

# Correlation of VIA Positive Cases with Colposcopic and Histopathological Findings in Diagnosis of Precancerous Lesion of Cervix in A Tertiary Care Hospital

Dr. Numaya Habib<sup>1\*</sup>, Dr. Najmatun Jikria<sup>2</sup>, Dr. Sadia Sharmin Suborna<sup>3</sup>, Dr. Nasrin Aker<sup>4</sup>, Prof. Dr. AKM Ahsan Habib<sup>5</sup>

<sup>1</sup>Medical Officer, Maternal and Child Health Training Institute (MCHTI), Azimpur, Dhaka, Bangladesh ORCID ID:

<sup>2</sup>Medical Officer, 250 Beded Sadar Hospital Naogaon, Bangladesh

<sup>3</sup>Junior Consultant (CC) (Gynae and Obs), Upazila Health Complex, Gosairhat, Shariatpur, Bangladesh

<sup>4</sup>Consultant, Z U Model Hospital, Shahid Shaidullah Kaiser Sarak, Feni, Bangladesh

<sup>5</sup>Professor & Head, Department of Oncology, & Project Director, TMSS Cancer Center, TMSS Medical College & RC Hospital, Bogura, Bangladesh

DOI: [10.36348/sijog.2024.v07i03.003](https://doi.org/10.36348/sijog.2024.v07i03.003)

Received: 21.01.2024 | Accepted: 26.02.2024 | Published: 15.03.2024

\*Corresponding author: Dr. Numaya Habib

Medical Officer, Maternal and Child Health Training Institute (MCHTI), Azimpur, Dhaka, Bangladesh

## Abstract

**Background:** Cervical cancer prevention strategies are evolving by integrating new screening modalities such as human papillomavirus (HPV) DNA testing and visual inspection with acetic acid (VIA). Colposcopy, as a diagnostic tool, plays a crucial role in the management of abnormal cytology smears, especially in developed countries. However, its utilization and efficacy in resource-limited settings like Bangladesh remain underexplored. **Objective:** This study aimed to assess the correlation between VIA positivity and colposcopic/histopathological findings in diagnosing precancerous cervical lesions among women in Bangladesh. **Method:** A cross-sectional study was conducted among 200 women aged 30-60 attending the Gynecology OPD of Dhaka Medical College and Hospital. VIA positivity was determined, and all positive cases underwent colposcopic evaluation. Histopathological examination was performed for tissue samples obtained during colposcopy. **Result:** Among the participants, 21% were VIA-positive. Colposcopic evaluation revealed inflammation (26.2%), CIN I (38.1%), CIN II (11.1%), CIN III (9.5%), and invasive carcinoma (9.5%). Histopathology findings included inflammation (28.6%), CIN I (40.5%), CIN II (7.1%), and invasive carcinoma (16.7%). True positive and false positive cases were identified, with percentages calculated accordingly. **Conclusion:** Detailed colposcopic evaluation with guided biopsy is crucial for detecting pre-invasive and early cervical cancer. Integrating colposcopy into screening programs in Bangladesh could significantly reduce morbidity and mortality among young women.

**Keywords:** Cervical cancer, VIA, Colposcopy, Precancerous lesions, Screening strategies.

**Copyright © 2024 The Author(s):** This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International License (CC BY-NC 4.0) which permits unrestricted use, distribution, and reproduction in any medium for non-commercial use provided the original author and source are credited.

## INTRODUCTION

Cervical cancer remains a significant global public health challenge, with approximately 0.6 million new cases and 0.3 million deaths reported annually, ranking as the fourth most common cause of cancer incidence and mortality among women worldwide [1]. Particularly alarming is its prevalence in developing countries, where it stands as the second most common cancer and the leading cause of cancer-related deaths among women, trailing only behind breast cancer. This burden is exacerbated by the long pre-invasive phase of cervical cancer, characterized by a progression from

cellular atypia to various grades of dysplasia known as Cervical Intraepithelial Neoplasia (CIN), before advancing to invasive carcinoma [2]. Human Papillomavirus (HPV) infection is identified as the primary etiological factor responsible for nearly all cases of cervical cancer and a significant portion of precancerous changes in the cervix.

