

Vesico Vaginal Fistula (VVF) in Katsina and Kano Centres: Its Psychological and Other Emergent Impact on VVF Patients

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Abstract: This research was set to study the causes of vesico vaginal fistula (VVF) and its psychological and medical impacts on VVF patients in Obstetric Fistula Katsina and Kano centres Nigeria. Research's evident showed that VVF arose from myriads of direct and remote factors. This is against the traditional claim of the cause of VVF in Northern Nigeria. Moreover, much emphasis is often paid on physical injuries of the patient while overlooking the patients' psychological conditions. This is despite untold suffering the victims may be subjected. Thus, prompting this research where survey method was adopted using interview to capture needed information. Using purposive sampling technique, the total fifty eight (58) VVF/RVF patients were used. The data collected were analyzed using frequency table with simple percentages. The mean scores of psychological level of the patients were determined. Majority of the patients have small body size which underweight having < 18.5 BMI. Significant number of the new born baby recorded large body size. Most of the patients seek medical assistance after more than 2 days of labor. On the psychological stress of the patients under study, it revealed no emotional, physical, behavioral and social stress with recorded ≤ 1.49 mean scores. However, under cognitive and psychological conditions insignificant elements of memory problems and loss of interest were noticed in the patients' represented by approximately 2 mean scores. Base on the research findings; to check the frequency of the obstetric fistula due to cephalo-pelvic disproportion, counselling can be employed to advice those with small stature to delaying either marriage or pregnancy. Moreover, pregnant women should be encouraged for regular anti-natal clinic during the pregnancy period.

Keywords: Obstructed labour, medical, depression, stillbirth and early marriage.

I. Introduction

There are several million cases of obstetric fistula which have been reported to exist in sub-Saharan Africa and south Asia [1]. The situation where obstruction occur during labor when the fetus will not fit through the birth canal, and if labor continues for a long period, the blood supply to the compressed tissues is disrupted. Eventually, the injured tissues will cause necrose and slough away, creating a fistula [2]. Wall (2014) defined obstetric fistula as a condition in which the tissues normally separating the vagina from the bladder and/or the rectum are destroyed during obstructed labor.

Patients with vesico vaginal fistula

An obstetric fistula is an abnormal passageway between the vagina and the urinary and/or gastrointestinal tract arising from obstetric trauma. These injuries most commonly in sub-Saharan Africa arise from a crush injury to the vesico vaginal septum during prolonged obstructed labor. These injuries are completely preventable provided the diagnosis of obstructed labor is made early and prompt intervention takes place before extensive ischemia has occurred. However, poorly developed systems of maternal healthcare in West Africa prevent many women from accessing emergency obstetric services in a timely fashion after labor becomes obstructed. This often leads to catastrophic injuries called obstetric fistula. Thus, can be considered largely as a disease of poverty, and West Africa is extremely poor [2].

The problem of vesico vaginal fistula (VVF) was reported to be intense in Nigeria, the most populous country in sub-Saharan Africa, where at least 1% in every pregnant women die of obstetric complications [3] and where obstructed labor either resulted in maternal death. While women who survive obstructed labor often develop a vesico vaginal fistula [4].

Signs and symptoms: woman with an obstetric fistula will have urinary and/or fecal incontinence, which is continuous and unremitting. In the worst cases, the patient may be constantly soaked in urine, shunned by people around her, abandoned or divorced by her husband, in some cases cast out from the family house, and forced to the margins of society [2].

Justification of Research

Forty thousand (40,000) VVF patients were treated at the National Obstetric Fistula Centre in Katsina State since its inception in 1984 [5]. One often hears over the radio and television and also reads in magazines and newspapers that VVF is caused mainly through early marriage. There are about 30% of VVF cases occur in girls who are given out in marriage at the ages between 10 – 14 years. These girls are usually not matured enough for this sacred institution, whenever they become pregnant and subsequently got into labor, their pelvic bones are often found not to be fully developed to allow for the passage of the babies' heads [6].

Estimates propose at least 3 million women in poor countries have unrepaired VVF and that 30 000–130 000 new cases arise each year in Africa alone. However, the world medical community remains largely unaware of this problem [7]. Despite this large number of VVF cases, there is no tangible information available on the level of psychological and socio-economic hardship the patients with VVF are being subjected.

It has been estimated that there are about 800,000 women affected by Vesico Vaginal Fistula (VVF) in Nigeria. This is about 40% of the total world's estimate of 2 million VVF patients [8]. The incidence of VVF in Nigeria is at the rate of 2 per 1,000 deliveries [9]. The estimated prevalence is approximately 800,000 as mentioned earlier, most of which occur in the endemic states of Katsina, Sokoto, Kebbi, Borno, Zamfara and Plateau states all in Northern Nigeria [6].

Fistula campaigns and vulnerable patients

In recent time, there is high public concern as obstetric fistula patients are vulnerable to Foreign aid donors of both governmental and non-governmental who have been funding programs for fistula repair and prevention, and whose motive driving these activities may not be to the best interests of the VVF patients. Thus, patients with VVF are vulnerable group worthy of giving special attention, because they are mostly at the lower social class [10]. The Council for Organizations of Medical Sciences defines vulnerable patients as individuals “who are relatively (or absolutely) incapable of protecting their own interests” [11]. Women are vulnerable as they are psychologically injured. Therefore, they may be vulnerable to exploitation by individuals who offer to assist, because they might have nowhere else to go [10]. Patients with fistula need special programs to repair not only their physical injuries but to include possible psychological torches as a result of the obstetric fistula.

There are numerous evidences linking obstetric fistulas to prolong labor, delay in receiving medical attention during obstructive labor, prevalence of male births in northern Nigeria whose birth weight is substantially greater than the average female birth weight, poor state of health care facilities, inadequate material resources, and a lack of trained physicians to address obstetric emergencies and medically unwise traditional practice such as random cuts (gishiri-cutting). Thus, there is need for new research to be conducted with view of ascertaining the major contributing factors to obstetric fistulas in Nigeria. Similarly, more emphasis are paid on surgical aspect of the VVF. The psychological condition of the patients with VVF are often ignored by both government and non-governmental organizations, this research will unravel extend of psychological damage mated on VVF patients.

The study is designed with the following objectives: 1) Determine the number of those that were affected by VVF in the fistula centres. 2) Main causes of VVF in the patients attending the fistula centres. 3) Determine other medical related problems faced by VVF in the fistula centres 4) Assess psychological condition of VVF patients in the fistula centres.

