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ORIGINAL ARTICLE

Cervical Cancer Knowledge, Attitudes, and Practices among Bangladeshi University Students

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ABSTRACT

Background: Cervical cancer (CC) is a key health concern in Bangladesh, yet the knowledge, attitudes, and preventive practices related to CC among university students in the country have not been thoroughly examined. This study sought to assess the knowledge, attitudes, and practices (KAP) regarding CC prevention among female university students at a public university in Dhaka, Bangladesh.

Methods: This cross-sectional quantitative study was conducted among 400 undergraduate students from Dhaka, recruited using stratified random sampling techniques. Data collection was conducted through a self-administered anonymous questionnaire from March-April 2024. Pearson correlation test was performed to determine the relationship between knowledge, attitudes, and practices related to CC using SPSS Version 27.

Results: Most students were single (90%), with 29% being postgraduates. Findings indicate that, while most students held positive attitudes toward CC prevention, their knowledge about the disease and its risk factors was limited. Only 4% of the students had received the human papillomavirus (HPV) vaccine, and just 1% had undergone Pap smear or Visual Inspection with Acetic Acid (VIA) testing. A statistically significant positive correlation was observed between knowledge and preventive practices ($r = 0.125$, $p = 0.015$), as well as between attitudes and practices ($r = 0.213$, $p < 0.05$).

Conclusion: The study underscores the need for targeted public health interventions to improve awareness, knowledge, and participation in CC prevention among university students. These insights are critical for informing policy aimed at strengthening cervical cancer prevention efforts in Bangladesh, particularly within the university student population.

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Introduction

Cervical cancer (CC) poses a major global public health challenge, being the fourth most common cancer among women worldwide and accounting for 6.6% of all female cancer cases.^{1,2} In the year 2020, an estimated 604,127 new cases of CC were reported, along with approximately 342,000 deaths attributed to the disease, with nearly 90% of these fatalities occurring in low- and middle-income countries.^{3,4} Projections suggest that by 2030, cancer-related fatalities could rise to 443,000, with 98% of these in middle- and low-income countries.^{3,4}

The primary cause of CC is human papillomavirus (HPV), with a global prevalence of 99.7% in cervical carcinoma cases. High-risk HPV genotypes, especially HPV-16 and HPV-18, are implicated in approximately 70% of CC cases globally, while other types—HPV-31, 33, 35, 45, 52, and 58—contribute to roughly 20% of cases.⁵ Additional risk factors include sexually transmitted infections, early initiation of sexual activity, multiple sexual partners, extended use of hormonal contraceptives, advanced age, high parity, and smoking.⁶

Prevention is the most effective approach to address the burden of CC, encompassing primary prevention with the HPV vaccine, secondary prevention via early detection and treatment of precancerous cells, and tertiary prevention for invasive cancer management.⁷ As part of its goal to eliminate cervical cancer by 2030, the WHO aims to vaccinate 90% of young women against HPV by age 16.⁴ Population-based screening methods, such as Pap smears or cytology, are crucial secondary prevention measures with high cure rates when pre-invasive disease is detected.^{7,8} With regular screenings and early treatment, cervical cancer is often preventable and, if caught early, treatable.^{5,7}

In Bangladesh, CC is the second most prevalent cancer among women, accounting for 12% of all

cancer cases. In 2018, there were 8,068 new cases and 5,214 deaths.⁹ Without intervention, it is projected that 505,703 women in Bangladesh could die from cervical cancer by 2070, potentially rising to 1,042,859 by 2120. Following WHO recommendations, the Bangladeshi government adopted a CC screening strategy involving visual inspection with acetic acid (VIA), expanding the program nationwide in 2023.¹⁰ Screening is recommended every five years for women over 30, but current coverage is limited, detecting less than 10% of cases at over 400 screening sites.⁹

Bangladesh has launched a countrywide HPV vaccination initiative targeting girls aged 10 to 14, including those not enrolled in school, with the goal of vaccinating 10 million females. The program, launched in the Dhaka division, is set to expand nationwide in three phases, with vaccines provided free of charge.¹¹ This effort aligns with the National Strategy for CC Prevention and Control (2017–2022), which supports HPV vaccination through the Expanded Program on Immunisation (EPI) to reduce HPV prevalence among adolescent girls.¹²

Raising awareness and promoting regular cancer screening are among the most effective strategies for CC prevention. Lack of knowledge and low awareness about prevention practices are key contributors to the rising incidence of CC. This study aims to assess the knowledge, attitudes, and practices (KAP) regarding CC prevention among female university students of reproductive age at a public university in Dhaka, Bangladesh, a demographic that has not previously been the subject of KAP research on CC prevention.

