

Original Research Article

Socio-demographic factors associated with obstetric fistula services among women of reproductive age in Garissa County, Kenya

Abdullahi Jimale Adow^{1*}, Margaret M. Keraka², Shadrack A. Yonge³, Bibi A. Bakari⁴

¹Department of Environmental and Occupational Health, Kenyatta University, Nairobi, Kenya

²Department of Environmental and Population health. Kenyatta university, Nairobi, Kenya

³Department of Environment and Health Sciences, Technical University of Mombasa, Mombasa, Kenya

⁴Department of Family Medicine, Community Health and Epidemiology, Kenyatta University, Kenya

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*Correspondence:

Dr. Abdullahi Jimale Adow,

E-mail: jimaleabdullahi@hotmail.com

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ABSTRACT

Background: Approximately 3000 instances of fistulas are known to emerge annually in Kenya, with a 1/1000-woman incidence. Within the ever-increasing backlog are 300,000 cases of untreated fistulas, which are important to guide the application of appropriate therapies. Finding sociodemographic variables associated with the emergence of obstetric fistula was the goal of this study.

Methods: Between October 2022 and March 2023, three large Kenyan hospitals participated in unmatched case control research. Patients having fistulas after deliveries during the last five years were considered cases. The control group consisted of women who did not currently have a history of fistula and were regularly seen in the obstetrics and gynaecology clinics at these institutions. A relationship between an object and its matching 95% confidence interval was measured using the odds ratio. components with a p value <0.05.

Results: Age ($\chi^2=10.3864$, df=3, p=0.0156), educational level of the respondent ($\chi^2=12.3001$, df=3, p=0.0064), distance to nearest health facility ($\chi^2=8.6592$, df=3, p=0.0342) and height of respondents ($\chi^2=36.6312$, df=1, p<0.0001) were significantly associated with obstetric fistula. Participants residing more than 5 km from the nearest health facility exhibited a 2.51 times higher likelihood of developing obstetric fistula (AOR=2.51, 95% CI=1.0056-6.2874, p=0.0486). Individuals with a height <150 cm faced a substantially elevated risk, with an odds ratio of 12.09 (95% CI=5.0958-28.6797, p<0.001).

Conclusions: Sociodemographic factors such as age, marital status, religious affiliation, and education level were identified as significant contributors to obstetric fistula occurrence. This study underscores the urgency of a comprehensive approach to tackle genital fistula, combining medical, social, and economic interventions.

Keywords: Kenya, Maternal morbidity, Obstetric fistula, Socio-demographic factors, Vesico vaginal fistula

INTRODUCTION

Millions of women worldwide suffer from genital fistula, a crippling and frequently unrecognized medical ailment that is especially common in underdeveloped and marginalized areas.¹ Numerous socio-demographic factors have a catastrophic effect on this illness, which is defined by an aberrant opening between the female reproductive

and urinary or gastrointestinal tracts.² This introduction will examine the critical role that socio-demographic factors play in the development of genital fistula, despite the fact that its etiology is intricate and multifaceted.³ Examining the complex interactions between social, economic, cultural, and demographic factors that influence the occurrence and persistence of genital fistula is a key component of a socio-demographic viewpoint on

the condition.⁴ The causes of genital fistula extend beyond medicine; they include social mores, deprivation, lack of access to healthcare, and disparities in educational opportunities. It is essential to comprehend these sociodemographic factors in order to properly prevent and treat the illness.⁵ Social conventions and discrimination based on gender frequently lead to genital fistulas which primarily afflict women. Women's decision-making authority over their healthcare, especially obstetric treatment and family planning, is restricted in many societies. Genital fistula is frequently caused by obstructed labor which can be exacerbated by sociodemographic factors such as early marriage, low educational attainment among women and a lack of reproductive autonomy.⁶

Age and reproductive health are the two sociodemographic characteristics that have the biggest impact on genital fistula prevalence.⁷ A higher risk of obstructed labor and fistula exists for young girls who are married off early and get pregnant before their bodies are fully formed. Furthermore, in certain areas, inadequate prenatal care and restricted access to family planning options increase the chance of developing fistulas.⁸