II. Materials and Methods

Study area: Katsina vesico vaginal fistula (VVF) center is the oldest in the country established on 1932 at Babbar ruga, Batagarawa, Katsina state [12]. Presently, having ninety one (91) beds capacity; pre VVF ward: 19 beds, post VVF ward; 12 beds and Abuja ward: 17 beds. Currently forty eight (48) VVF patients were on admission. On the other hand, Kano vesico vaginal fistula (VVF) center was officially open on 1987 [13] at Murtala Muhaamad Specialist Hospital Kano. It is equipped with 21beds and ten (10) VVF pateints were currently on admission by the center.

Population and Sampling: The patients of the VVF Centres in Katsina an Kano states are the population of the study. Purposive sampling was adopted where all the VVF/RVF patients were sampmed.

Research Design and Instrument

The researchers adopted survey method to obtain the needed information using interview. The oral interview guided by structured questions was conducted to all VVF patients in the National Obstetric Fistula Katsina and Kano centres.

Interview: Between 15th to 30th July 2025, structured questions designed for this study was used to assess the participant's demographic characteristics, health related questions. The last part of the questions was related to the patients' psychological conditions. See Appendix A.

Similarly, the Cohen Perceived Stress Scale (PSS) and the Stress Overload Scale (SOS) [14] [15] was modified to determine the psychological stress of the patients with VVF. The scores were calculated using a five-point scale (0 = never, 1 = almost never, 2 = once in a while, 3 = often, and 4 = very often) which was summed for a total mean score, where higher scores represent a greater level of perceived stress [16] [17] [18] [19] [20].The response for each linear scale indicating the extent respondents align the level of perceived stress. A mean score of 2 and above indicates that the patients have high psychological stress to a particular statement and having a mean less than 2 indicates the patients have low psychological stress to a particular statement to a particular statement as represented.

Ethical approval and consent to participate

Participants gave consent for the responses from their interviews to be used in this manuscript. The study was conducted in compliance with the principles of the [21] [22].

Data Analysis: Data was analyzed using Microsoft excel. The mean was calculated to determine the psychological and social level of the patients with VVF in Katsina state.

III. Results

The prevalence of VVF patients in the centres

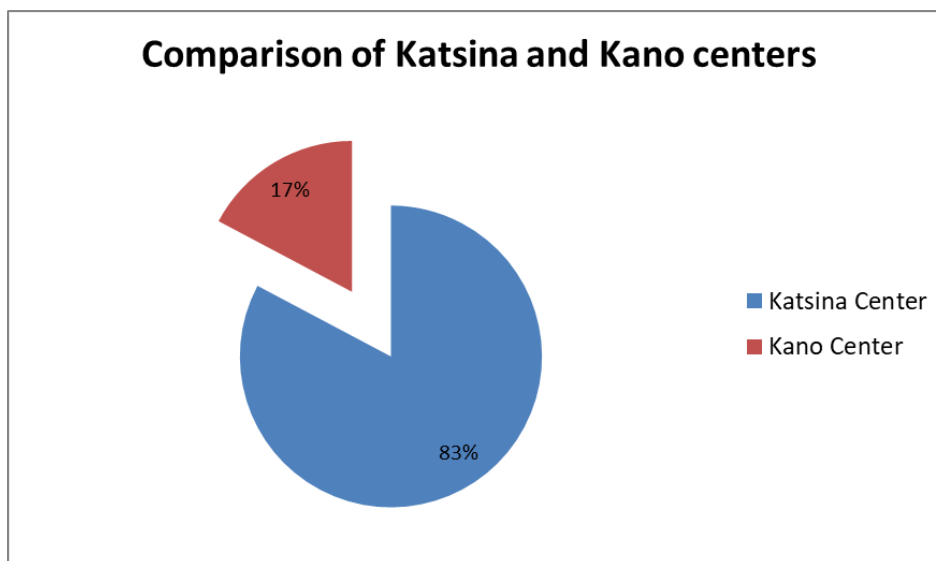


Figure 1: Comparison in the number of patients Between Katsina and Kano Centers

The Katsina center recorded a total 48 patients and 10 patients in Kano center representing 83% and 17% respectively. Thus, indicating Katsina center to have the highest number of VVF patients. This may be linked to the long history of the center which was established for the past 90 years against Kano center is less than 40 years. Moreover, Katsina center has been designed to cover the whole North west zone of the country [12].

Causes of Vesico vaginal Fistula (VVF) in the centres

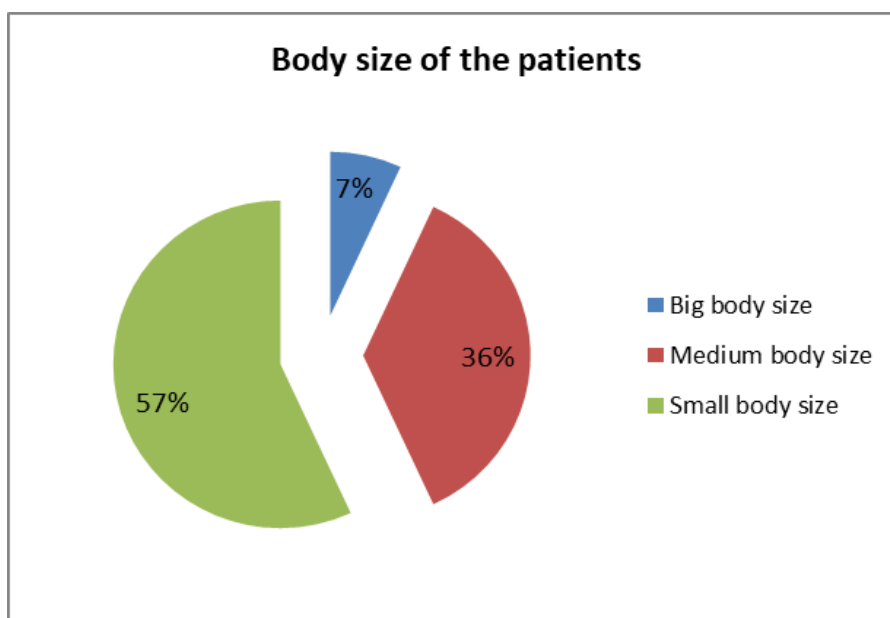


Figure 2: Body size of the patient at point of the incidence

Figure 2 showed the body size of the patient that 57% of the patient have small body size; the size of approximately less than 18.5 BMI (body mass index). This is followed by 36% patient with medium body size of ≤ 30 BMI. The patient with big body size of ≤ 31 BMI recorded the less having 7%. Majority of the patients have small body size which underweight having < 18.5 BMI. The term BMI is defined as weight in kilograms divided by the square of height in meters). The patients' weight based on BMI categories are, underweight below 18.5 BMI, healthy/medium weight 18.5 to 24.9 BMI, overweight 25.0 to 29.9 BMI and obese 30.0 above BMI [23] [24] [25] [26].

