Cervical Cancer Prevention Knowledge and Practices Among Reproductive-Age Women: A Cross-Sectional Study at a Tertiary Hospital in Dhaka

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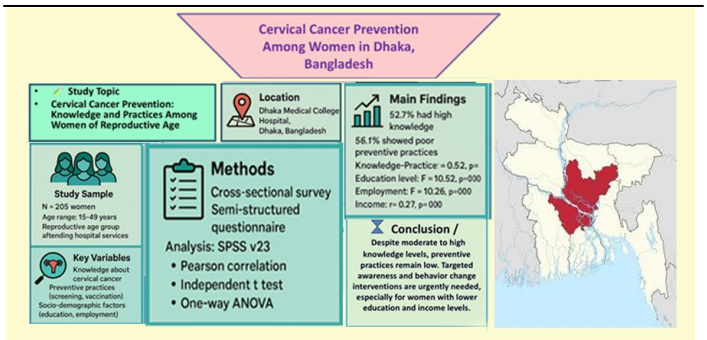
ABSTRACT

While cervical cancer is both preventable and curable if detected early, knowledge and preventive practices among reproductive-age women in Bangladesh remain largely underexplored, particularly in urban settings. This study aims to address this gap through an assessment of cervical cancer prevention knowledge and practices among female patients at a tertiary hospital in Dhaka. A cross-sectional survey was conducted at Dhaka Medical College Hospital over a one-month period, with data collected from 205 women using a semi-structured questionnaire. SPSS version 23 was utilized for data analysis, including Pearson correlation, two-sample t-test, and one-way ANOVA. The results showed that 52.7 percent of participants had high knowledge of cervical cancer prevention, while 56.1 percent exhibited poor preventive practices. A significant correlation ($r = 0.52$, $p < 0.001$) was found between knowledge and practice. Additionally, factors like level of secondary education ($F = 10.52$, $p < 0.001$), employment status ($F = 10.26$, $p < 0.001$), and monthly income ($r = 0.27$, $p < 0.001$) were significantly associated with knowledge. The findings indicate that, despite high levels of knowledge, preventive practices remain poor, highlighting the need for enhanced awareness initiatives and behavior change interventions aimed at improving cervical cancer prevention. This disconnect between awareness and practice underscores the importance of designing culturally sensitive and accessible behavior change interventions, particularly targeting populations with lower educational attainment and those who are unemployed, to translate knowledge into sustained preventive practices.

ABSTRAK

Meskipun kanker serviks dapat dicegah dan disembuhkan jika terdeteksi sejak dini, pengetahuan dan praktik pencegahan di kalangan perempuan usia reproduksi di Bangladesh masih belum banyak diteliti, khususnya di wilayah perkotaan. Penelitian ini bertujuan untuk mengisi kesenjangan tersebut dengan menilai pengetahuan dan praktik pencegahan kanker serviks pada pasien perempuan di sebuah rumah sakit tersier di Dhaka. Survei potong lintang dilakukan di Rumah Sakit Dhaka Medical College selama satu bulan, dengan pengumpulan data dari 205 perempuan menggunakan kuesioner semi-terstruktur. Analisis data dilakukan menggunakan SPSS versi 23, termasuk uji korelasi Pearson, uji t dua sampel, dan ANOVA satu arah.Hasil penelitian menunjukkan bahwa 52,7 persen partisipan memiliki pengetahuan tinggi tentang pencegahan kanker serviks, namun 56,1 persen menunjukkan praktik pencegahan yang rendah. Ditemukan korelasi yang signifikan antara pengetahuan dan praktik ($r = 0,52$, $p < 0,001$). Selain itu, beberapa faktor seperti tingkat pendidikan menengah ($F = 10,52$, $p < 0,001$), status pekerjaan ($F = 10,26$, $p < 0,001$), dan pendapatan bulanan ($r = 0,27$, $p < 0,001$) secara signifikan berhubungan dengan tingkat pengetahuan.Temuan ini menunjukkan bahwa meskipun tingkat pengetahuan tinggi, praktik pencegahan tetap rendah, sehingga menekankan perlunya inisiatif peningkatan kesadaran dan intervensi perubahan perilaku untuk meningkatkan upaya pencegahan kanker serviks. Ketidaksesuaian antara kesadaran dan praktik ini menunjukkan pentingnya merancang intervensi perubahan perilaku yang peka terhadap budaya dan mudah diakses, khususnya dengan menyasar kelompok dengan tingkat pendidikan rendah dan perempuan yang tidak bekerja, agar pengetahuan yang dimiliki dapat diterapkan dalam praktik pencegahan yang berkelanjutan.

