

Knowledge, Perceptions and Practices regarding Human Papillomavirus (HPV) Vaccination Among 10 to 14 years School Going Adolescent Girls and Parents of Korail Slum in Dhaka, Bangladesh

Final Report of Summative Learning Project (SLP)

Presented to- the **BRAC James P Grant School of Public Health, BRAC University**

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Abstract

Cervical cancer remains a leading cause of mortality among women in low- and middle-income countries (LMICs), including Bangladesh. However, the Human Papillomavirus (HPV) vaccine provides up to 97% protection against cervical cancer when given to women during adolescence. Barriers such as limited healthcare access, misinformation and cultural norms hinder HPV vaccination efforts. This study aimed to explore the knowledge, perceptions and practices regarding HPV vaccination among adolescent girls aged 10 to 14 years and their parents in Korail slum, Dhaka by using the Behavioral and Social Drivers (BeSD) framework.

A mixed-method approach was adopted. Quantitative data were collected through a census survey of 161 school-going adolescent girls aged 10 to 14 years. On the other hand, qualitative insights were derived from three focus group discussions (FGDs), two with mothers and one with fathers. Challenges in conducting FGDs with fathers arose due to their work schedules and heightened political tensions in the area, limiting their participation. Data analysis combined descriptive statistics for the quantitative findings and thematic analysis for the qualitative data. Quantitative results revealed that while 99.38% of participants had heard about the HPV vaccine, primarily through schools, only 62.73% understood its purpose. Schools (95.71%) and the perceived health benefits of vaccination (96.43%) were key motivators for uptake. However, barriers like fear of side effects (20%), lack of parental approval (13.33%) and misinformation (71.43%) persisted. Qualitative findings emphasized the role of trusted figures, such as teachers and healthcare workers, in addressing misconceptions. Community members valued the vaccine's preventive benefits and its free availability but stressed the need for clearer communication and community outreach. In conclusion, high awareness of HPV vaccination was observed. Yet detailed knowledge and acceptance were limited among the residents by misinformation and logistical challenges. Effective interventions must focus on targeted health education campaigns, community engagement and strategies to overcome socio-political barriers to improve vaccine uptake and reduce cervical cancer prevalence in underserved communities.

Introduction

Cervical cancer is a leading cause of death among women worldwide, with low- and middle-income countries (LMICs) bearing the greatest burden. It is the fourth most common cancer in women globally, responsible for significant morbidity and mortality (Small et al., 2017). This burden is especially severe in low- and middle-income countries (LMICs) like Bangladesh. Over 85% of cervical cancer deaths occur in LMICs, where healthcare systems are often under-resourced and preventive services like screening and vaccination are not widely available (Allanson & Schmeler, 2021). The Human Papillomavirus (HPV) is the primary cause of cervical cancer, responsible for 99.7% of cases (Okunade, 2020). Vaccination against HPV has proven to be a highly effective measure in preventing cervical cancer (Lee & Garland, 2017).

The global introduction of the HPV vaccine began in 2006, with high-income countries rapidly adopting it into their immunization programs (Markowitz et al., 2012). In LMICs, introduction has been slower due to logistical, financial, and infrastructural challenges. The World Health Organization (WHO) launched the Global Strategy to Accelerate the Elimination of Cervical Cancer in 2020, emphasizing HPV vaccination as a cornerstone of prevention (Dorji et al., 2021). Despite these efforts, vaccination rates in LMICs remain alarmingly low (Ebrahimi et al., 2023). Globally, studies from similar low- and middle-income countries (LMICs) have identified multiple barriers to HPV vaccination, such as a lack of knowledge, logistical challenges, and cultural misconceptions (Pathak et al., 2022). Research from Kenya and India highlights the influence of misinformation about HPV vaccine, including myths about infertility and safety concerns, which are often amplified by social media (Magunda et al., 2023). Addressing these barriers requires a multi-dimensional approach that incorporates both individual and community-level interventions (Jacobs et al., 2012).

In Bangladesh, cervical cancer is the second most common cancer among women (Islam et al., 2015). However, awareness of the HPV vaccine remains very limited among the general population in Bangladesh. Moreover, individuals from lower socioeconomic groups tend to have less knowledge, awareness and HPV vaccine acceptance compared to those from higher socioeconomic backgrounds.. These factors can significantly influence the uptake of vaccines among the beneficiaries (Eva et al., 2024).