One major sociodemographic element that contributes to many genital fistula cases is poverty. Poor women frequently do not have access to high-quality treatment, which increases the risk of untreated obstetric problems during labor.⁹ Cultural norms and the stigma associated with women's reproductive health have a crucial role in the development of genital fistulas.¹⁰ Traditional beliefs and practices allow for harmful rites such as female genital mutilation and isolating women during menstruation and delivery. These behaviours increase the risk of a fistula forming during childbirth.¹¹

Geographical inequalities in socio-demographic characteristics can have a substantial impact on the occurrence of genital fistula. Obstetric treatment may be delayed or insufficient in remote or marginalised communities because of lack of access to healthcare facilities, qualified healthcare professionals, and reliable transportation.¹² One important sociodemographic variable that is correlated with the occurrence of genital fistula is education. Women with lesser levels of education might not know enough about family planning and safe reproductive health practices. They might also have less empowerment and access to possibilities for earning money, which could impair their capacity to make wise decisions about their health.¹³

Objective

This study is a very crucial cornerstone for other scholars intending to undertake studies related to fistula especially in rural areas with low social economic status. It sought to determine the socio-demographic factors influencing utilization of obstetric fistula services among women of reproductive age in Garissa County.

METHODS

Study area

The study was conducted across three designated hospitals in Daadab Sub-County, Garissa County. Daadab sub-county itself spans approximately 6,479.8 km² (IEBC, 2016) and is home to a population of around 185,252 individuals, including 99,059 males, 86,185 females, and 8 intersex individuals, as indicated by the 2019 national census (KNBS, 2019). Unlike Garissa County Referral Hospital, which has hosted fistula treatment medical camps in recent years, there is adequate existing evidence on women experiencing labor-related complications, such as obstetric fistula, within these three hospitals.

Study population

Cases were patients confirmed by a doctor to have obstetric fistula irrespective of type and duration. The controls were other women without fistula who had ever given birth and were seeking treatment or attending to patients in the study units. Since these are community units, it was assumed that both cases and controls had a similar environmental exposure and were representative of the population in the area.

Study design

The study adopted an unmatched case-control design, where a case was identified as a woman who had experienced treated or untreated fistula within the last three years following pregnancy. A control was characterized as a woman who had given birth in the previous three years and had no history of treated or healed fistula. The study was conducted between October 2022 to March 2023.

Inclusion and exclusion criteria

All consenting adult women of ages 18 and above, lived in Garissa County for the last six months and who had delivered within the previous three years attending the three hospitals were included in the study. A case was defined as a woman with treated or untreated fistula following pregnancy within the previous three years at the gynecological clinic at the study sites and had consented to take part in the study. A control was defined as a woman who had delivered within the previous three years no history of treated or healed fistula, in obstetrics and gynecology clinic at the study sites and had consented to take part in the study.

Variables under study

The dependent variable for this study was obstetrical fistula (outcome) while independent variables were social demographic characteristics (age, occupation, and marital status).

Sample size estimation

The sample size for this study was calculated using the formula recommended by Fleiss for determining the sample size in a study where the investigator can estimate the proportion of the control group and can state the difference to be detected between the case and the control group.

$$n = C \frac{p_c q_c + p_e q_e}{d^2} + \frac{2}{d} + 2$$

Substituting every value in the formula,

$$n = 10.51 \frac{0.75 \times 0.25 + 0.25 \times 0.75}{0.25 \times 0.25} + \frac{2}{0.25} + 2 = 74$$

The experiment group when rounded off was 74, giving the study a sample size of 222 participants, with 74 cases and 148 controls. Therefore, the ratio of cases to controls was 1:2.

Sampling procedure

Based on how many cases were diagnosed at each research site between 2020 and 2023, cases were selected from among them. In order to achieve the required sample size, cases (patients) that met the inclusion criteria were progressively enrolled as they came into the hospital. Two times as many controls as selected cases were present at each research site. The total number of controls that needed to be gathered from a study location divided by the number of clinic days during the course of the study period yielded the daily recruitment of controls. Daily examination of patient records was done to determine which ones fit the description of a control. Simple random sampling with replacement was then used to select the controls.

Data collection techniques

The study relied on primary data collected over a 6-month period. Questionnaires were administered with the assistance of three research assistants who guided participants (both cases and controls) in the completion process. To ensure a high response rate, the research assistants clearly and precisely communicated the study's purpose to all participants, emphasizing confidentiality.

