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Research Article

HPV Vaccination

Awareness & Knowledge of Bangladeshi Female Adolescents about HPV and their Attitude towards HPV Vaccination

Al Amin KMY[1*], Khan MR[2]

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[1*] K M Yasin Al Amin, Senior Health Officer, Health Department, Bangladesh Red Crescent Society, Dhaka, Bangladesh.

[2] Mussarat Rahman Khan, Resident Medical Officer, Neuro ICU, Square Hospital Limited, Dhaka, Bangladesh.

Background: Human Papillomavirus is a major cause of cervical cancer, which is a leading cause of mortality among women worldwide. Despite the availability of the HPV vaccine, awareness and knowledge regarding HPV and its prevention remain low, particularly in developing countries. Understanding the awareness, knowledge, and attitudes of female adolescents toward HPV vaccination is essential for improving vaccine uptake and cervical cancer prevention.

Method: A cross-sectional study was conducted in the different educational institutes & healthcare facilities of Chandpur Sadar Upazila, Chandpur from April 2024 to March 2025. A total of 300 female adolescents participated in the study. Data were collected using a structured questionnaire, covering socio-demographic details, knowledge of HPV, and attitudes toward vaccination. Descriptive and inferential statistics were used for data analysis.

Results: Among the 300 participants, 40% had heard of HPV, while only 32% knew that it was associated with cervical cancer. Knowledge regarding HPV transmission and prevention was insufficient, with only 25% recognizing vaccination as a preventive measure. Despite this, 70% of participants expressed willingness to receive the HPV vaccine if recommended by healthcare professionals. Major barriers to vaccination included a lack of awareness, misconceptions, and parental concerns.

Conclusion: The study highlights a significant gap in knowledge regarding HPV and its vaccination among female adolescents in Bangladesh. However, the positive attitude towards vaccination suggests an opportunity for public health initiatives.

Keywords: HPV awareness, HPV vaccination, cervical cancer prevention, adolescent health

Corresponding Author

K M Yasin Al Amin, Senior Health Officer, Health Department, Bangladesh Red Crescent Society, Dhaka, , Bangladesh.
Email: yasinalaminprotik07@gmail.com

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Introduction

Cervical cancer is one of the leading causes of morbidity and mortality among women worldwide, particularly in low- and middle-income countries. Human Papillomavirus (HPV) is the primary causative agent of cervical cancer, with certain high-risk strains, such as HPV-16 and HPV-18, accounting for nearly 70% of cases [1]. Despite the development of an effective vaccine to prevent HPV infection, vaccine coverage remains suboptimal in many regions, including Bangladesh, due to a lack of awareness, cultural barriers, and misconceptions surrounding HPV and its vaccination. Understanding the level of awareness, knowledge, and attitudes of female adolescents toward HPV and its vaccine is crucial for developing effective public health interventions and increasing vaccine uptake [2,3].HPV is one of the most common sexually transmitted infections (STIs) globally, affecting both males and females. While many HPV infections resolve spontaneously, persistent infection with high-risk HPV types can lead to cervical cancer and other anogenital malignancies. According to the World Health Organization (WHO), cervical cancer accounts for approximately 342,000 deaths annually, with the highest burden in low-resource settings where routine screening and vaccination programs are limited [4].

Bangladesh, like many other developing countries, faces significant challenges in HPV prevention. Studies suggest that HPV vaccine awareness remains low among adolescents and their parents due to limited health education and the absence of nationwide immunization programs targeting HPV. The lack of knowledge and misconceptions surrounding HPV infection contribute to the reluctance toward vaccination, leaving many young females vulnerable to future health risks. The introduction of the HPV vaccine has significantly reduced HPV-related infections and cervical cancer incidence in vaccinated populations [5]. The vaccine is most effective when administered before the onset of sexual activity, making adolescent girls the primary target group for vaccination campaigns. WHO recommends that girls aged 9–14 receive the HPV vaccine as part of routine immunization efforts to prevent cervical cancer and other HPV-associated diseases. Despite the proven benefits of the HPV vaccine, its acceptance remains low in many countries due to various barriers,

Including a lack of awareness, misinformation, parental concerns, and social stigma [6,7]. In Bangladesh, previous studies have reported that many parents and adolescents are unaware of HPV, its link to cervical cancer, and the availability of the vaccine. Addressing these gaps through targeted awareness programs is essential to improve vaccine coverage and reduce cervical cancer rates [8].

