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Impact of Surgery on the QoL of VVF Patients in South-west Nigeria

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Abstract

Background: Vesico-vagina fistula (VVF) is a type of obstetric fistula that affects women mostly in Africa and Southeast Asia as Nigeria accounts for 40% of its global cases. VVF, a disability experienced by women after childbirth, is characterized by abnormal communication between the vagina and bladder, resulting in urinary incontinence. This condition affects the quality of life (QoL) of the women.

Objective: We assessed the impact of reconstructive surgery on QoL among VVF patients as measured by pre-and post-surgery evaluations.

Methods: A quasi-experimental pre- and post-design, utilizing an adapted version of the King Health Questionnaire (KHQ) to measure health-related QoL of 32 VVF patients was used. The KHQ was administered before surgery and 6-8 weeks after surgery to assess the impact of reconstructive surgery on their QoL. Changes from baseline in total QoL scores were analyzed using paired t-tests. An independent t-test was used to evaluate the differences in the QoL scores between successful and unsuccessful surgery groups. Three post-surgery in-depth interviews among those who had successful surgeries were conducted to complement the findings from the KHQ assessment.

Results: Thirty-two patients participated in the pre-surgery evaluations and 29 in post-surgery. Approximately 72% of participants had successful surgeries. We found significant improvements in the QoL scores in the 9 domains and Symptom Severity subscale pre- and post--surgery. Our study revealed significant differences in 7 domains and Symptom Severity between the women who had successful surgeries and those who did not. All participants in the qualitative interviews reported positive impacts on self-perception, relationships, and daily living activities following successful surgeries.

Conclusion: Our findings suggest the need for early repair of the fistula to avoid an extended reduction in the patient's QoL. A holistic approach to preventing VVF is necessary, considering the condition is unmistakably entangled in a highly complex socioeconomic context.

Keywords: Vesico-Vaginal Fistula; VVF; Quality of Life (QoL); Reconstructive Repair; Surgery Repair; Nigeria

Abbreviations

VVF = Vesico-Vaginal Fistula; QoL = Quality of life; HRQoL = Health-related quality of life; KHQ = King Health Questionaire

Introduction

Vesico-vagina fistula (VVF) is a disability experienced by women after childbirth characterized by abnormal communication between the vagina and bladder following an obstetrical or gynecological injury, leading to urinary incontinence [1,2]. The women in sub-Saharan Africa and Asia are the ones primarily affected, accounting for more than 2 million young women living with untreated obstetric fistula [3]. According to the United Nations Population Funds (UNFPA), of the estimated 1,000,000 to 2,000,000 global cases of VVF, Nigeria alone accounts for almost half (40%) of the total global estimate [4]. Although VVF is an avoidable and treatable condition, over the past decade, there were approximately 400,000 to 800,000 cases in Nigeria, with 20,000 new cases annually nationwide [5].

VVF is usually the result of obstructed and prolonged labor due to poor and delayed healthcare access. The condition has social consequences [6] that affect the quality of life of the affected women, who often end up divorced, unemployed, ostracized, or labeled as witches in their communities [7]. The consequences of VVF include low self-esteem, infertility, shame, being traumatized; most importantly, the majority of these women have stillbirths [7,8]. Ninety-eight percent of the women who have had obstetric fistula surgery reported having at least one stillborn [9]. This condition impedes the productivity of these women, leaving them financially burdened and having to fend for themselves and borrow money for treatment [9-11]. The fear of pregnancy and fistula recurrence negatively impacts their sexual lives with their husbands/partners. These factors impact their social interactions and sexual and emotional health.

Health-related quality of life (HRQoL) is a multifactorial construct related to patients' perceptions of the impact of disease and treatment on their physical, psychological, and social function and well-being [12]. HRQoL is vital in evaluating health care interventions [13]. Although several studies have shown that the quality of life and mental health of VVF patients are negatively affected, it is unclear to what extent and which areas of their lives are most impacted. Therefore, the purpose of this study was to conduct domain-specific assessment of women's QoL, before surgery, along with an evaluation of the impact of reconstructive surgery. We hypothesized that: 1) Women who have undergone VVF reconstructive surgery will report improved mental/psychological health, improved QoL, less stigma, and discrimination 6 to 8 weeks after surgery; and 2) Women who have successful surgeries will report improved QoL post-surgery compared to women whose surgeries were not successful.

