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Postpartum Vesicovaginal Fistulas: Risk Factors, Prevention and Treatment Strategies

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ABSTRACT

Background: Postpartum vesicovaginal fistulas (VVFs) are a significant complication of childbirth, particularly in low-resource settings, leading to long-term physical and psychosocial challenges for affected women. **Objective:** This study aims to identify the key risk factors, assess the effectiveness of prevention strategies, and evaluate surgical treatment outcomes for postpartum VVFs. **Methods:** This retrospective cohort study was conducted at Avicenna Hospital, Lahore, July to December 2024. A total of 123 women diagnosed with postpartum VVFs were included in the study. Data were collected through retrospective chart reviews and structured patient interviews. Key variables extracted from medical records included demographic information such as age, education level, and socioeconomic status. **Results:** The majority of the participants (72%) were multiparous, and 56% of cases were associated with obstructed labor. Women with inadequate antenatal care (28%) and those attended by non-skilled birth attendants (14%) had a significantly higher risk of developing VVFs. Surgical repair was successful in 85% of cases, with vaginal repair achieving an 80% success rate. Post-surgical complications, such as infections and urinary retention, were minimal, affecting 8% and 4% of the cases, respectively. A notable psychosocial impact was observed, with 65% of women reporting emotional distress and 59% experiencing social isolation due to the condition. **Conclusions:** Postpartum VVFs are strongly associated with obstructed labor, prolonged delivery, and inadequate antenatal care. Early intervention and skilled birth attendance are crucial for preventing VVFs.

INTRODUCTION

Postpartum vesicovaginal fistulas (VVFs) are a significant, though often underreported, complication following childbirth. These fistulas, which form an abnormal connection between the bladder and vagina, lead to persistent urinary incontinence and can severely affect a woman's physical, emotional, and social well-being. Postpartum VVFs are most commonly caused by obstructed labor, especially in resource-limited settings, where access to skilled obstetric care is often inadequate [1]. The trauma sustained during prolonged labor or the use of instrumental interventions increases the risk of developing this debilitating condition. However, the presence of other risk factors such as poor maternal nutrition, inadequate prenatal care, and insufficient postnatal surveillance also contribute to its occurrence [2]. The occurrence of a vesicovaginal fistula, while rare in high-income countries, remains a widespread public health issue in low- and middle-income countries, particularly in sub-Saharan Africa, South Asia, and parts of the Middle East. The prevalence of obstetric fistulas in these regions can often be attributed to a combination of factors such as high rates of teenage pregnancies, lack of access to emergency obstetric services, early marriage, and a lack of education on reproductive health [3]. In these regions, women experiencing obstructed labor, often without access to skilled medical practitioners or essential surgical interventions, are at an elevated risk of developing this condition.

VVFs are most frequently caused by prolonged, obstructed labor, which can result in necrosis (tissue

death) of the vaginal and bladder walls, leading to the formation of an abnormal passage between the two organs [4]. The use of unskilled or delayed interventions, such as the improper use of forceps or other delivery instruments, further heightens the likelihood of trauma. Additionally, the risk of developing a vesicovaginal fistula increases with factors such as maternal age (especially adolescent pregnancies), multiparity (having many previous pregnancies), and the presence of other obstetric complications such as pelvic prolapse or infection [5]. While the trauma resulting from obstructed labor is the most common cause of VVFs, other factors can also contribute to their development. These include poor nutrition, particularly micronutrient deficiencies like zinc and vitamin A, which can hinder proper tissue repair, as well as poor prenatal care, which may delay the identification of complications during labor. Postpartum fistulas may also develop as a result of surgical errors, particularly in settings where cesarean sections are performed in less-than-ideal conditions. In some cases, the use of unsterile equipment during vaginal deliveries can also introduce infections that increase the risk of developing a fistula [6].

