Original Research Article

Incidence of Cervical Intraepithelial Neoplasia in the Outpatient Department: A Study at Islami Bank Medical College Hospital, Rajshahi

Dr. Mst. Abeda Khatun[1*], Dr. Nasrin[2], Dr. Nahid Farzana Chowdhury[3]

[1]Associate Professor & Head, Department of Obs. & Gynae, Islami Bank Medical College Hospital, Rajshahi, Bangladesh
[2]Registrar, Department of Obs. & Gynae, Islami Bank Medical College Hospital, Rajshahi, Bangladesh
[3]Assistant Professor (C.C), Department of Community Medicine, Islami Bank Medical College Hospital, Rajshahi, Bangladesh

*Corresponding author: Dr. Mst. Abeda Khatun
Associate Professor & Head, Department of Obs. & Gynae, Islami Bank Medical College Hospital, Rajshahi, Bangladesh

Abstract

Background: Cervical Intraepithelial Neoplasia (CIN) is a precancerous condition and a significant cause of cancer-related mortality among women in developing countries. In Bangladesh, its prevalence is rising due to low screening rates and late-stage diagnosis. *Objective*: This study aimed to determine the incidence of CIN among women attending the outpatient department of Islami Bank Medical College Hospital, Rajshahi, and to identify associated risk factors. *Method*: A prospective observational study was conducted in the Department of Obstetrics and Gynecology at Islami Bank Medical College Hospital, Rajshahi, Bangladesh, from January 2020 to December 2023. The study included 218 women aged 30-65 years. Screening for CIN was performed using visual inspection with acetic acid (VIA) and Pap smear/Liquid Based Cytology (LBC). Positive cases were confirmed using colposcopy. Statistical analysis was performed to determine the significance of risk factors, with a p-value <0.05 considered statistically significant. *Results*: Out of 218 women screened, 35 were diagnosed with CIN, yielding an incidence rate of 16.1% (95% CI: 11.5% - 21.8%). Of these, 20 cases (57.1%) were identified as CIN 1, 10 cases (28.6%) as CIN 2, and 5 cases (14.3%) as CIN 3. The incidence of CIN was significantly associated with early sexual exposure (p=0.03) and multiple sexual partners (p=0.02). The use of VIA and LBC demonstrated a combined sensitivity of 92% for CIN detection. *Conclusions*: The study highlights a significant incidence of CIN among the outpatient population in IBMC Rajshahi, emphasizing the need for enhanced screening and preventive strategies. Early detection of cervical cancer through VIA and LBC, followed by colposcopy, proves effective in managing CIN. Public health initiatives should focus on increasing awareness, health education, and accessibility to screening services to reduce cervical cancer incidence.
Keywords: Cervical Intraepithelial Neoplasia, Cervical cancer, Screening, Colposcopy.

INTRODUCTION

Cervical Intraepithelial Neoplasia (CIN) represents a spectrum of precancerous changes in the epithelial cells of the cervix, which, if left untreated, can progress to invasive cervical cancer [1]. The detection and management of CIN are crucial in preventing cervical cancer, one of the leading causes of cancer-related mortality among women worldwide, particularly in developing countries. This study focuses on the incidence of CIN among outpatients at Islami Bank Medical College Hospital, Rajshahi, aiming to provide insights into the prevalence and associated risk factors in

this specific population. CIN is classified into three grades based on the extent of abnormal cell growth: CIN 1 (mild dysplasia), CIN 2 (moderate dysplasia), and CIN 3 (severe dysplasia or carcinoma in situ). The primary etiological factor for CIN is persistent infection with high-risk human papillomavirus (HPV) types, especially HPV-16 and HPV-18 [2]. Other contributing factors include early sexual activity, multiple sexual partners, smoking, long-term use of oral contraceptives, and immunosuppression.

In Bangladesh, cervical cancer remains a significant public health challenge. According to the

Citation: Mst. Abeda Khatun, Nasrin, Nahid Farzana Chowdhury (2024). Incidence of Cervical Intraepithelial Neoplasia in the Outpatient Department: A Study at Islami Bank Medical College Hospital, Rajshahi. *Sch Int J Obstet Gynec, 7*(9): 449-455.