GRAPHICAL ABSTRACT



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INTRODUCTION

Efforts to address cervical cancer align with global and national priorities, including Sustainable Development Goal 3.4, which aims to reduce premature mortality from non-communicable diseases, the WHO Global Strategy to Eliminate Cervical Cancer (World Health Organization [WHO], 2020), and Bangladesh's National Strategy for Cervical Cancer Prevention and Control (Directorate General of Health Services [DGHS], 2017), underscoring the urgency of improving awareness and preventive practices among women of reproductive age. Cervical cancer is a malignancy that originates in the cells of the cervix — the lower part of the uterus that connects to the vagina (Baral et al., 2022). Cervical cancer is the second most common cancer in women in Bangladesh (Qayum et al., 2022). In Bangladesh, approximately 11,956 new cases of cervical cancer are diagnosed annually, and 6,582 women die of the disease (Directorate General of Health Services, 2017).

Globally, cervical cancer is the second most common cancer among women. It is a devastating disease for women around the world and is the leading cause of female cancer deaths in developing countries (Singh et al., 2023). It is a public health problem, accounting for 230,000 deaths every year, of which more than 80% occur in developing countries. In India, approximately 132,000 new cases and 74,000 deaths due to cervical cancer are reported annually (Satapathy et al., 2024). Worldwide, cervical cancer is one of the leading causes of cancer-related mortality in women. Most deaths occur in low- to middle-income countries (WHO, 2021). Globally, 604,000 women were diagnosed with cervical cancer and 304,000 deaths occurred (Qayum et al., 2022). About 96,922 new cervical cancer cases are diagnosed annually in India. While incidence is declining in developed nations, cervical cancer continues to pose a substantial burden on developing countries, where the risk of developing cervical cancer is 35% greater compared to developed countries. About 25% of global mortality due to cervical cancer occurs in India (Taneja et al., 2021).

The most common symptoms of cervical cancer are abdominal pain, bleeding before or after sexual intercourse, persistent back pain, urinary urgency, white vaginal discharge, and foul-smelling vaginal odor (Kadian et al., 2021). In many developing countries, women's knowledge of cervical cancer is very limited. It has been demonstrated that the vast majority of women in some countries are unaware of cervical cancer and unfamiliar with cervical screening procedures (Banik et al., 2022). According to hospital records, cancer is the sixth leading cause of death and accounts for 10% of overall mortality in Bangladesh. Therefore, this study was carried out to assess knowledge and awareness of cervical cancer risk factors and screening procedures in the Gynae Outpatient Department of Chittagong Medical College Hospital, a tertiary hospital in Bangladesh (Papri et al., 2015). The burden of cervical cancer in Bangladesh is particularly acute due to poverty, early marriage, multiple marriages, high parity, and illiteracy. In developing countries, women's knowledge about cervical cancer risk factors remains limited (Papri et al., 2015).

Hospital records indicate that cancer is the sixth leading cause of death in Bangladesh, accounting for approximately 10% of total mortality. Therefore, this study was conducted to assess knowledge and awareness of cervical cancer risk factors and screening procedures among women attending the Gynecology Outpatient Department of Chittagong Medical College Hospital, a tertiary care facility in Bangladesh (Papri et al., 2015). The burden of cervical cancer in Bangladesh is particularly severe due to factors such as poverty, early marriage, multiple marriages, high parity, and low literacy levels. In many developing countries, women possess limited knowledge regarding cervical cancer risk factors (Kadian et al., 2021). This reflects a broader pattern of inadequate public health awareness in low-resource settings.

