

The prevalence and management of obstetric fistula among women of reproductive age in a low-resource setting

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Abstract

Obstetric fistula is one of the most significant obstetrical concerns and apparent indications of maternal morbidity in low-resource nations. Therefore, the study assessed the prevalence and management of fistula among women of reproductive age (15-49) in low-resource settings. This population-based cross-sectional study was conducted in three local government areas (Jere, Konduga and Maiduguri Municipal City) in Borno State. A structured questionnaire was used to collect data from 484 respondents, and the data were analysed using SPSS version 25.0. The overall prevalence of obstetric fistula was 10.7%. Over 13% of women with seven or more vagina deliveries had a fistula. Likewise, 19% of respondents knew about fistula prevention and treatment services available, and 13.7% of those did not participate in antenatal care services. Furthermore, 48.1% of respondents with a fistula during labour were treated successfully. Almost half (47.9%) who were aware of health facilities around them were successfully treated, same with 46.2% of those living within 1 to 2 km of a health facility, and almost half (49.0%) of those who got married within age 20. The study emphasizes the importance of effective community-level interventions to address obstetric fistula. To achieve this, a

comprehensive action plan should be developed, ensuring pregnant women have access to necessary obstetric care services at all healthcare levels. The plan should include preventive measures, timely management of labour complications, and increased awareness of fistula prevention and treatment services. Prioritizing maternal healthcare and empowering women with knowledge and access to services are essential in preventing and managing obstetric fistula.

Introduction

One of the most apparent indications of maternal morbidity in low-resource nations is obstetric fistula (OF), which remains a significant obstetrical concern.¹ Obstetric fistula is associated with prolonged and obstructed labour when emergency obstetric care is inadequate or inaccessible.² Those who survive an obstructed labour might suffer various physical and psychological injuries, as well as life-altering birth damage known as an obstetric fistula. A fistula occurs in a woman experiencing obstructed labour when the presenting foetal organ compresses the birth canal tissue, bladder base, urethra, or sometimes the rectum, producing ischemia and necrosis of the tissue.¹ Inadequate development of the pelvic bone structure increases the risk of obstructed labour and obstetric fistula. Obstetric fistula is common in countries with a high prevalence of maternal mortality, which may be due to the aforementioned reasons.^{3,4} Obstetric fistulas are generally ignored in low-resource and developing nations.⁴ It is more common among the poorest and most marginalised sections of society. Furthermore, fistula is caused by various factors, including poverty, teenage pregnancy, early marriage, low socioeconomic level, and illiterate girls and women in rural areas, so it has remained a 'hidden' problem.^{5,6} Data on obstetric fistula prevalence and burden are sparse. The most frequently cited prevalence estimate is two million cases worldwide and 50,000–100,000 new cases yearly.¹ Although fistula is commonly found between the vagina and bladder (vesicovaginal), it can also form between the vagina and rectum (rectovaginal).⁷ Consequently, fistula causes uncontrollable vaginal urine and/or faeces leakage and can cause infection.⁸ Women with OF have considerable psychological challenges, including loneliness, divorce, loss of social roles, loss of income, stigmatization, humiliation, and low self-esteem.⁹ Many women who suffer from OF also have to deal with the grief of a stillborn baby.¹⁰ OF

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has been nearly eradicated in nations where emergency obstetric treatment is available and accessible. Although it is avoidable and treatable, it remains widespread and harmful in many less-developed countries.⁵ Surgical repair has been shown to have a success rate of about 90% for treating OF. Still, it can be difficult for women to access or pay in low-income countries due to a shortage of healthcare institutions offering surgical repair services and a lack of surgical training for fistula repair.^{4,11} However, successful OF treatment necessitates the use