Despite advancements in healthcare, the global incidence of cervical cancer continues to rise, with an upward trend observed in recent years [3]. Notably, low- and middle-income countries (LMICs) shoulder the majority of the burden, accounting for approximately

four-fifths of new cases and deaths annually. The lack of effective screening methods exacerbates this situation in many LMICs, leaving a large portion of the population vulnerable to undetected cervical abnormalities.

Screening procedures such as Visual Inspection with Acetic Acid (VIA), Pap smear, and HPV DNA testing serve as frontline tools for detecting cervical abnormalities. VIA, in particular, offers a simple and cost-effective screening method, allowing for the identification of aceto-white areas indicative of dysplasia or invasive diseases [4]. Colposcopy, introduced by Hans Hinselmann in 1925, is a clinically proven method for evaluating cervical abnormalities and guiding further diagnostic and therapeutic interventions [5]. However, challenges persist, including observer variability and limitations in distinguishing between normal and abnormal cervical tissue [6].

Various scoring systems have been proposed to address these challenges and enhance diagnostic accuracy, such as the Reid Colposcopic Index (RCI) and the Swede score, aiming to standardize colposcopic interpretation and improve lesion characterization [7]. These scoring systems demonstrate promising sensitivity and specificity in identifying high-grade lesions and invasive cancer.

In Bangladesh, cervical cancer constitutes a significant portion of female cancers, yet effective screening and diagnostic strategies remain underutilized [8]. Understanding the role of colposcopy in evaluating VIA-positive cases and detecting precancerous lesions is crucial for early intervention and reducing the burden of cervical cancer-related morbidity and mortality. This study aims to elucidate the contribution of colposcopy in this context, emphasizing the importance of early detection and management in reducing the impact of cervical cancer.

## OBJECTIVES

### General Objective

- To correlate VIA-positive cases with colposcopic and histopathological findings in the diagnosis of precancerous lesions of the cervix.

### Specific Objective

- To find out the correlation of VIA with colposcopy in cases of healthy and unhealthy cervix.
- To investigate the correlation of VIA-positive cases with histopathological findings.
- To compare findings of Colposcopy & histopathology findings in VIA-positive cases.
- To investigate the risk factors of Cervical Cancer.

## MATERIALS AND METHODS

### Study Design

This cross-sectional study was conducted from July to December 2019 at the Department of Obstetrics & Gynaecology, Dhaka Medical College Hospital. The study included women aged 30 to 60 attending the Gynecology OPD during this period, with a purposive sample size of 200 participants. The study utilized a purposive sampling method to ensure representation across relevant demographics.

### Inclusion Criteria

- Women of the age group of 30->60 years.
- Women presented with abnormal vaginal discharge, abdominal pain, irregular menstrual bleeding, post-menopausal bleeding, postcoital bleeding, prolapse, and burning micturition.
- Non-pregnant women.

### Exclusion Criteria

- Women <30 years old.
- Women with bleeding at the time of examination.
- Women with frank lesions.
- Women with clinical evidence of acute pelvic infection.
- Women who were previously treated for carcinoma cervix.
- H/O hysterectomy.
- Pregnant women.

### Data Collection

In this cross-sectional study conducted at the Gynecology OPD of Dhaka Medical College and Hospital, 200 women aged 30 to 60 were included. After obtaining written informed consent, demographic data were collected, including age, socioeconomic status, education, parity, and age at marriage. All women underwent VIA testing with 3-5% acetic acid, and results were recorded as negative or positive. Immediately following VIA, a colposcopy was performed by the involved gynecologist. Women with normal colposcopy findings did not undergo biopsy, while those with abnormal findings did. Colposcopy was conducted using standard procedures, including applying normal saline, acetic acid, and Lugol's iodine. Biopsies were taken from areas with abnormal colposcopic findings. Statistical analysis was performed to calculate the sensitivity, specificity, and positive and negative predictive values of VIA and colposcopy in screening for premalignant cervical lesions and early-stage cervical cancer. Data collected were analyzed to compare and correlate the diagnostic efficacy of these screening modalities.