Table 1
Socio-demographic information of the respondents

Item	Frequency (N)	Percentage (%)
Age(years)	Age (years): 32.48 ± 8.80 (Range: 17–48)	
Religion		
Muslim	167	81.5
Hindu	29	14.1
Christian	7	3.4
Buddhist	2	1
Marital status		
Married	177	86.3
Separate	9	4.4
Divorce	10	4.9
Widow	9	4.4
Educational qualification		
Illiterate	31	15.1
Primary education	47	22.9
Secondary education	78	38
Above secondary education	49	23.9
Occupation		
Service	19	9.3
Business	8	3.9
Housewife	171	83.4
Others	7	3.4
Monthly family income	26,073 ± 15,145.68 Taka (Range: 5,000–85,000)	
Family type		
Nuclear	143	69.8
Extended	62	30.2
Age of marriage	13.88 ± 8.96 years (Range: 1–35)	
Number of children		
0	27	13.2
1-2	113	55.1
3-4	58	28.3
> 5	7	3.4
Birth contraception do you prefer		
Pill	67	32.7
Injection	25	12.2
Condom	35	17.1
others	78	38
Friend or family died of cervical cancer		
Yes	26	12.7
No	179	87.3

A cross-sectional study aimed to describe the trends and patterns of cancer cases presented at a specialized hospital in Dhaka (Chowdhury et al., 2022). In Bangladesh, cervical cancer is often diagnosed at an advanced stage, primarily because women seek medical attention too late. An earlier study found that although Bangladeshi women acknowledged the protective benefits of Pap testing, most failed to undergo screening due to limited awareness and inadequate healthcare infrastructure (Mustari, 2019). These findings suggest systemic barriers within the healthcare system that contribute to poor screening uptake.

Numerous international studies examining women's awareness and preventive behaviors related to cervical cancer have consistently revealed significant gaps. For instance, a study in Nigeria by Oyediran et al. (2021) re-

Table 2
Knowledge regarding cervical cancer prevention of the respondents

Item	Frequency(N)	Percentage (%)
Know that human papilloma virus can cause cancer		
No	112	54.6
Yes	93	45.4
Think that family history increases risk		
No	107	52.2
Yes	98	47.8
Poor hygiene affects cervical cancer		
No	109	53.2
Yes	96	46.8
Cervical cancer is caused by premature pregnancy		
No	94	45.9
Yes	111	54.1
Belief that multiple partners increase risk		
No	51	24.9
Yes	154	75.1
Having more children can lead to cervical cancer		
No	104	50.7
Yes	101	49.3
Proper diet list help prevent cervical cancer		
No	91	44.4
Yes	114	55.6
Prolonged use hormonal pillsmay cause cancer		
No	86	42
Yes	119	58
Condom use can prevent cancer		
No	95	46.3
Yes	110	53.7
Know that pain during sex as symptom		
No	94	45.9
Yes	111	54.1
Know that Cancer causes vaginal discharge		
No	87	42.4
Yes	118	57.6
Know that bleeding after sex as symptom		
No	93	45.4
Yes	112	54.6
Know that cancer causes heavy periods		
No	83	40.5
Yes	122	59.5
Personal hygiene can minimize the causes of cancer		
No	52	25.4
Yes	153	74.6
Know about aware early screening helps		
No	107	52.2
Yes	98	47.8
Know that pap smear test can detect cervical cancer		
No	97	47.3
Yes	108	52.7
Know about vaccine that can prevent cervical cancer		
No	60	29.3
Yes	145	70.7
Know that avoiding tobacco reduces risk		
No	70	34.1
Yes	135	65.9
Know that late marriage lowers risk		
No	66	32.2
Yes	139	67.8

Table 3
Information on the practice of cervical cancer prevention of the respondents