Data management and analysis

Descriptive analysis using means, proportions, and frequencies were performed on the demographic data for the cases and the controls. When exposures were evaluated for relationships with the end variable (obstetric fistulae) using the chi-square test or Fisher's exact test,

bivariate analysis produced crude odds ratios and 95% confidence intervals.

RESULTS

Socio-demographic characteristics of the respondents

Table 1 provides a detailed overview of the socio-demographic characteristics of the study participants. The majority of both cases (79.7%, 59/74) and controls (58.1%, 86/148) fell within the age group of 26-35 years. Regarding marital status, 40.5% (30/74) of the cases were married, while 37.2% (55/148) of the controls were in a married status. Religious affiliation revealed that the majority of both cases (85.1%, 63/74) and controls (87.2%, 129/148) practiced the Islamic faith. Education level was also a differentiating factor, with 81.1% (60/74) of the cases and 58.1% (86/148) of the controls having attained primary education. The educational distribution of spouses for cases and controls indicated that most had primary or secondary education. In terms of employment status, 55.4% (41/74) of the cases and 63.5% (94/148) of the controls were self-employed. A similar pattern was observed for the spouses of both cases and controls, with the majority being self-employed as well. Regarding, wealth index poorest 15 (20.3%) of mothers in cases and 22 (14.8%) in controls. Notably, 70.3% (52/74) of the cases and 58.8 % (87/148) of the controls reported that the nearest health facility was more than 3 km away. Furthermore, a substantial majority of both cases (54.1%, 40/74) and controls (90.5%, 134/148) had a height of 150 cm and above.

Socio-demographic characteristics associated with obstetric fistula

Table 2 provides a detailed overview of the association between socio-demographic and obstetric fistula. Age ($\chi^2=10.3864$, $df=3$, $p=0.0156$), educational level of the respondent ($\chi^2=12.3001$, $df=3$, $p=0.0064$), distance to nearest health facility ($\chi^2=8.6592$, $df=3$, $p=0.0342$) and height of respondents ($\chi^2=36.6312$, $df=1$, $p<0.0001$) were significantly associated with obstetric fistula.

For those over 45 and those between the ages of 26 and 35, the percentage who had ever had an obstetric fistula rose from 2.5% to 79.7%, respectively. In a similar vein, among those over 45 and between 26 and 35 years old, the percentage who said they had never had an obstetric fistula rose from 7.4% to 58.1%. In terms of education, the percentage of participants who had ever had an obstetric fistula rose from 2.7% to 81.1% for those with a primary certificate and a university degree, respectively. In the meanwhile, among those with a university degree and those with a primary certificate, the percentage who had never had an obstetric fistula rose from 3.4% to 58.1%, respectively.

Table 1: Socio-demographic characteristics of the study participants.

Variables	Category	Cases (n=74), N (%)	Controls (n=148), N (%)
Age (in years)	18-25	8 (10.8)	34 (23)
	26-35	59 (79.7)	86 (58.1)
	36-45	5 (6.8)	17 (11.5)
	Above 45	2 (2.7)	11 (7.4)
Marital status	Single	13 (17.6)	32 (21.6)
	Married/cohabiting	30 (40.5)	55 (37.2)
	Divorced/separated	16 (21.6)	40 (27)
	Widowed	15 (20.5)	21 (14.2)
Religion	Christian	11 (14.9)	19 (12.8)
	Muslim	63 (85.1)	129 (87.2)
Highest level of Education attained by respondent	Primary certificate	60 (81.1)	86 (58.1)
	Secondary certificate	9 (12.2)	48 (32.4)
	College diploma	3 (4.1)	9 (6.1)
	University degree	2 (2.7)	5 (3.4)
Highest level of Education attained by respondent's spouse	Primary certificate	26 (35.1)	56 (37.8)
	Secondary certificate	26 (35.1)	59 (39.9)
	College diploma	11 (14.9)	20 (13.5)
	University degree	11 (14.9)	13 (8.8)
Occupation of the respondent	Unemployed	11 (14.9)	25 (16.9)
	Self-employed	41 (55.4)	94 (63.5)
	Employee	15 (20.3)	23 (15.5)
	Student	7 (9.5)	6 (4.1)
Occupation of the respondent's spouse	Unemployed	5 (6.8)	14 (9.5)
	Self-employed	41 (55.4)	97 (65.5)
	Employee	20 (27)	29 (19.6)
	Student	8 (10.8)	8 (5.4)
Wealth index	Poorest	15 (20.3)	22 (14.8)
	Poorer	15 (20.3)	30 (20.3)
	Middle	20 (27.0)	67 (45.3)
	Richer	10 (13.5)	14 (9.5)
	Riches	14 (18.9)	15 (10.1)
Distance to the nearest health facility	1-3 km	22 (29.7)	61 (41.2)
	>3 km	52 (70.3)	87 (58.8)
Height of the respondent (cm)	<150	34 (45.9)	14 (9.5)
	150≥	40 (54.1)	134 (90.5)

Table 2: Socio-demographic characteristics associated with obstetric fistula.