Several studies have examined the level of awareness and knowledge regarding HPV and its vaccination among female adolescents. A study conducted in South Asia found that less than 30% of adolescent girls had heard of HPV, and only 20% were aware of the availability of the HPV vaccine [9]. Similar trends have been observed in Bangladesh, where studies indicate that a majority of adolescents have little to no knowledge about HPV, its transmission, and prevention methods. To improve HPV vaccination rates among Bangladeshi female adolescents, targeted public health interventions are necessary [10,11]. Strategies such as integrating HPV education into school curricula, engaging parents in awareness campaigns, and utilizing mass media to dispel myths can enhance vaccine acceptance. Additionally, government-led initiatives, such as subsidized or free HPV vaccination programs, can address financial barriers that prevent access to the vaccine [12]. Collaboration between healthcare professionals, educators, and policymakers is essential to promote HPV vaccination as a public health priority. By increasing awareness and addressing misconceptions, Bangladesh can work towards achieving higher HPV vaccine coverage, ultimately reducing burden of cervical cancer among women.

Materials and Methods

This study was a cross-sectional survey conducted among female adolescents in Bangladesh to assess their awareness and knowledge about Human Papillomavirus (HPV) and their attitudes toward HPV vaccination. A cross-sectional study was conducted in the different educational institutes & healthcare facilities of Chandpur Sadar Upazila, Chandpur from April 2024 to March 2025. The study included 300 female adolescents, aged 12 to 19 years, selected from schools, colleges, and healthcare facilities centres in Bangladesh. The sample size was determined using the Cochran formula for cross-sectional studies,

Assuming a 95% confidence level and an expected awareness rate based on previous studies.

Solution Criteria

Inclusion Criteria:

- Female adolescents aged 12-19 years.
- Willing to participate and provide informed consent (for minors, parental consent was obtained).
- Residing in Bangladesh for at least one year.

Exclusion Criteria:

- Those with a history of HPV vaccination (to assess awareness before vaccination).
- Individuals with medical conditions preventing participation.

Data Collection Procedure

A structured questionnaire was used to collect data from Bangladeshi female adolescents regarding their awareness, knowledge, and attitude toward HPV and HPV vaccination. Sociodemographic Information Age, education level, socioeconomic status, and residence. Knowledge about HPV questions assessing familiarity with HPV, transmission routes, and its link to cervical cancer. Awareness and attitude toward HPV vaccination knowledge about the vaccine, willingness to receive it, and reasons for hesitancy or acceptance. Sources of information healthcare providers, school education, media, family, and peers. Data were collected from 300 female adolescents in schools, colleges, and healthcare centres of Chandpur Sadar Upazila Chandpur. Trained female research assistants facilitated the data collection process to maintain a comfortable and non-judgmental environment.

Ethical Considerations

Ethical approval was obtained from the Institutional Review Board of different educational institutes & health care centres. Informed consent was collected from all participants, and parental consent was obtained for participants under 18. The study complied with the Declaration of Helsinki guidelines for ethical research involving human participants. No personal identifiers were collected. Participants could withdraw at any stage without consequences. The survey posed no physical risks, and participants were given information on HPV and vaccination after completing the study.

Statistical Analysis

Data were analyzed using Statistical Package for the Social Sciences(SPSS) version 25.0. Descriptive statistics (percentages, means, and standard deviations) were used to assess knowledge and attitudes.

Chi-square tests and logistic regression were applied to identify associations between awareness levels and demographic factors. A p-value of <0.05 was considered statistically significant.

Results

A total of 300 Bangladeshi female adolescents participated in this study. The participants' ages ranged from 12 to 19 years, with a mean age of 15.5 years. The participants were surveyed on their awareness and knowledge about Human Papillomavirus (HPV) and their attitude towards the HPV vaccine.

Education Level Adolescent

Figure 1 the majority of adolescents had a high school (45.3%) or university-level (40.4%) education. A smaller proportion had only primary (1.0%) or secondary (13.3%) education.