Methodology

This was a descriptive cross-sectional quantitative study conducted among enrolled

university students. Approximately 6,000 undergraduate and postgraduate students were registered at the university during the study conducted. The minimum sample size for the study was calculated using the Raosoft sample size calculator, based on a 95% confidence

interval and a 5% margin of error.¹⁴ This yielded a required sample size of 362. To account for potential non-response or incomplete questionnaires, the sample size was increased to 400 female students.

Table 1: Socio-economic Information of Participants

Variables	Categories	n	Percentage
Marital Status (n=380)	Married	37	9.7
	Single	342	90
	Having Relationship	1	0.3
Educational Status (n=378)	Postgraduate	111	29.4
	Undergraduate	267	70.6
Residential Status (n=373)	Urban	279	74.8
	Rural	94	25.2
Religious Status (n=376)	Muslim	330	87.8
	Non-Muslim	46	12.2

Multi-level sampling was adopted in selecting study participants. In Stage One, one department was randomly selected from four faculties within the university. In stage two, participants were selected using a simple random sampling technique, with a sampling frame comprising lists of students sourced from the registrar's office. Based on prior research, a self-administered, closed-ended, structured questionnaire was constructed for data collection.^{14, 15} The questionnaire consisted of four sections. Section A included socio-demographic information such as participants' ages, marital statuses, educational levels, places of residence, and religious affiliations. Sections B to D focused on the KAP of CC. The Knowledge section comprised 25 items, the Attitudes section had six items, and the Practice section contained nine items. Each correct answer was assigned 1 point, while incorrect

answers received 0 point. The higher the score, the more the knowledge, attitudes, and practices among the female university students. The questionnaire was first composed in English and subsequently translated into Bangla, the national language of Bangladesh. Two research assistants received training on data collection. Prior to data collection, the researcher liaised with the relevant lecturer to arrange access to the classroom. As scheduled, the researcher and a research assistant entered the classroom following the conclusion of the lecture. The researcher provided an overview of the study's aim and objectives, informed participants of the study's ethical approval by the institutional ethics committee, and emphasized the principles of anonymity and confidentiality. The research assistant then distributed informed consent forms and anonymized questionnaires to randomly selected participants. Upon

completion, the questionnaires were collected by the research assistant and subsequently reviewed for completeness by the researcher. Data were collected between March and April 2024. The data were analysed using SPSS 27. Data was thoroughly cleaned after entry to ensure

accuracy. We used frequency, mean, standard deviation, and percentages for descriptive analysis. Pearson's correlation test was used to determine the relationship between knowledge, attitude, and practice, where p-values of 0.05 or less indicated statistical significance.

Table 2: Knowledge regarding CC among the participants

Variables	Yes	Percent
Ever heard about cervical cancer	381	95.3
Knowledge of risk factors		
Early marriage	207	54.3
Sexually transmitted disease	296	77.7
Unhygienic condition of cervix	299	78.5
Multiple sexual partners	233	61.2
Conceive more than five times	70	18.4
Human Papilloma Virus	305	80.1
Long term use of contraceptives > 5 years	139	36.5
Habit of using tobacco	75	19.7
Habit of using alcohol or substances	69	18.1
Knowledge of prevention of Ca cervix		
Early marriage	207	54.3
Prevention of chronic infection	305	80.1
HPV vaccine use	294	77.2
Avoid of multiple sexual partners	244	64
Continuous use of condom	117	30.7
Knowledge of symptoms of CA cervix		
Heaviness in lower abdomen	146	38.3
Foul smelling vaginal discharge	270	70.9
Weight loss	128	33.6
Bleeding in between periods	214	56.3
Abdominal Pain after intercourse	149	39.1
Bleeding after intercourse	113	29.7
Vaginal bleeding after menopause	194	50.9
Knowledge of treatments		
Cervical screening can help in the early detection of the precancerous lesion	338	88.7
Early detection of the precancerous lesion can help in the prevention and treatment of cervical cancer	359	94.4
Precancerous lesion takes a long time to progress to cervical cancer	177	46.5
VIA Test is used for CC screening	118	31.0
Pap Smear Test is used for CC screening	63	16.5