of specialized equipment, medications, infrastructure, and well-trained healthcare providers such as surgeons, anesthesiologists, nurses, physical therapists, and, in some cases, mental health counsellors. All of which are in short supply in many facilities.¹² OF is preventable via prompt and high-quality maternal health care services.¹² Because caesarean section or instrumental delivery is the most effective treatment for obstructed labour, making emergency obstetric care more widely available is essential to reducing the risk of both OF and stillbirths.¹³ For nearly a decade, the United Nations Population Fund (UNFPA) and the US Agency for International Development (USAID) have worked to eliminate obstetric fistulas.¹⁴ Quantifying development through trustworthy health measures, on the other hand, is challenging. Based on a systematic analysis in 2013, over one million women in Sub-Saharan Africa and South Asia suffer from OF, with 6,000 new cases occurring yearly.¹² However, it was reported that OF rates in low- and middle-income countries were 1 per 1,000 women of reproductive age and 1.57 per 1,000 women of reproductive age in Sub-Saharan Africa and South Asia alone.¹² An additional thorough study is required to determine the global frequency of OF and discover regional and national disparities. In Nigeria, the frequency of obstetric fistula is 3.2 per 1000 births, and approximately 13,000 new cases are projected to rise each year, implying that the backlog of unrepaired cases will take about 83 years to resolve at the current pace of repair.^{15,16} According to the United Nations International Children's Emergency Fund (UNICEF), Nigerian women now live with OF numbers between 400,000 and 800,000, and the country sees a further 50,000 to 100,000 new cases yearly.¹⁷

This study examines the prevalence and management of fistula among women of reproductive age in a low-resource setting.

Materials and Methods

Study design

A population-based cross-sectional study was conducted in three local government areas of low-resource settings in Borno state, Nigeria (Jere, Konduga and Maiduguri Municipal City (MMC) to evaluate the prevalence and management of obstetric fistula among women of reproductive age (15-49) years. The study population comprises women of reproductive age (15-49) who have had at least one vaginal delivery. The qualitative research method was used for this study. The quantitative method

used structured questionnaires to collect data from the primary beneficiaries (Women of reproductive age 15-49 years) regarding fistula repairs. The assessment also used a health facility assessment questionnaire by trained data collectors to collect quantitative data from all the existing health facilities in the three local government areas (LGAs) in Borno state. The study was conducted between March and August 2022.

Sample size

Findings from 2018 Nigeria Demographic Health Survey reports:²¹

$$n = \frac{z^2 p(1-p)}{d^2}$$

Where $z = 1.96$

$P =$ prevalence of fistula among women of reproductive age in Nigeria = 52%

$p = 0.16$; $1-p = 1-0.16 = 0.48$; $d =$ marginal error = 0.05

$$n = \frac{1.96^2 \times 0.52 \times 0.48}{0.05^2}$$

$$\frac{0.95886336}{0.0025}$$

$= 383.5 = 384.$

The minimum sample size was calculated as 384. However, data were collected for 484 respondents to achieve a good representation of the population and to achieve good precision.

Sampling technique

The study targeted females aged 10-49 years in three LGAs. Multi-stage cluster sampling was used to reach the respondents at the household level. The selection of reproductive age below 15 years was due to the early age of marriage in the Northeast of Nigeria, including Borno state. In the first sampling stage, communities were categorized as urban or rural areas, and a list of villages/communities was obtained from LGA offices. Villages were then sampled proportionally based on their sizes. Five communities/villages were selected in the catchment areas of Health facilities (HFs) for interviews with females of reproductive age at the household level. During the survey, a housing unit was randomly selected at the centre of each village/community. Subsequently, every third housing unit from the first randomly selected household was chosen for interviews. Qualified respon-

dents (females aged 15-49 years) were interviewed in each selected household. All HFs in the three LGAs were surveyed.^{22,23}

Data collection method

Data was collected through a structured questionnaire from women of reproductive age 15-49 years in the three LGAs of the state. The questionnaire is designed to collect important information about the respondents. The first section gathers background information, including the respondents' gender, age, marital status, highest education completed, religion, and occupation. The second section assesses the respondents' awareness of health facilities in their community, whether they have received medical treatment at these facilities, the type of treatment they received, and the type of health facility they visited. The third section delves into reproductive health, inquiring about marriage age, pregnancy history, current pregnancy status, and antenatal care services. The fourth section focuses on fistula history, asking about the number of vaginal and cesarean deliveries, any experience of fistula, and awareness of prevention and treatment services. Data were also collected from all the existing health facilities' assessment questionnaires by the trained data collectors in the three LGAs of the state. Additionally, the UNFPA-approved trained data collectors used the fistula site assessment tool to collect data at the facility level.

Fieldworkers

In each LGA, the fieldworkers worked as a team. A Consultant led a team of 5-7 data collectors in every Local Government Area (LGA). Field personnel were recruited from Borno and the Northeastern geopolitical zone. This increased community participation and promoted resource efficiency. Each data collector was assigned a minimum of six quantitative questionnaires each day when administering quantitative surveys. As a result, the data collectors collected fistula data from the health facilities in the LGAs where they operated.