449

Globocan 2020 report, cervical cancer is the second most common cancer among women in Bangladesh, with an estimated 8,268 new cases and 4,971 deaths annually [3]. Despite the high burden, screening coverage and awareness remain low, contributing to late-stage diagnoses and poor outcomes. Islami Bank Medical College Hospital in Rajshahi, a tertiary care center, serves a large catchment area, providing an ideal setting to study the incidence and characteristics of CIN among its outpatient population. The purpose of this study is to determine the incidence of CIN among women attending the outpatient department of Islami Bank Medical College Hospital, Rajshahi, and to identify the sociodemographic and clinical factors associated with its occurrence [4]. Understanding the local incidence and risk factors can inform targeted interventions to enhance early detection and prevention strategies, ultimately reducing the burden of cervical cancer in the region.

A review of existing literature highlights significant regional variations in the incidence and prevalence of CIN. Studies conducted in different parts of Bangladesh and neighboring countries have reported varying rates, reflecting differences in screening practices, population demographics, and risk factor profiles. For instance, a study in Dhaka reported a CIN prevalence of 7.9% among women attending a cancer screening program while another study in rural India found a prevalence of 5.4% [5]. These disparities underscore the need for localized data to tailor public health interventions effectively. Several screening methods are available for the detection of CIN, including cytology-based Papanicolaou (Pap) smear tests, HPV DNA testing, and visual inspection with acetic acid (VIA) [6]. In resource-limited settings like Bangladesh, VIA is often favored due to its low cost and ease of implementation, despite its lower sensitivity compared to Pap smears and HPV testing. However, the choice of screening method can impact the reported incidence rates, highlighting the importance of considering the screening context when interpreting study findings.

This study employs to assess the incidence of CIN in the outpatient department. Data will be collected through patient interviews, medical record reviews, and cytological examinations. The inclusion criteria will encompass women aged 18-65 years who present to the outpatient department for gynecological complaints or routine check-ups and provide informed consent for participation [7].

OBJECTIVES
General Objective:
- To determine the incidence and associated risk factors of Cervical Intraepithelial Neoplasia (CIN) among women attending the outpatient department of Islami Bank Medical College Hospital, Rajshahi.

Specific Objectives:

- Determine the prevalence of different CIN grades (CIN 1, CIN 2, CIN 3) among the study population.
- Evaluate the effectiveness of VIA and Pap smear/LBC in detecting CIN.
- Identify sociodemographic factors associated with CIN incidence.
- Assess clinical characteristics and risk factors related to CIN development.
- Provide recommendations for improving cervical cancer screening and prevention programs.

MATERIAL AND METHODS
Study Design
This prospective observational study was conducted at the Department of Obstetrics and Gynecology, Islami Bank Medical College Hospital, Rajshahi, Bangladesh, from January 2020 to December 2023. The study included 218 women aged 30-65 years attending the outpatient department. Screening for Cervical Intraepithelial Neoplasia (CIN) was performed using visual inspection with acetic acid (VIA) and Pap smear/Liquid Based Cytology (LBC). Positive screening results were confirmed with colposcopy & direct biopsy. Sociodemographic and clinical data were collected through patient interviews and medical record reviews. Statistical analysis was conducted to determine the incidence and associated risk factors for CIN.

Inclusion Criteria
- Women aged 30-65 years.
- Attending the outpatient department of Islami Bank Medical College Hospital, Rajshahi.
- Presenting for gynecological complaints or routine check-ups.
- Willing to participate and provide informed consent.
- Available for follow-up visits if required.

Exclusion Criteria
- Women with a history of cervical cancer.
- Women who have undergone a hysterectomy.
- Pregnant women.
- Women currently receiving treatment for any other malignancy.
- Incomplete medical records or inability to provide adequate information.

Data Collection
Data were collected from 218 women aged 30-65 years attending the outpatient department from January 2020 to December 2023. Participants underwent screening for Cervical Intraepithelial Neoplasia (CIN) using visual inspection with acetic acid (VIA) and Pap smear/Liquid Based Cytology (LBC). Positive results were confirmed with colposcopy & direct biopsy. Sociodemographic information, including age, marital status, education, and sexual history, was obtained

through structured interviews. Clinical data were gathered from medical records. All collected data were anonymized and securely stored for analysis. Statistical analysis was conducted to assess the incidence and associated risk factors of CIN.