Independent variables (and category)	Dependent variable (ever experienced obstetric fistula)		Statistical significance
	Yes N (%)	No N (%)	
Age (in years)			$\chi^2=10.3864$, df=3, p=0.0156*
18-25	8 (10.8)	34 (23)	
26-35	59 (79.7)	86 (58.1)	
36-45	5 (6.8)	17 (11.5)	
Above 45	2 (2.7)	11 (7.4)	
Marital status			$\chi^2=2.2435$, df=3, p=0.5234
Single	13 (17.6)	32 (21.6)	
Married/cohabiting	30 (40.5)	55 (37.2)	
Divorced/separated	16 (21.6)	40 (27)	
Widowed	15 (20.5)	21 (14.2)	
Religion			$\chi^2=0.0434$, df=1, p=0.8351
Christian	11 (14.9)	19 (12.8)	
Muslim	63 (85.1)	129 (87.2)	

Continued.

Independent variables (and category)	Dependent variable (ever experienced obstetric fistula)		Statistical significance
	Yes N (%)	No N (%)	
Highest level of education attained by respondent			
Primary certificate	60 (81.1)	86 (58.1)	$\chi^2=12.3001$, df=3, p=0.0064*
Secondary certificate	9 (12.2)	48 (32.4)	
College diploma	3 (4.1)	9 (6.1)	
University degree	2 (2.7)	5 (3.4)	
Highest level of education attained by respondent's spouse			
Primary certificate	26 (35.1)	56 (37.8)	$\chi^2=2.1378$, df=3, p=0.5443
Secondary certificate	26 (35.1)	59 (39.9)	
College diploma	11 (14.9)	20 (13.5)	
University degree	11 (14.9)	13 (8.8)	
Occupation of the respondent			
Unemployed	11 (14.9)	25 (16.9)	$\chi^2=3.7646$, df=3, p=0.2880
Self-employed	41 (55.4)	94 (63.5)	
Employee	15 (20.3)	23 (15.5)	
Student	7 (9.5)	6 (4.1)	
Occupation of the respondent's spouse			
Unemployed	5 (6.8)	14 (9.5)	$\chi^2=3.7646$, df=3, p=0.2149
Self-employed	41 (55.4)	97 (65.5)	
Employee	20 (27)	29 (19.6)	
Student	8 (10.8)	8 (5.4)	
Distance to the nearest health facility			
1-3 km	22 (29.7)	61 (41.2)	$\chi^2=8.6592$, df=3, p=0.0342*
>3 km	52 (70.3)	87 (58.8)	
Height of the respondent (cm)			
<150	34 (45.9)	14 (9.5)	$\chi^2=36.6312$, df=1, p<0.0001*
≥150	40 (54.1)	134 (90.5)	

*Statistically significant (p value <0.05)

Table 3: Socio-cultural characteristics associated with obstetric fistula.

Independent variables	Dependent (ever experienced obstetric fistula)		Statistical significance
	Yes N (%)	No N (%)	
Used traditional medicine or herbs during pregnancy and labour			
Yes	57 (77)	124 (83.8)	$\chi^2=1.0807$, df=1, p=0.2985
No	17 (23)	24 (16.2)	
Patients with obstetric fistula are treated equally as the rest of the patients in this community			
Yes	25 (33.8)	83 (56.1)	$\chi^2=8.9457$, df=1, p=0.0028*
No	49 (66.2)	65 (43.9)	
Cost of treating obstetric fistula affordable for all in this community			
Yes	8 (10.8)	25 (16.9)	$\chi^2=1.0010$, df=1, p=0.3170
No	66 (89.2)	123 (83.1)	
Area has enough health care facilities that care for patients with obstetric fistula			
Yes	18 (24.3)	48 (32.4)	$\chi^2=1.1886$, df=1, p=0.2756
No	56 (75.7)	100 (67.6)	
Culture promotes stigmatization of obstetric fistula			
Disagree	2 (2.7)	9 (6.1)	$\chi^2=4.9170$, df=3, p=0.1780
Neutral	12 (16.2)	12 (8.1)	
Agree	37 (50.0)	86 (58.1)	
Strongly agree	23 (31.1)	41 (27.7)	

*Statistically significant (p value<0.05)

Table 4: Multiple logistic regression model determining predictors for obstetric fistula.