The previous studies have found that maternal height of less than 146 cm or 150 cm and low weight (under 50 kg) are at a higher risk for fistula [27]. As reported in the previous research that fistulas are usually associated with cephalopelvic disproportion [28]. Logically, the smaller body size of the mother could be linked with underdeveloped pelvis and general poor health due to childhood malnutrition. Thus cephalo-pelvic disproportion; where the baby's head is too large for the mother's pelvis [29] can lead to obstructed fistula formation.

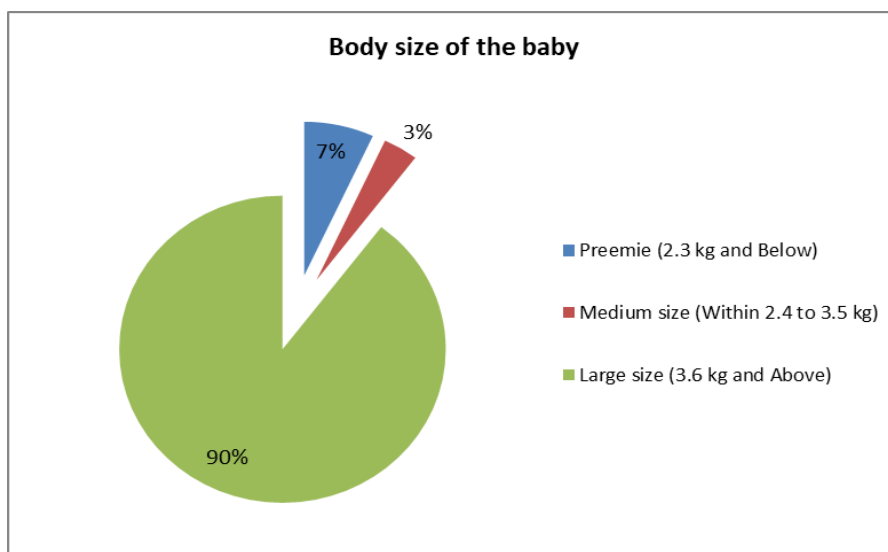


Figure 3 Body size of the baby at birth

Figure 3 indicated large body size of the new born with 90%. This is followed by 7% medium body size. The least is premie body size having 3%. Highly significant number of the new born baby recorded large body size. Previous studies have revealed that women with heights ≤ 150 cm are at a higher risk for obstetric fistula [28]. Thus, baby size in conjunction with mother body size could be additional factor leading to the obstetric complication in the study area. Where the baby's head presents with diameters whose dimensions are larger than the proportions of the pelvic canal through which it passes [30] leading to obstruction caused by cephalopelvic disproportion [29].

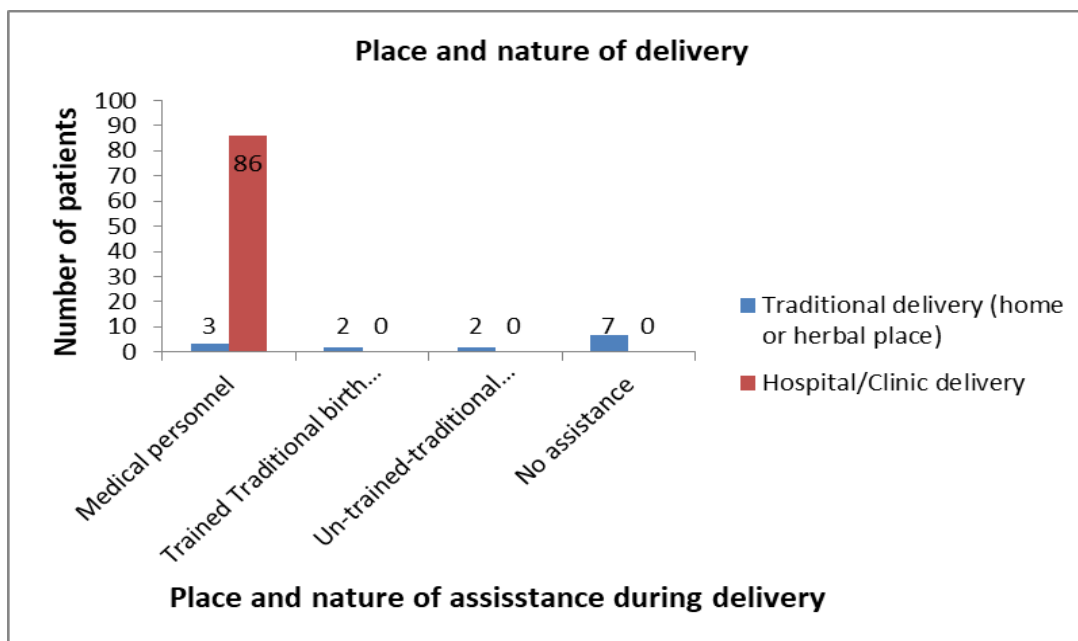


Figure 4: Place and nature of delivery

Figure 4 showed 86% of the patients delivered in the hospital or clinic followed by 7% of the patients delivered with no assistance while 3% of the patients delivered at home under medical personal. On the other hand, some patients delivered either under traditional birth attendance or under untrained traditional birth attendance with 2% each. Trained Traditional are trained and qualified to assist women on labour. Majority of the patients have access to health care facilities. However, the patients often take longer period of labour before attending to the health centers, which may result in birth's complication including obstruction.

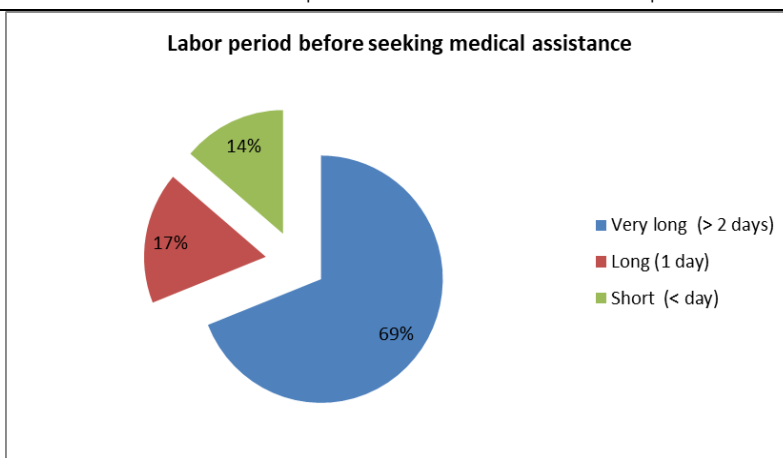


Figure 5: Labor period before seeking medical assistance

The **Figure 5** showed the period of labor before seeking medical assistance, where 69% seek medical assistance after more than 2 days of labour. This is followed by a day labour with 17%. The least recorded are the labour period of less than one day having 14%. The record also showed that some patients only seek medical assistance on critical condition and they do not go to anti-natal clinic during the pregnancy period. It has been noted that the fundamental cause of obstetric fistula is protracted obstructed labour and delay in looking for emergency obstetric care as indicated by **figure 4** and corroborated [30].