Methods

A quasi-experimental prospective, pre- and post-design study was conducted between September 2019 and February 2020. An adapted version of the KHQ was used to measure the HRQoL of participants due to VVF [14]. The KHQ is a validated disease-specific HRQoL 21-item tool, with Cronbach's $\alpha > .70$, and has been utilized in several QoL studies that assess urinary incontinence (UI) and VVF in resource-poor settings [14,15]. The KHQ consists of 9 domains and a Symptom Severity scale. The 9 domains are General Health Perceptions, Impact on Life (Incontinence Impact), Role Limitations, Physical Limitation, Social Limitations, Personal Relationships, Emotions, Sleep/Energy, and Severity Measures [14]. All 9 domains were scored from 100 (worse health) to 0 (improved health). The Symptom Severity scale lists ten bladder-related

symptoms such as frequency, nocturia, urgency, urge and stress incontinence, bedwetting, intercourse incontinence, urinary infection, dysuria, and dribbling. It was scored from 30 (worse health) to 0 (improved or better health).

Due to the low literacy rates among this population, the KHQ was interviewer-administered in either English or Yoruba, the local language for the study site. It was administered to patients at baseline (before surgery) and 6-8 weeks after surgery during their follow-up visits with the doctors. The surveys were administered by female research assistants because of the sensitivity of the questions. Survey administration took between 15-25 minutes. All participants provided informed consent before participating in the study.

A total of 32 VVF patients who were awaiting surgery and admitted to the urogynecology department of the University College Hospital (UCH) were included in the present study. Inclusion criteria included females ≥ 18 years of age, receiving care, scheduled for VVF reconstructive surgery, and specifically had Vesico-vagina fistula only (no other types of fistula cases were enrolled).

Sample size and Power calculation

This is an exploratory study. The sample size was calculated for a one-sided test since the hypothesis examined change in one direction: "there will be improved quality of life 6-8 weeks after surgery." The analyses used an effect size of 0.5, ⍺ (significance level) = 0.05, and a power of 80%. The calculation yielded a sample size of 27; 10% (2.7) was added because of a hypothesized attrition, therefore the total sample size calculation for cases was 30.

Questionnaire scoring

Scoring for the questionnaire was done by following existing guidelines in the literature [16]. For the post-surgery survey evaluations, Incontinence Impact, Role Limitations, Social Limitations, Emotions, Personal Relationships, and Sleep/Energy Question 2, were reverse scored as the questions were in opposite directions of the pre-surgery survey. General Health Perception, Severity Measures, Sleep/Energy Question 1, and Symptom Severity Scale were assigned the same scoring values as the pre-surgery survey. See Appendix A for sample questions in the pre-surgery and post-surgery surveys. Severity measures and symptom severity scale questions were the same as the pre-surgery survey. The participants were asked at follow-up whether their surgery was successful or not. Participants were categorized into the successful or unsuccessful surgery groups based on their responses to this item.

Demographic Measures

Demographic variables measured included: age, city of residence, place of birth, marital status, marital age, type of marriage, number of co-wives, co-wife rank, education level, employment, occupation, salary level, religion, age at first and last pregnancy, the total number of pregnancies, and number of living children, the pregnancy that led to fistula, fistula surgical history and length of fistula diagnosis. Demographics were analyzed using frequencies and percentages.

Statistical Analysis

The primary outcome assessed in the present study was the degree of change in the QoL scores measured by the KHQ pre-and post-surgery. All data are presented as mean ± SD. Statistical analyses were performed using SPSS (version 25; Chicago, IL, USA). Changes from baseline in total QoL scores were analyzed using paired t-tests. Independent t tests were used to evaluate the average QoL scores between the successful and unsuccessful surgery groups. Weighted summary scores of KHQ in each domain ranging from 0 to 100 were combined and analyzed. Higher scores indicate more significant impairment, and lower scores indicate less impairment/-better quality of life. Confidence Intervals of 95% were used, and p values <0.05 were considered significant.

