



Trend Analysis of Vesico-vaginal Fistula among Attendee's in Fistula Centres in Kano State, Nigeria

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Authors' contributions

This work was carried out in collaboration among all authors. Author OGU designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors CI, CRN, SI, OGU and HIU managed the analyses of the study. Authors OGU and SI managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

A study on the trend analysis of VVF among attendee's in fistula centers, Kano State, Nigeria was carried out using ten (10) years hospital records. Results showed three peaks in prevalence in year 2010 (73.8%), 2015 (77.2%) and 2017 (59.3%). The highest peak was in the year 2015 while the lowest prevalence occurred in 2014 (46.0%). Overall, there is a decline in prevalence for the ten years studied. It was observed in this study that most of the patients reside in the rural area of the state, where lack of access to appropriate emergency obstetric care and strong hold to traditional practice is obtained. Therefore, there is need to expand the current strategies employed in the fight against VVF to include initiating a men-targeted programme to enlighten and educate men, especially those living in rural areas on the need to allow their women access to medical care during pregnancy to avoid complications that could result to Vesico-vaginal fistula.

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1. INTRODUCTION

Vesico-vaginal fistula (VVF) is a preventable disease of public health importance which is predominant among women in the low-income population especially in rural areas of the world. Worldwide, there is an estimated two million women living with vesico-vaginal fistula with the bulk of cases located in Sub-Saharan Africa and South Asia [1,2]. In West Africa, reports show that the incidence rate of VVF ranges between 1-4 cases per 1,000 deliveries [3,4].

The United Nations Population Fund (UNFPA) [24] estimated two million women in Sub-Saharan Africa and South Asia have vesico-vaginal fistula. About 50,000 to 100,000 and 30,000 - 130,000 new cases of VVF are recorded annually in South Asia and Sub-Saharan Africa respectively [8]. In Sub-Saharan Africa, Ethiopia had about 142,387 cases as at the year 2013 [5,6], Kasamba, Kaye and Mbalinda, [7] observed that about 2.6% to 2.8% Ugandan women of reproductive age suffered from VVF and Kasamba [7] opined that in Nigeria alone 800,000 to 1,000,000 women are estimated to be awaiting surgery for VVF, the annual obstetric fistula incidence is estimated at 2.1 per 1000 births.

Vesico-vaginal fistula is defined as the abnormal connection between the urinary tract and the vagina such that there is an incessant, uncontrollable leakage of urine into the vaginal tract [8,9]. According to Villey, [8] VVF is an abnormal communication between the urinary bladder and the vagina that results in the continuous involuntary discharge of urine into the vaginal vault; the pathogenesis of VVF is expressed by the contraction of the pelvis, the prolonged and obstructed labor (labor usually becomes obstructed, when the pelvis is too small for the passage of the baby) resulting in ischemia of tissues between the bladder and vagina [10,11]. Few weeks later; the woman experiences sloughing of the tissues and fistula occurs, this could lead to diverse complications like vaginal or urinary tract infections, hygiene problems, stool or gas that leaks through the vagina, irritated or inflamed skin around the vagina, an abscess (a swollen clump of infected tissue with pus that could be life-threatening), and also the risk of fistula forming again. The hallmark symptom of VVF is the uncontrolled leakage of urine into the vagina [12].

In Kano State, Nigeria, this situation is fast becoming one of the most debilitating health challenge, as most of these married women are either under-aged or exhibit carefree attitude during pregnancy as a result of inadequate financial strength to access skilled health care providers, they resort to seek advice from elderly female family members, neighbors and friends that have being pregnant to advise them concerning their current pregnancies and complications that follows instead of reaching out to health facilities for antenatal care [3]. The fistula centre named Laure Fistula Centre located within the Murtala Specialist hospital and the rehabilitation centre; Kwalli Fistula Rehabilitation Centre was established in 1987 and 1990 respectively. The Laure fistula centre performs over 500 fistula repairs surgeries yearly, including many referrals throughout Nigeria as well as neighboring countries. It has one operating room and 24 beds for pre-operative and post-operative care. At the Laure Fistula centre an average of 200 patients are registered in-patient per week, they are operated upon and stay for two weeks for acute treatment, before being moved to the Kwalli Rehabilitation Centre where they are managed until they are discharged. The surgery for fistula repair is free but patient require money for the purchase of pre-operative commodities, drugs and follow-up treatment. However, within the vicinity of the fistula centre, women with VVF lay around unable to seek treatment due to financial challenges eventually, most of these women take up begging in a bid to raise money for the treatment expenses and care of their babies for those whose babies are still alive.