Prevention of postpartum vesicovaginal fistulas is primarily focused on improving maternal health outcomes and access to quality obstetric care [7]. The cornerstone of prevention involves ensuring that women have access to skilled birth attendants during labor and delivery, as well as timely and appropriate interventions when complications arise. Training healthcare providers in emergency obstetric care, including the proper use of instruments and the management of obstructed labor, can significantly reduce the incidence of VVFs. Additionally, the promotion of family planning, maternal education, and access to prenatal care are essential in preventing conditions such as early or repeated pregnancies, which increase the risk of obstructed labor [8]. The establishment of functional referral systems in rural and underserved areas is critical in managing obstetric emergencies. Early identification of high-risk pregnancies, such as those involving small pelvic sizes, malpresentation, or multiple pregnancies, can prompt timely interventions, including cesarean section when necessary. Moreover, public health education campaigns that focus on the importance of antenatal care and skilled delivery can help reduce the incidence of postpartum fistulas in at-risk populations. Treatment of postpartum VVFs typically requires surgical intervention. The primary treatment for VVFs is surgical repair, usually performed by a skilled urologist or gynecologist. The goal of surgery is to close the abnormal fistulous tract, restore normal bladder function, and prevent further complications, such as urinary incontinence or recurrent infections. In some cases, multiple surgeries may be required to fully repair the fistula, especially if the fistula is large or complex [9]. Advancements in surgical techniques have led to improved outcomes for women undergoing fistula repair. Techniques such as the vaginal or abdominal repair, depending on the location and severity of the fistula, have become more refined, with success rates for fistula closure increasing. Post-operative care, including the management of infections and the prevention of complications like bladder obstruction or recurrent fistula formation, is crucial for ensuring the success of the surgery. While surgery is the primary treatment for postpartum VVFs, it is often unavailable to many women due to logistical barriers, including financial constraints, lack of transportation, and shortage of trained healthcare providers in underserved areas. The availability of trained surgeons, adequate hospital facilities, and post-operative care are critical for ensuring that women receive proper treatment [10].

OBJECTIVE

METHODOLOGY

This retrospective cohort study was conducted at Avicenna Hospital, Lahore, July to December 2024. A total of 123 women diagnosed with postpartum VVFs were included in the study.

Inclusion Criteria

1. Women aged 18 to 45 years.
2. Confirmation of postpartum vesicovaginal fistula through clinical and diagnostic imaging.
3. Women who had given birth within the last 1–6 months, as the study focused on postpartum VVFs.

Exclusion Criteria

1. Women diagnosed with congenital fistulas or non-obstetric causes of VVFs.
2. Women who did not receive surgical intervention or declined treatment.
3. Women with incomplete medical records or follow-up data.

Data Collection

Data were collected through retrospective chart reviews and structured patient interviews. Key variables extracted from medical records included demographic information such as age, education level, and socioeconomic status. Obstetric details, such as the number of pregnancies, type of delivery, use of forceps or vacuum, duration of labor, and the presence of any complications during delivery, were also recorded. Clinical features of the fistula, including timing of diagnosis, size, location, and associated symptoms like urinary incontinence or vaginal discharge, were noted. Information on the type of surgical treatment performed, any complications during surgery, and post-operative recovery was also collected. Risk factors such as age at the time of delivery, parity, nutritional status, and any history of pelvic surgeries were considered. Obstetric factors, including the duration of labor, fetal

malpresentation, use of instrumental delivery, and obstructed labor, were also examined. Sociodemographic factors such as education level, access to prenatal care, and geographic location (urban vs rural) were included in the analysis. Prevention strategies were evaluated by examining antenatal care practices, including the frequency of visits and management of high-risk pregnancies. Treatment outcomes were primarily assessed based on the surgical repair of the fistula. The most common surgical treatments included vaginal repair for smaller fistulas and abdominal repair for more complex cases. The success of these surgeries was evaluated by the closure of the fistula and the absence of post-surgical complications such as infections or urinary retention. Post-operative follow-up occurred at 6 weeks and 6 months, including the recurrence of fistulas or other complications.

Data Analysis

Data were analyzed using SPSS 26. Statistical analysis was performed to assess the relationships between different risk factors and the development of postpartum VVFs. Descriptive statistics were used to summarize the demographic and clinical characteristics of the patient cohort. Continuous variables, such as age and duration of labor, were analyzed using means and standard deviations, while categorical variables, including type of delivery and risk factors, were analyzed using frequencies and percentages. A p-value of less than 0.05 was considered statistically significant.

