fistula patients

Characteristic	*n* (%)
Age	
<20	37 (49.3)
21- 30	20 (26.7)
31- 40	15 (20.0)
≥41	3 (4.0)
Religion	
Islam	72 (96.0)
Christianity	3 (4.0)
Ethnicity	
Hausa	23 (30.7)
Fulani	37 (49.3)
Kanuri	5 (5.0)
Others	10 (13.3)
Education	
None/nonformal	61 (81.3)
Primary	8 (10.7)
Secondary	6 (8.0)
Marital status	
Married	34 (45.3)
Separated	32 (42.7)
Divorced	5 (6.7)
Widowed	4 (5.3)
Occupation	
Housewife	60 (80.0)
Trader	8 (10.7)
Farmer	6 (8.0)
Others	1 (1.3)
Place of residence	
Rural	58 (77.3)
Urban	17 (22.7)

The breakdown of the direct cost revealed that direct medical cost was 2966140.00 (USD 9725.05) and direct nonmedical was 2785600.00(USD 9133.11).

DISCUSSION

The principal findings of this study explored the cost of care of OF in a tertiary referral center in Northeastern Nigeria. The total cost of care for the 75 patients studied in the facility was NGN 8211640.00 (USD26923.41), direct cost was NGN 5751740.00; (USD 18858.16) and the indirect cost was NGN 2785600.00 (USD 9133.11). The average cost of illness per patient is NGN109488.50 (USD 358.98), The principal cost driver in this study is surgery (followed by the cost of feeding the patient on admission. The cost of surgery per patient was NGN 37734.00 (USD 123.72), which is almost twice the national minimum wage of Nigeria and household income of majority of Nigerians.[13] This underscores the catastrophic nature of the expenditure on the income of households that have fistula patients.

Majority of our fistula patients had no formal education (81.3%), were mostly housewives (80%), and live in rural areas (77.3%). About half of the studied population were teenagers and are not living with their husbands. The findings in this study reveal the huge cost of treating OF in our setting where most of the patients with OF are unemployed, rural dwellers, dependent, uneducated, and have to travel from their villages to urban or peri-urban areas for treatment. The average cost of transportation per patient was NGN 8121.33 (USD 26.63); this is about half of the minimum wage and therefore expensive to the patients who are generally poor. This amount in itself can deny or delay care to the patient in need as majority had to travel to another town for treatment and their families had to allocate resources to other areas of need such as feeding and shelter.

The characteristics of our patients are similar to other works on fistula where the patients are usually poor, uneducated, and mostly living in rural areas with weak or nonexistent health facilities.[3,14,15] This is the reason

Table 2: Cost components per patient

Costs	Average cost per patient		Minimum		Maximum	
	NGN	USD	NGN	USD	NGN	USD
Total costs	109,488.53	26,923.41	14,070.0	46.13	235,300.00	771.48
Direct cost	76,689.87	251.44	9270.00	30.39	153,240.00	502.43
Direct medical	39,548.53	129.67	5700.0	18.69	85,440.00	280.13
Direct nonmedical	37,141.33	121.77	2500.0	8.20	67,800.00	222.30
Indirect cost	32,798.67	107.54	4400.00	14.43	91,600.00	300.33

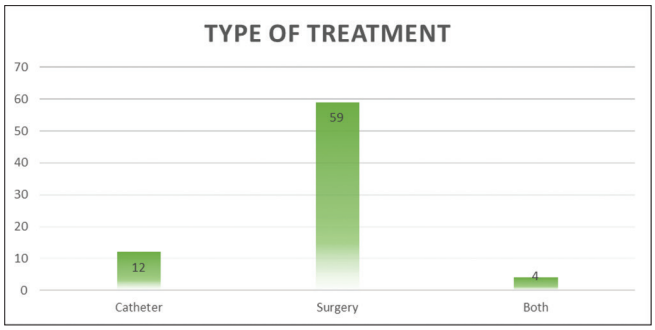

Figure 1: Type of treatment for 75 fistula patients

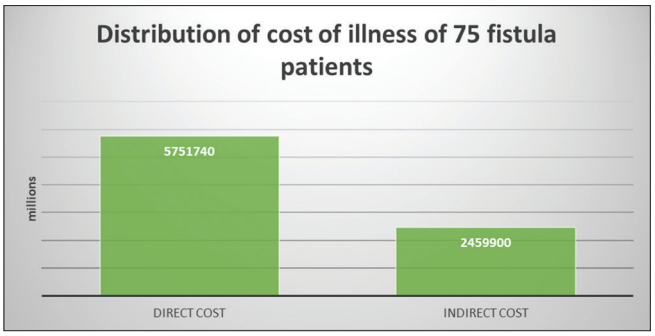

Figure 2: Distribution of Costs of illness

why some see OF as a neglected tropical disease which affects mainly people of socioeconomic strata of the society.[16] This is in contrast to other diseases such as malaria, diabetes, and hypertension, which affects all strata of the society.[17,18]