This study is designed to determine the trend analysis of VVF among attendees in fistula centres in Kano State, Nigeria. The study is geared towards revealing the actual proportion in percentages of VVF cases among the attendees in fistula centers and the demographic characteristics of these attendees in fistula center. The findings of this study would portray the proportion of VVF cases in fistula centers within the last ten years and the various demographic exposures that led to the development of VVF.

2. MATERIALS AND METHODS

Hospital-based retrospective study design was used to determine the trend of Vesico-vaginal

fistula among attendees in fistula centres in Kano State, Nigeria from August 2018 to February 2019. Data was collected using the data collecting proforma/guide and a semi-structured questionnaire developed by the researcher with the permission of the Ethical Consent from the Kano State Ministry of Health, the Ethical Review Committee of the hospital and oral consent of the participants. The distribution and supervision in the filling was carried out by the researcher and two trained research assistants, the research assistants were trained in Hausa language, to help explain the meaning of the questions, so as not to change the questions, or give it a different meaning. The respondents at the Laure fistula Centre were requested to stay in a comfortable position, undistracted to respond to the questions in the instrument. Those who were not able to complete the questionnaire were assisted to do so by the research assistants.

2.1 Method of Data Analysis

Data collected was statistically analyzed using Statistical Package for Social Science (SPSS) version 22.0. As part of the initial analysis, descriptive analysis was used for demographic characteristics, the hospital record was analyzed using the Microsoft excel package, and was represented in statistical line graph. Chi-square and One Sample t-test was used to analyze the research hypotheses. They were performed at 5% level to test for significant differences. Probability value (p-value) was used to interpret the results and p-value less than 0.05 was considered significant.

3. RESULTS

3.1 Demographic Characteristics of VVF Attendees in Fistula Centers in Kano state

The result revealed that, out of 250 women with VVF attending fistula centers, majorities 101 (40.4%) were between 19-28 years of age, 80(32.0%) were between 9-18 years of age, 45 (18.0%) were between 29-38 years of age, 21(8.4%) were between 39-48 years of age, 3(1.2%) were between 48 years and above.

Result from the educational status revealed that, most 169 (67.6%) had quar'anic education, 39 (15.6%) had primary education, 25 (10.0%) had

non- formal education, 16(6.4%) had secondary education and 1(0.4%) had tertiary education.

Income status of respondents revealed that, 212(84.8%) had income less than 18,000 Naira per month, 31(12.4%) had income of 18,000 Naira to 36,000 Naira and 7(2.8%) had an income of 36,000 Naira and above.

With respect to their occupation, the result revealed that, 191(76.4%) are housewives, 27 (10.8%) are traders, 16(6.4%) are apprentice, 6 (2.4%) are students, while 5(2.0%) are farmers and civil servants respectively.

Area of residence of respondents revealed that most 149 (59.6%) reside in the rural area, while 101(40.4%) reside in the urban area.

3.2 Proportion of Vesico-vaginal Fistula among Attendees in Fistula Centres in Kano State, from 2009 to 2018

The result revealed that in 2009 there were documented 1, 560 cases of fistula with a VVF prevalence of 54.7%. In 2010 and 2011, there were 1345 and 1986 cases of documented fistula with VVF having a prevalence rate of 73.8% and 65.3% respectively. There was a slight decline in 2012 and 2013 as 1,876 and 1984 fistula cases were documented with VVF prevalence rates of 52.0% and 50.3% respectively. In 2014, there was also a sharp drop in VVF cases with 46.0% prevalence rate. In 2015, there was a sharp increase of fistula cases with VVF prevalence rate of 77.2%. A continued decline was recorded from 2016 with fistula cases of 1043 and VVF prevalence rate of (52.1%). A slight increase was recorded in 2017 as fistula cases were 964 with VVF prevalence rate of 59.3% and in 2018, with 578 fistula cases with 51.2% prevalence rate (see Table 1).