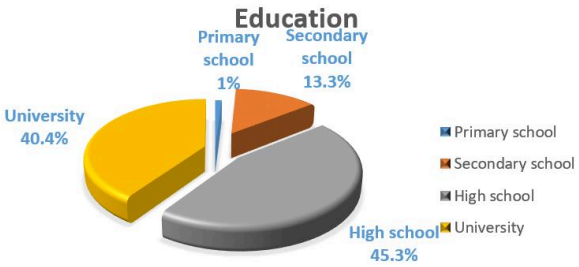

Figure 1: Education level of adolescent

Awareness about HPV

Table 1 summarizes the level of awareness about HPV among the participants. A significant proportion of the adolescents (65%) reported having heard of HPV, primarily through media (40%) and educational institutions (35%). However, 35% of the participants had never heard of HPV, indicating a significant gap in awareness.

Table 1: Awareness of HPV

Awareness Level	Frequency	Percentage
Heard of HPV	195	65%
Never Heard of HPV	105	35%

Sources of Information on HPV

Figure 2 illustrates the distribution of sources from which participants had learned about HPV. The majority (40%) of participants were informed through mass media (e.g., television, internet), followed by schools (35%), family members (15%), and healthcare providers (10%).

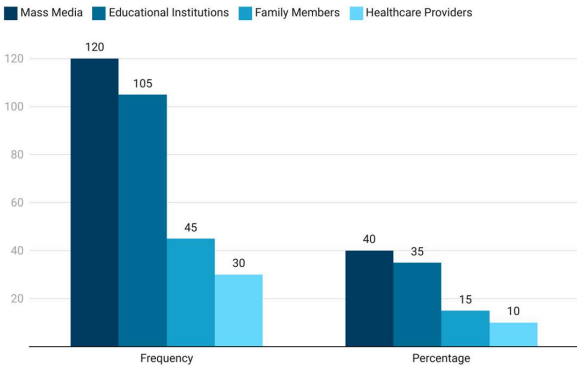

Figure 2: Sources of Information on HPV

Knowledge about HPV Transmission

Table 2 presents the responses regarding participants' knowledge about the transmission modes of HPV. While 70% of the participants correctly identified sexual contact as the primary mode of transmission, only 40% were aware that HPV could be transmitted through skin-to-skin contact. This highlights a significant knowledge gap regarding non-sexual transmission.

Table 2: Knowledge of HPV Transmission

Knowledge Item	Correct Response	Frequency	Percentage
Transmission via Sexual Contact	Yes	210	70%
Transmission via Skin-to-Skin Contact	Yes	120	40%
Transmission via Casual Contact	No	180	60%

Attitude Towards HPV Vaccination

Table 3 shows the participants' attitudes towards the HPV vaccine. The majority (80%) of participants were aware of the HPV vaccine, with 50% expressing a positive attitude towards getting vaccinated. However, 20% were hesitant, citing concerns about vaccine safety and side effects as the main reasons for their reluctance.

Table 3: Attitude Towards HPV Vaccination

Response to Vaccination	Frequency	Percentage
Positive Attitude	150	50%
Neutral Attitude	90	30%
Negative Attitude	60	20%

HPV Vaccination Acceptance & Decline

Figure 3 shows healthcare provider recommendations have the highest acceptance rate at 80 percent, with only a 20 percent decline. Awareness and knowledge contribute significantly, with 75 percent acceptance and 25 percent decline. Government policies and accessibility impact acceptance at 70 percent, while a 30 percent decline suggests that some barriers still exist despite support programs. Socioeconomic and demographic factors show 65 percent acceptance and 35 percent decline. Cultural and religious beliefs present the biggest challenge, with an equal 50 percent acceptance and 50 percent decline, suggesting that societal norms and misinformation heavily influence vaccine hesitancy.