Qualitative Data Analysis

Three post-surgery in-depth interviews among those who had successful surgeries were conducted to complement the findings from the KHQ assessment. Qualitative data analyses included thematic content analysis of open-ended responses. Data were coded using Nvivo software by three trained public health professionals in Maternal and Child Health with prior experience in qualitative data acquisition and analysis.

Ethical Considerations

IRB ethical approvals were obtained from Florida International University, USA, and Oyo State Ministry of Health, Ibadan, Nigeria, before the commencement of the study. Written informed consent was sought and obtained from each participant.

Results

A total of 33 patients were approached, 32 were eligible to participate in the study, and 32 were enrolled. Thirty-two patients participated in the pre-surgery evaluation. Of the 32 patients enrolled, 29 completed the study. Three discontinued the study; two did not do surgery due to other underlying health conditions later discovered, and the third patient was lost to follow-up as she did not return to the hospital for her post-surgery follow-up appointment with the doctor (See Figure 4.1). Before the surgery, 100% of the women were incontinent; 21 participants (72.4%) had successful surgeries.

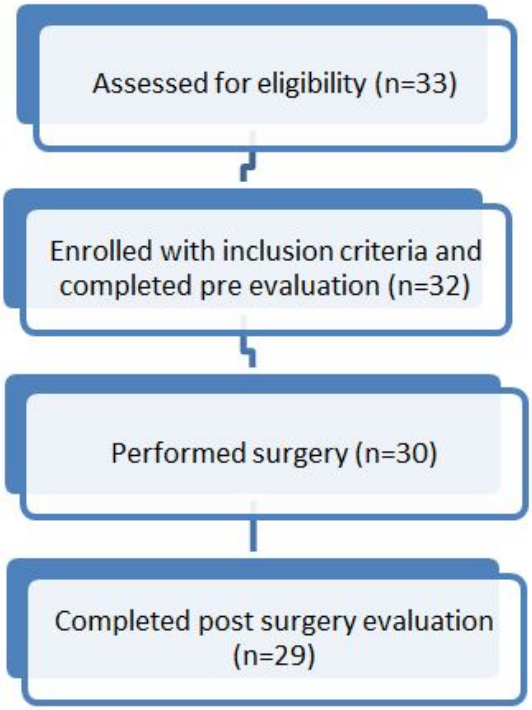

Figure 4.1: Flow chart of patients' recruitment and retention

The mean age of the participants was 37.6 (S.D = 11), and the average age of marriage was 24.3 (S.D = 3.3) years old. Nearly half of the participants were aged 30-39 (43.8%, 14/32). The mean age at first pregnancy was 23.8 years (SD=3.6), and the mean age for the last pregnancy was 29.6 years (S.D = 7.2) (see Table 4.1). Approximately 62.5% (20/32) of the VVF patients were married, while 25% were separated. Of those married, 77.8% of the participants did not have co-wives. Regarding education, 90.6% of the VVF patients (29/32) had secondary school education or less, and a majority (77.8%) of the women earned less than ₦30,000 Nigerian Naira/$83 USD per month. The women had low-status jobs such as traders, artisans, farmers, hairdressers, fashion designers, auxiliary nurses, etc., with the highest proportion being traders (39.3%; See Table 4.1). Approximately 43.7% (14/32) had been pregnant at least three times, although nearly 47% (15/32) of the women had no children, as most of the birth outcomes were stillbirths. Approximately 15.6% had 1 living child, and 25% had 3 or more living children (See Table 4.1).