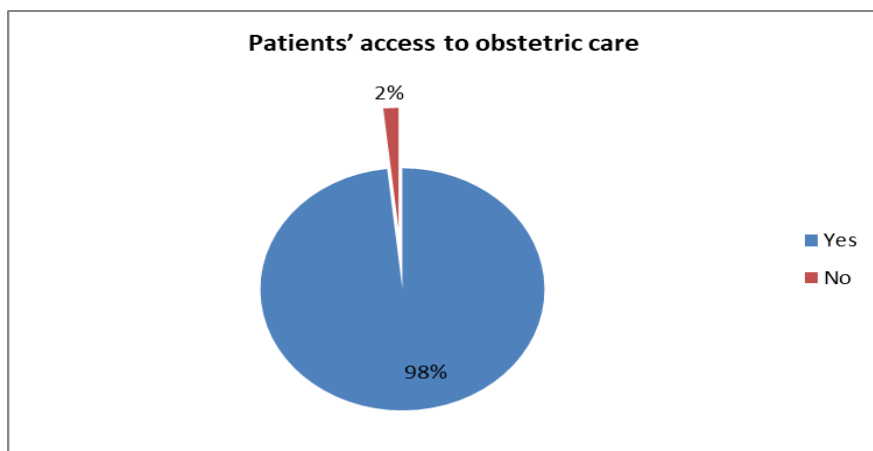


Figure 6: Patients' access to obstetric care

Figure 6 showed 98% have access to obstetric care whereas 2% do not have access to obstetric care in the two centers. Some pregnant women only seek medical assistance during critical period and do not go for medical check-up. The less number of antenatal visits is also associated with prevalence and risk of developing obstetric fistula [31].

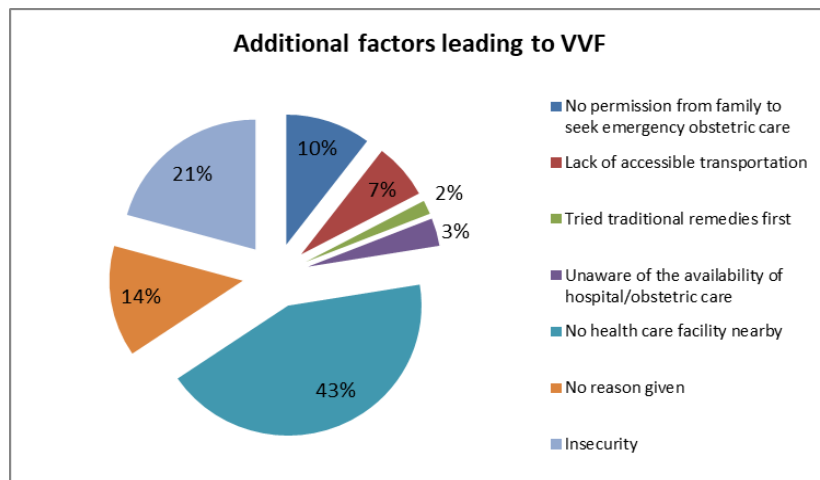


Figure 7: Causes of delay in seeking care in obstructed labor

The responses indicated 43% 'no health care facility nearby' as reason for delay in seeking care in obstructed labor. This is followed by 'insecurity' having 21%. There is also 'use of traditional remedy first' and 'no permission from family to seek emergency obstetric care' with 14% and 10% respectively. Other factors, though with insignificant percentages of less than 10% are 'lack of accessible transportation' and 'unaware of the availability of hospital/obstetric care'.

The absence of nearby health care could be likely the cause of prolong labor. It is noted that the most frequent cause of obstructed labor is cephalopelvic disproportion; a mismatch between the fetal head and the mother's pelvic brim. It can be due to malpresentation or malposition of the fetus (shoulder, brow, or occipito-posterior positions), in few cases locked twins or pelvic tumors can cause obstruction [29] and caesarean section [32].

Some emergent issues arising from vesico vaginal fistula on the patients

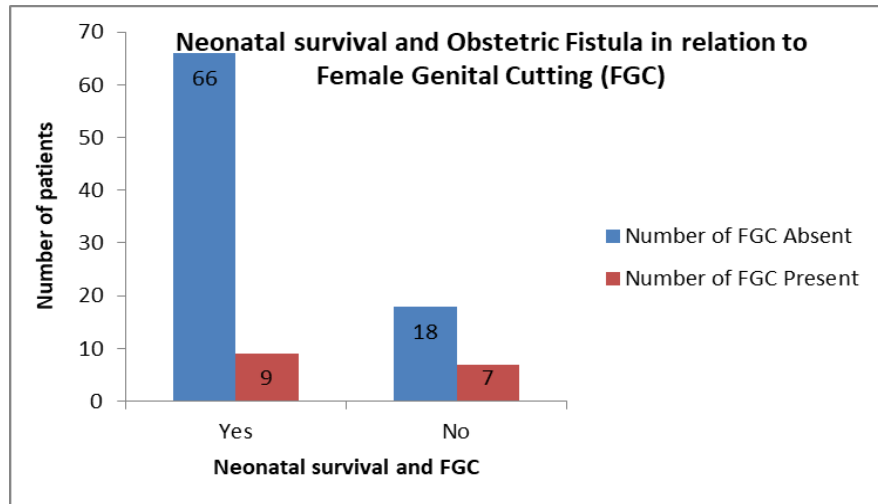


Figure 8: Period of labor, Reproductive outcome

Figure 8 showed period of labor, reproductive outcome (neonatal survival) and obstetric fistula with and without Female Genital Cutting (FGC). The patients with or without FGC are comparatively negligible with 16%. The two days labour with stillborn and FGC recorded the highest having 24%. However, both one and three days labour with stillborn and FGC recorded 21%. The other scenarios 1 and above days with no stillborn were insignificant with $\leq 10\%$. The high percentage of obstetrical fistulae cases occurred following labor for more than 24hrs before delivery. This was also reported in Zambia where 95.5% [34]. Kasamba et al. (2013) reiterated that prolonged obstructed labour and delay in seeking emergency obstetric care. Usually, after unsuccessful labor at home women are more likely to come to the hospital at a late stage. Furthermore, delays due to absence of transportation, poor roads, heavy rains, and great distances to the health facility [33]. It can also be complete health care access denial due to the insecurity.