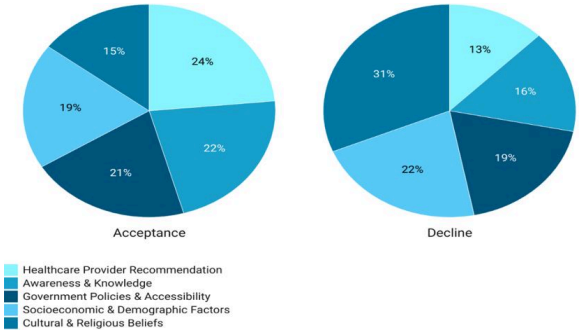

Figure 3: Factors Influencing HPV Vaccination Acceptance

Demographic Factors and HPV Awareness

Table 4 presents the relationship between demographic factors and HPV awareness. The study found that older adolescents (ages 16-19) had significantly higher levels of awareness compared to younger adolescents (ages 12-15). The educational level also played a role, with participants who attended higher secondary school having better knowledge about HPV and its vaccine.

Table 4: Demographic Factors and HPV Awareness

Factor	High Awareness	Low Awareness
Age 12-15	40%	60%
Age 16-19	70%	30%
School Level (Higher Secondary)	80%	20%

Barriers to HPV Vaccination

Table 5 outlines the barriers to HPV vaccination identified by the participants. The most frequently reported barrier was the lack of information about the vaccine (35%),

Followed by concerns about safety (30%), and a lack of vaccine availability (25%).

Table 5: Barriers to HPV Vaccination

Barrier	Frequency	Percentage
Lack of Information	105	35%
Safety Concerns	90	30%
Lack of Availability	75	25%
Other	30	10%

This study revealed a critical gap in both knowledge and awareness of HPV among Bangladeshi female adolescents, indicating the need for improved educational initiatives. Despite a moderate awareness of the HPV vaccine, concerns about safety and insufficient information remain significant barriers to vaccination acceptance. Efforts to enhance knowledge and provide accessible information can contribute to better vaccine uptake in this population.

Discussion

Human papillomavirus (HPV) is a significant public health concern, particularly due to its association with cervical cancer and other anogenital and oropharyngeal cancers. Despite the availability of an effective vaccine, HPV vaccination rates remain suboptimal in many regions. This study aimed to assess the awareness and knowledge of female adolescents regarding HPV and their attitude toward vaccination. The findings provide crucial insights into the gaps in knowledge and the factors influencing vaccine acceptance. The results of this study indicate that while a certain proportion of female adolescents have heard of HPV, their overall knowledge about the virus remains inadequate. Many participants were unaware of the modes of HPV transmission, its link to cervical cancer, and the importance of early vaccination [13,14]. 40% had heard of HPV, while only 32% knew that it was associated with cervical cancer. Knowledge regarding HPV transmission and prevention was insufficient, with only 25% recognizing vaccination as a preventive measure.

This finding is consistent with previous studies that highlight a general lack of HPV-related knowledge among adolescents, particularly in low- and middle-income countries. One of the key factors influencing HPV awareness is the source of information. In this study, adolescents who had received information from healthcare providers or school-based education programs demonstrated higher knowledge levels.

In contrast, those who relied on peers or social media often had misconceptions about the virus and vaccine by Canfell et al [15]. This underscores the importance of formal health education in schools and healthcare settings to improve adolescent awareness. Despite gaps in knowledge, a significant proportion of participants expressed a willingness to receive the HPV vaccine. However, vaccine hesitancy was also observed, with concerns related to vaccine safety, side effects, and parental disapproval being the primary reasons for reluctance. These findings align with previous research indicating that parental influence plays a crucial role in adolescent vaccination decisions [16].