Item	Frequency(N)	Percentage (%)
Participated in any awareness program		
Never	147	71.7
Sometimes	31	15.1
Often	17	8.3
Always	10	4.9
Use napkin or clean cloth during menstruation		
Never	37	18
Sometimes	40	19.5
Often	22	10.7
Always	106	51.7
Seek medical treatment for female disease		
Never	24	11.7
Sometimes	39	19
Often	83	40.5
Always	59	28.8
Have cervical cancer screening routinely		
Never	113	55.1
Sometimes	29	14.1
Often	15	7.3
Always	48	23.4
Consult for gynecology issues		
Never	53	25.9
Sometimes	49	23.9
Often	54	26.3
Always	49	23.9
Encourage screening for others		
Never	118	57.6
Sometimes	25	12.2
Often	19	9.3
Always	43	21
I wish to take cervical cancer vaccination		
Never	83	40.5
Sometimes	22	10.7
Often	20	9.8
Always	80	39
Cervical cancer vaccine is considered safe		
Never	54	26.3
Sometimes	21	10.2
Often	25	12.2
Always	105	51.2

ported that although many women had heard of cervical cancer, their actual awareness and screening practices were insufficient. Similarly, women in Ethiopia demonstrated moderate awareness but minimal participation in screening procedures (Aweke et al., 2017). This limited engagement is often attributed to misinformation, stigma, and fear. These trends mirror the situation in Bangladesh and underline a global challenge in cervical cancer prevention among women in low- and middle-income countries. Despite the availability of cervical cancer screening programs, Saeed et al. (2021) identified cultural and psychological barriers as major impediments to women's participation. In South Africa, Makura et al. (2015) highlighted that limited healthcare access and low health literacy significantly hindered effective prevention efforts. Such international evidence reinforces the urgency of tailored interventions to enhance knowledge and facilitate access to screening services in similar contexts.

Many studies have primarily concentrated on rural communities or broad population-level assessments, with an emphasis on identifying general awareness and structural

Table 4
Relationship between socio demographic characteristics and knowledge

Variable	Knowledge	
	Mean ± SD/ N (%)	t/F/r (*p*)
Age(years)	-	0.05(0.495)
Religion		
Muslim	0.58 ± 0.24759	-0.16 (0.874)
Non-Muslim	0.57 ± 0.24279	
Marital status		
Married	0.57 ± 0.24956	0.07 (0.947)
Other	0.57 ± 0.22772	
Educational qualification		
Illiterate	0.50 ± 0.25883	
Primary education	0.46 ± 0.23909	10.52 (0.000)
Secondary education	0.58 ± 0.22231	
Above secondary education	0.71 ± 0.21596	
Occupation		
Service	0.77 ± 0.21370	
Business	0.58 ± 0.22855	10.26 (0.000)
Housewife	0.54 ± 0.23904	
Monthly family income	-	0.27 (0.000)
Family type		
Nuclear	0.58 ± 0.25436	0.63 (0.526)
Extended	0.56 ± 0.22722	
Age of marriage	-	0.02 (0.759)
Number of children		
0	0.46 ± 0.25668	
1-2	0.60 ± 0.23799	4.44 (0.013)
3-4	0.60 ± 0.23496	

Note: SD=Standard Deviation, t= for Two sample t-test, F= One way ANOVA

barriers. However, these studies often lack granularity in understanding how individual sociodemographic factors shape knowledge and preventive behaviors in specific urban healthcare settings. Although informative, most of these studies focus on rural or community-based settings. To date, there remains a paucity of evidence from tertiary-level hospitals in urban Bangladesh, where women's contact with healthcare services presents a unique opportunity for targeted health education and intervention. By contrast, the present study addresses a critical gap by investigating reproductive-age women attending a tertiary hospital in urban Bangladesh. This study is novel in its approach to analyzing the statistical association between sociodemographic variables and both knowledge and preventive practices, thereby identifying which subgroups are most at risk of not translating awareness into action. It offers unique insights from an underrepresented population and supports the development of targeted, context-specific public health strategies.

METHODS

Study Design and Setting

A hospital-based cross-sectional study was conducted at the Gynae Outdoor Patients Department of Dhaka Medical College Hospital in Dhaka. This facility is a 2,600-bed tertiary care hospital, serving patients from across the country by providing advanced treatment and specialized care. The study was conducted over one year, from July 2023 to June 2024.