Additionally, still born normally occurs due to prolonged and untreated obstructed labor [33] 78% - 96% of fistula patients have still birth in the previous researches conducted in Sub-Sharan African countries Ethiopia, Niger and Nigeria [34].

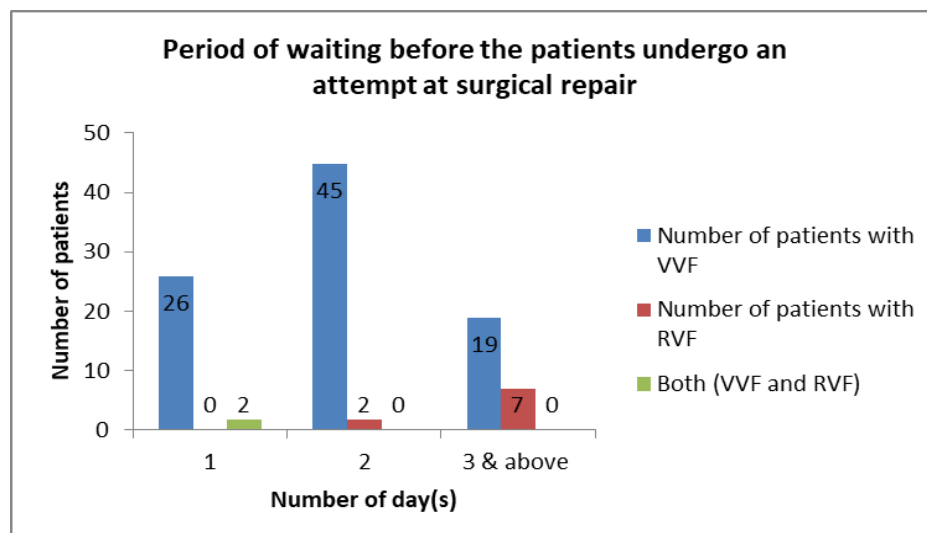


Figure 9: Period of labor and type of obstetric fistula

Figure 9 indicated vesico vaginal fistula (VVF) patients are comparatively higher than recto-vaginal fistula (RVF) patients. Those patients with both VVF and RVF are relatively negligible. The result showed 45% of the VVF patients had two (2) days waiting period before delivery. Followed by one (1) days with 26%, the least were those who had more three (3) days waiting period before the delivery. Patients with two days labor were the highest. Previous study revealed that the prolonged labor and less number of antenatal visits increases the risk of developing obstetric fistula [31].

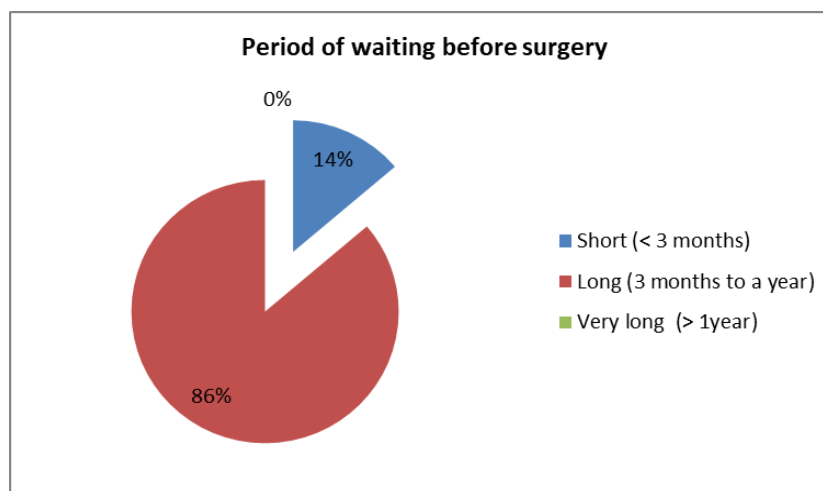


Figure 10: Period of waiting before surgery

Figure 10 showed 86% of the patients to have period of waiting before surgery usually within 3 months to a year, while 14% of the patients to stay within short period before surgery. There are no single patients with very long stay of more than a year. The possible psychological and social disturbance suffer by the patients might not be there or if presence at minimal level. However, due to shortage of skilled surgeons and resources, women continue to live with the consequences of fistula for a long time; and in some cases for the rest of their lives [33]. Thus, subject patients to negative psychological condition.

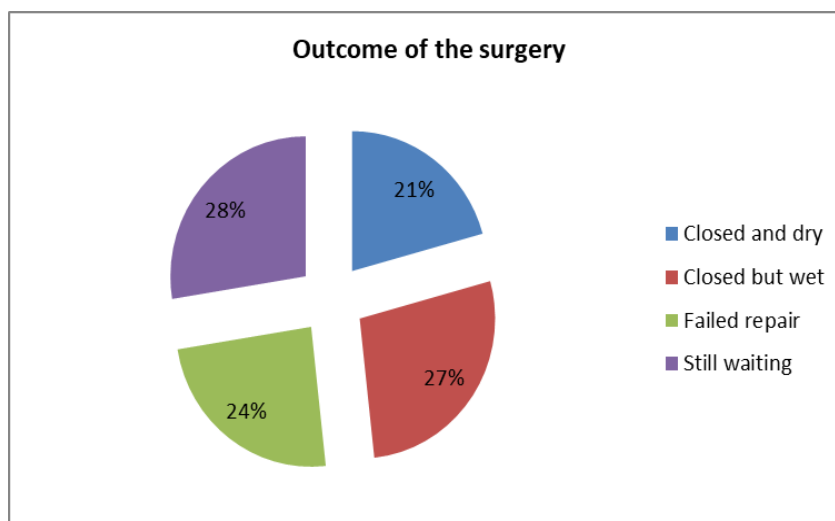


Figure 11: Success of fistula surgery

Figure 11 showed the responses on patients' success of fistula surgery showed closed but wet status as the highest, represented by 28%, while still waiting and failed repair have 27% and 24% respectively. The less were patients with closed and dry with 21%. Majority of the surgery were close, even though some complained of wet. The healing might take a while for it to be completely recovered. Using proper surgical technique and adequate resources, the obstetric fistula is treatable with report of $\geq 80\%$ closure rate [33]. Similarly, patients with underweight Body Mass Index (BMI)s had lower chance of having successful surgical repair outcomes than those with a normal BMI [27] and the likelihood of obstetric fistula repair failure was much higher in patients with fistulas larger than 3 cm [35].