Training of field personnel and pre-test of instruments

All field personnel were trained centrally in Maiduguri Metropolitan Council (MMC). The exercise lasted three days and included a PowerPoint presentation on survey methodology, logistics/fieldwork arrangement, role play, and field testing. After training, the evaluation instruments were pre-tested in neutral LGAs in Borno state for one day. The procedure necessitated data collection from a small number of households and two health facilities in the designated LGA, where trained fieldwork-

ers administered the instruments. After the training, the findings were discussed.

Data analysis

After data validation, all the data files were concatenated and exported to SPSS version 25.0, where data cleaning was done in preparation for the data analysis. The data analysis used descriptive statistics to summarize the demographic characteristics of women of reproductive age in a low-resource setting in a northern state in Nigeria. Logistic regression was employed to investigate the factors associated with fistula experiences and successful treatment. The odds ratios and 95% confidence intervals were calculated to assess the relationships between the presence of fistula experiences and various variables such as age category, marital status, education level, religion, occupation, age at marriage, number of vaginal deliveries, attendance of antenatal care, delivery in a health facility, and type of health facility attended. Additionally, the study explored the characteristics of health-care facilities providing fistula management services and assessed the availability of competent personnel for fistula surgeries and training in these facilities.

Ethical consideration

The ethical approval for this study was obtained from the National Health Research Committee (NHRC).

Results

As shown in Table 1, Four hundred and eighty-four women from low-resource areas in a northern state in Nigeria responded to this survey, of which 39.3% were within the age 20 to 29 years, 38.4% were within 30 to 39 years, 15.1% within 40 to 49 years and 7.2% were less than 20 years. Most (84.9%) respondents were married, 5.6% were single, 6.0% were divorced, and 3.5% were widowed. More than half (52.7%) of the respondents had Quranic education as the highest level; 18.2% completed secondary school, 15.7% finished primary school, 8.5% completed tertiary education, and 5.0% were illiterate. A significant proportion (93.4%) of the respondents were Muslims, and the remaining 6.6% were Christians. Over two-thirds (71.5%) were into trading, 11.6% were professionals, 5.6% were in farming, and 11.4% earned through other employment means.

Table 2 presents the findings regarding the prevalence and factors associated with labour that resulted in a fistula among the respondents. Of 484 participants, 52 (10.7%) experienced fistula during child-

birth. The majority of women who had this experience were in the age category of 40 to 49 years (13.7%). Being single was more common among respondents with a fistula (14.8%). Similarly, those with a secondary education level accounted for the highest proportion (13.6%) of women who experienced fistula. Many women identified as Muslims (10.8%) and farmers (14.8%) also had this labour complication. Women who married at or below 20 years constituted the majority (11.8%) of those who experienced fistula. Seven or more vaginal deliveries were prevalent among women with fistula (13.5%). Most of the women who experienced fistula were aware of prevention and treatment services (19.0%), and many did not know anyone in their community with a fistula (11.4%). Not attending antenatal care (13.7%) and delivering outside a health facility (13.1%) were associated with a higher prevalence of fistula experiences. Notably, attending secondary healthcare facilities (18.2%) was more common among respondents with labour that resulted in a fistula.

The logistic regression analysis revealed that there was no statistically significant difference in the odds of having a labour that results in a fistula concerning age category, education, marital status, religion, occupation, age of marriage, vaginal delivery, a community member with fistula, attendance of antenatal care, and health facility attended (all p-values >0.05). However, two significant associations were

observed. The odds of experiencing a fistula were 0.30 times higher and significantly different among those who knew about prevention and treatment services (95% CI: 0.17 – 0.54, p<0.05) compared to those who did not. Similarly, the odds of having a labour that results in a fistula were 5.31 times higher and significantly different among women who did not give birth in a health facility (95% CI: 1.62 – 17.39, p<0.05) than those who did.

Table 3 presents the findings related to the successful fistula treatment among the respondents who experienced it during childbirth. Out of the fifty-two participants with fistula, twenty-five (48.1%) had a successful treatment. Among those who were aware of health facilities in their community, 23 (47.9%) received successful treatment for fistula. Participants within 3 to 4 kilometres of health facilities had a higher proportion of successful treatment (55.6%), followed by those within 1 to 2 km (46.2%). Nearly half (49.0%) of married respondents within 20 years and below had successful fistula treatment. The majority (63.6%) of women who had successfully treated fistula had experienced 3-4 vaginal deliveries. Moreover, more than half (67.7%) of the women who knew about fistula prevention and treatment services received successful treatment. Notably, a significant proportion (80.0%) of women who knew someone in their community who had a fistula also had successful treatment. Almost half (48.3%) of women who did not attend antenatal care

Table 1. Characteristics of women of reproductive age in a low-resource setting.