Study Population and Recruitment Criteria

Women who were either inpatients or outpatients seeking gynecological care at Dhaka Medical College Hospital, a well-known tertiary

Table 5
Relationship between socio demographic characteristics and practice

Variable	Practice	
	Mean ± SD/N(%)	t/F/r (p)
Age(years)	-	-0.07(.312)
Religion		
Muslim	2.45 ± 0.71365	3.05 (0.003)
Non-Muslim	2.07 ± 0.72524	
Marital status		
Married	2.40 ± 0.72813	
Separate	2.18 ± 0.73281	0.82 (0.443)
Widow	2.42 ± 0.78312	
Educational qualification		
Illiterate	1.97 ± 0.77373	
Primary education	2.11 ± 0.61842	12.60 (0.000)
Secondary education	2.44 ± 0.70444	
Above secondary education	2.80 ± 0.60854	
Occupation		
Service	3.00 ± 0.66940	
Business	2.30 ± 0.83969	12.01 (0.000)
Housewife	2.30 ± 0.69051	
Monthly family income	-	0.010 (0.165)
Family type		
Nuclear	2.46 ± 0.72083	2.43 (0.016)
Extended	2.20 ± 0.72309	
Age of marriage	-	0.010 (0.165)
Number of children		
0	2.40 ± 0.69640	
1-2	2.43 ± 0.71341	1.00 (0.369)
3-4	2.27 ± 0.78003	

Note: SD=Standard Deviation, t= for Two sample t-test, F= One way ANOVA. P value less than (0.05) is significant.

care center in Bangladesh, comprised the study population. Using predetermined inclusion and exclusion criteria, participants were chosen to guarantee the quality and applicability of the data. Married women aged 15–49 who were in the hospital during the data collection period and able to complete the structured questionnaire on their own were eligible participants. The study excluded women who declined to participate or were unable to provide meaningful responses due to physical or mental limitations. By ensuring a targeted sample of women in their reproductive years who were typical of those seeking gynecological care in an urban tertiary hospital environment, this recruitment method enhanced the study's external validity and contextual relevance.

Sample Size and Sampling Technique

Using a 95% confidence level and a 5% margin of error, the study's sample size was established using a conventional statistical approach for determining proportions. To determine the appropriate sample size, the estimated prevalence of cervical cancer preventive information from a prior study was used. A total of 205 women were chosen for participation based on these criteria. Data were gathered from March 1 to March 30 (excluding Fridays), with an average of 18 interviewees per day. Participants who satisfied the inclusion criteria were recruited through purposive sampling, which ensured the selection of women most pertinent to the study's objectives.

Questionnaire Development

In order to ensure content relevance

Table 6
Knowledge and practice levels among participants

Category	Frequency (N)	Percentage (%)
Knowledge Level		
High	102	52.70%
Low	97	47.30%
Mean Score	10.91	
Practice Level		
Good	90	43.90%
Poor	115	56.10%
Mean Score	19.05	

and compatibility with the study's aims, the questionnaire utilized in this investigation was modified from previously published and peer-reviewed research instruments. It was divided into three sections: knowledge of cervical cancer prevention, preventive practices, and socio-demographic variables. Yes/No questions comprised the knowledge component, while a four-point Likert scale (never, sometimes, often, always) was utilized for the practice section. Two public health experts and a gynecological consultant reviewed the modified questionnaire to verify construct validity and cultural appropriateness. Based on their feedback, minor revisions were made. Although formal psychometric testing, such as Cronbach's alpha, was not conducted in this study, the scoring methodology was based on verified standards provided by Assoumou et al. (2015) for practice (mean = 19.05) and Qayum et al. (2021) for knowledge (mean = 10.91). Scores above these cutoff points were classified as either good practice or high knowledge. This method assisted in maintaining consistency with previous research while adapting to the specific context of the local community.

Data Collection Procedure

Data were collected through face-to-face interviews conducted from 8:00 AM to 2:00 PM on official working days. Each interview lasted no more than 20 minutes. Ethical considerations were strictly adhered to, with informed consent obtained from all participants. The study was approved by the Institutional Review Board (IRB) at Universal Medical College Research Center, and permission was obtained from the Director of Dhaka Medical College Hospital. Participants were informed of their right to withdraw at any point, and confidentiality was ensured.