### Data Analysis

Data analysis was conducted using SPSS (Statistical Package for Social Science) version 23. Recorded data were tabulated and analyzed. Cross-checks at the end of interviews identified and collected

any missing data. The guide periodically reviewed completed data sheets for accuracy, and entries were regularly inputted into the SPSS program for analysis. This comprehensive approach ensured that the data were accurately processed and analyzed, facilitating the evaluation of sensitivity, specificity, and predictive values of VIA and colposcopy in screening for premalignant cervical lesions and early-stage cervical cancer.

**Ethical Considerations**

Ethical approval was paramount throughout the study. Clearance was obtained from the Research Committee, and permission to access patient records was secured from the Department of Obstetrics & Gynaecology, Dhaka Medical College & Hospital.

Written informed consent, including consent for any photographs, was obtained from participants or their legal guardians, ensuring respect for autonomy. Strict confidentiality protocols safeguarded patient information. Participants were allowed to withdraw from the study at any time, upholding their autonomy. The study adhered to guidelines set forth by the BMRC, ensuring ethical integrity and participant welfare.

**RESULTS**

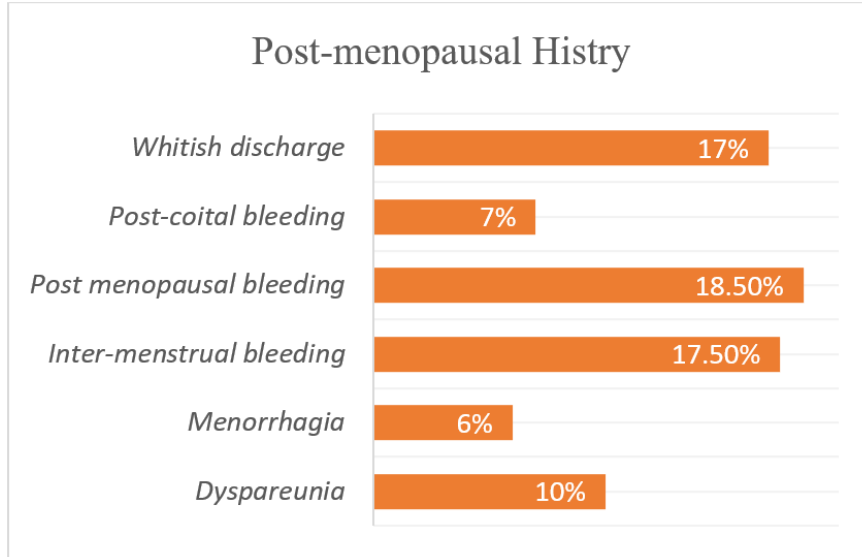
This study was a cross-sectional study conducted over 6 months in Dhaka Medical College & Hospital. The following tables and figures show the analysis of the values found in this study.

**Table 1: Age distribution of the patients (n=200)**

Age	Frequency	Percentage
30 – 40	89	44.5
40 – 50	33	16.5
50 – 60	56	28
>60	22	11

The age distribution reveals diverse participation, with a substantial portion in the 30-40 age range constituting 44.5%. Those aged 40-50 represent 16.5%, while the 50-60 range accounts for 28%. Participants above 60 contribute 11%. This demographic

breakdown underscores the need for inclusive analytical approaches, considering the varying perspectives and experiences across age groups. Understanding this diversity is crucial for data analysis and decision-making processes tailored to the entire demographic spectrum.



**Figure 1: Depicts post-menopausal complaints for the women**

Bleeding (18.5%) and inter-menstrual bleeding (17.5%) are the most common presenting complaints for the women.