3.3 Distribution of the Predisposing Factors Associated with VVF

The result revealed the causes of VVF from both patient's opinion and patient's record. From the opinion of the patients, majority 144(57.6%) said VVF was caused through prolonged labour, 69(27.6%) said VVF was caused by Traditional birth attendants, 12(4.8%) said Female Genital Mutilation, 11(4.4%) said Gishiri cut, 6(2.4%) said Early marriage was the cause of VVF and 8 (3.2%) had No Idea on the causes of VVF (see Table 3).

Based on their records, results showed that prolonged labour 182 (72.8%) was the highest cause of VVF, then Early Pregnancy 58 (23.3%) as another major cause of VVF. Result on the duration of labour before childbirth revealed that, majority 112 (44.8%) were in labour that lasted 4days to 5 days, 102 (40.8%) were in labour that lasted between 1day to 3days and 36 (14.4%) had less than 24 hours labour duration (see Table 3).

Table 1. The prevalence of Vesico-vaginal fistula cases among other fistulas in fistula centres in Kano State

Year	New cases	Old cases	Old & new cases	Fistula pop.	Prevalence %
2009	332	521	853	1560	54.67948718
2010	561	431	992	1345	73.75464684
2011	758	538	1296	1986	65.25679758
2012	423	553	976	1876	52.02558635
2013	360	638	998	1984	50.30241935
2014	342	536	878	1907	46.04090194
2015	304	456	760	985	77.15736041
2016	219	324	543	1043	52.06136146
2017	270	302	572	964	59.33609959
2018	175	121	296	578	51.21107266

Table 2. Distribution of the socio-economic characteristics of the respondent

		Frequency	Percentage (%)
Age	9-18	80	32.0
	19-28	101	40.4
	29-38	45	18.0
	39-48	21	8.4
	49 & above	3	1.2
	Total	250	100
Occupation	Housewife	191	76.4
	Apprentice	16	6.4
	Trading	27	10.8
	Farming	5	2.0
	Student	6	2.4
	Civil servant	5	2.0
	Total	250	100
Religion	Muslim	246	98.4
	Christian	2	0.8
	None	2	0.8
	Total	250	100
Residence	Urban	101	40.4
	Rural	149	59.6
	Total	250	100
Income (Naira)	<18,000 Naira	212	84.8
	18,000-36,000 Naira	31	12.4
	>36,000 and above	7	2.8
	Total	250	100
Level of education	Non- formal education	25	10.0
	Quar'anic	169	67.6
	Primary	39	15.6
	Secondary	16	6.4
	Tertiary	1	0.4
	Total	250	100

Table 3. Distribution of the predisposing factors associated with VVF

		Frequency	Percentage (%)
Causes of VVF (From patient)	Prolonged labour	144	57.6
	Traditional birth attendant	69	27.6
	Female genital mutilation	12	4.8
	Gishiri Cut	11	4.4
	Early marriage	6	2.4
	No idea	8	3.2
	Total	250	100
Causes of VVF (From patient's records)	Prolonged labour	182	72.8
	Early pregnancy	58	23.3
	Female Genital mutilation	1	0.4
	Gishin cut	9	3.6
	Total	250	100
Duration of labour	<24 hours	36	14.4
	1day-3 days	102	40.8
	4 days-5 days	112	44.8
	Total	250	100

Table 4. Relationship between the predisposing factors associated with VVF and the development of VVF among attendees in Fistula Centres in Kano State