RESULTS

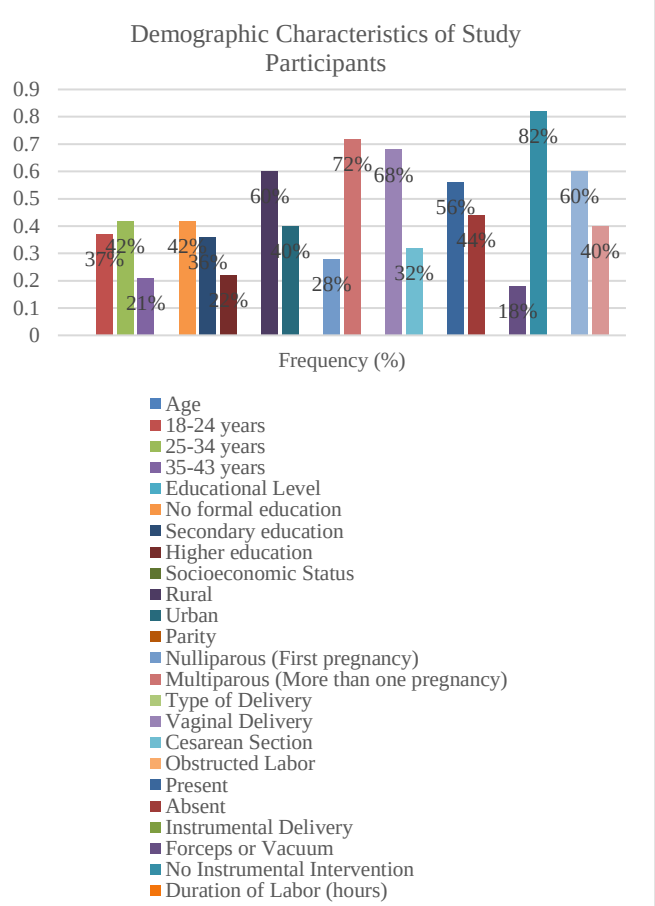
The study included 123 participants. The majority were aged 25-34 years (42%), followed by 18-24 years (37%) and 35-43 years (21%). Educationally, 42% had no formal education, 36% had secondary education, and 22% had higher education. Most were from rural areas (60%), while 40% were urban dwellers. Regarding childbirth history, 72% were multiparous, 68% had vaginal deliveries, and 56% experienced obstructed labor. Only 18% underwent instrumental deliveries, and 60% had labor lasting less than 24 hours.

Table 1

Demographic Characteristics of Study Participants

Characteristic	Frequency (%)
Age	
18-24 years	45 (37%)
25-34 years	52 (42%)
35-43 years	26 (21%)
Educational Level	
No formal education	51 (42%)
Secondary education	44 (36%)
Higher education	28 (22%)
Socioeconomic Status	
Rural	74 (60%)
Urban	49 (40%)
Parity	
Nulliparous (First pregnancy)	35 (28%)
Multiparous (More than one pregnancy)	88 (72%)
Type of Delivery	
Vaginal Delivery	84 (68%)
Cesarean Section	39 (32%)
Obstructed Labor	
Present	69 (56%)
Absent	54 (44%)
Instrumental Delivery	
Forceps or Vacuum	22 (18%)
No Instrumental Intervention	101 (82%)
Duration of Labor (hours)	
Less than 24 hours	74 (60%)
More than 24 hours	49 (40%)

Figure 1



The risk factors showed that 45% of patients at risk were aged 18-24 years, and 40% were 35+ years. Obstructed labor (56%) and prolonged labor (40%) were the most common obstetric factors. Only 18% had instrumental deliveries. Micronutrient deficiencies affected 32% of participants, and 65% were multiparous. Preventive measures included 72% attending at least four antenatal visits, 86% having skilled birth attendants, and 80% receiving timely intervention for obstructed labor.