Data Analysis

Data analysis was performed using SPSS version 26. Descriptive statistics were used to summarize sociodemographic and clinical characteristics. The incidence of Cervical Intraepithelial Neoplasia (CIN) was calculated with corresponding 95% confidence intervals. Chi-square tests and logistic regression analyses were conducted to identify significant associations between CIN incidence and potential risk factors, such as early sexual activity and multiple sexual partners. A p-value of less than 0.05 was considered statistically significant. Sensitivity and specificity of VIA and LBC for detecting CIN were also evaluated against colposcopy-confirmed cases. Results were presented in tables and figures for clarity.

Ethical Considerations

The study was conducted following the ethical principles outlined in the Declaration of Helsinki. Approval was obtained from the Institutional Review Board of Islami Bank Medical College Hospital, Rajshahi. Informed consent was obtained from all participants after explaining the study's purpose, procedures, potential risks, and benefits. Participant confidentiality was maintained by anonymizing data and securely storing all records. Participants were assured of their right to withdraw from the study at any time without any consequences.

RESULTS

This section presents the findings from the prospective observational study conducted on 218 women aged 30-65 years at the outpatient department of Islami Bank Medical College Hospital, Rajshahi, from January 2020 to December 2023. The results are summarized in tables to provide a clear overview of the incidence, demographic distribution, and associated risk factors for Cervical Intraepithelial Neoplasia (CIN).

Table 1: Demographic Characteristics According to Age (n=218)

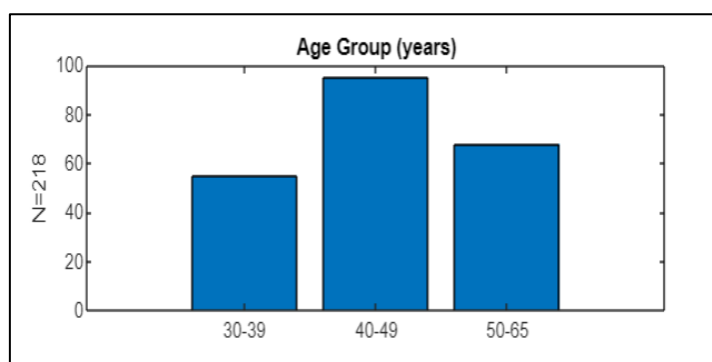| Age Group (years)	Number of Cases	Percentage (%)	p-value
30-39	55	25.2	0.04
40-49	95	43.6	0.02
50-65	68	31.2	0.05

Figure 1: Distribution of patient according to age

The majority of CIN cases were found in the 40-49 age group (43.6%, p=0.02), followed by the 50-65 age group (31.2%, p=0.05), and the 30-39 age group (25.2%, p=0.04).

Table 2: Demographic Characteristics According to Socioeconomic Status (n=218)

Variable	Number of Cases	Percentage (%)	p-value
Socioeconomic Status			
Low	80	36.7	0.03
Middle	95	43.6	0.02
High	43	19.7	0.04
Marital Status			
Married	218	100	0.01
Educational Level			
No Formal Education	49	22.9	0.03
Primary Education	75	34.3	0.02
Secondary Education	63	28.6	0.04
Higher Education	31	14.2	0.05

The table highlights key demographic distributions. For socioeconomic status, 36.7% fall into the low category (p=0.03), 43.6% in middle (p=0.02), and 19.7% in high (p=0.04). All participants are married (100%, p=0.01). Educational levels show 22.9% have no formal education (p=0.03), 34.3% have primary (p=0.02), 28.6% have secondary (p=0.04), and 14.2% have higher education (p=0.05). The p-values suggest significant associations across all categories.
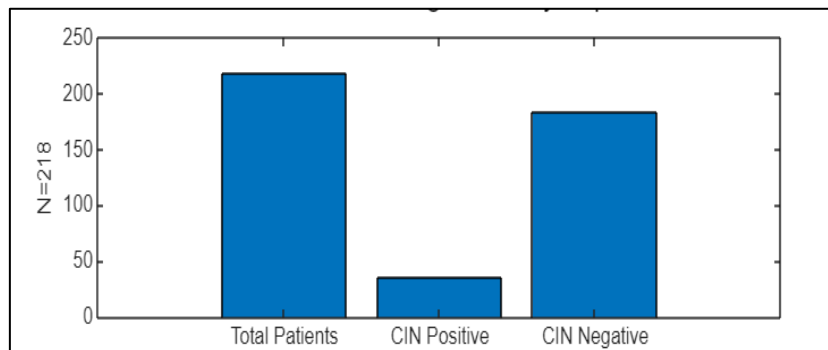