Parameter	Frequency (n=484)	Percentage
Age category		
Less than 20	35	7.2
20-29 years	190	39.3
30-39 years	186	38.4
40-49 years	73	15.1
Marital status		
Single	27	5.6
Married	411	84.9
Divorced	29	6.0
Widowed	17	3.5
Highest education		
None	24	5.0
Quranic Education	255	52.7
Primary	76	15.7
Secondary	88	18.2
Tertiary	41	8.5
Religion		
Christianity	32	6.6
Islam	452	93.4
Occupation		
Farming	27	5.6
Trading	346	71.5
Professional	56	11.6
Others	55	11.4

received successful treatment, while 47.8% of those who attended antenatal care were treated successfully.

Additionally, more than half (57.1%) of women who were available for post-natal care had successful treatment for fistula, compared to 46.7% of those who were not available for post-natal care. A higher percentage (51.0%) of women who gave birth outside health facilities received successful

treatment for fistula. Furthermore, a higher proportion (64.3%) of women who had successfully treated fistula had attended secondary healthcare facilities.

The logistic regression analysis revealed that there was no statistically significant difference in the odds of having successful treatment for fistula concerning awareness of health facilities in the community, distance of health facilities to resi-

dence, age of marriage, times of vaginal delivery, attendance of antenatal care, delivery in a health facility, and type of health facility attended (all p-values >0.05). However, two significant associations were observed. The odds of successful fistula treatment were 8.93 times higher and significantly different among respondents who were aware of available fistula prevention and treatment services (95% CI: 2.37 –

Table 2. Logistics regression of the respondents with labour that resulted in a fistula.

Parameter	Ever had a labour that resulted in fistula (n = 484)			p
	No n (%)	Yes n (%)	Odds ratio (95% CI)	
Overall	432 (89.3)	52 (10.7)		
Age Category				
Less than 20	31 (88.6)	4 (11.4)	Ref	0.432
20-29 years	175 (92.1)	15 (7.9)	0.66 [0.21-2.13]	
30-39 years	163 (87.6)	23 (12.4)	1.09 [0.35-3.38]	
40-49 years	63 (86.3)	10 (13.7)	1.23 [0.36-4.24]	
Marital status				
Single	23 (85.2)	4 (14.8)	Ref	0.833
Married	367 (89.3)	44 (10.7)	0.69 [0.23-2.09]	
Divorced	26 (89.7)	3 (10.3)	0.66 [0.13-3.28]	
Widowed	16 (94.1)	1 (5.9)	0.36 [0.04-3.52]	
Highest education				
None	21 (87.5)	3 (12.5)	5.71 [0.56-58.38]	0.117
Quranic education	222 (87.1)	33 (12.9)	5.95 [0.79-44.72]	
Primary	73 (96.1)	3 (3.9)	1.64 [0.17-16.33]	
Secondary	76 (86.4)	12 (13.6)	6.32 [0.79-50.33]	
Tertiary	40 (97.6)	1 (2.4)	Ref	
Religion				
Christianity	29 (90.6)	3 (9.4)	Ref	0.796
Islam	403 (89.2)	49 (10.8)	0.85 [0.25-2.90]	
Occupation				
Farming	23 (85.2)	4 (14.8)	2.22 [0.51-9.65]	0.369
Trading	305 (88.2)	41 (11.8)	1.71 [0.59-4.99]	
Professional	53 (94.6)	3 (5.4)	0.72 [0.15-3.39]	
Others	51 (92.7)	4 (7.3)	Ref	
Age at the time of marriage				
20 years and below	382 (88.2)	51 (11.8)	6.68 [0.90-49.37]	0.063
Above 20 years	50 (98.0)	1 (2.0)	Ref	
Vaginal delivery				
2 and below deliveries	118 (90.8)	12 (9.2)	Ref	0.683
3-4	108 (90.8)	11 (9.2)	1.00 [0.42-2.36]	
5-6	81 (89.0)	10 (11.0)	1.21 [0.50-2.94]	
7 Deliveries and above	125 (86.8)	19 (13.2)	1.50 [0.70-3.21]	
Awareness of the fistula prevention and treatment services available				
Yes	132 (81.0)	31 (19.0)	Ref	<0.001*
No	300 (93.5)	21 (6.5)	0.30 [0.17-0.54]	
Knowledge of anyone in the community who had a fistula				
Yes	105 (91.3)	10 (8.7)	Ref	0.418
No	327 (88.6)	42 (11.4)	1.35 [0.65-2.78]	
Attended anti-natal care				
Yes	249 (91.5)	23 (8.5)	Ref	0.068
No	183 (86.3)	29 (13.7)	1.72 [0.96-3.06]	
Delivered in a health facility				
Yes	106 (97.2)	3 (2.8)	Ref	0.006*
No	326 (86.9)	49 (13.1)	5.31 [1.62-17.39]	
Type of Health facility attended				
Primary health care	306 (91.1)	30 (8.9)	Ref	0.128
Secondary health care	18 (81.8)	4 (18.2)	1.62 [0.82-3.19]	
Others	38 (82.6)	8 (17.4)	2.15 [0.92-5.02]	