A common misconception among participants was the belief that HPV vaccination is unnecessary if one is not sexually active. This misunderstanding highlights the need for education emphasizing the preventive nature of the vaccine, which is most effective when administered before HPV exposure. Additionally, some participants feared that receiving the vaccine might encourage early sexual activity, a misconception that has been debunked in multiple studies but remains a barrier in conservative societies Markowitz et al [17]. Adolescents who reported parental support were more likely to express willingness to receive the vaccine. In contrast, those whose parents had concerns about vaccine safety were less inclined to get vaccinated. This highlights the need for parental education and involvement in vaccination campaigns by Radisic, G. et al [18]. Participants who had discussed HPV vaccination with a healthcare provider demonstrated a higher level of trust in the vaccine. This suggests that physicians and nurses play a crucial role in addressing vaccine hesitancy and improving uptake rates study by Denny, L. et al. [19]. Schools serve as a vital platform for disseminating health information. Adolescents who had received HPV education through school programs exhibited better knowledge and more positive attitudes toward vaccination. Expanding school-based vaccination awareness initiatives could significantly improve vaccine acceptance [20,21]. In a recent study from Malaysia which included mothers, it was found that the acceptance of the HPV vaccine to be administered to daughters was 87.1% Ezat et al [22]. In our study, the perceptions of the adolescents about their parental attitudes towards vaccination were broadly positive, only 1.7% of them stated that their parents would not allow them to be vaccinated.

Multivariate analysis showed that the intention to receive vaccination was related to older age and being informed about cervical cancer.

In some communities, cultural and religious beliefs contribute to vaccine hesitancy. Misconceptions linking HPV vaccination to promiscuity or moral concerns can deter adolescents and their families from accepting the vaccine by Yu, L. et al, [23]. Addressing these concerns through culturally sensitive health promotion strategies is essential. The findings of this study have important public health implications. The low level of knowledge about HPV highlights the need for comprehensive education programs targeting both adolescents and their parents. Healthcare providers should be actively involved in vaccine advocacy, and school-based health initiatives should be strengthened to provide accurate and accessible information [24,25]. Additionally, addressing vaccine hesitancy through community engagement, social media campaigns and myth-busting initiatives can help counter misinformation. Policymakers should consider integrating HPV vaccination into national immunization programs with strong awareness campaigns to ensure widespread acceptance. Regarding attitude, the pooled estimate of positive attitude towards the HPV vaccine was found to be 45% with a 95% CI of 33%–57%. This finding aligns with research conducted in the United States and Ethiopia, where a positive attitude toward HPV vaccination was reported in the range of 45%–50% [26-28]. However, this estimate was lower than findings from European countries, where public awareness campaigns and school-based vaccination programs have significantly improved acceptance. Similarly, the pooled prevalence of knowledge in our study was lower than the estimate from a study conducted in Hungary [30]. These differences may be attributed to variations in cervical cancer burden, socioeconomic factors, healthcare accessibility, and public health policies related to HPV vaccination. Countries with well-established immunization programs and extend. Furthermore, our study found that knowledge levels were lower than those reported in other studies conducted across various regions worldwide. Research suggests that countries that integrate HPV vaccination into their national immunization schedules generally achieve better public awareness and vaccine acceptance. For instance, studies from Australia and Canada have demonstrated that sustained government-backed vaccination programs,

Along with community engagement and awareness initiatives, result in increased vaccine coverage [31]. Similarly, Japan and South Korea have shown imp

In this study, the overall pooled proportion of HPV vaccine uptake was 4%, with a 95% confidence interval (CI) of 2%–7%. As expected, vaccine uptake was lower compared to countries where it was implemented through government health systems [32,33].

However, it was comparable to pooled estimates from less developed regions [34]. The overall estimates related to knowledge, attitude, and practice may improve following the vaccine's incorporation into the National Immunization Schedule (NIS).

Evidence from previous studies highlights the importance of integrating HPV vaccination into routine immunization schedules to enhance accessibility and uptake, especially since HPV vaccination is primarily recommended for adolescents, school-based vaccine delivery has proven to be one of the most effective strategies.

This approach has been successfully implemented in various regions, including Haryana and Sikkim in India, where structured school immunization programs led to increased vaccine acceptance [35]. Future nationwide implementation should consider leveraging school-based initiatives, community outreach programs, and digital health interventions to improve awareness, accessibility, and overall coverage.

Conclusion

This study underscores the importance of improving HPV awareness and addressing barriers to vaccination among female adolescents. While many participants showed a willingness to receive the vaccine, knowledge gaps and parental influence significantly impacted vaccine acceptance.

Future interventions should focus on enhancing health education, involving parents in vaccination decisions, and leveraging healthcare providers' influence to promote HPV vaccination. By addressing these challenges, public health efforts can effectively increase vaccine uptake and contribute to reducing HPV-related disease burden.

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