Predisposing factor associated with VVF	T	Df	P Value	Mean difference	95% confidence interval of the difference	
					Lower	Upper
Level of education	48.543	249	<0.0001	2.196	2.11	2.29
Occupation	21.485	249	<0.0001	1.536	1.40	1.68
How do you earn money?	29.949	249	<0.0001	1.860	1.74	1.98
What area in the state do you reside?	51.324	249	<0.0001	1.596	1.53	1.66
Number of deliveries before the vvf occurs?	93.197	249	<0.0001	3.544	3.47	3.62
Place of delivery when vvf occurs?	31.461	249	<0.0001	2.348	2.20	2.49
Duration of labour before child birth?	51.437	249	<0.0001	2.304	2.22	2.39
Usual place of delivery?	32.827	249	<0.0001	2.184	2.05	2.32
Who attended to the delivery?	49.930	249	<0.0001	2.320	2.23	2.41

The result also reveals that prolonged labour,(103) account for major causes of VVF among multi-parous women, followed by traditional birth attendants aided delivery in same multi-parous women (see Fig. 2).

3.4 Relationship between the Predisposing Factors Associated with VVF and the Development of VVF among Attendees in Fistula Centres in Kano State

There is no significant relationship between the predisposing factors associated with VVF and

the development of VVF among attendees in Fistula Centres in Kano State.

The decision rule is to reject null hypothesis, if the P-value is less than $\alpha = 0.05$ level of significance, otherwise do not reject. Considering the factors characterizing the women living with VVF and predisposing factors which are shown in Tables 4 and 5, we reject the null hypothesis of no significant relationship and accept the alternate hypothesis which states that there is statistically significant relationship existing incidence of VVF and the predisposing factors associated with it among attendees in Fistula Centres in Kano State, since the

probability value is less than $\alpha = 0.05$ level of significance.

4. DISCUSSION

Findings from this study showed statistically significant relationship ($P = <0.0001$) between some demographic characteristics of the development of Vesico-vaginal fistula among women in fistula centers in Kano State. The marital status doesn't key in as independent risk factors for Vesico-vaginal fistula, which contrasts with other research work which views it as a risk factor.

This study however reveals that the respondents seen in the facility are restricted to the Northern region, this is not surprising as a large chunk of the patients are muslims and the hospital serve as a referral center for other hospitals, this however correspond to the findings in Sokoto where Hausa/ Fulani Muslims predominated with 87.4% [13,14], while contradicting with the findings of Daru.et al 2011 where 70.4% of the respondents were Christians and not restricted to the northern region as respondents hailed from various parts of Nigeria.

According to the model proposed by Maine 1994, the gross deficit in the educational attainment is one of the reasons of their unemployment and poor income rate. This finding is in line with that identified in Zeinab (2013) in a case- control research on the factors associated with obstetric fistula occurrence in Kenya, In the study the low level of western education (Primary, Secondary and Tertiary) showed a significant relationship ($p < 0.0001$) with Vesico-vaginal fistula, the result hence agrees with other studies in Africa where no education or low- level of western education poise a significant risk factor for fistula [15,16,17].

This findings indicates that a large chunk of these respondents are financially disadvantaged as they didn't obtain the basic elementary education, they end up being house-wives and therefore live at the mercies of their husband to be able to provide for their daily needs, this finding correspond with the World Health Organization [18,19] report that pervasive poverty is an important underlying cause of Vesico-vaginal fistula, however due to extreme poverty, most of the respondents face difficulty raising funds to access proper medical care. Findings from the study reveals most 149

(59.6%) of the respondent's reside in the rural area of the state, where lack of access to appropriate emergency obstetric care and strong hold to traditional practice is obtained, this explains the reason Vesico-vaginal fistula occurs mostly among women living in the rural area, which in most cases they live far away from a health facility, this findings correspond with findings of Muhammed [20,21,22].

The study illustrated the trend of VVF among attendee's in fistula center in Kano State, Nigeria. An overall decreasing trend was observed in VVF within the ten years with different peak periods as illustrated in Fig. 1. Highest peak was recorded in 2015, while the lowest drop was recorded in 2014; it was observed by Ahmed [23,24] that increase in VVF correlates to cultural factors which include early marriage, early child-birth, genital practice, marital customs, environmental factors, individual/personal factors and social factors. The role of these factors results in the high prevalence of Vesico-vaginal fistula. Findings from this study also aligns with the findings of Daru.et al. (2011) which revealed the prevalence of Vesico-vaginal fistula is 87% in Kano state, it also aligns with the study of Kees [25,26,27], who stated 90% prevalence of Vesico-vaginal fistula among women in Sub-Saharan Africa. It was also observed in this study that most of the patient's reside in the rural areas, where they have limited or no access to quality health care and traditional practices are held in high esteem. It was also observed that the deficit in educational attainment is one of the reasons for unemployment and poor income status which hinders women from accessing quality health care during pregnancy. With respect to the educational attainment, the educational sector of the state is engrafted to give room mainly for the masculine folks, in the light of this, incubating the girl-child in illiteracy; hence policy adjustment is needed to accommodate the girl-child education, which would limit the rate of early marriage in the region.