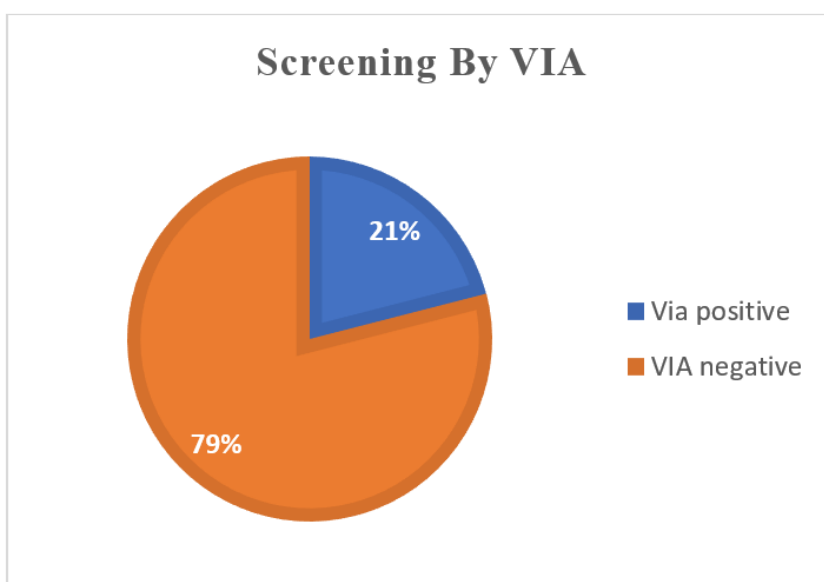
**Table 2: Risk factors of Cervical Cancer (n=200)**

Factors	Frequency	Percentage
<b>Age of marriage</b>		
< 15 years	38	19
15- 20 years	140	70
>20 years	22	11

Factors	Frequency	Percentage
<b>Age of first pregnancy</b>		
< 15 years	10	5
15- 20 years	136	68
>20 years	54	27
<b>Parity</b>		
1-2	36	18
2-4	102	51
>4	62	31
H/O taking OCP	34	17
Multiple sexual partner	43	21.5

Regarding the risk factors, 19% of patients were married before the age of 15, and most (70%) were married between the ages of 15 and 20. Ten (5%) patients had their first child before the age of 15 years, and 68% had their first child between 15 and 20 years. Thirty-six

(18%) had 1-2 children, and 31% of women had >4 children. Thirty-four (17%) of them had H/O taking OCP, and forty-three (21.5%) had multiple sexual partners.



**Figure 2: Screening by VIA**

Figure 2 shows that out of 200 cases, 21 % of patients were VIA positive whereas 79% were VIA negative.

**Table 3: Colposcopic findings of acetowhite area (Total = 57)**

Colposcopic findings	Frequency (n=42)	Percentage
Normal	4	9.5
Inflammation	11	26.2
Aceto-white lesion present	42	100
Colposcopic positive (swede score)	29	69.1
CIN I/low-grade (0-4)	16	38.1
CIN II/high grade non-invasive (5-6)	5	11.1
CIN III/high grade suspected invasive ca (7-10)	5	11.1
Invasive squamous cell ca	3	7.1

The table depicts that out of 42 patients with acetowhite area, 9.5% had normal colposcopic findings, and 26.2% had cervix inflammation. Out of 69.1% colposcopic positive cases, CIN I/ low-grade (0-4) was

found in 38.1% of cases, CIN II/ high grade non-invasive (5-6) in 11.1% of cases, CIN III/ high grade suspected invasive ca (7-10) in 11.1% cases. Invasive squamous cell carcinoma was found in 7.1% of cases.

**Table 4: Histopathology results of biopsy specimen of acetowhite area (n=15+27)**

Biopsy findings	Frequency	Percentage
Biopsy negative	15	35.7
Normal	3	7.1
Inflammation	12	28.6
Biopsy positive	27	64.3
CIN-I	17	40.5
CIN-II	3	7.1
CIN-III	4	9.5
Invasive carcinoma	3	7.1

The biopsy results depict a range of findings, with 35.7% showing negativity and 7.1% normalcy. Notably, 28.6% indicate inflammation. A significant portion, 64.3%, is positive, encompassing various grades—CIN-I (40.5%), CIN-II (7.1%), CIN-III (9.5%),

and invasive carcinoma (7.1%). These findings underscore the complexity of diagnoses, emphasizing the importance of tailored approaches in medical analysis and interventions based on the diverse spectrum of biopsy results.