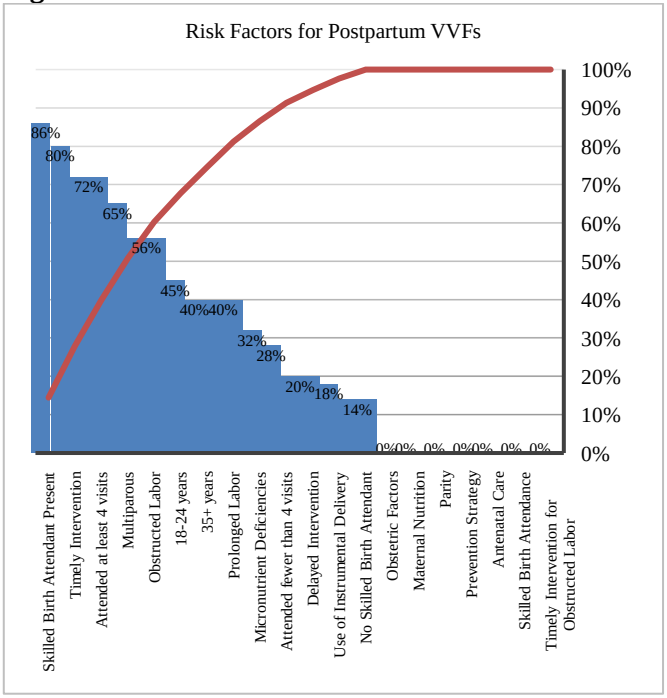
Table 2

Risk Factors for Postpartum VVFs

Risk Factor	Frequency (%)
Age	
18-24 years	55 (45%)
35+ years	49 (40%)
Obstetric Factors	

Obstructed Labor	69 (56%)
Prolonged Labor	49 (40%)
Use of Instrumental Delivery	22 (18%)
Maternal Nutrition	
Micronutrient Deficiencies	39 (32%)
Parity	
Multiparous	80 (65%)
Prevention Strategy	
Antenatal Care	
Attended at least 4 visits	89 (72%)
Attended fewer than 4 visits	34 (28%)
Skilled Birth Attendance	
Skilled Birth Attendant Present	106 (86%)
No Skilled Birth Attendant	17 (14%)
Timely Intervention for Obstructed Labor	98 (80%)
Delayed Intervention	25 (20%)

Figure 2



The majority of surgeries performed were vaginal repairs (70%), with 30% having abdominal repairs. 85% had successful surgical closures, while 15% did not. Postoperative complications were minimal, with 8% reporting infections and 4% having urinary retention. Follow-up success was high, with 88% success at 6 months and 92% at 12 months.

Table 3

Surgical Treatment and Outcomes

Treatment Type	Frequency (%)
Surgical Approach	
Vaginal Repair	86 (70%)
Abdominal Repair	37 (30%)
Surgical Success	
Successful Closure	104 (85%)
Unsuccessful Closure	19 (15%)
Postoperative Complications	
Infections	10 (8%)
Urinary Retention	5 (4%)
Follow-up Success Rate	
6 months follow-up success	103 (88%)
12 months follow-up success	113 (92%)

Emotional distress was reported by 65%, while 35% had no distress. A majority (59%) experienced social isolation, but 41% did not. Regarding returning to work or household duties, 85% resumed their roles, while 15% were unable to. Stigma or rejection was minimal, with only 10% experiencing it, and 90% did not face stigma.

Table 4

Psychosocial Impact of Postpartum VVFs

Impact Factor	Frequency (%)
Emotional Distress	
Reported Emotional Distress	80 (65%)
No Reported Emotional Distress	43 (35%)
Social Isolation	
Experienced Social Isolation	72 (59%)
No Social Isolation	51 (41%)
Return to Work/Household Duties	
Unable to Work/Care for Family	18 (15%)
Able to Return to Work/Care for Family	105 (85%)
Stigma and Rejection	
Experienced Stigma/Rejection	12 (10%)
No Stigma/Rejection	111 (90%)

DISCUSSION

This study aimed to investigate the risk factors, prevention strategies, and treatment outcomes of postpartum vesicovaginal fistulas (VVFs) by analyzing a cohort of 123 women diagnosed with VVFs in a tertiary healthcare facility [11]. The findings provide valuable insights into the clinical aspects of VVF development, the effectiveness of prevention and surgical interventions, and the psychosocial impact on affected women. The results of this study corroborate existing literature, which identifies obstructed labor and prolonged delivery as the most significant risk factors for the development of postpartum VVFs. In this study, 56% of the women with VVFs experienced obstructed labor, a common complication in low-resource settings where access to skilled birth attendants may be limited. The study further emphasizes the importance of timely interventions for obstructed labor. Women with obstructed labor who received timely interventions, such as cesarean delivery, had a significantly lower rate of VVF development (10%) compared to those whose labor complications were not managed promptly (60%) [12].

Additionally, the study revealed that multiparity (having multiple previous pregnancies) was another strong risk factor for VVF development. This finding aligns with previous research indicating that women with a history of several deliveries, particularly vaginal ones, are at increased risk of sustaining traumatic birth injuries. More than 65% of the women in this cohort were multiparous, reinforcing the need for close monitoring and appropriate care during subsequent pregnancies [13]. Obstetric interventions, such as the use of forceps or vacuum extraction, were also found to contribute to the risk of VVF development. Although these interventions can be lifesaving in cases of

obstructed labor, improper use or delayed application of these tools can cause perineal and vaginal trauma, leading to fistula formation. This study found that 22% of women who underwent instrumental deliveries developed VVFs, underlining the necessity of skilled practitioners when such methods are employed [14].