HPV vaccine was launched in Bangladesh in 2016 through pilot programs supported by Gavi, the Vaccine Alliance (Markowitz et al., 2012). These initial campaigns were school-based and aimed at vaccinating adolescent girls aged 10–14 years. The pilot programs were implemented in selected areas to assess feasibility and community response (Teresi et al., 2022). Based on their success, Bangladesh announced plans to integrate the HPV vaccine into its national immunization schedule. The Government of Bangladesh launched a nationwide HPV vaccination campaign targeting adolescent girls. The campaign began in 2023 in Dhaka, successfully vaccinating over 1.5 million girls—a promising start, though still falling short of covering the entire eligible population (UNICEF, 2023; Reza et al., 2024). In October 2024, the campaign entered its final phase, extending to five major divisions and remaining areas across the country (UNICEF, 2024).

This gap in knowledge is even more pronounced in urban informal settlements like Dhaka's Korail slum, the largest informal settlement in the city. Home to over one lakh people living in densely packed conditions, Korail faces challenges such as overcrowding, poverty, and limited access to healthcare services (Rahman & Islam, 2021). Adolescents in these settings are particularly vulnerable due to heightened barriers, including cost, low health literacy, and inadequate healthcare infrastructure (Crocker-Buque et al., 2017). Cultural norms, religious beliefs, and misinformation further influence vaccine perceptions, creating obstacles to HPV vaccine uptake among adolescent girls (Keselman et al., 2022). Community members often rely on schools or peers for guidance about the HPV vaccine, but this information may not address their concerns adequately. While most research on HPV vaccination in Bangladesh focuses on high-income urban populations, significant gaps remain in understanding the socio-cultural and practical barriers faced by underserved communities (Eva et al., 2024). For instance, the role of parents including fathers in shaping HPV vaccination decisions in this context remains underexplored, despite their potential influence. Furthermore, the voices of adolescents, the target group for HPV vaccination campaigns, are often missing from these discussions (Holman et al., 2014). Research on HPV vaccine acceptance in Bangladesh is scarce, particularly regarding social and cultural factors (Muthukrishnan et al., 2022). Addressing these barriers with culturally relevant messaging can improve vaccine uptake and help prevent cervical cancer in similar settings (Lubeya et al., 2022). The Behavioral and Social Drivers (BeSD) framework is used to examine the interplay between individual beliefs, social processes, motivations, and

practical barriers to vaccine uptake (Bonner et al., 2023). This framework enables a holistic understanding of the factors influencing vaccination behavior and identifies actionable pathways for intervention (Cooper et al., 2021).

Vaccination against HPV is a cost-effective and proven intervention, yet its success depends on overcoming the barriers unique to informal settlements like Korail slum. While urban slums that are falling behind in vaccination coverage, understanding the knowledge, perceptions, and practices of both adolescents and their parents is key to designing effective interventions that address local challenges. This study aimed to fill the gaps by exploring the knowledge, perceptions and practices related to HPV vaccination among adolescent girls aged 10-14 years and their parents in Korail slum, Dhaka. By capturing the voices of adolescents and their parents, this research highlighted the critical role of trusted figures, such as teachers and healthcare workers, in driving vaccine acceptance. It also shedded light on the socio-political challenges that limit male engagement and the need for adaptive strategies to involve fathers in health campaigns. These insights were not only relevant to Korail but also applicable to similar settings in LMICs, where health systems face comparable challenges.

Research Question:

General Research Question: What is the knowledge, perceptions, and practices regarding HPV vaccination among adolescent girls (10-14 years) and parents of adolescent girls in Korail slum of Dhaka, Bangladesh?

Objectives:

To explore knowledge and perceptions on HPV vaccine uptake among adolescent girls (10-14 years) and parents of adolescent girls residing in Korail slum of Dhaka.

Specific Objectives:

1. To assess knowledge and perception regarding HPV vaccine among adolescent girls aged 10-14 years and their parents in Korail slum.
2. To understand the motivating factors for the uptake of HPV vaccine among adolescent girls and their parents of Korail slum.