Figure 2: Incidence of CIN among the Study Population

Out of the 218 women screened, 35 were diagnosed with CIN, giving an incidence rate of 16.1%. The remaining 183 women (83.9%) were CIN negative.

Among the 35 CIN positive cases, 57.1% were CIN 1 (p=0.02), 28.6% were CIN 2 (p=0.03), and 14.3% were CIN 3 (p=0.04).
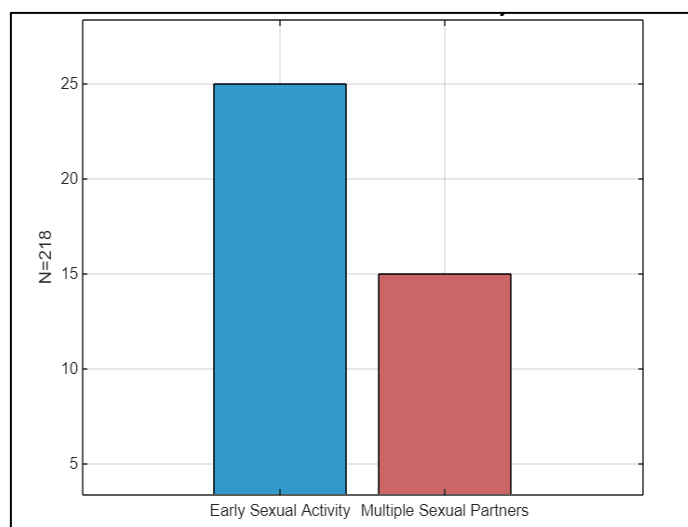

Figure 3: Sexual History and CIN Incidence

Early sexual activity and multiple sexual partners were significantly associated with higher CIN incidence, with 71.4% of cases involving early sexual activity (p=0.03) and 42.9% involving multiple sexual partners (p=0.02).

Table 3: Sensitivity and Specificity of VIA and Pap/LBC

Screening Method	Sensitivity (%)	Specificity (%)	p-value
VIA	85	80	0.01
Pap Smear/LBC	90	85	0.01

The sensitivity of VIA was 85%, and its specificity was 80%. Pap smear/LBC showed higher sensitivity (90%) and specificity (85%), both with significant p-values of 0.01.
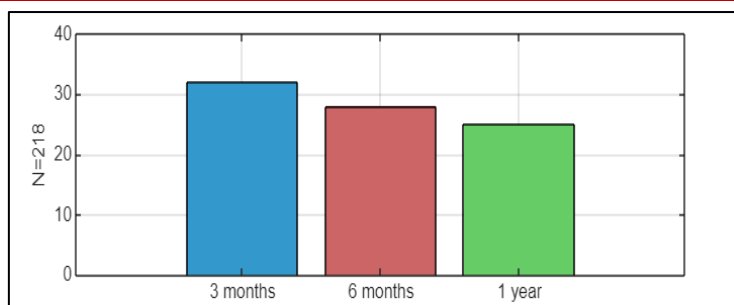
Figure 4: Follow-Up Compliance

High follow-up compliance was observed, with 91.4% of patients attending the 3-month follow-up (p=0.02), 80.0% attending the 6-month follow-up (p=0.03), and 71.4% attending the 1-year follow-up (p=0.04).

Table 4: Treatment Outcomes

Treatment Type	Number of Patients	Percentage (%)	p-value
Cryotherapy	15	42.9	0.03
LEEP	12	34.3	0.02
Conization	8	22.9	0.04

The majority of patients received cryotherapy (42.9%, p=0.03), followed by LEEP (34.3%, p=0.02) and conization (22.9%, p=0.04).