**Table 5: Findings of Colposcopy directed Biopsy of VIA positive cases**

Colposcopic findings of all VIA positive cases(n=42)	Colposcopy-directed biopsy findings					
	Normal	Inflammation	CIN I	CIN II	CIN III	Invasive carcinoma
Normal	2	-	-	-	-	-
Inflammation (11)	-	-	-	-	-	-
CIN I (15)	-	-	13	2	-	0
CIN II (2)	-	-	2	2	-	1
CIN III (5)	-	-	-	1	2	2
Invasive carcinoma (4)	-	-	-	-	-	4
Total	2	11	15	5	2	7
Total biopsy positive - 29						

Among the 42 VIA-positive cases, colposcopy-directed biopsies yielded diverse findings. Expected results were observed in 2 cases, while 11 cases showed inflammation. Among the 15 cases of CIN I, biopsies indicated 13 cases with the same diagnosis and 2 with CIN II. The 2 cases of CIN II exhibited 2 with the same

diagnosis and 1 with CIN III. CIN III cases (5) showed 1 with CIN II and 2 with invasive carcinoma. Four cases of invasive carcinoma were identified independently. These findings underscore the nuanced nature of colposcopic evaluations in VIA-positive cases, guiding appropriate biopsy decisions.

**Table 6: Test outcome of VIA-positive cases**

Variable	Patients with CIN (as confirmed on histopathology)		
	Disease positive	Disease negative	Total
Test outcome positive (colposcopy)	True positive (TP=29)	False positive (FP=13)	42
Percentage	69.04%	30.96%	

The colposcopy results in patients with confirmed CIN (histopathology) showed a 69.04% true positive rate (29 cases) and a 30.96% false positive rate (13 cases). These findings underscore the diagnostic accuracy of colposcopy in identifying cervical intraepithelial neoplasia, providing valuable insights for clinical assessments and interventions.

**DISCUSSION**

Colposcopy is a valuable tool in evaluating the health of the cervix, with proven accuracy in identifying clinically unhealthy cervix [9]. In this study, the cohort exhibited variations in age and parity, with 44.5% of the 200 patients falling within the 30-40 age group [10]. Previous research by [11] highlighted that the mean age of CIN-positive individuals was 36.75 years, with a

majority being homemakers and having lower levels of education. Moreover, the World Health Organization recommends screening for CIN in the age group of 35-45 years.

The duration of marriage and exposure to sexual intercourse emerged as significant factors in the genesis of cervical intraepithelial neoplasia, with early marriage being associated with increased risk [12]. Early marriage exposes women to HPV soon after first sexual intercourse, potentially due to the biological vulnerability of the immature cervix during adolescence [13]. In this study, a considerable proportion of patients were married before the age of 15 years (19%), with an even higher percentage (70%) marrying between 15-20 years, indicating a substantial association between early marriage and cervical abnormalities. Furthermore,



polygamy and early marriage have been identified as significant contributors to cervical cancer development, often associated with low socioeconomic status and poor access to healthcare [14]. These risk factors are compounded by the lack of effective screening measures, emphasizing the importance of early detection and prevention strategies [15].

Multiparity emerged as another risk factor for cervical cancer, with several pregnancy-induced cervical changes predisposing individuals to malignant transformation [16]. The increased number of squamous metaplastic cells during pregnancy may heighten susceptibility to HPV infection and subsequent progression to CIN [17]. In our study, 18% of participants had 1-2 children, while 31% had more than four children, indicating multiparity as a prevalent risk factor for CIN. The study's findings regarding colposcopic evaluations revealed a range of cervical abnormalities, including inflammation, CIN, and invasive carcinoma [18]. Notably, colposcopy-directed biopsies confirmed the presence of CIN and invasive lesions among VIA-positive patients, underscoring the importance of VIA as a screening tool. In our study, 21% of VIA-positive cases exhibited a range of abnormalities, including inflammation (26.2%), CIN I (38.1%), CIN II (11.1%), CIN III (11.1%), and invasive cervical carcinoma (9.5%).