Psychological and social status of the patients with VVF in the centers

The impact of obstetric fistula is multifaceted, affecting both social, medical and psychosocial conditions of the patients [33]. The psychological/emotional background of the patients can be assess using Likert rating scale for the stress status of the patients with the interpretation; 0 = never, 1 = almost never, 2 = once in a while, 3 = often, and 4 = very often.

Table 1: Emotional condition of the patients

SNO	Emotional Indicators	0	1	2	3	4	Mean
1	Anxiety: Feelings of worry, nervousness, or unease	0	2	10	45	20	1.33
2	Depression: Persistent sadness, lack of interest in activities, and feelings of hopelessness.	0	4	28	24	24	1.38
3	Irritability: Increased frustration or anger	0	3	6	42	28	1.36
	Total						1.36

The sets of statement (**table 1**), measures the emotional condition of the patients, recorded mean score below ≤ 1.5 indicating almost zero emotional stress in VVF patients of the two centers. This is contrary to finding of the previous research conducted in the Southeastern Nigeria where VVF patients were often subjected to emotional stress [36]. The actions of unsupportive partners seemed to hurt the women emotionally. The patients in the two centers were found to be emotionally sound. This could be connected to the fact that their husbands and parents supported them. Thus, there is correlation between the VVF patients receiving emotional and social support and lower depression scores, higher self-esteem scores [36].

Table 2: Physical condition of the patients

SNO	Physical Indicators	0	1	2	3	4	Mean
1	Fatigue: Persistent tiredness or exhaustion	0	6	8	18	64	1.66
2	Headaches: Frequent tension headaches or migraines.	0	9	6	33	56	1.79
3	Gastrointestinal issues: Stomachaches, nausea, diarrhea, or constipation	0	11	4	15	32	1.07
4	Muscle tension: Especially in the neck, shoulders, and back	0	7	10	36	24	1.33
5	Sleep disturbances: Insomnia, restless sleep, or oversleeping	0	3	12	21	28	1.10
	Total						1.39

Table 2 measures the physical condition of the patients. There are 2 mean scores on items 1 and 2 on revealing once in a while of 'patients' fatigue: Persistent tiredness or exhaustion and patients having headaches: Frequent tension, headaches or migraines respectively. However, the rest; items 3 to 5 and the total showed mean score below ≤ 2 indicating almost never of stressful physical condition of the patients.

Table 3: Behavioral condition of the patients

SNO	Behavioral Indicators	0	1	2	3	4	Mean
1	Changes in appetite: Eating too much or too little	0	5	24	27	28	1.45
2	Substance abuse: Increased use of alcohol, drugs, or other substances	0	6	0	18	0	0.41
3	Social withdrawal: Avoiding social interactions and activities	0	6	0	0	24	0.52
4	Procrastination: Delaying tasks and responsibilities	0	6	10	18	28	1.07
5	Nervous habits: Nail-biting, pacing, or other repetitive behaviors	0	5	8	3	28	0.76
	Total						0.84

Table 3 measures the behavioral condition of the patients showed ≤ 1.45 mean scores across the items including that of the total mean score. Thus, indicating almost absent of the negative behavioral condition of the patient. This could be ascribed to the fact that majority of them do not take very long period waiting of surgical repair with high success rate within < 12 months as attested [37].

Table 4: Cognitive condition of the patients

SNO	Cognitive Indicators	0	1	2	3	4	Mean
1	Difficulty concentrating: Trouble focusing or staying on task.	0	7	14	9	28	1.00

2	Memory problems: Forgetfulness or difficulty recalling information	0	5	16	51	40	1.93
3	Negative thinking: Pessimism or catastrophic thinking	0	0	12	27	20	1.02
4	Indecisiveness: Difficulty making decisions	0	5	8	24	32	1.19
	Total						1.28

Table 4 showed four (4) statements used to test and measure the cognitive condition of the patients. The result recorded 2 mean score in item 2. Thus, revealing ‘memory problems such as forgetfulness or difficulty in recalling information’ occurs once in a while on the patients. Whereas, the mean scores of items 1, 3 to 4, including that of the total mean score showed ≤ 1.28 . Therefore, indicating sound cognitive condition of the patients under study.

Table 5: Psychological condition of the patients

SNO	Psychological Indicators	0	1	2	3	4	Mean
1	Low self-esteem: Feelings of worthlessness or inadequacy	0	6	8	12	12	0.66
2	Sense of overwhelm: Feeling unable to cope with daily demands.	0	11	14	24	20	1.19
3	Loss of interest: Diminished interest in activities previously enjoyed	0	3	26	21	48	1.69
	Total						1.18

Table 5 revealed the three (3) statements used to measure and test the psychological condition of the patients. The result revealed 2 mean score in item 3. Therefore, indicating once in a while ‘Loss of interest: diminished interest in activities previously enjoyed’ on the patients. While, these mean scores of items 1 to 2, including that of the total mean score showed ≤ 1.19 . Thereby, signify healthy psychological condition of the patients under study. This finding is contrary to the result of the previous study that reported psycho-social challenges such as stigmatization, depression, loneliness, loss of self-esteem, self-worth and identity for women who experienced obstetric fistula [39] [40].

Table 6: Social condition of the patients

SNO	Social Indicators	0	1	2	3	4	Mean
1	Conflict in relationships: Increased arguments or tension with family, friends, or colleagues	0	9	6	15	12	0.72
2	Isolation: Avoiding social situations and interactions.	0	5	12	21	12	0.86
3	Decreased performance: Decline in work or academic performance	0	8	24	42	4	1.34
	Total						0.98

Table 6 indicated the set statements used to test and measure the social condition of the patients. The result recorded ≤ 1.34 mean score across all the items 1 to 3 and that of the total mean score. This invariably showed good social condition of the patients in the study area. Moreover, stillborn occurs due to prolonged and untreated obstructed labor could reduce the woman’s prospects of a better marital relationship [33]. This could negatively affect social status of the patients. In addition, VVF and RVF cause acute social issues, due to constant leaking of urine or faeces and the accompanying smell. Lack of support from husbands and family may negatively from psychological condition of the patients [36]. However, patients in the two centers do not experience such cases as most of them do not wait for very long period before the repair partly due to support received from husbands, parents [38], government and non-governmental organizations.