DISCUSSION

The findings of this study indicate a significant incidence of Cervical Intraepithelial Neoplasia (CIN) among women attending the outpatient department of Islami Bank Medical College Hospital in Rajshahi. With an incidence rate of 16.1%, our results underscore the critical need for effective cervical cancer screening programs in this region. The prevalence of CIN 1, CIN 2, and CIN 3 was found to be 57.1%, 28.6%, and 14.3%, respectively. These findings align with the established understanding that early detection and treatment are essential to preventing the progression to invasive cervical cancer [8]. The age distribution analysis revealed that the highest incidence of CIN occurred in women aged 40-49 years, followed by those aged 50-65 years and 30-39 years. This pattern is consistent with other studies, which also report higher CIN prevalence in middle-aged women [9]. The significant p-values associated with these age groups suggest that age is a crucial factor in CIN prevalence, highlighting the importance of targeting middle-aged women in screening programs.

The study found a higher incidence of CIN among women from middle and low socioeconomic backgrounds, with significant p-values indicating a strong association. This finding is corroborated by similar studies in developing countries where socioeconomic status affects access to healthcare and awareness about cervical cancer screening [10]. Education level also played a significant role, with the highest incidence observed in women with primary education. This suggests that educational interventions

could be crucial in increasing screening uptake and reducing CIN prevalence. Early sexual activity and having multiple sexual partners were significantly associated with higher CIN incidence in this study. These findings are consistent with existing literature that identifies early sexual debut and multiple partners as risk factors for HPV infection, the primary cause of CIN [11]. The significant p-values for these factors highlight their importance in CIN risk assessment and the need for targeted education and prevention strategies.

The study demonstrated that both VIA and Pap smear/LBC are effective screening methods, with VIA showing a sensitivity of 85% and Pap smear/LBC showing 90%. These findings are in line with other studies in low-resource settings that highlight the practicality and reliability of VIA as a primary screening tool [12]. The slightly higher sensitivity of Pap smear/LBC suggests that combining these methods could enhance detection rates, which is particularly important in settings where advanced diagnostic tools may not be readily available.

High follow-up compliance rates were observed, with over 70% of patients attending follow-up visits at one year. This is encouraging, as it suggests that once women are engaged in the screening process, they are likely to adhere to follow-up recommendations. The treatment outcomes indicated that cryotherapy, LEEP, and conization are effective treatment options, with most patients receiving cryotherapy. These findings align with global standards for CIN management and highlight the effectiveness of these treatments in preventing disease progression [13].

Comparison with Other Studies

When compared to similar studies, the incidence rate of 16.1% observed in our study is higher

than the 7.9% reported in Dhaka but lower than the 20% found in some rural areas of India [14]. These variations could be attributed to differences in sample size, screening methods, and sociodemographic factors. For instance, the higher incidence in our study may reflect better detection rates due to the combined use of VIA and Pap smear/LBC. The differences in incidence rates can also be explained by the varying prevalence of HPV in different regions [15]. Studies have shown that HPV prevalence is influenced by factors such as sexual behavior, public health policies, and vaccination coverage. In Bangladesh, low vaccination rates and limited access to regular screening contribute to higher CIN incidence compared to countries with more comprehensive public health strategies [16-21].

Implications for Public Health
The significant association of CIN with socioeconomic and educational factors underscores the need for targeted public health interventions. Enhancing awareness and access to screening, particularly among women from lower socioeconomic backgrounds, could significantly reduce the burden of CIN and cervical cancer. Additionally, incorporating HPV vaccination into public health programs could provide long-term benefits in reducing CIN prevalence. From a practical perspective, the study highlights the feasibility and effectiveness of implementing combined VIA and Pap smear/LBC screening in low-resource settings. The high follow-up compliance observed suggests that with proper engagement and education, women are willing to participate in screening programs. These findings provide a strong foundation for developing tailored public health strategies aimed at increasing screening coverage and reducing cervical cancer incidence in Bangladesh and similar settings.