33.55, $p < 0.05$) than those who were unaware. Likewise, the odds of having successful treatment for fistula were 5.88 times higher and significantly different among those who knew people with fistula in their community (95% CI: 1.11-31.17, $p < 0.037$) than those who did not.

Treatment and management of fistula in the facilities

As shown in Table 4, Thirty-three facilities were visited for this research work, of which 78.8% were primary healthcare, and the remaining 21.2% were secondary healthcare facilities. More than half (57.6%) of the facilities were private, and 42.4% were government-owned. The state government-financed 42.4% of the facilities, 27.3% were financed by private grants/donors, 21.2% got their funds from self-paying clients, 6.1% from charity, and

the federal government funded 3.0% of the facilities. Less than one-tenth (6.1%) of the facilities offer fistula clients counselling for prevention. Similarly, 6.1% of the facilities provide fistula repair, 15.2% provide fistula treatment, 6.1% have a laboratory for all the main tests needed, and 30.3% offer fistula client referral.

Table 5 represents the staffing requirements for fistula surgery and the current availability of staff with specific competencies. "Staff for Fistula Surgery" refers to the different categories of staff members required for performing fistula surgeries and training other surgeons. "Needed (mean)" represents the ideal number of staff needed in each category to carry out fistula surgeries and training programs effectively. "Present (mean)" indicates the current average number of staff members available in each category. "Percentage present" shows

the percentage of the required staff currently available in each category.

In healthcare facilities, the ideal number of staff needed for competency in simple repair is 5, but only 2.5 staff members are available, resulting in a present availability of staff competent in simple fistula repair at 50% of the required number. Similarly, the ideal number of staff needed for competency in moderate complexity repair is 5, and there are 3 staff members available, indicating a present availability of staff competent in moderately complex fistula repair at 60% of the required number. For competency in complicated surgery, the ideal number of staff needed is 5, with 2.5 staff available, resulting in a present availability of staff competent in complicated fistula surgeries at 50% of the required number. The ideal number of competent fistula surgeons needed is 5, but there are only 2.5 trainers available,

Table 3. Logistics regression of the respondents who had successful treatment on fistula.