Statistical Analysis

Data were analyzed using SPSS version 20.0. Descriptive statistics (mean, standard deviation, frequencies) and inferential statistics (Pearson correlation, two-sample t-tests, ANOVA) were applied to examine associations between variables. A p-value of <0.05 was considered statistically significant. Results were presented through tables and figures.

Ethical Considerations

Throughout the study process, ethical integrity was maintained in compliance with accepted guidelines for research involving human subjects. To ensure that the study complied with both national and institutional ethical standards, ethical approval was obtained from the Universal Medical College Research Center prior to data collection. After being fully informed about the goals, methods, and participant rights related to the study, each participant provided signed informed consent. Respondents were made aware that participation was entirely voluntary and that they could withdraw at any time without any consequences. All personal identifiers were removed to preserve participant privacy and ensure confidentiality and anonymity. Additionally, the data obtained were used solely for academic and research purposes, ensuring that participant information was handled with the utmost confidentiality and ethical responsibility.

RESULTS

Participant Characteristics

A total of 205 participants were recruited for the study, with a mean age of 32.48 years (SD = 8.80). The majority of participants were Muslims (81.5%), married women (86.3%), and homemakers (83.4%). The mean age at marriage was 13.88 years (SD = 8.96), and the average number of children was 2.51, with 55.1% having two or more children. Most participants (69.8%) belonged to nuclear families, and the mean monthly family income was 26,073 Bangladeshi Taka. With respect to family planning, 38.0% reported using alternative methods of contraception, while 87.3% indicated that no one in their family had died from cervical cancer (Table 1).

Knowledge of Cervical Cancer Prevention

Among the 205 participants, 54.6% were aware that Human Papillomavirus (HPV) could lead to cervical cancer, and an equal percentage (54.6%) knew that a family history of cervical cancer could influence the health of future generations. A slight majority (53.2%) recognized poor hygiene as a contributing factor to cervical cancer. Additionally, 75.1% believed that having multiple sexual partners could increase the risk, while 50.7% thought that having more children could be a contributing factor. More than half (55.6%) acknowledged that maintaining a proper diet could help prevent cervical cancer.

Regarding preventive practices, 53.7% were aware that using condoms during sexual intercourse could reduce the risk of cervical cancer, and 54.1% identified pain during intercourse as a possible symptom. A significant proportion (59.5%) recognized that cervical cancer could result in heavier menstrual bleeding, while 74.6% understood that maintaining personal hygiene could mitigate the risk. Furthermore, 52.7% of participants were aware that a Pap smear could be used to detect cervical cancer, and 70.7% had knowledge of the HPV vaccine (Table 2).

Practice of Cervical Cancer Prevention

In terms of preventive practices, a large proportion (71.7%) had never participated in any cervical cancer awareness programs. Only 51.7% reported using sanitary napkins or clean cloths during menstruation, and 40.5% frequently sought medical attention for gynecological issues. A majority (55.1%) reported undergoing routine cervical cancer screening, while 26.3% consulted healthcare professionals for gynecological concerns. Additionally, 57.6% had never encouraged others to undergo cervical cancer screening, and 40.5% expressed unwillingness to receive the cervical cancer vaccine (Table 3).

Relationship Between Demographic Factors and Knowledge/Practice

The study found a significant relationship between secondary education and knowledge ($F = 10.52$, $p = .000$), as well as between employment status and knowledge ($F = 10.26$, $p = .000$). Additionally, the number of children was significantly associated with knowledge ($F = 4.44$, $p = .013$). However, there was no statistically significant association between knowledge and age, religion, marital status, or family type (Table 4).

Regarding practice, there was a significant relationship between religion (being Muslim) and practice ($t = 3.05$, $p = .003$), and between secondary education and higher levels of practice ($F = 12.60$, $p = .000$). Employment status also showed a significant correlation with practice ($F = 12.01$, $p = .000$). Furthermore, family type was significantly related to practice ($t = 2.43$, $p = .013$) (Table 5).