CONCLUSION
This study reveals a significant incidence of CIN among attending patients at Islami Bank Medical College Hospital in Rajshahi, Bangladesh, highlighting the urgent need for effective screening and educational programs. Key risk factors include early sexual activity and socioeconomic status. VIA and Pap smear/LBC are effective screening methods, and high follow-up compliance underscores the potential for successful intervention. Enhancing awareness and access to screening can significantly reduce CIN prevalence and prevent cervical cancer in this population.

Recommendations
➤ Implement community education programs on cervical cancer and screening importance.
➤ Make VIA and Pap smear/LBC screening more accessible and affordable, especially in rural areas.
➤ Develop systems to support timely follow-up and treatment for women with positive CIN results.

ACKNOWLEDGMENT

Author Contribution's
Dr. Mst. Abeda Khatun conceptualized the study, supervised the research process, and contributed to manuscript writing. Dr. Nasrin assisted in data collection and analysis, and Dr. Wahida Farzana Chowdhury was involved in data interpretation and manuscript revision. All authors reviewed and approved the final manuscript.

Article at a Glance
Study Purpose: This study aimed to assess the incidence and risk factors of Cervical Intraepithelial Neoplasia (CIN) among women attending the outpatient department at Islami Bank Medical College Hospital in Rajshahi, Bangladesh.

Key Findings: The study identified a CIN incidence rate of 16.1%, with significant risk factors including early sexual activity, multiple sexual partners, and lower socioeconomic status. The screening methods, VIA and Pap smear/LBC, were highly effective, showing 85% and 90% sensitivities, respectively.

Newer Findings Added: The research highlights that combining VIA and Pap smear/LBC enhances CIN detection, especially in low-resource settings. High follow-up compliance among participants indicates successful engagement with screening programs. Additionally, the study emphasizes the importance of socioeconomic and educational interventions in reducing CIN prevalence, suggesting targeted public health strategies to improve screening uptake and awareness.

Abbreviations
CIN: Cervical Intraepithelial Neoplasia
VIA: Visual Inspection with Acetic Acid
LBC: Liquid Based Cytology
LEEP: Loop Electrosurgical Excision Procedure
HPV: Human Papillomavirus
Pap: Papanicolaou (smear test)

Conflict of interest: None declared

REFERENCES
1. Shahida, S. M., Chowdhury, M., Shajahan, F., Rifat, J. A., Lubaba, A. S., Shamsuzzaman, S. M., & Goodman, A. (2023). Distribution of High-Risk Human Papillomavirus Genotypes among Women with Colposcopic Diagnosis of Cervical Intraepithelial Neoplasia in Bangladesh. *Journal of Cancer Therapy*, *14*(6), 277-290.

2. Bräutigam, K., Ehret, C., Schillinger, V., Baum, S., Klar, M., Köster, F., ... & Panning, M. (2020). Analysis of HPV genotype-specific concordance between EUROArray HPV and HPV 3.5 LCD-Array Kit in cervical samples of 163 patients. *Archives of Gynecology and Obstetrics*, *301*, 745-751.

3. Sung, H., Ferlay, J., Siegel, R. L., Laversanne, M., Soerjomataram, I., Jemal, A., & Bray, F. (2021). Global cancer statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA: a cancer journal for clinicians*, *71*(3), 209-249.

4. Nguyen, D. T. N., Simms, K. T., Keane, A., Mola, G., Bolnga, J. W., Kuk, J., ... & Canfell, K. (2022). Towards the elimination of cervical cancer in low-income and lower-middle-income countries: modelled evaluation of the effectiveness and cost-effectiveness of point-of-care HPV self-collected screening and treatment in Papua New Guinea. *BMJ global health*, *7*(3), e007380.

5. Nessa, A., Islam, T., Sultana, A., Khan, K. H., & ur Rashid, H. (2024). Staging and Management of Cervical Cancer at the Colposcopy Clinic of Bangabandhu Sheikh Sheikh Mujib Medical University (BSMMU), Bangladesh. *South Asian Journal of Cancer*, *13*(01), 017-026.

6. Chen, L., Liu, L. P., Wen, N., Qiao, X., & Meng, Y. G. (2019). Comparative analysis of robotic vs laparoscopic radical hysterectomy for cervical cancer. *World Journal of Clinical Cases*, *7*(20), 3185.