Data were captured, coded, cleaned, and analysed using SPSS version 27. Descriptive statistics, including frequencies, means, standard deviations, and percentages, were computed. Pearson's correlation analysis was employed to assess the relationships between knowledge, attitude, and practice, with a p-value of <0.05 considered statistically significant

Ethical Approval

The Human Research Ethics Committee of Jagannath University approved the study (Ref no: HREC/JnU/Psy/08-2024). Participants provided informed consent before data collection, and their participation was entirely voluntary. They were informed about the study's overarching objective, and rapport was

established to create a conducive atmosphere. Participants were assured that the research was

Results

Four hundred students completed the questionnaire. Most of the students (90%) were single, and over a quarter (29%) were postgraduate students. Additionally, 75% of the students resided in urban areas, and 88% identified as Muslim (Table 1).

Nearly all students (95%) had heard of CC. However, only 53% answered correctly on the

conducted solely for scholarly purposes and that their comments would remain confidential. overall knowledge score. Regarding CC risk factors, the majority were aware of HPV (80%), followed by unhygienic cervical conditions and sexually transmitted diseases (78%). Fewer students recognized having more than five pregnancies (18%) or substance use (18%) as risk factors. For CC prevention, students most cited preventing chronic infections (80%), HPV vaccination (77%), and avoiding multiple sexual partners (64%) (Table 2).

Table 3: Participants' attitudes regarding CC screening

Variables	Yes (%)	No (%)
Advise other women to do a VIA test or Pap smear test	358 (94.7)	20 (5.3)
Ever recommended a VIA or Pap smear test to any women	331 (88.0)	45 (12.0)
Willing to undergo a VIA test in future	341 (91.7)	31 (8.3)
Believe young women should screen for HPV early	276 (75.2)	91 (24.8)
Believe young women should be vaccinated for HPV	282 (76.4)	87 (23.6)
Recommend regular screening for the early detection of precancerous lesion	352 (93.1)	26 (6.9)

In response to inquiries regarding CC symptoms, 71% reported foul-smelling vaginal discharge, 56% indicated bleeding between menstrual periods, and 51% observed vaginal bleeding following menopause. Regarding treatment, the majority of students emphasized the importance of cervical screening for the early identification of precancerous lesions (88%) and believed that early detection could facilitate prevention and treatment efforts (94%). Nonetheless, fewer than one-third were aware of the VIA test, and only 16.5% had knowledge of the Pap smear test (Table 2).

Students exhibited positive attitudes towards CC prevention (Table 3). The majority of students (>85%) expressed agreement on several key

points: 95% would advise other women to undergo a VIA or Pap smear test, 88% had already recommended these tests to others, 92% were willing to undergo a VIA test in the future, and 93% supported regular screening for the early detection of precancerous lesions.

Only 4.2% of students had received the HPV vaccine, 1% had undergone a Pap smear, and another 1% had completed a VIA test. Most students (93%) reported using napkins or clean cloths during menstruation, and 89% sought medical treatment for female health issues (Table 4).

The study demonstrated a very weak positive connection between knowledge of CC and related practices ($r = 0.125$, $p = 0.015$). A

modest yet substantial positive relation was identified between attitudes towards CC and preventive actions ($r = 0.213$, $p < 0.05$) (Table 5).

Discussion

This study aimed to thoroughly investigate the KAP of Bangladeshi female university students regarding CC prevention. It offers insights into how this demographic perceives and engages with CC prevention strategies. Given the rising global incidence of CC, especially in low- and middle-income countries, this research sheds light on important gaps in awareness and practice, while also highlighting positive attitudes that could be leveraged to improve prevention efforts.