Levels of Knowledge and Practice

The overall analysis showed that 52.7% of respondents had high knowledge (mean score > 10.91), while 47.3% demonstrated low knowledge (mean score < 10.91) (Table 6). In terms of preventive practices, 43.9% of participants exhibited good practice (mean score > 19.05), while 56.1% showed poor practice (mean score < 19.05) (Table 6).

This study highlights a clear disparity between knowledge and practice regarding cervical cancer prevention among women of reproductive age in Dhaka. While a majority demonstrated sufficient knowledge, the actual implementation of preventive practices remained inadequate. These findings underscore the urgent need for targeted awareness campaigns and improved access to preventive health services to bridge the gap between knowledge and behavior.

DISCUSSION

The results of this study provide valuable insights into cervical cancer prevention among Bangladeshi women of reproductive age, particularly concerning screening procedures, awareness levels, and associated sociodemographic characteristics. The participants' average age was 32.48 years (SD = 8.80), which indicates a relatively young adult population. This age closely resembles the demographic profiles found in previous research, including the one conducted by Qayum et al. (2021), which found that the mean age was 41.23 years.

With the majority identifying as Muslim (81.5%), the sample's religious makeup aligns with national demographics and supports previous research findings (Qayum et al., 2021). The findings of Assoumou et al. (2015) were supported by the fact that 86.3% of respondents were married, which is consistent with the general population the majority of participants had secondary-level education, which is consistent with other studies and suggests that the literacy environments of the studied groups were comparable. These results, taken together, offer a contextual foundation for the current sample and establish the framework for analyzing knowledge and practice gaps identified in subsequent sections.

Compared to Qayum et al. (2021), the much lower mean age at marriage among study participants (13.88 years, SD = 8.96) may point to underlying sociocultural and geographic differences, especially in marginalized and rural populations. Due to deep-rooted patriarchal norms, a lack of educational opportunities for females, and socioeconomic constraints, early marriage is still common in many Bangladeshi rural areas (UNICEF, 2020; Nasrin & Rahman, 2021). According to NIPORT et al. (2020), these early marriages frequently lead to early births, less autonomy in healthcare decision-making, and restricted access to knowledge on reproductive health. Women's ability to access preventive healthcare for diseases like cervical cancer may be hampered by these circumstances. Long travel distances, inadequate transport infrastructure, limited availability of female healthcare providers, and pervasive stigma associated with gynecological problems pose additional barriers for rural women (WHO, 2021; Islam et al., 2018).

Knowledge about the causes and prevention of cervical cancer was moderately high. The majority of participants understood that Human Papillomavirus (HPV) can cause cervical cancer, and they were aware of the risk factors such as family history, poor hygiene, multiple sexual partners, and early pregnancy. These findings correspond to those of Nelson et al. (2018), who similarly identified these risk factors. However, while knowledge about cervical cancer symptoms, such as abnormal vaginal bleeding and discharge, was widespread, there was insufficient understanding regarding the full spectrum of preventive measures, particularly in terms of the HPV vaccine.

A substantial proportion of participants acknowledged that cervical cancer could be detected via Pap smear testing, and more than half were aware that early screening could help prevent the disease. These findings are consistent with studies by Kakotkin et al. (2023), Arrivillaga et al. (2023), and Nelson et al. (2018), where early screening and Pap smears were recognized as effective preventive tools. However, despite having adequate knowledge, the level of preventive practice among participants remained low. Most respondents had not participated in any awareness programs, and many did

not encourage others to undergo screening or receive the HPV vaccine, which is in line with the findings of Qayum et al. (2021).

The study found significant relationships between various factors, such as education, age at marriage, and family type, with the level of knowledge and practice. Specifically, secondary education and employment status were associated with better knowledge and practice, as was the case in other studies conducted in Bangladesh (Qayum et al., 2021). Furthermore, the study found that individuals from nuclear families tended to have better knowledge and preventive practices regarding cervical cancer, a trend also reported in Indian studies (Banik et al., 2022).