Table 4.1: Basic sociodemographic characteristics of participants

Characteristics	Number of Patients (%)
Surgery successful	
Yes	21 (72.4)
No	8 (27.6)
Mean Age	37.59 (S.D =10.95)
Marital Status	
Married	20 (62.5)
Single/Separated/Divorced/Widowed	12 (37.5)
Marital age (mean)	24.3 (S.D = 3.27)
Type of marriage	
Selective	28 (96.6)
Arranged	1 (3.4)
Cowives Status	
No Cowives	21 (77.8)
Has Cowives	6 (22.2)
Education level	
None	4 (12.5)
Primary school	11 (34.4)
Secondary school	14 (43.8)
Diploma	2 (6.3)
Some or completed University	1 (3.1)
Employed	
Yes	27 (84.4)
No	5 (15.6)
Occupation Type	
Trader	11 (39.3)
Artisan/farming	6 (21.4)
Fashion designer	3 (10.7)
Auxillary nurse	2 (7.1)
Others	6 (21.5)
Salary level (₦)/USD equivalent	
<10,000/<$28	8 (29.6)
10,000 – 30,000/ ¡$ny28$—83	13 (48.1)

30,000 – 50,000/ ¡ny83—139	4 (14.8)
>50,000/>$139	2 (7.4)
Religion	
Christian	18 (56.3)
Muslim	14 (43.8)
Residence	
Ibadan	9 (28.1)
Lagos	11 (34.4)
Others	12 (37.5)
Mean age at first pregnancy	23.8 (S.D = 3.63)
Total number of pregnancies	
1	10 (31.3)
2	8 (25.0)
3>	14 (43.7)
Mean age at last pregnancy	29.6 (S.D = 7.19)
Number of living children	
0	15 (46.9)
1	5 (15.6)
2	4 (12.5)
3>	8 (25)

Table 4.2: Characteristics associated with the Fistula condition of VVF patients

Characteristics	VVF patients (N=32) (%)	p-value
Pregnancy that caused fistula		.135
First	16 (50)	
Second	8 (25)	
Third >	8 (25)	
Had surgery before for present fistula		.377
Yes	19 (59.4)	
No	13 (40.6)	
Length of diagnosis		.194
Less than a year	5 (15.6)	
1-5 years	10 (31.3)	
5-10 years	4 (12.5)	

11-15 years	7 (21.9)	
16 - 20 years	2 (6.2)	
20 -25 years	4 (12.5)	

There were no statistically significant differences in being at risk for developing VVF during the first, second, or third and greater pregnancies (p=.135). However, 50% (16/32) of the fistula cases occurred as a result of the participant's first pregnancy (see Table 4.2). Nearly 59.4% (19/32) had previously undergone surgery for the present fistula, but the surgeries were unsuccessful. The length of time participants were living with the condition ranged from 1 month to 25 years. About 40.6% had lived with the condition for over 10 years (see Table 4.2).

Prior to the surgery, 100% of the women were continuously incontinent. Significant improvements were seen in the sample post-surgery. Approximately 72.4% (21/29) of the participants had successful surgeries. A paired sample t-test suggested that there had been significant improvement in the QoL scores across all scales of the KHQ. The KHQ domain scores ranged from 0-100. Lower QoL scores represent a better quality of life following surgery. Overall, the KHQ outcomes at 6-8 weeks post-repair showed significant improvements in all the 9 domains and the Symptom Severity scale was significantly improved as well. The details are presented in Table 4.3.

Table 4.3: Differences in the quality of life scores of the KHQ domains before and after treatment

KHQ Domain	Before surgery	After surgery	Mean difference	SD of the difference	(95%) CI	p-value
General health perception	81.90	18.97	62.93	39.31	47.98, 77.89	<.001
Incontinence impact	89.66	16.09	73.56	32.59	61.17, 85.96	<.001
Role limitations	82.19	31.61	50.57	39.96	35.37, 65.78	<.001
Physical limitations	74.71	30.46	44.25	53.32	23.97, 64.53	<.001
Social limitations	61.49	26.43	35.06	49.07	16.39, 53.72	.001
Personal relationships	64.50	5.80	58.70	32.52	44.64, 72.76	<.001
Emotions	83.33	34.92	48.41	34.77	34.93, 61.896	<.001
Sleep/Energy	71.84	29.31	42.53	45.55	25.20, 59.86	<.001
Severity measures	81.03	24.71	56.32	40.01	41.10, 71.54	<.001
Symptom severity	18.83	6.69	12.14	7.85	9.15, 15.12	<.001