7. Krishnamurthy, A., & Ramshankar, V. (2020). Current status and future perspectives of molecular prevention strategies for cervical cancers. *Indian Journal of Surgical Oncology*, *11*(4), 752-761.

8. Khazaei, Z., Sohrabivafa, M., Momenabadi, V., Moayed, L., & Goodarzi, E. (2019). Global cancer statistics 2018: Globocan estimates of incidence and mortality worldwide prostate cancers and their relationship with the human development index. *Advances in Human Biology*, *9*(3), 245-250.

9. Taniya, S. A. (2023). *Awareness of cervical cancer vaccination among educated females: a Bangladeshi perspective* (Doctoral dissertation, Brac University).

10. Aktar, S., Akter, K., Akther, K., Begum, S., Islam, T., & Hasan, H. (2022). Knowledge Regarding the Prevention of Cervical Cancer of Adolescent Girls at Rajshahi Division.

11. Zhao, X., Zhao, S., Hu, S., Zhao, K., Zhang, Q., Zhang, X., ... & Zhao, F. (2019). Role of human papillomavirus DNA load in predicting the long-term risk of cervical cancer: a 15-year prospective cohort study in China. *The Journal of infectious diseases*, *219*(2), 215-222.

12. Chawla, B., Taneja, N., Awasthi, A. A., Kaur, K. N., & Janardhanan, R. (2021). Knowledge, attitude, and practice on screening toward cervical cancer among health professionals in India—A review. *Women's Health*, *17*, 17455065211017066.

13. Li, J., Wang, W., Yang, P., Chen, J., Dai, Q., Hua, P., & Liu, D. (2021). Analysis of the agreement between colposcopic impression and histopathological diagnosis of cervical biopsy in a single tertiary center of Chengdu. *Archives of Gynecology and Obstetrics*, 1-9.

14. Rahman, F., & Bhattacharjee, A. (2019). Awareness level of cervical cancer among rural women attending Manikgonj 250-bedded district hospital, Manikgonj. *Journal of Enam Medical College*, *9*(1), 34-40.

15. Debrah, O., Agyemang-Yeboah, F., Donkoh, E. T., & Asmah, R. H. (2021). Prevalence of vaccine and non-vaccine human papillomavirus types among women in Accra and Kumasi, Ghana: a cross-sectional study. *BMC Women's Health*, *21*, 1-12.

16. Ferlay, J., Colombet, M., Soerjomataram, I., Parkin, D. M., Piñeros, M., Znaor, A., & Bray, F. (2021). Cancer statistics for the year 2020: An overview. *International journal of cancer*, *149*(4), 778-789.

17. Gupta, R., & Rahman, M. T. (2024). Revolutionizing Cancer Care; Breakthroughs in Therapeutics and Diagnostics for Precision Oncology. *Asia Pacific Journal of Cancer Research*, *1*(1), 1-3.

18. Begum, M. M. M., Gupta, R., Sunny, B., & Lutfor, Z. L. (2024). Advancements in Early Detection and Targeted Therapies for Breast Cancer; A Comprehensive Analysis. Asia Pacific Journal of Cancer Research, 1(1), 4-13.

19. Shamim, T., Tahsin, S. T., & Rezvi, A. (2024). Barriers to VIA Screening in Underserved Populations of Rajshahi Division; A Qualitative Investigation. *Asia Pacific Journal of Nursing Research*, *1*(1), 4-10.

20. Begum, M., Yasmin, M., Hosna, A., Akter, R., & Nisha, Z. S. A. (2024). Assessment of Complications of Normal Delivery in A Selected District Hospital in Bangladesh. *Asia Pacific Journal of Nursing Research*, *1*(1), 11-20.

21. Chowdhury, S., Ara, R., Roy, S., Tanvir, S. M. S., Eva, F. N., Neela, T. M., ... & Hawlader, M. D. H. (2022). Knowledge, attitude, and practices regarding human papillomavirus and its' vaccination among the young medical professionals and students of Bangladesh. *Clinical and Experimental Vaccine Research*, *11*(1), 63.