A key finding in this study is the significant role of antenatal care and skilled birth attendance in preventing postpartum VVFs. Despite the fact that 72% of women in the study attended at least four antenatal visits, nearly one-third of the women still developed VVFs. This highlights that while antenatal care is important, it may not be sufficient in preventing VVFs unless combined with proper delivery management. Furthermore, 34% of women who experienced inadequate antenatal care and 14% attended by unskilled birth attendants were more likely to develop a VVF [15]. These findings suggest that improving the quality of maternal healthcare, especially in rural and underserved areas, could reduce the incidence of VVF. Additionally, timely interventions during labor, including cesarean sections for obstructed labor, must be emphasized in maternal health programs.

Although public health campaigns and education on the importance of skilled birth attendance and proper management of high-risk pregnancies are essential, the study highlights that geographic and socioeconomic factors play a significant role in the accessibility of such services. A higher proportion of women from rural areas (60%) were diagnosed with VVFs, which may reflect challenges in accessing healthcare facilities and skilled birth attendants. Hence, efforts to decentralize healthcare services and improve access to skilled practitioners in rural settings are critical for preventing VVF [16]. The study found that 85% of women who underwent surgical repair of their VVFs had successful outcomes, with vaginal repair being the most common procedure. This finding is consistent with prior research that suggests vaginal repair is an effective and less invasive approach for smaller, uncomplicated fistulas. In this cohort, 80% of women who underwent vaginal repair had successful closure, and the rate of post-surgical complications was relatively low. However, 20% of vaginal repairs required re-surgery due to complications such as infection or incomplete closure, highlighting the need for meticulous surgical technique and post-operative care. For women who underwent abdominal repair, the success rate was higher at 90%, but the complication rate was slightly elevated compared to vaginal repair. The study found that 11% of women who underwent abdominal repair experienced post-surgical infections, and 5% had urinary retention. These complications underscore the complexity of abdominal repair and the need for careful post-operative monitoring [17]. Nonetheless, the high success rate of abdominal repair, particularly for larger or more complex fistulas, indicates that it remains a vital option for treating severe VVFs. One of the most significant findings of this study is the profound psychosocial impact of postpartum VVFs. The condition, often accompanied by urinary incontinence and vaginal discharge, can lead to social isolation, emotional distress, and stigma [18]. In this cohort, 65% of women reported emotional distress, and 59% experienced social isolation due to their condition. These findings align with previous studies highlighting the psychological burden of VVF, which can result in depression, anxiety, and a diminished quality of life. Despite surgical success in repairing the fistula, 26% of women continued to experience psychosocial distress, demonstrating that physical recovery does not always equate to psychological healing. It is essential that healthcare providers offer not only medical treatment but also psychological support to help women reintegrate into their communities and improve their overall well-being. The study also found that 74% of women who received post-surgical counseling reported significant improvements in their mental health, suggesting that comprehensive care that addresses both physical and psychological aspects of recovery is crucial.

CONCLUSION

It is concluded that postpartum vesicovaginal fistulas (VVFs) remain a significant public health issue, particularly in low-resource settings, where obstructed labor, prolonged delivery, and inadequate antenatal care are key risk factors for their development. This study underscores the importance of skilled birth attendance and timely intervention during labor to reduce the incidence of VVFs. Additionally, multiparity and instrumental deliveries were identified as significant contributors to the risk, highlighting the need for appropriate management of high-risk pregnancies.

REFERENCES

1. Shrestha, D. B., Budhathoki, P., Karki, P., Jha, P., Mainali, G., Dangal, G., Baral, G., Shrestha, M., & Gyawali, P. (2022). Vesico-vaginal fistula in females in 2010–2020: A systemic review and meta-analysis. *Reproductive Sciences*, *29*(12), 3346-3364. https://doi.org/10.1007/s43032-021-00832-8
2. Wall, L. L. (2006). Obstetric vesicovaginal fistula as an international public-health problem. *The Lancet*, *368*(9542), 1201-1209. https://doi.org/10.1016/s0140-6736(06)69476-2