Note. KHQ = King Health Questionnaire; CI = Confidence Intervals; SD = Standard Deviation

An independent samples t-test examining differences in QoL between the two surgical outcome groups (successful vs. non--successful surgeries) was conducted across all 9 domains and the Symptom Severity scale (see Table 4.4). The analysis revealed significant differences in 7 domains between the two surgical outcome groups. Overall, patients who had successful surgeries had greater improvement in the QoL scores across 7 domains: General Health Perception (p<.001), Incontinence Impact (p=003), Role Limitations (p=.031), Physical Limitations (p=.004), Social Limitations (p =.049), Emotions

(p=.013), Severity Measures (p< .001), and Symptom Severity scale (p=.012). There were no significant differences found in the personal relationship and sleep/energy domain between groups (see Table 4.4).

Table 4.4: Independent t test between successful and unsuccessful surgery groups

KHQ Domains	Surgery Status	Mean	S.D	S.E Mean	MeanDifference	S.E Difference of Means	(95%) CI	p-value
General Health					52.38	13.23	25.23, 79.54	<.001
	Successful	77.38	28.40	6.20				
	Unsuccessful	25.00	40.09	14.17				
Incontinence Impact					38.29			
	Successful	84.13	29.10	6.35		11.65	14.39, 62.20	.003
	Unsuccessful	45.33	24.80	8.77				
Role limitation					35.32	15.48	3.55, 67.08	.031
	Successful	60.32	40.65	8.87				
	Unsuccessful	25.00	25.20	8.91				
Physical Lim					61.11	19.25	21.61, 100.61	.004
	Successful	61.11	46.05	10.05				
	Unsuccessful	.00	47.14	16.67				
Social Limitations					39.78	19.30	.19, 79.38	.049
	Successful	46.03	50.53	11.03				
	Unsuccessful	6.25	32.04	11.33				
Emotions					26.94	10.05	6.27, 47.62	.013
	Successful	56.11	37.55	8.40				
	Unsuccessful	29.17	15.64	5.531				
Personal Relationships					-14.54	15.48	-46.74, 17.65	.358
	Successful	54.90	33.73	8.18				
	Unsuccessful	69.45	28.71	11.72				
Sleep/Energy					27.08	18.56	-10.99, 65.16	.156
	Successful	50.00	45.34	9.89				

	Unsuccessful	22.92	42.67	15.09				
Severity Measures					59.08	12.54	33.35, 84.81	<.001
	Successful	72.62	31.86	6.95				
	Unsuccessful	13.54	24.78	8.76				
Symptom Severity					11.07	2.55	5.84, 16.30	.012
	Successful	15.19	4.46	.973				
	Unsuccessful	4.13	9.40	3.32				

KHQ =King Health Questionnaire; CI = Confidence Intervals; SE=Standard Error

Table 4.5: Characteristics of post in-depth interview participants

Participant no	Age	Marital Status	Education	Religion	Years lived with fistula	Occupation
Participant 1	31	Married	Secondary school	Muslim	11 years	Auxiliary nurse
Participant 2	28	Married	Secondary school	Muslim	4 months	Tailoring
Participant 3	70	Widowed	None	Muslim	23 years	Fashion

Qualitative Data Analysis: A post-operation interview was conducted among three participants who had successful surgeries. The purpose of the interviews was to provide an in-depth understanding and narrative perspective of the impact of successful surgeries on their lives and to complement the findings of the KHQ quantitative assessment. Thematic content analyses led to the identification of four major themes: Self-perception, future pregnancy interest, attitudes of others, and impact (daily activities, religious activities, relationships, and job/career). Characteristics of the in-depth interview participants are found in Table 4.5.

Themes and sample quotes from the post-surgery in-depth interviews illustrating the impact of surgery on their quality of life

Theme 1: Self-perception

".....I am seeing myself like a queen because I am very happy now. I am the happiest woman in the world now after the surgery. So, I thank God." (P1, 31 years old, 11 years with fistula).