Majority of respondents associate delivery in the hospital as sign of weakness and tend to show off their strength as women to deliver in the homes of these traditional birth attendant. However, findings from this study is a wake- up call to the government of the state to consider a scheme to fund the home-antenatal care, where antenatal care is given to the pregnant women in their homes and also education of these traditional birth attendants, since most of the

respondents employ their services, the need to acquaint them educationally and health wise on the rudiments of carrying out deliveries and emergency numbers of health care providers to reach out in cases of emergencies. Findings from this study reveals increased occurrence of deliveries carried out by traditional birth attendants, however contrasts with findings from a study in Zambia where it was observed that 76.6% of respondents had their deliveries at a hospital. A study carried out in the north western, Nigeria corresponds with the findings from this study where it was observed and reported that 85.7% of respondents had their deliveries in the homes of traditional birth attendants [28].

The respondents however could correctly identify some of the causes that led to their development of Vesico-Vaginal fistula among

which are (prolonged labour, gishiri cut, early marriage, traditional birth attendants, hospital operation). This however is not surprising as they were on admission in the facility at the time of this study. However, some respondents still believed it was due to some evil spirits or as God's will, findings from this study reveals that prolonged labour is mostly due to the fact that most traditional birth attendants cannot recognize prolonged obstructed labour when it occurs and as such ask the woman in labour to continue pushing, further complication arises which results in necrosis pressure and subsequently Vesico-Vaginal fistula, these respondents labour for days until when they feel "numb" from their hip region downwards, or they begin to convulse, then they seek medical assistance, at this point it becomes too late to save the child and the mother from having VVF. The findings from this study is however in line

Table 5. Relationship between the predisposing factors and the development of VVF

	Numbers of deliveries before the VVF occurs			
	1	2 -4	5 and above	Total
Prolonged labour	7	34	103	144
Traditional birth attendant	6	32	31	69
Female genital mutilation	0	5	7	12
Gishin cut	0	5	6	11
Early marriage	0	4	2	6
No Idea	1	6	1	8
Total	14	86	150	250
Chi-Square tests	Value	Df	P-Value	
Pearson Chi- Square	27.181	10	0.002	
Likelihood ratio	29.023	10	0.001	
Linear by linear association	11.073	1	0.001	

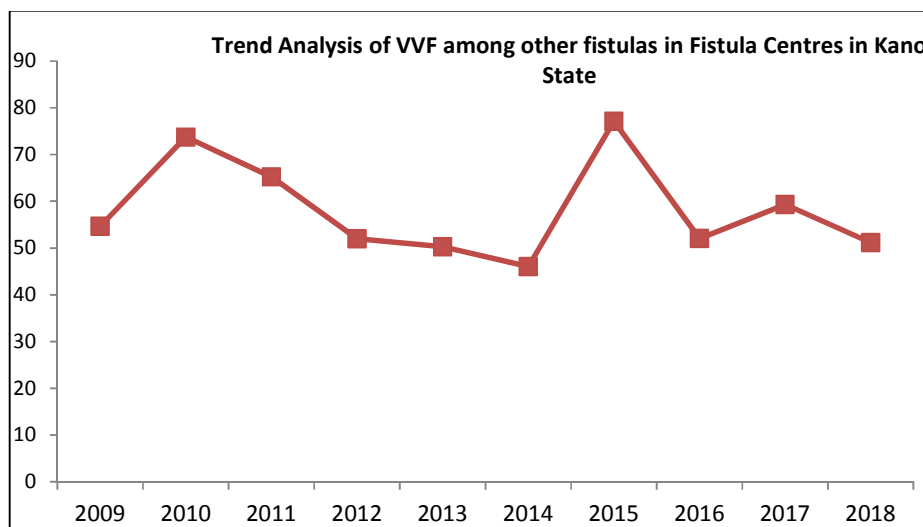


Fig. 1. Showing the trend analysis of vesico vaginal fistula among women in fistula centres in Kano State