3. To identify the barriers that prevent adolescent girls from receiving the HPV vaccine according to adolescent girls and their parents.
4. To explore the current practices regarding HPV vaccination according to the parents of adolescent girls of Korail slum.

Method

Study Design

This implementation research applied an embedded mixed method design where a qualitative component (focus group discussion with parents who have adolescent girls) was embedded within a quantitative component (Survey). We conducted focus group discussions with parents who have adolescent girls to dive deeper into their thoughts, beliefs and cultural influences around HPV vaccination. Alongside this, we carried out surveys to gather measurable data on what adolescent girls know, think and do about HPV vaccination in the community. We applied the Behavioral and Social Drivers (BeSD) framework to explore knowledge and perception regarding HPV vaccine uptake among adolescent girls through census and understand the practices that influence the uptake through focus group discussions (Jiang & Feng, 2022). The BeSD framework highlights four interconnected domains that shape vaccination behaviour: thinking and feeling, social processes, motivation, and practical issues. By applying the BeSD framework, this study provides a comprehensive analysis of both the enablers and barriers influencing HPV vaccine knowledge, motivation and practices among adolescent girls in Korail slum. This understanding will help inform strategies to improve vaccine uptake through targeted interventions that address specific behavioural and social drivers.

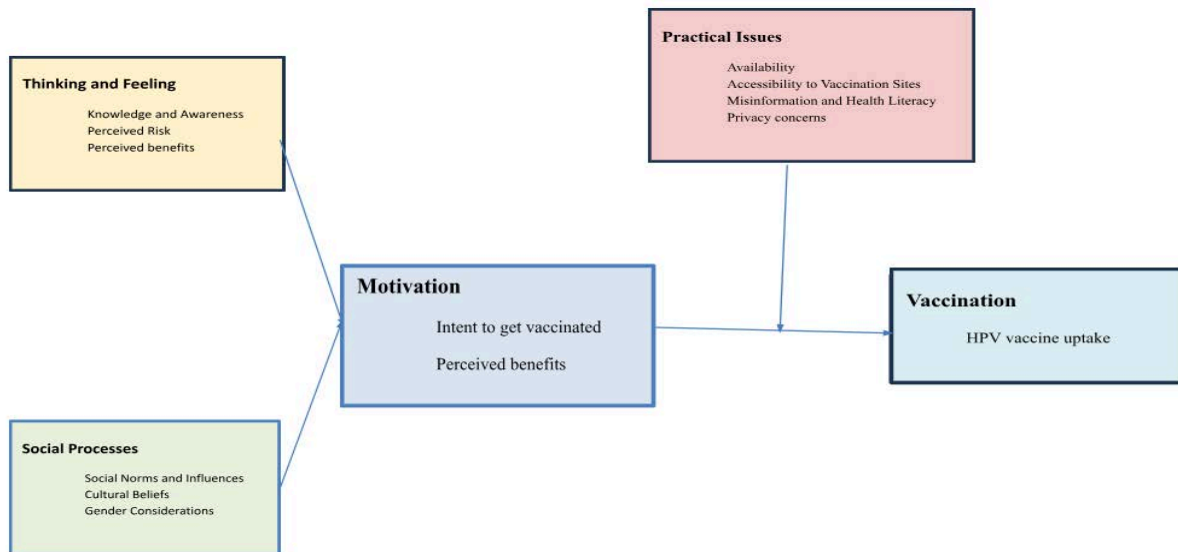


Fig 1. Behavioural and Social Drivers (BeSD) framework.

Study Site

The study was conducted in Korail slum, Dhaka, one of Bangladesh's largest informal settlements. 5 Schools from Korail (Bidyasagor Model School, Glory Future Model School, Mayer Doa Bidyaniketon and High School, Pathshala Korail TNT Colony School, Pathshala Korail) were used as the primary data collection sites for quantitative surveys, while FGDs were conducted among the parents of adolescent girls within the community spaces for qualitative insights.

Study Population

The study targeted:

- School-going adolescent girls aged 10–14 years for the quantitative component.
- Parents of adolescent girls for the qualitative component.

Inclusion Criteria:

- School going adolescent girls aged 10-14 who reside in Korail slum and are willing to participate.

- Parents who have adolescent girls aged 10-14 and willing to participate in the study to share their experience.