"I feel so great after the surgery was successful, I feel so special and normal, there is [no] thing I cannot do now, I can do it easily without any embarrassment." (P2, 28 years old, 4 months with fistula).

Theme 2: Future Pregnancy Interest

"If I want [pregnancy], I will have it. If there is every assurance that there won't be a problem, I will have it (P1, 31 years old, 11 years with fistula)."

Theme 3: Attitude of others

"With my husband, we are happy. Everybody is happy. Before the surgery, everybody was thinking about me and getting tired of what was happening. So now, they [family and friends] are

happy. They come to visit me from time to time to check on me." (P1, 31 years old, 11 years with fistula).

Theme 4: Impact on relationships, religious activity, daily activities, job/career/ financial adequacy or stability

"Even from my husband's side, I was treated special, and we are happy that the surgery came out successfully." (P2, 28 years old, 4 months with fistula).

[if] someone calls me on the phone, says madam, we need your attention, it's very easy for me to see them and to go easily." (P2, 28 years old, 4 months with fistula).

"It has a good impact because holy is everything about our service [the service at the mosque should be holy]. I can now worship my God and pray. It makes a good impact in my life." (P3, 70 years old, 23 years with fistula).

"Yes, I do them [daily activities] well now without getting tired. Before, I always used to get tired, but now I do them well, happily." (P1, 31 years old, 11 years with fistula).

"I can cook food and sweep the floor now [after surgery]." (P3, 70 years old, 23 years with fistula).

Findings from the in-depth interviews were used to supplement the findings from the quantitative analysis. Overall, participants in the three qualitative interviews reported positive self-perception, impact, and changes in their lives as a result of successful surgeries. They also reported a positive impact on their relationships, daily activities, careers, and social life and advised other women to embrace and seek medical care. Implications of the results will be explored in the discussion section (see Table 5.6).

Discussion

This study sought to evaluate the impact of reconstructive surgery on the QoL of women who have undergone fistula surgery. The initial QoL assessment was done at baseline (before surgery), and a follow-up assessment was conducted 6-8 weeks following surgical intervention. To the best of our knowledge, this is the first study to examine the effect of reconstructive surgery on the QoL of VVF patients in Nigeria. It was also the first to adapt and use the KHQ for VVF-related QoL assessment in Nigeria. Overall, across all quality-of-life domains, there were significant improvements in the QoL after surgery compared to pre-surgery evaluations. Also, patients who had successful surgeries reported improved QoL compared to those who did not. Findings from this study are in line with previous studies on quality of life and VVF [9,15,17,18] and provide insights in this area of investigation.

More than two-thirds of the participants had successful surgeries, and a majority of the patients were retained for the post-surgery evaluation, with only one patient lost to follow-up. The relatively high follow-up rate is considered a strength of the present study. Most patients had low education levels, held low-skilled jobs, and were low-income earners living below the World Bank International Poverty limit of $1.90 per day. These findings confirm previous literature that the average fistula patient is a poor, uneducated woman [7,19,20,21].

Almost half of the participants had no children, as their pregnancies usually led to stillbirths; this finding is consistent with those reported in previous studies [7,9]. Half of the fistula cases were a result of their first pregnancy experience, and about two-thirds of the patients had repair surgeries for the fistula condition in the past but were unsuccessful, hence the reason for seeking surgical care at the UCH. Some of the patients had been living with the condition for as short as 1 month and as long as 25 years, with a majority of the respondents living with the condition for 1-15 years. This finding is similar to previous studies in Africa where patients have been found to live with the condition between 7-20 years [7,9,22].