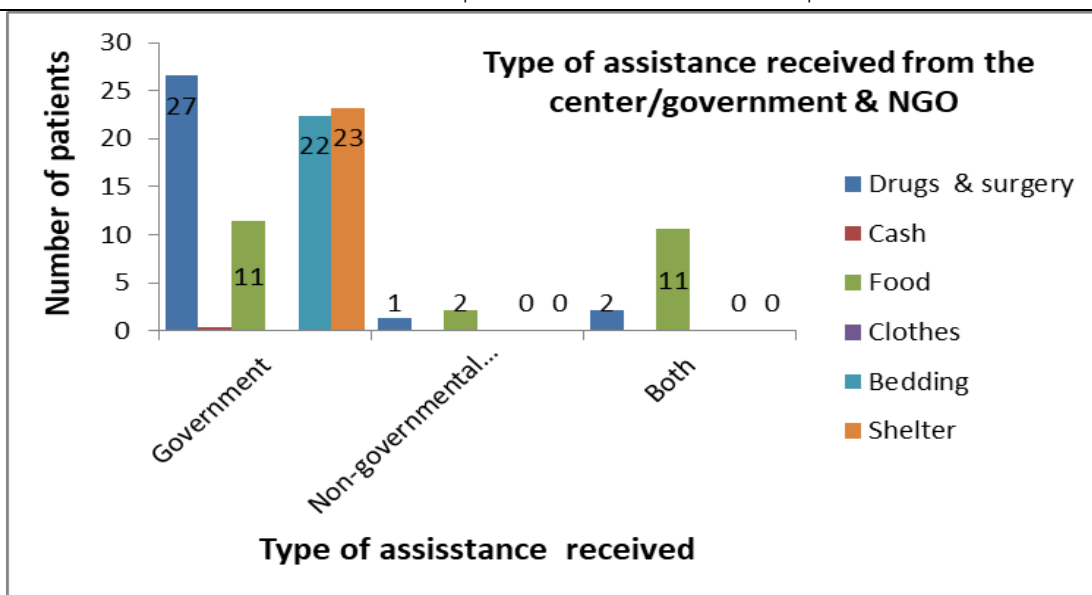


Figure 12: Type of assistance received from the center/government & non-governmental organization (NGO)

Figure 12 revealed the assistance received by the patients from the government to be the highest as they provide drugs and surgery with 27%, shelter and bedding having 23% and 22% respectively Others support received include food representing 11% each from both government & NGO. The less support received were clothes and cash representing $\leq 2\%$. The support received from government and non-governmental organisation could positively impact the quality of life of the patients and after fistula repair [41].

IV. Recommendations

1. There is need to put more efforts to encourage support include educating communities and men particularly husband toward supporting their wives with obstetric fistula. Though, some husbands use to give a helping hand to their wives but often grossly inadequate in providing instrumental support during treatment and social reintegration.
2. The obstetric fistula cause due to cephalo-pelvic disproportion can be averted through clinical advice to those with small stature to delaying either pregnancy or marriage.
3. Pregnant women should be encouraged to have regular hospital visit for anti-natal clinic during the pregnancy period.
4. Relevant organizations and parastatals including ministries of health at federal and state levels should raise awareness about the causes and danger of VVF/RVF among pregnant women particularly younger one with small body stature.

V. Conclusion

This study was carried out via survey method using interview to get the required information. Purposive sampling technique was used to sample 58 VVF/RVF patients within Katsina and Kano centers. The findings showed a very high frequency of the patients have small body size. Highly significant numbers of the new born baby with large body size were recorded. Most of the patients gave birth in the health care facilities. However, they seek medical assistance after more than 2 days of labour. Lack of nearby health care facility, deniel of access to health care due to insecurity, delay due to use of traditional remedy and 'no permission from family are additional causes of obstructed labor recorded. The study further revealed revealed no emotional, physical, behavioral and social stress. Though, there is insignificant memory problems and loss of interest in the patients. It is suggested that health organizations and parastatal should raise awareness about the causes and danger of VVF/RVF among pregnant women.

VI. Acknowledgement

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References

1. Lewis, W.L. (2012). Preventing Obstetric Fistulas in Low-Resource Countries: Insights From a Haddon Matrix obstetrical and gynecological survey by Lippincott Williams & Wilkins. 67(2).