The findings of the study suggest that while the majority of students demonstrated a favourable attitude toward CC prevention, there was a notable deficiency in their comprehensive

knowledge of the subject. This gap in understanding is concerning, as it suggests that despite general support for preventive strategies, students may lack critical information regarding the disease's etiology, its risk factors, and the importance of early detection for effective intervention. Nearly all of the students exhibited inadequate practical engagement in terms of undergoing screenings, vaccinations, or other preventive measures. These findings align with global patterns, wherein knowledge and practice frequently trail behind attitudes towards public health measures. For example, an Indian study conducted among women aged 12-65 years demonstrated that adequate knowledge, a positive attitude, and appropriate practices regarding cervical cancer screening were 20.31%, 43.64%, and 13.22%, respectively.¹³ The majority of undergraduate female students enrolled in higher education institutions in Cabo Verde exhibited limited knowledge and negative attitudes toward cervical cancer.¹⁵

Table 4: Participants' risk and preventive practices

Variables	Yes (%)	No (%)
Smoke	3 (0.8)	373 (99.2)
Previously gone for Pap examination	3 (0.8)	376 (99.2)
Vaccinated against HPV	16 (4.2)	364 (95.8)
Had more than one sex partner	2 (0.5)	369 (99.5)
Use condom during sex	38 (13.0)	267 (87.0)
Use hormonal oral contraception	14 (4.1)	325 (95.9)
Had a VIA test	5 (1.3)	370 (98.7)
Use napkin or clean cloth during menstruation	355 (93.4)	25 (6.6)
Seek medical treatment for female disease	336 (88.9)	42 (11.1)

One of the key contributions of this research is its provision of evidence on KAP regarding CC prevention among Bangladeshi female

university students. The results suggest that educational initiatives aimed at raising awareness, facilitating access to screenings, and

advocating for vaccinations could significantly enhance students' participation in preventive measures. Such interventions would be particularly valuable because, while a significant proportion of students were aware of CC, more than half lacked adequate knowledge about the disease, its risk factors, and the available prevention methods.

The findings of this study are consistent with a previous study conducted among women aged 30 years and above in Dhaka, Bangladesh.¹⁶ The study reported that women with sufficient knowledge were significantly more likely to undergo VIA screening compared to those with insufficient knowledge (39%; Odds Ratio = 2.5). A recent South African study conducted among university students reported that overall, 88.9% of students demonstrated adequate knowledge of cervical cancer, and 67.9% were knowledgeable about the HPV vaccine. In comparison, only 33.7% had sufficient knowledge of the human papillomavirus (HPV) itself.¹⁷ Additionally, a review study in India reported that only 40% of females had adequate knowledge of cervical cancer prevention.¹³ This trend points to a broader need for comprehensive public health education on CC prevention, particularly in regions with similar socio-economic and educational contexts. When examining students' awareness of the risk factors for CC, most participants correctly identified sexually transmitted infections (STIs) and HPV as significant contributors to the development of the disease. It is important to note that these findings are noteworthy when compared to research carried out in Saudi Arabia and Ethiopia, where the levels of knowledge were drastically different. In Saudi Arabia, 67% of students were aware of the role of STIs and HPV in causing cervical cancer, whereas only 15.6% of Ethiopian students demonstrated such awareness.¹⁸ The relatively higher level of awareness among Bangladeshi students may be

attributed to their increased access to online health resources, international media, and global awareness campaigns regarding CC and HPV. These resources have likely played a role in enhancing students' knowledge and understanding of the disease and its risk factors. When it comes to the awareness of symptoms, more than two-thirds of the students (71%) were aware that foul-smelling vaginal discharge is a symptom of CC, and more than half of the students (56%) identified abnormal vaginal bleeding as another key symptom. These findings reflect a stronger awareness compared to Ethiopian students, where only 32% and 22% of respondents, respectively, recognized these symptoms.¹⁹ Similarly, a Saudi Arabian study found that 50% of students were aware of irregular vaginal bleeding, and 49% identified pelvic discomfort as symptoms of CC.²⁰ Although Bangladeshi students exhibited a comparatively greater awareness of symptoms, these findings highlight the necessity for further education on the early warning signals of CC, which could facilitate early detection and boost treatment outcomes.

Despite the gaps in knowledge and practice, the students displayed overwhelmingly positive attitudes towards CC prevention. More than 85% of participants showed robust support for frequent cervical cancer screenings, with 95% affirming they would advocate for early detection of precancerous lesions to other women. Furthermore, 92% expressed their readiness to participate in a VIA test in the future, while 95% stated they would endorse the VIA or Pap smear test to others. These attitudes align with research conducted in Ethiopia, where 67.7% of students had favourable opinions towards early diagnosis and believed that screening could aid in the prevention of cervical cancer.¹⁸ Similarly, it was observed that students in China demonstrated a strong willingness to receive the HPV vaccine,

indicating a comparably favourable perspective on cervical cancer prevention.¹⁷

The present study revealed that only 4% of the students had received the HPV vaccine, and just 1% had undergone screening procedures such as the Pap smear or VIA test. While the vaccination rate in this study is higher than that reported in Ethiopia, where none of the students had been vaccinated, it remains lower than rates reported in Hong Kong, Nigeria, and Turkey.^{21,22,23} The main reasons cited for not undergoing screening included a lack of symptoms, feeling healthy, limited awareness, fear of the procedure, and discomfort with pelvic examinations. These barriers highlight critical areas where targeted interventions, such as awareness campaigns and health education, can have a significant impact on improving screening rates.