However, colposcopy has limitations, including observer variability and challenges in distinguishing between normal and abnormal cervical tissue [19]. These limitations highlight the need for complementary screening modalities and ongoing research to improve the accuracy of cervical cancer detection. In the study provides valuable insights into the epidemiology of cervical cancer and the role of colposcopy in its detection and management. By identifying key risk factors and highlighting the importance of early detection, the study contributes to efforts aimed at reducing the global burden of cervical cancer. However, further research is needed to address the limitations of current screening methods and improve overall outcomes for individuals at risk of cervical cancer.

## CONCLUSIONS

Cervical cancer is a major public health concern, claiming millions of lives annually, especially among young women. Colposcopy offers valuable insights into cervical lesion morphology, aiding in effective management. Its integration into screening programs in Bangladesh could significantly reduce morbidity and mortality rates among young women. With early detection facilitated by colposcopy-guided biopsies, pre-neoplastic and early-stage cervical cancers can be identified and treated promptly, potentially saving countless lives. This underscores the importance of promoting widespread colposcopy utilization as a vital component of cervical cancer screening initiatives, thereby enhancing women's health outcomes in Bangladesh.

## RECOMMENDATIONS

- Ensure all women, especially those aged 30-49, undergo regular cervical exams and precancerous lesion tests.
- Conduct regular education programs for the public and healthcare professionals to increase awareness of cervical cancer prevention.
- Enhance training for primary healthcare personnel, including nurses and staff in community centers, to improve prevention and early detection efforts.

## ACKNOWLEDGMENTS

I sincerely thank Professor Dr. Nilufar Sultana, Head of the Dept. of Obstetrics & Gynaecology at DMCH, for facilitating this research—special thanks to Associate Professor Dr. Nazneen Begum for her invaluable guidance. Gratitude is also owed to the medical staff and patients for their cooperation and to my well-wishers and colleagues for their unwavering support.

**Funding:** No funding sources.

**Conflict of Interest:** None declared.

Article at a Glance	
<b>Study purpose:</b>	To evaluate the effectiveness of colposcopy in diagnosing cervical abnormalities in women aged 30-60 years.
<b>Key findings:</b>	Colposcopy showed promising accuracy in detecting cervical lesions. Early marriage and multiparity were identified as significant risk factors for cervical neoplasia.
<b>Newer findings added:</b>	This study contributes to understanding the role of colposcopy in cervical cancer screening, particularly in resource-limited settings.
<b>Abbreviations</b>	CIN: Cervical Intraepithelial Neoplasia HPV: Human Papillomavirus OPD: Outpatient Department VIA: Visual Inspection with Acetic Acid