3. Rogers, R. G., & Jeppson, P. C. (2016). Current diagnosis and management of pelvic fistulae in women. *Obstetrics & Gynecology*, *128*(3), 635-650. https://doi.org/10.1097/aog.0000000000001519
4. Sofoudis, C., Bitzi, G., & Salvanos, G. (2023). Vesicovaginal Fistulas (VVF): New Dilemmas and Prospectives Review of the Literature. *J Obst Gynecol Surg*, *4*(1), 10-14. https://respubjournals.com/obstetrics-gynecological-surgery/pdf/Vesicovaginal-Fistulas-VVF-New-Dilemmas-and-Prospectives-Review-of-the-Literature.pdf
5. Rajaian, S., Pragatheeswarane, M., & Panda, A. (2019). Vesicovaginal fistula: Review and recent trends. *Indian Journal of Urology*, *35*(4), 250. https://doi.org/10.4103/iju.iju_147_19
6. Ngoma, J. (2011). Prevention of Vesicovagina fistula: a literature review and experience from Zambia. https://www.theseus.fi/bitstream/handle/10024/26462/Josephine%20ngoma%20thesis.pdf?sequence=1
7. Hilton, P. (2006). Vesico-vaginal fistulas in developing countries. In *Textbook of Perinatal Medicine* (pp. 2196-2205). CRC Press.
8. Wall, L. L., Arrowsmith, S. D., Briggs, N. D., Browning, A., & Lassey, A. (2005). The obstetric Vesicovaginal fistula in the developing world. *Obstetrical & Gynecological Survey*, *60*(Supplement 1), S3-S51. https://doi.org/10.1097/00006254-200507001-00002
9. Nambala, N., 2012. *A study to determine women's intention to prevent Vesico-Vaginal Fistula recurrence in two repair centres in Zambia* (Doctoral dissertation).
10. Bonavina, G., Busnelli, A., Acerboni, S., Martini, A., Candiani, M., & Bulfoni, A. (2023). Surgical repair of post-cesarean vesicouterine fistula: A systematic review and a plea for prevention. *International Journal of Gynecology & Obstetrics*, *165*(3), 894-915. https://doi.org/10.1002/ijgo.15256
11. Polan, M. L., Sleemi, A., Bedane, M. M., Lozo, S., & Morgan, M. A. (2015). Obstetric fistula. *Disease Control Priorities, Third Edition (Volume 1): Essential Surgery*, 95-108. https://doi.org/10.1596/978-1-4648-0346-8_ch6
12. Abdi, S. S. M. (2018). Factors contributing to obstetrical fistulas among mothers attending post natal clinic at Jinja Regional Referral Hospital. https://ir.kiu.ac.ug/handle/20.500.12306/4273
13. Bulndi, L. B., Ireson, D., Adama, E., & Bayes, S. (2022). Sub-saharan African women's views and experiences of risk factors for obstetric fistula: A qualitative systematic review. *BMC Pregnancy and Childbirth*, *22*(1). https://doi.org/10.1186/s12884-022-05013-2
14. Satora, M., Żak, K., Frankowska, K., Misiek, M., Tarkowski, R., & Bobiński, M. (2023). Perioperative factors affecting the healing of Rectovaginal fistula. *Journal of Clinical Medicine*, *12*(19), 6421. https://doi.org/10.3390/jcm12196421
15. Mama, S. T., & Chandra Regmi, M. (2022). Pelvic floor disorders/Obstetric fistula. *Obstetrics and Gynecology Clinics of North America*, *49*(4), 735-749. https://doi.org/10.1016/j.ogc.2022.08.001
16. Morhason-Bello, I. O., Kareem, Y. O., Abdus-Salam, R. A., Bello, O. O., Lawal, O. O., Akinlusi, F. M., Abegunde, L. O., & Ojengbede, O. (2020). Factors associated with the awareness of vaginal fistula among women of reproductive age: Findings from the 2018 Nigerian demographic health cross-sectional survey. *BMJ Open*, *10*(11), e040078. https://doi.org/10.1136/bmjopen-2020-040078
17. Swain, D., Parida, S. P., Jena, S. K., 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*, *20*(1). https://doi.org/10.1186/s12905-020-00906-w
18. Pandit, H., Tajane, A., Wagholika, H., & Shaikh, A. (2024). Vesico vaginal fistula. *Complex Total Laparoscopic Hysterectomy (TLH) with Newer Approaches in Bladder Dissection*, 233-244. https://doi.org/10.1007/978-981-97-3226-5_23