The study identified a notable positive correlation between awareness of CC and

involvement in preventive measures ($r = 0.125$, $p = 0.015$), suggesting that students with a greater understanding are more likely to engage in preventive actions. Additionally, the study revealed a positive correlation between students' attitudes and their practices related to CC ($r = 0.213$, $p < 0.05$). These findings are like those from research conducted in Uganda, which reported a weak association between attitude and practice ($r = 0.206$, $p = 0.001$) regarding CC screening uptake. A Saudi Arabian study similarly identified a positive correlation between students' educational levels and attitudes toward CC.²⁰ The Ethiopian study revealed that pupils with favourable attitudes were 1.88 times more likely to possess knowledge about HPV vaccinations. At the same time, those with a substantial understanding of HPV exhibited a 1.6 times more favourable attitude towards vaccination.²⁴

Table 5: Relationship between knowledge, attitude, and practice regarding CC

		Knowledge	Attitude	Practice
Knowledge	Pearson Correlation	1		
	Sig. (2-tailed)			
Attitude	Pearson Correlation	-,042	1	
	Sig. (2-tailed)	,410		
Practice	Pearson Correlation	,125*	,213**	1
	Sig. (2-tailed)	,015	<,001	

*Correlation is significant at the 0.05 level (2-tailed), **Correlation is significant at the 0.01 level (2-tailed).

The findings of this study represent a crucial first step in understanding the current state of KAP regarding CC among Bangladeshi female university students. These insights can inform the development of targeted educational programs and policies designed to increase awareness, promote early detection, and

encourage greater participation in preventive practices. However, the study does have several limitations. The data, derived from a single university in Bangladesh, may lack generalisability to the entire population of university students in the nation. Moreover, the utilisation of self-reported data may have

engendered response biases, including underreporting or exaggeration, while recollection bias could have compromised the accuracy of the responses. Furthermore, due to the cross-sectional nature of this study, causal links between knowledge, attitudes, and practices could not be determined.

Strengths and Limitations of the Research

This study has several strengths: it is among the first attempts to assess knowledge, attitude, and practice towards cervical cancer among female university students in a public university in Bangladesh, thereby filling an important gap in current literature. The use of a pretested, interviewer-administered questionnaire and a large, proportionally randomized sample (n = 400) increased the validity and generalizability of the findings. However, limitations include its focus on a single university, limiting broader applicability, and its cross-sectional design, which prevents causal inferences. Self-reported data may introduce bias and recall errors, and low variability in screening and vaccination rates may weaken correctional analyses.

Policy Implications and Future Research

At the policy level, incorporating cervical cancer (CC) education within university curricula and HPV vaccine and VIA screening among university students can greatly enhance awareness and coverage rates. Educational and public health interventions to overcome prevalent misconceptions and socio-cultural barriers are also important. There needs to be increased research conducted across various geographical settings to gain a comprehensive appreciation, using qualitative methods to explore contextual factors, and assessing intervention-based strategies such as awareness and peer education sessions for improved knowledge and adoption of protective behaviours.

Conclusions

Although, they hold favourable views, the study reveals that female university students in Bangladesh exhibit poor practices and gaps in their knowledge regarding the prevention of CC. These difficulties could be addressed by the government through the implementation of national awareness programs, the expansion of screening services, and an increase in healthcare funds designed to focus on the prevention of CC.

Authors' Contributions

MH and MAU conceptualized and designed the study, coordinated the research activities, and led the drafting of the manuscript. MH and MAU contributed to the development of the study methodology, supervised data collection, and assisted with data interpretation. MH, MMR, and MAP were responsible for data analysis and contributed to the interpretation of the results. All authors reviewed and approved the final version of the manuscript and agreed to be accountable for all aspects of the work.

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