## REFERENCES

- Banik, M., Akhter, S. N., & Kasem, S. B. (2016). Role of colposcopy for the Detection of Precancerous Lesion of Cervix in a Medical College Hospital. *ICMH Journal*, 7(1), 15-19.
- Wong, L. P., Wong, Y. L., Low, W. Y., Khoo, E. M., & Shuib, R. (2009). Knowledge and awareness of cervical cancer and screening among Malaysian women who have never had a Pap smear: a qualitative study. *Singapore medical journal*, 50(1), 49.
- Jemal, A., Bray, F., Center, M. M., Ferlay, J., Ward, E., & Forman, D. (2011). Global cancer statistics. *CA: a cancer journal for clinicians*, 61(2), 69-90.
- WHO, I. (2010). WHO/ICO Information Centre on HPV and Cervical Cancer (HPV Information Centre). *Human Papillomavirus and Related Cancers in Kenya. Summary Report, 2010*.
- Boicea, A., Patrascu, A., Surlin, V., Iliescu, D., Schenker, M., & Chiuu, L. (2012). Correlations between colposcopy and histologic results from colposcopically directed biopsy in cervical precancerous lesions. *Rom J Morphol Embryol*, 53(3 Suppl), 735-741.
- Mohamad, K. A. A., Saad, A. S., Murad, A. W. A., & Altraigy, A. (2016). Visual inspection after acetic acid (VIA) as an alternative screening tool for cancer cervix. *Apollo Medicine*, 13(4), 204-207.
- El Sökkary, H. H. A. H. (2017). Comparison between Pap smear and visual inspection with acetic acid in screening of premalignant cervical intraepithelial lesion and subclinical early cancer cervix. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology*, 6(1), 54-60.
- Olaniyan, O. B. (2002). Validity of colposcopy in the diagnosis of early cervical neoplasia: a review. *African journal of reproductive health*, 59-69.
- Kasem, S. B., Razzaque, S. A., Adiba, R., Anika, S., & Banik, M. (2019). Colposcopic Evaluation of Visual Inspection with Acetic Acid Positive Cases of Unhealthy Cervix. *Journal of Bangladesh College of Physicians & Surgeons*, 37(2).
- Peng, J. Y., Lee, Y. K., Pham, R. Q., Shen, X. H., Chen, I. H., Chen, Y. C., & Fan, H. S. (2024). Trends and Age-Period-Cohort Effect on Incidence of Male Breast Cancer from 1980 to 2019 in Taiwan and the USA. *Cancers*, 16(2), 444.
- Jin, L., Lu, L., Kong, L., Bai, Y., Yao, Z., Ji, G., ... & Mao, D. (2013). The 5-year incidence of male breast cancer in Southwest of China from 2007 to 2011. *The Chinese-German Journal of Clinical Oncology*, 12, 524-527.
- Nayani, Z. S., & Hendre, P. C. (2015). Comparison and correlation of pap smear with colposcopy and histopathology in evaluation of cervix. *Journal of Evolution of Medical and Dental Sciences*, 4(53), 9236-9248.
- Savitha, T. S., & Sapna, W. (2015). A comparison of pap smear, colposcopy and colposcopy directed biopsy in evaluation of unhealthy cervix. *Journal of Evolution of Medical and Dental Sciences*, 4(21), 3639-3648.
- Najib, F. S., Hashemi, M., Shiravani, Z., Poordast, T., Sharifi, S., & Askary, E. (2020). Diagnostic accuracy of cervical pap smear and colposcopy in detecting premalignant and malignant lesions of cervix. *Indian journal of surgical oncology*, 11, 453-458.
- Karimi-Zarchi, M., Peighambari, F., Karimi, N., Rohi, M., & Chiti, Z. (2013). A comparison of 3 ways of conventional pap smear, liquid-based cytology and colposcopy vs cervical biopsy for early diagnosis of premalignant lesions or cervical cancer in women with abnormal conventional pap test. *International journal of biomedical science: IJBS*, 9(4), 205.
- Akter, T., Siddika, A., Akter, K., Akhter, S., Haque, M. A., & Akther, N. (2022). Colposcopic Findings of Cervix in VIA (Visual Inspection of Cervix by Acetic Acid) Positive Cases at BSMMU, Dhaka, Bangladesh. *Sch Int J Obstet Gynec*, 5(10), 407-413.
- Nessa, K., Nazneen, K., Munni, N., Laila, R., Islam, F., & Akhter, S. R. (2014). Role of Visual Inspection of Cervix with Acetic Acid (VIA) in Detecting Precancerous Lesions of Cervix. *Journal of Enam Medical College*, 4(1), 39-44.
- Rahman, M. F., Akhter, S. N., Alam, M. J., Sarker, A. S., Uddin, M. J., Bashar, A., & Banu, S. (2016). Detection of Cervical Cancer through Visual Inspection of Cervix with Acetic Acid (VIA) and Colposcopy at Mymensingh Medical College Hospital. *Mymensingh Medical Journal: MMJ*, 25(3), 402-409.
- Goyal, S., Tandon, P., Bhutani, N., & Gill, B. K. (2017). To study the role of visual inspection of cervix with acetic acid (VIA) in cervical cancer screening. *Int J Reprod Contracept Obstet Gynecol*, 3(3), 684-7.