Cervical cancer poses a significant public health challenge in Bangladesh, with various cultural and systemic barriers hampering effective prevention, diagnosis, and treatment. There is a profound lack of awareness surrounding cervical cancer among the population. Studies have reported that only a small fraction of women in Bangladesh, around 12%, are aware of cervical cancer screening options, and less than 10% of the population demonstrates adequate understanding of the disease and its preventive measures (Hoque et al., 2023; Alam et al., 2022). These gaps in knowledge are exacerbated by socio-cultural determinants, such as early marriage and deeply embedded stigmas, which contribute to higher prevalence and delayed treatment (Islam, 2025; Rahman et al., 2025).

Financial constraints further illustrate the systemic issues at play. Cancer treatment in Bangladesh can be prohibitively expensive, limiting accessibility to chemotherapy, radiotherapy, and surgical interventions (Hoque et al., 2023; Deeba & Hossain, 2023. This economic burden is particularly challenging in the context of a healthcare system that lacks comprehensive health insurance coverage for cancer treatments (Deeba & Hossain, 2023). The limited availability of specialized cancer care facilities also reflects systemic inadequacies, as most of these services are concentrated in urban areas, while approximately 70% of the population resides in rural settings (Deeba & Hossain, 2023; (Rakhshanda et al., 2021). Consequently, many women face barriers to physical access to healthcare facilities.

Additionally, the absence of national guidelines for cervical cancer treatment highlights a critical oversight in public health policy, deteriorating the quality of care available for patients. Although initiatives like the National Cervical Cancer Control Program have aimed to expand services at the primary healthcare level, many facilities remain underprepared, lacking trained staff, equipment, and necessary resources for effective cervical cancer management (Rakhshanda et al., 2021). At the policy level, the response to the World Health Organization's call for action to eliminate cervical cancer has been mixed, with reports indicating urgent needs for improved screenings and treatment protocols (Reza et al., 2024).

Several limitations of this study should be acknowledged. First, the sample comprised only 205 women from a single major hospital in Dhaka, which limits the generalizability of the findings, especially to rural and underserved populations in Bangladesh. The purposive sampling method may have introduced selection bias, as participants who consented to participate may have had higher levels of interest or knowledge regarding health-related topics. The reliance on self-reported data for assessing knowledge and behavior introduces the possibility of social desirability and recall bias. Additionally, the cross-sectional design restricts the ability to establish causal relationships between knowledge and preventive behaviors. Despite these limitations, the study provides valuable insights into urban women's understanding and practices related to cervical cancer prevention.

CONCLUSIONS

Although the women in this study showed a moderate-to-high level of knowledge regarding cervical cancer prevention, their actual preventive behaviors, such as regular screen-

ing and HPV vaccination, were found to be inadequate. This indicates a significant gap between awareness and action that must be addressed through targeted and effective interventions. The reach and impact of current maternal and reproductive health programs can be enhanced by integrating cervical cancer awareness and prevention services, particularly in underserved and rural regions. Furthermore, deploying mobile screening units, organizing school-based HPV vaccination programs, and training community health workers are all feasible strategies to strengthen preventive practices. These efforts should align with the WHO's cervical cancer elimination targets and Bangladesh's national control strategies to effectively reduce the incidence of cervical cancer and improve women's health outcomes across diverse settings.

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AUTHORS' CONTRIBUTIONS
Fatema Khatun designed the study, formulated the concept, wrote the manuscript, reviewed the manuscript, enrolled participants, collected data, acquired the data, analyzed the data, revised the manuscript, and performed the field work. Ismail Hosen reviewed the manuscript, collected data, acquired the data, and performed the field work. Laila S. Lipi designed the study, reviewed the manuscript, acquired the data, and analyzed the data. Pilot Hossen reviewed the manuscript, analyzed the data, revised the manuscript. Fardina R. Omi designed the study, formulated the concept, wrote the manuscript, reviewed the manuscript, analyzed the data, revised the manuscript, and performed the field work. All authors read and approved the final manuscript.

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COMPETING INTERESTS
The authors confirm that all of the text, figures, and tables in the submitted manuscript work are original work created by the authors and that there are no competing professional, financial, or personal interests from other parties.

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