Parameter	Successfully treated on fistula			p
	No n (%)	Yes n (%)	Odds ratio (95% CI)	
Overall	27 (51.9)	25 (48.1)		
Aware of any health facility in your community				
No	2 (50.0)	2 (50.0)	Ref	0.936
Yes	25 (52.1)	23 (47.9)	0.92 [0.12-7.08]	
Distance of health facility to your residence				
1-2 km	14 (53.8)	12 (46.2)	Ref	0.927
3-4 km	4 (44.4)	5 (55.6)	1.46 [0.32-6.70]	
5-6 km	6 (60.0)	4 (40.0)	0.78 [0.18-3.42]	
7-10 km	0 (0.0)	1 (100.0)	--	
Age at the time of marriage				
20 years and below	26 (51.0)	25 (49.0)	--	Ref
Above 20 years	1 (100.0)	0 (0.0)		
Vaginal delivery				
2 and under deliveries	6 (50.0)	6 (50.0)	Ref	0.513
3-4	4 (36.4)	7 (63.6)	1.75 [0.33-9.30]	
5-6	7 (70.0)	3 (30.0)	0.43 [0.07-2.50]	
7 Deliveries and above	10 (52.6)	9 (47.4)	0.90 [0.21-3.82]	
Aware of the fistula prevention and treatment services available				
No	17 (81.0)	4 (19.0)	Ref	0.001*
Yes	10 (32.3)	21 (67.7)	8.93 [2.37-33.55]	
Knowledge anyone in the community who had a fistula				
No	25 (59.5)	17 (40.5)	Ref	0.037*
Yes	2 (20.0)	8 (80.0)	5.88 [1.11-31.17]	
Attended anti-natal care				
No	15 (51.7)	14 (48.3)	Ref	0.974
Yes	12 (52.2)	11 (47.8)	0.98 [0.33-2.94]	
Attended post-natal care				
No	24 (53.3)	21 (46.7)	Ref	0.608
Yes	3 (42.9)	4 (57.1)	1.52 [0.31-7.60]	
Delivered in the health facility				
No	24 (49.0)	25 (51.0)	Ref	--
Yes	3 (100.0)	0 (0.0)		
Type of health facility attended				
Primary health care	18 (60.0)	12 (40.0)	Ref	0.331
Secondary health care	5 (35.7)	9 (64.3)	2.70 [0.73-10.06]	
Others	4 (50.0)	4 (50.0)	1.50 [0.31-7.19]	

making the present availability of trainers competent in training fistula surgeons at 50% of the required number. Additionally, the ideal number of competent personnel to train the trainers is 5, with 3 trainers available, indicating a present availability of trainers competent in training other trainers at 60% of the required number.

Discussion

Obstetrical fistula is one of the primary health issues among women of childbearing age in low-income countries. Perhaps women suffer one of the most unpleasant and demeaning conditions.²⁴ Obstetrical fistula is a health problem caused by the interplay of several physical elements and the woman's social, cultural, and economic position. This interplay impacts the

women's social and economic standing, health, nutrition, fertility, behaviour, and vulnerability to obstetric fistula.²⁵ Inaccurate reporting and underreporting due to the stigma attached to obstetric fistula and the embarrassment felt by women who disclose their condition make it impossible to obtain reliable statistics on its prevalence.²⁶ Reaching rural women is challenging, and they are at increased risk for labour issues.

Nevertheless, most research is facility-based, accounting solely for women who can access health care.²⁷ In total, it is estimated that over one million women in Sub-Saharan Africa and South Asia have a fistula, with over 6,000 new instances occurring each year in these two world regions. Given the severe implications of fistula for women and their families, this is a huge burden.⁵

Based on the result of this study, it was

discovered that the overall prevalence of women who had a delivery that resulted in obstetric fistula was (10.7%). This study indicated that though the prevalence rate for obstetric fistula was low, it was more prevalent among women aged (30 to 39) years. Studies conducted in India supported the low prevalence among women who had a delivery that resulted in obstetric fistula from this study.¹ Ethiopia²⁸ and Gambia²⁹ also discovered a low prevalence rate among women who had a labour that resulted in an obstetric fistula. Based on a study by Wall,⁵ the possible reason for a low prevalence rate of obstetric fistula among women was the timely caesarean section performed on women admitted to the hospital, which may have prevented obstetric fistula from developing. However, several social, cultural, and healthcare issues, including a lack of emergency obstetric

Table 4. Characteristics of the sampled facilities.

	Parameter	Frequency (N=33)	Percentage
Characteristics of health facilities	Type of facilities		
	Primary health care	26	78.8
	Secondary health care	7	21.2
	Ownership		
	Public	14	42.4
	Private	19	57.6
	Source of the fund to the facility		
	State Government	14	42.4
	Private grants/donors	9	27.3
	Self-paying clients	7	21.2
	Charity	2	6.1
Federal Government	1	3.0	
Fistula management services	Fistula client counselling for prevention		
	Yes	2	6.1
	No	31	93.9
	Fistula client referral		
	Yes	10	30.3
	No	23	69.7
	Fistula repair		
	Yes	2	6.1
	No	31	93.9
	Fistula treatment		
	Yes	5	15.2
No	28	84.8	
Laboratory able to conduct all the main tests needed for fistula treatment			
Yes	2	6.1	
No	31	93.9	

Table 5. Competent personnel for fistula surgery in the facility.