A significant strength of the study was the use of the King Health Questionnaire, which is a validated disease-specific HRQoL instrument for the evaluation of patients with urinary incontinence, lower urinary tract symptoms, and overactive bladder [14,16,23-26]. This study was the first to adapt and use this instrument to assess the QoL of patients in Nigeria. The KHQ consists of nine domains. Across the overall

sample, the incontinence impact domain had the highest improvement. Incontinence impact is a one-item domain focused on how much patients thought their VVF condition affected their life (pre-surgery) and how much they thought surgery for their VVF condition affected their life positively (post-surgery). Interestingly, in the general health perception domain, most of the patients felt surgery improved their life positively. Incontinence, the smell, and the burden of maintaining hygienic standards may be associated with isolation from loved ones, as they may be harmful to a patient's self-esteem [27,28]. Remarkably, the social limitations domain had the lowest average improvement in the quality of life across all respondents. This domain involves interactions with other persons, seeing and visiting family/friends. New insights from the study suggest that the women may need more time to build their relationships and become engaged again to the level that they were prior to developing VVF. Social limitations and personal relationships were also found to have the lowest level of improvement in a study by Mwangi and others [15].

Furthermore, improvement in QoL following repair surgery was recorded in the emotion domain. This dimension focused on three sub-components: feelings of depression, anxiety/nervousness, and feeling bad about oneself. Previous studies have shown that women who have fistula are likely to suffer from depression [29]. In this study, there was a general improvement in the QoL following surgical intervention compared to before surgery. When stratified by successful surgery group and non-successful surgery, the women who had successful surgeries reported more improvement in the QoL of their emotions compared to those whose repairs were not successful. Study findings show that the surgery was found to reduce depression, anxiety/nervousness, and negative thought about oneself. Hence, as much as possible, surgery should be sought early, and these women should not have to experience an extended period of sadness.

Between-group differences between those who had successful surgeries and those who did not found no significant differences in the QoL in personal relationships and sleep/energy domain after surgery. There was no way to assess the reason for this finding. Also, the personal relationship domain could not be fully assessed because the questions related to sexual intimacy were removed post-surgery because the doctors advised the women not to have sexual relations until after 6 months post-surgery which was after our post-surgery evaluation period of 6-8 weeks. Also, sleep/energy domain may not have shown significant differences because the women were told to rest after surgery and not to get involved in activities that could make them feel worn out. However, we hypothesized that women who have undergone VVF reconstructive surgery will report improved mental/psychological health, improved QoL, less stigma, and discrimination 6 to 8 weeks after surgery; and the women who have successful surgeries will report improved QoL post-surgery compared to women whose surgeries were not successful. The results from this study fully support our hypothesis as, indeed, women who had VVF repair surgery reported improved QoL after surgery.

During our follow-up in-depth interviews, participants reported self-perceptions were positive. The impact of the surgery on their relationships with their spouse, family members, daily activities, social life, and religious activities, such as attending prayer sessions, were significantly improved. Likewise, participants reported that they were experiencing positive attitudes from their family members, friends, neighbors, and religious communities. During the post-surgery evaluations, the research assistants also observed that the participants were happier, more confident, more outspoken, and well-dressed compared to the baseline assessment period. Also, regarding pregnancy expectations, although they desired future pregnancies, participants expressed not wanting to get pregnant again for fear that it would lead to further complications and surgical interventions. Overall, participants with successful surgeries reported experiencing social reintegration into their societies, returning to normal daily activities, restoration in social life, and spending more time with their husbands, children, and friends. These positive changes following surgery correspond with previous literature [9,17,18,30].

Health promotion campaigns are also essential to promote healthy outcomes for women with fistula as QoL and continence significantly improved following a combined surgical and health promotion program[15]. Social and economic reintegration programs are also critical, as some of these women

have lived with the condition for so long that surgeries alone are not enough to reinstate them fully into the society. Social support has been found to be beneficial and health-promoting and could lead to a higher quality of life [8,31,32]. Combined surgical and health promotion efforts may reduce the time it takes for a woman to reintegrate into society wholly. Health promotion programs at community and health facility levels should also involve the spouses and families of these women to facilitate their re-integration into their social networks and communities.

Findings from this study should be interpreted in light of several limitations. The study had a small sample size of 29 for the post-operation evaluation due to time constraints. The study occurred during the festive period, and most patients did not want to visit the hospital during holidays. This small sample size has implications for the generalizability of study findings. The study findings may also have limited application to other geographical locations as characteristics of patients in the southwest may differ from other regions in Nigeria. The post-evaluation period was short (6-8 weeks); hence the study may have benefitted from increasing the post-evaluation period to a period of 6 months, or one - two years, to capture their complete social reintegration. The short post--surgery evaluation period limited the complete assessment of the personal relationship domain; the question regarding their sex life was removed because the doctors had advised them not to engage in sexual activities for 6 months after surgery for them to heal. Also, the study may have benefitted from having multiple post-operation evaluations to track their progress or changes following surgery.