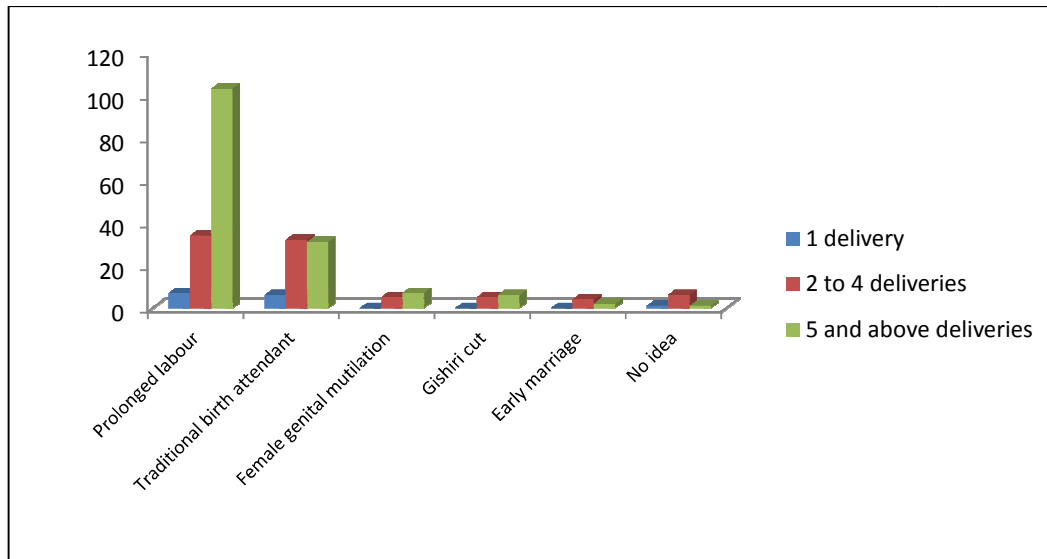


Fig. 2. Showing Parity as it relates to causes of VVF

with the study of Muhammed [29] who outlined that the direct result of prolonged labour, early marriage, traditional birth attendants, ignorance, caesarian section, gishiri cut and female genital mutilation is Vesico-Vaginal fistula.

In this study, weight of the baby, height of the respondents was not viewed as risk factors as revealed in the study of Justus (2014) [30] who stated them as predisposing factors to Vesico-Vaginal fistula.

Findings from this study connotes parity as another predisposing factor to Vesico-Vaginal fistula, this finding is however in line with findings by Zeinab [31] where 70.4% of the Vesico-Vaginal fistula patients were multi-parous women.

Findings from this study reveals duration of labour was generally longer among the respondents, this findings is however, in agreement with result from a study in Kenya where 67.5% of women who developed a fistula had a median duration of labour of more than 24 hours [7].

5. CONCLUSION

This study has revealed a decline in the prevalence of VVF in a ten year trend from 2009 to 2018. However the trend showed high peaks of VVF prevalence in some years. There is therefore need to monitor risk factors responsible for increase in VVF prevalence and

efforts should be made to formulate strategic, consistent and integrated control measures that would ensure a steady decline of VVF in Kano State.

CONSENT AND ETHICAL APPROVAL

A letter of introduction was obtained from the Department of Public Health, Federal University of Technology Owerri, and was submitted to the Kano State Ministry of Health for ethical approval. An Ethical Approval to carry out the study at the Laure Fistula Centre of Murtala Mohammed Specialist Hospital and the Kwalli Rehabilitation Centre, Kano State was obtained from the Kano State Ministry of Health and was signed by the Ethical Review Committee of the hospital chaired by the Chief Medical Director of the hospital, while an informed verbal consent was sought from participants.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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