Variables	COR (95% CI), p value	AOR (95% CI), p value
Socio-demographic characteristics		
Age (in years)		
18-25	Ref	Ref
26-35	2.92 (1.2607, 6.7431), 0.0124*	1.33 (0.4986, 3.5714), 0.5657
36-45	1.25 (0.3546, 4.4065), 0.7285	0.66 (0.1409, 3.115), 0.6022
Above 45	0.77 (0.1423, 4.1965), 0.7652	0.42 (0.0651, 2.6526), 0.3531
Highest level of education attained by respondent.		
Primary certificate	2.09 (0.5439, 8.0543), 0.2827	6.60 (0.6379, 68.1791), 0.1135
Secondary certificate	1.2 (0.1474, 9.7675), 0.8647	3.28 (0.7171, 14.9817), 0.1258
College diploma	Ref	Ref
University degree	0.56 (0.127, 2.4909), 0.4485	0.61 (0.1107, 3.3521), 0.5690
Distance to the nearest health facility		
1-3 km	Ref	Ref
>3km	2.20 (0.9994, 4.8559), 0.0501	2.51 (1.0056, 6.2874), 0.0486*
Height of the respondent (cm)		
<150	8.14 (3.9776, 16.6408), <0.001*	12.09 (5.0958, 28.6797), <0.001*
≥150	Ref	Ref
Wealth index		
Poorest	4.621 (2.998, 6.123), 0.01	3.34 (2.238, 5.015), 0.01*
Poorer	0.871 (0.745, 1.017), 0.090	
Middle	1.037 (0.881, 1.221), 0.562	
Richer	1.124 (0.889, 1.421), 0.330	
Richest	Ref	
Patients with obstetric fistula are treated equally as the rest of the patients in this community		
Yes	Ref	Ref
No	0.40 (0.2235, 0.7143), 0.002*	0.40 (0.2235, 0.7143), 0.002

*Statistically significant (p value <0.05), COR- crude odds ratio, AOR- adjusted odds ratio, CI- confidence interval

Socio-cultural factors associated with obstetric fistula among women of reproductive age

Table 3 provides a detailed overview of the socio-cultural associated with obstetric fistula. A statistically significant association was observed between obstetric fistula and participants who reported that patients with obstetric fistula were treated equally as other patients in the community ($\chi^2=8.9457$, $df=1$, $p=0.0028$).

Multiple logistic regression model determining predictors for obstetric fistula

In bivariate logistic regression analysis age between 26-35 years were 2.9 times (COR=2.9;95% CI; 1.2607, 6.743, $p<0.012$) more likely with developing fistula than 18-25 years. In multivariable analysis, participants residing more than 3 km from the nearest health facility exhibited a 2.51 times higher likelihood of developing obstetric fistula (AOR=2.51, 95% CI=1.0056-6.2874, $p=0.0486$). Individuals with a height less than 150 cm faced a substantially elevated risk, with an odds ratio of 12.09 (95% CI=5.0958-28.6797, $p<0.001$). Wealth index poorest category 4.6 times (AOR=4.62;95% CI; 2.238, 5.015, $p=0.01$) more likely with developing fistula than richest wealth index. Furthermore, patients with obstetric

fistula not being treated equally as the rest of the patients in the community were associated with a 60% reduced risk (AOR=0.40, 95% CI=0.2235-0.7143, $p=0.002$).