There is also the possibility of language barriers and poor literacy levels influencing participants' understanding of the questions being asked. It should be noted that this barrier was addressed by administering the questionnaire in the Yoruba language for those who could not speak English. Due to the patients' poor literacy levels, the survey was interviewer-administered by two female research assistants. This approach may have led to possible differences in how the questions were asked. One way this issue was tackled was by administering training before implementing the study to ensure the standardization of procedures. Also, self-report bias may have been an issue. Patients may have felt pressured to provide socially desirable responses to the questions as they might have thought that undergoing surgery would mean that by default, it was expected that their QoL should improve.

Regarding surgical outcomes, a few of the patients reported that their surgeries were successful, although their case files indicated they were not fully continent or that they had residual UI. The post-surgery in-depth interviews only captured the thoughts of those who had successful surgeries. The interviews would have benefited from also capturing the feelings of those whose surgeries were unsuccessful to know if there were any impacts or benefits of undergoing surgery. In all, this was a pilot, preliminary study and subsequent prospective studies are needed.

Conclusion

Generally, there was an improvement in the quality of life across all domains after surgery compared to baseline. Women who had successful surgeries were found to have more significant improvement in their QoL compared to those whose surgeries were not successful. Findings from the present study suggest the need for early repair of the fistula to avoid an extended reduction in the patient's quality of life. We also suggest that a holistic approach to preventing fistula is necessary, considering the condition is unmistakably entangled in a highly complex socioeconomic context. Awareness about VVF in urban and rural areas across Ibadan, other southwest regions, and Nigeria should be raised. There is a need for more widespread availability of VVF treatment across primary and secondary hospitals rather than only at tertiary hospitals, as is currently the case. Both VVF surgery and medications need to be made easily accessible and affordable to the poor. Implementation of policies that ensure that women have access to free or affordable maternal and child health services is essential. Government support can complement the primary sector contributions to ensure that Nigeria and other developing countries can successfully reduce the burden of this debilitating disease.

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The authors declare no competing interests.

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Appendix A: Sample questions in the Pre-surgery and Post–surgery survey

Sample questions in the pre- surgery survey were: "How would you describe your health at present? Please tick one answer" (general health perception); "How much do you think your VVF condition affects your life?" (incontinence impact); "To what extent does your VVF condition affect your household tasks (e.g. cleaning, shopping, cooking, etc.)?" (role limitations); "Does your VVF condition affect your physical activities (e.g. going for a walk, run, etc.)?" (physical limitations); "Does your VVF condition limit your ability to see/visit friends and family members?" (social limitations); "Does your VVF condition make you feel depressed?" (emotions); "Does your VVF condition affect your relationship with your partner?" (personal relationships); "Do you feel worn out/tired?" (sleep/energy); "Worry in case you smell?" (severity measures); and "Frequency: going to the toilet very often" (symptom severity).

Sample questions in the post- surgery survey were: "How would you describe your health at present after your surgery? Please tick one answer" (general health perception); "How much do you think surgery for your VVF condition affected your life positively?" (incontinence impact); "To what extent has surgery for your VVF condition affected positively your ability to carry out your household tasks (e.g. cleaning, shopping, cooking, etc.)?" (role limitations); "Has surgery for your VVF condition affected positively your physical activities (e.g. going for a walk, run, etc.)?" (physical limitations); "Has surgery for your VVF condition affected positively your ability to see/visit friends?" (social limitations); "To what extent has surgery for your VVF condition affected your feelings of depression?" (emotions); "Has surgery for your VVF condition affected positively your relationship with your partner?" (personal relationships); "Now that you have done your surgery, how often do you feel worn out/tired?" (sleep/energy). Severity measures and symptom severity scale questions were the same as the pre-surgery survey.

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