The cost of surgery was the single most important contributor to the direct cost. This is in contrast to studies on diseases such as malaria and pneumonia in which the cost of drugs was the most important contributor to the direct cost of care.[17,19] This is due to the fact that surgery is the main form of treatment of fistula [Figure 1] and although drugs are used, they are mainly used in a supplementary way. The other major contributor to direct cost of care is the cost of feeding the patients. This is expected as most had to leave their villages for a faraway town where the hospital is located leaving their families behind. They incur cost of feeding while on admission at the hospital for the treatment. This component of cost may not be important in diseases such as diabetes mellitus, epilepsy, and skin diseases where most of the care is done on outpatient visits rather than admission to hospitals.[20]

The indirect cost is a critical component of cost of illness and plays an even important role in the weak health-care system of developing countries. A relative is usually needed to do some duties for the patients while on admission. There is clearly some financial loss incurred by both the patient and his/her caregiver during the course of the illness. In our studied population, the average indirect cost was 32,798.67 (USD 107.54) [Table 2], which is almost twice the national minimum wage of Nigeria for those employed in the formal sector. This alone can have a catastrophic effect on household income if one has to forgo this amount while on treatment for this illness.

Our patients represent the typical description of fistula patients in terms of sociodemographic characteristics. It has been said that the social characteristics of fistula patients actually predisposed them to have the fistula. In fact, the condition is seen as a by-product of the interactions of the sociodemographic characteristics of the patients.[16] In our studied women, all the women were in social classes 4 and 5. There was a significant difference in costs between the patients that had surgery and those that had conservative treatment ($P < 0.001$). This was not unexpected as surgery was the major driver of cost of illness, so those who did not have surgery as a form of treatment would generally have lower cost of care. This finding is also found in other diseases that have surgery and drugs as forms of treatment and markedly different from diseases such as malaria, diarrheal diseases, or diabetes mellitus.[21,22] Teenagers were more likely to incur less cost compared to those patients 20 years and above ($P = 0.004$). This could be explained by the duration of illness which may be longer in those presenting 20 years and above, who are also more likely to have multiple surgeries and other treatment modalities.

There was no significant difference in costs of illness between the patients with regard to educational status, marital status, place of residence, and type of fistula. This could be explained by the fact that almost all the women in our study had no formal education, most live in rural areas, so share the same characteristics, hence the finding of no difference among them. The main limitations of the study include the perspective of the study is that of the patients, hence does not give the cost to the society. The intangible cost of the illness such as pain, depression, and low self-esteem could not be measured due to the difficulty in capturing such issues. It is a single-center study in northern Nigeria and may not be generalizable to centers, especially in southern Nigeria

CONCLUSIONS

The cost of illness of OF is high in the studied area, and the patients are from the low socioeconomic

background. The major driver of the cost is the cost of surgery, followed by cost of feeding of the patients. Both the direct and indirect costs were high relative to the national minimum wage in Nigeria. The age of the patients and the type of treatment received by the patient accounted for some differences in cost of illness between the patients. Other sociodemographic factors did not significantly affect the cost of illness in the study population. Government and international donors should increase funding allocation for OF care to reduce both direct and indirect costs associated with its treatment on the patients.

Limitations of the study

The study covers the costs of illness from the perspective of the patients, consequently, the provider perspective, and more importantly, the society's perspectives were not covered. The intangible costs due to the psychological impact of the OF, increased pain, and reduced quality of life associated with the disease were not considered in the cost analysis due to the known difficulty of placing monetary values on such parameters in economic evaluation.

The study is hospital-based and it is possible that those with OF who did not report to the hospital may have characteristics that are different from those who do come to the hospital. Hence, extrapolation of the results of the study needs to be done in context.

The study is within the context of OF care in northern Nigeria; some of the issues may not be applicable to settings outside northern Nigeria as the organization of the health-care system for fistula may be different.

Other limitations include the variability in the exchange rate of the local currency and the dollar which may affect prices of items and consumables over time. This may result in over or underestimation of cost.

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Conflicts of interest

There are no conflicts of interest.

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