DISCUSSION

Socioeconomically disadvantaged women in developing nations such as Nigeria continue to suffer from obstetric fistula, either as a result of poor modern maternity facilities or ignorance that undercuts their willingness to seek health care. The three factors that have been linked to this tragedy are poverty, ignorance, and illiteracy. These factors not only make the ailment more likely to develop in the first place but also discourage afflicted women from seeking surgical correction as soon as possible.^{14,15}

The results of this investigation provide a thorough grasp of the sociodemographic variables connected to obstetric fistula in Dadaab sub-county. The age distribution of cases and controls showed a statistically significant correlation, emphasising how susceptible women between the ages of 26 and 35 were to obstetric fistula. This is consistent with previous research showing the reproductive age group to be especially vulnerable to difficulties related to childbirth.¹⁶⁻¹⁸ However, our

findings present a deviation from a study carried in Nigeria who reported a majority seeking obstetric fistula services to be aged 15-26 years, and in Kenya who observed a prevalence among those aged 15-24 years.^{19,20}

Age is an important sociodemographic factor in determining the risk of genital fistula. Younger females who marry at a young age are more vulnerable to obstetric fistula because their bodies are not fully matured for childbirth.²¹ Childbirth at a young age increases the risk of obstructed labour, which is a leading cause of fistula. Furthermore, elderly women who have had several pregnancies and extended labour may be at danger. Comprehensive sexual and reproductive health education, focused at postponing childbirth, is critical in reducing the occurrence of genital fistula among young females.²²

Marital status appears as a distinguishing factor, with a sizable proportion of cases being married, highlighting the intricate interplay of sociodemographic determinants in marital dynamics. In contrast, a study conducted in Kenya found that divorce was a contributing factor to the development of fistulas.²³

Marital status influences the etiology of genital fistula. Early and forced marriages in some societies often result in young brides becoming pregnant before their bodies are ready for childbirth, leading to an increased risk of obstetric fistula.²⁴ Moreover, women who are socially isolated or lack family support may delay seeking appropriate medical care during childbirth, further complicating the situation. The role of marriage and family dynamics in addressing fistula prevention is a critical aspect of any comprehensive strategy.²⁵ Religious affiliation and educational level showcase notable patterns, underlining the importance of cultural and educational factors in obstetric outcomes. The concentration of cases and controls within the Islamic faith suggests the need for culturally sensitive interventions.

Our findings on the link between lower education levels and obstetric fistula are consistent with global initiatives to alleviate health disparities based on educational attainment. These findings are consistent with those reported by Ameka who found that most respondents with primary education encountered hurdles to accessing health information.²⁶ The education level has a substantial impact on the aetiology of genital fistula. Women with low educational opportunities are more likely to marry early, are less aware of their reproductive rights, and lack knowledge about safe birth techniques. Education is a critical factor in raising knowledge about the risks of premature birth and inadequate obstetric care. As a result, improving girls' education can be an effective technique in reducing genital fistulas.

In our study, employment status of cases and controls reveals a significant pattern, with a notable proportion

being self-employed. Studies conducted in different sites have linked wealth index with obstetric fistula occurrence.²⁷⁻²⁹ The poorest wealth index is shown to be more likely to develop obstetric fistula than the richest wealth index. This disparity might be attributed to women with a better wealth index being able to afford payment and transportation to healthcare services. Economic status is closely intertwined with the risk of genital fistula. Poverty often restricts women's access to adequate healthcare facilities and skilled birth attendants, increasing the chances of experiencing prolonged, obstructed labor. Furthermore, impoverished women may lack the means to cover the costs of fistula repair surgeries. Addressing economic disparities through policies that promote economic empowerment and provide financial assistance for fistula surgery is crucial. In our study, there was on reliance on traditional practices which may contribute to delays in seeking obstetric care, thereby impacting maternal health outcomes. This emphasizes the critical need to address stigma and discrimination within healthcare settings. A study conducted in Nigeria indicated that obstetric fistula is stigmatized globally, making it challenging to accurately assess its prevalence.³⁰

There might be recall bias, cross-sectional study; it cannot show cause-effect relationship between the variables studied and the same to other behavioral studies, respondents might not reply openly to sensitive and private questions.

CONCLUSION

A complex interaction of social dynamics in maternal health outcomes is demonstrated by the identification of sociodemographic characteristics, including age, marital status, religious affiliation, and education level, as important contributors to the development of obstetric fistula. Women's health-seeking behaviours are influenced by deeply ingrained cultural norms.

Recommendations

Comprehensive initiatives that address the underlying socio-demographic causes as well as the medical components must be put into action in order to effectively combat this condition. The occurrence of genital fistula can be decreased, and the general welfare of those affected can be enhanced, by empowering women, enhancing the healthcare system, and increasing awareness.

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