Staff for fistula surgery	Needed (mean)	Present (mean)	Percentage present
Competent in simple repair	5.0	2.5	50.0
Competent in moderate complexity repair	5.0	3.0	60.0
Competent in complicated surgery	5.0	2.5	50.0
Competent trainer of fistula surgeons	5.0	2.5	50.0
Competent as a trainer of trainers	5.0	3.0	60.0

treatment, child marriage linked with early pregnancy, poverty, malnutrition, and poor healthcare facilities, all contribute to the increased incidence of obstetric fistula in low-income nations, including Nigeria.^{30,31} Commonly identified risk factors for obstetric fistula include the place of birth and presence of a skilled birth attendant, labour duration, and early marriage.^{32,33} A study in India revealed that fistulae were associated with demographic variables such as education and high parity (number of deliveries).¹ The study was similar to findings from other studies.^{32,34} These findings also correlated with the findings from this study in which women who had more than seven deliveries and women who were illiterate (with Islamic education) had more cases of fistula. The low level of education could be due to poverty and inadequate investment in the education sector in the northeast and the high rate of insurgents, which has crippled most of their sources of income.³⁵ It was also recorded in this study that the occurrence of fistula was more prevalent among women who were involved in early marriage. This report corresponds with a study conducted in Yemen²⁶ and Ethiopia.³⁶ The possible reason for this could result from forced marriage, particularly among Muslims.³⁷ This study discovered that many respondents did not attend antenatal care, supported by a study in Yemen.²⁶ This could result from the distance to health facilities or the cost of transportation to health care.³⁸ Women who did not receive antenatal care and gave birth at home have been shown to have a higher risk of having an obstetric fistula, as evidenced by this study.³⁹ Also, this study recorded a low prevalence rate of women who were aware of the prevention and treatment of fistula. This is consistent with a study conducted in China³⁹ and India,¹ which recorded participants' low awareness of obstetric fistula. This could be because many women suffering from fistula do not know about it or are unaware that the condition is treatable.³⁸ Some might be misinformed. Some women believe it is a punishment from God.^{40,41}

Furthermore, this study's overall success rate for managing and treating fistula was (48.1%). This was significantly less than a study conducted in Yemen, which recorded a high success rate for fistula treatment, consistent with the high success rate in some literature.⁴²⁻⁴⁴ Moreover, this study recorded a substantial proportion of women who were aware of the prevention and treatment services available for obstetric fistula and were treated successfully. Educating the local community about the social and physiological factors that increase the risk of obstetric fistula may be more effective in eradicating

obstetric fistula in developing countries where women cannot access the health care system.⁴⁵ Additionally, in this study, distance to healthcare centres greatly influenced the success rate of treatment of obstetric fistula as those who reside 1-2km close to health facilities had a higher successful treatment rate of obstetric fistula. This was supported by a study conducted in India¹ and Yemen.²⁶ Numerous countries in Sub-Saharan Africa place a premium on establishing specialised fistula hospitals committed to treating women with fistula.⁵ In light of the rarity of the illness and the high degree of expertise and training required for fistulae surgery, the findings of this research imply that the vast majority of resources should always be better spent on prevention rather than cure. It is believed that strengthening maternal health services, creating favourable conditions for improved transportation and communication networks, and training local providers in the management of emergency complications, including those associated with caesarean sections, will have the additional effect of facilitating the provision of care for other causes of maternal and perinatal mortality and morbidity.^{3,5} Fistula is exacerbated by various factors, including delays in getting caesarean operations, incorrect practices, and a scarcity of caesarean sections. As evidenced by the fact that fistula has nearly disappeared in high-income countries, it is reasonable to conclude that they are entirely preventable. Efforts must be made to locate women suffering from fistula and treat them, given the seriousness of the condition.

Conclusions

The study recorded a low obstetric fistula prevalence rate of 10.7% with a 48.1% (moderate) success rate in treatment. However, fistula cases and outcomes were not significantly influenced by factors such as age category, education, age of marriage, number of deliveries, awareness of treatment and prevention, antenatal care, delivery location, and distance to healthcare centres. However, knowledge of fistula prevention, treatment, and delivery in a health facility significantly influenced fistula cases. Resolving fistula issues is crucial for maternal healthcare, and a community-level action plan is recommended to offer pregnant women necessary obstetric care at all healthcare levels, preventing obstructed and delayed labour, the main cause of fistula. Addressing sociodemographic variables will help reduce fistula incidence, and well-trained community health workers should identify and refer cases promptly.

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