2. Wall, L. L. (2014). A bill of rights for patients with obstetric fistula. *International Journal of Gynecology & Obstetrics*, 127(3), 301–304. doi:10.1016/j.ijgo.2014.06.024
- Wall, L.L., Arrowsmith, S.D, Briggs, N.D, Browning, A., Lassey, A. (2005). The obstetric VVF in the developing world. *Obstetric and Gynecological Survey* 60(7); 1-45.
3. World Health Organization and UNICEF (1996). Revised 1990 estimates of maternal mortality: a new approach. Geneva: World Health Organization; 1996
4. Harrison, K.A. (1985). Child-bearing, health, and social priorities: a survey of 22,774 consecutive deliveries in Zaria, northern Nigeria. *Br Obstet Gynaecol* 1985;92(suppl):1-119.
5. www.todaynewspaper.com (2016). Accessed 25th April, 2016
6. Sambo, A. E. (1990). Vesico Vaginal Fistula Campaign: A Vision Released. El-Rafi'u Prints & Company, Kano.1990, Pp 1.
7. Lewis, W.L. (2006). Obstetric vesicovaginal fistula as an international public-health problem. *Review Lancet* 2006; 368: 1201–09 www.thelancet.com
8. Hajara, I. (2017). Obstetric Gynaecologist, Aminu Kano Teaching Hospital, Kano. NTA News Interview, 2014/2017
9. KeesWaalldjik (nd) is a Consultant Surgeon for Katsina and Kano VVF Centres.
10. Lewis, W.L. (2014). A bill of rights for patients with obstetric fistula. Special article *International Journal of Gynecology and Obstetrics* 127 (2014) 301–304
11. Council for Organizations of Medical Sciences (2002). International ethical guidelines for biomedical research involving human subjects. http://www.cioms.ch/publications/layout_guide2002.pdf. Published 2002. Accessed August 8, 2014.
12. NOFICKT [National Obstetric Fistula Center Katsina] (2023). The first and oldest Fistula Center in Nigeria. Babbar-Ruga, Katsina. info@nifickatsina.gov.ng
13. Ahmadu, A.M. (2023). Doctor call for more support as Kano fistula center becomes oversaturated. *Premium Times*. 25th May 2023.
14. Remor E.(2006). Psychometric properties of a European Spanish version of the Perceived Stress Scale (PSS). *Span J Psychol* 2006;9(1):86–93. 10.1017/S113874160000600416673626
15. Lu W, Bian Q, Wang W, Wu X, Wang Z, Zhao M. (2017). Chinese version of the Perceived Stress Scale-10: a psychometric study in Chinese university students. *PLoSOne* 2017;12(12):e0189543. 10.1371/journal.pone.018954329252989
16. Cohen S, Kamarck T, Mermelstein R.(1983). A global measure of perceived stress. *J Health Soc Behav* 1983;24(4):385–96. 10.2307/21364046668417.
17. Peacock, EJ, Wong PT. The Stress Appraisal Measure (SAM)(1990).: A multidimensional approach to cognitive appraisal. *Stress Med* 1990;6(3):227–36. 10.1002/smi.2460060308
18. Razavi, T.(2001). Self-report measures: an overview of concerns and limitations of questionnaire use in occupational stress research. *Discussion Papers in Accounting and Management Science*, 01–175. University of Southampton; 2001. Available from: <https://eprints.soton.ac.uk/35712/29>.
19. Demetriou C, Özer B & Essau C. (2015). Self-report questionnaires. In *The encyclopedia of clinical psychology*. Wiley Online Library; 2015. 10.1002/9781118625392.wbecp507.
20. Gray MJ, Litz BT, Hsu JL, Lombardo TW. (2016). Psychometric properties of the life events checklist. *Assessment* 2004;11(4):330–41. 10.1177/1073191104269954
21. Declaration of Helsinki (nd). WMA Declaration of Helsinki: ethical principles for medical research involving human subjects [<https://www.wma.net/policies-post/wmadeclaration-of-helsinki-ethical-principles-for-medical-research-involvinghuman-subjects/>].
22. Green J, (2009). Thorogood N: Qualitative methods for health research: Sage; 2009.
23. McTigue K, Harris R, Hemphill MB, Bunton AJ, Lux LJ, Sutton S, Lohr KN. (2003). Screening and Interventions for Overweight and Obesity in Adults [Internet]. Rockville (MD): Agency for Healthcare Research and Quality (US); 2003 Dec. PMID: 20722117.
24. Spencer, L., Rollo,M., Hauck,Y., MacDonald-Wicks,L., Wood,L., Hutchesson,M Roslyn Giglia,R., Smith,R and Collins,C .(2015).The effect of weight management interventions that include a diet component on weight-related outcomes in pregnant and postpartum women: a systematic review protocol. *JBIM Database of Systematic Reviews & Implementation Reports* 2015;13(1) 88 - 98
25. Better health channel (2022). Body Mass Index (BMI). (<https://www.betterhealth.vic.gov.au/health/healthyliving/body-mass-index-bmi>) . Accessed 05/06/2022
26. Poirier, P and Despres, J. (2001). Exercise in secondary prevention and cardiac rehabilitation exercise in weight management of obesity and cardiology clinics. 19 (3) August 2001
27. Zeleke, B.L., Welsh, A., Abeje, G & Khajehei, M. (2024). Treatment outcomes of obstetrical fistula surgical repair in low-and middle-income countries: A scoping review. *Int J Gynecol Obstet*. 2024;167:491–500. John Wiley & Sons Ltd wileyonlinelibrary
28. Tsui, A.O. Creanga, A.A. & Ahmed, A (2007). The role of delayed childbearing in the prevention of obstetric fistulas. *International Journal of Gynecology and Obstetrics* (2007) 99, S98–S107

29. Rizwan, S.N. & Mughal, A. (2008). Frequency of maternal morbidity in women with obstructed labor: A study at Liaquat University Hospital Hyderabad. *Applied Medical Research*, 2018 4(1) 1–4 DOI: doi.org/10.47363/AMR/2018(5)153
30. Kasamba, N, Kaye, D.K & Mbalinda, S.N. (2013). Community awareness about risk factors, presentation and prevention and obstetric fistula in Nabitovu village, Iganga district, Uganda *BMC Pregnancy and Childbirth* 2013, 13:229
31. Swain, D , Parida, S.P., Jena, SK., Das, M & Das, H. (2020). Prevalence and risk factors of obstetric fistula: implementation of a need-based preventive action plan in a South-eastern rural community of India. *BMC Women's Health* (2020) 20:40
32. Dattijo, L.M, Yakubu A, Faruk M.I. (2022). Iatrogenic Vesicovaginal Fistula (VVF) Secondary to “Treatment” of Pelvic. *Tropical Journal of Obstetrics & Gynaecology/ Published by Journal Gurus* 39 (2) 2022:
33. Changole, J., Thorsen, C & Kafulafula, U. (2017). “I am a person but I am not a person”: experiences of women living with obstetric fistula in the central region of Malawi. *BMC Pregnancy and Childbirth* (2017) 17:433
34. Pierre Marie Tebeu & Joseph Nelson Fomulu & Sinan Khaddaj & Luc de Bernis & Thérèse Delvaux & Charles Henry Rochat (2012) Risk factors for obstetric fistula: a clinical review. *Int Urogynecol J* (2012) 23:387–394
35. Afaya, A., Abukari, A.S & Mohammed, S. (2022). Prevalence and factors associated with the awareness of obstetric fistula among women of reproductive age in The Gambia: a multilevel fixed effects analysis. *BMC Public Health* (2022) 22:1736.
36. Amutaigwe, E.C. (2015). The Effects of Vesico-Vaginal Fistula in the Lives of Women in Southeastern Nigeria. Dissertation Submitted in Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy Public Health. Walden University.
37. Wadie, B.S., Kamal, M.M. (2011). Repair of vesicovaginal fistula: Single-centre experience and analysis of outcome predictors. *Arab Journal of Urology* (2011) 9, 135–138
38. Lawal, M.O., Akinrinde, O.O., Monday, A., Kayode Wakili Olawoyin, K.W & Osuwa, A.A. (2023). The Contributing Elements in the Development of Vesicovaginal Fistula: A Medical-Sociological Study of Vesicovaginal Fistula Patients in Nigeria. *TWIST* 18(4) 88-97
39. Ngaski, S.G., Haruna, A.I., Mohammed, M.H., Ejembi, E.A., Umar, F.A. & Shehu, F. (2022). Levels and associated factors of depression among vesicovaginal fistula patients in a state hospital, Northwest Nigeria. *International journal of scientific research* 11(09) September - 2022
40. Nduka, I.R, Ali, N., Kabasinguzi, I and Abdy, D. (2023). The psycho-social impact of obstetric fistula and available support for women residing in Nigeria: a systematic review. *BMC Women’s Health* (2023) 23:87
41. Delamou A, Douno M, Bouédouno P, Millimono S, Barry TH, Tripathi V and Diallo M (2021) Social Immersion for Women After Repair for Obstetric Fistula: An Experience in Guinea. *Front. Glob. Womens Health* 2:713350.doi: 10.3389/fgwh.2021.713350