Exclusion Criteria:

- Adolescents outside the 10–14 years age range.
- Parents and adolescents who do not reside in the Korail slum.
- Adolescents and parents unwilling to provide consent.
- Parents without adolescent girls.

Sample Size & Technique

The sample size was determined using the census method, which included all eligible school-going adolescent girls aged 10–14 years in Korail slum. Sample size was calculated using the following formula.

Sample size calculation:

Here,

$$z=1.96$$

$$p=61.2\%$$

$$q=1-p$$

$$d=0.1$$

$$\text{so, } n = \frac{z^2 pq}{d^2}$$

$$\Rightarrow n = \frac{1.96^2 \cdot 61.22}{0.12}$$

$$\Rightarrow n = 91.22$$

If we considered 25% of responses were non-responses, only 75% of the collected data would be usable. To maintain the effective sample size, we adjusted Sample Size.

$$\text{Adjusted Sample Size} = 91.22 / 0.75 = 121.63$$

Since the sample size must be a whole number, the roundup is 122.

So, for quantitative data, the survey sample size was 122 within the Korail slum to ensure adequate representation which was estimated through calculation (Islam et al., 2018).

During the census, a total of 161 participants were surveyed, representing the entire target population. This approach ensured comprehensive data collection, minimizing bias and providing robust insights into vaccination knowledge and practices (Dorji et al., 2021).

For qualitative data three Focus Group Discussions (FGDs) were conducted among the parents. We could conduct two FGD with mothers and one FGD with fathers.

A census approach was employed for quantitative data collection, where all eligible school-going adolescent girls aged 10-14 years were enrolled in five schools (class 5 to 9) in Korail slum. This approach had ensured comprehensive data collection from the entire target population, eliminating sampling bias.

Again, for qualitative data collection, convenience sampling was employed to recruit participants. Most of the people of this sort of settlement either go out during day time for earning purpose or become very busy with household work. So, we took help from the school authority and local community health workers to arrange FGDs with parents of adolescent girls who were residents of Korail slum. Snowball sampling was also utilized to get some participants (Hailu et al., 2023).

Tool Development

For quantitative: Quantitative data were collected using a structured questionnaire aligned with the BeSD framework (Christian et al., 2010) (Dashiff, 2001) (Hern et al., 1998).

For quantitative data collection: we used a structured questionnaire aligned with the BeSD framework. The questionnaire was developed through the review of relevant literature ((Christian et al., 2010) (Dashiff, 2001) (Hern et al., 1998)). It had 3 parts-

Knowledge and attitude- This domain assesses participants' understanding of the topic and their general feelings or attitudes towards it. It includes questions about awareness, beliefs, and perceptions related to the subject matter.

Motivating factors- This domain examines the factors that encourage or inspire individuals to engage in the behavior. It might include intrinsic and extrinsic motivations such as personal benefits, social influences, or external rewards.

Barriers- This domain explores the obstacles or challenges that prevent individuals from adopting the behavior. It includes practical barriers (e.g., cost, accessibility) and psychological barriers (e.g., fear, misinformation).

For qualitative: We used a semi structured guideline for qualitative data collection. Qualitative data were gathered through semi-structured guides focusing on perceptions, motivations and barriers (McKenzie et al., 2023) (Watson-Jones et al., 2015) (Moretti et al., 2011).

Operational Definitions

- HPV (Human Papillomavirus): A group of more than 200 related viruses, some of which can cause cervical cancer. The HPV vaccine protects against the most common types that lead to cervical cancer (Okunade, 2020).
- Cervical Cancer: A type of cancer that occurs in the cells of the cervix, often linked to persistent infection with high-risk HPV types (Burd, 2003).
- Adolescent Girls: Girls aged 10–14 years, who are the primary target of the HPV vaccination campaign (Pathak et al., 2022)

Data Collection Procedure

After obtaining ethical permission from the Institutional Review Board of BRAC James P Grant School of Public Health, we approached for starting data collection. We recruited one data collector for full time and provided her proper training regarding the total procedure of data collection. By this time, we obtained permission from the school's authority to conduct the data collection. The schools were selected based on their accessibility to the target population, ensuring representation from both formal and informal educational institutions commonly attended by girls in the community. Collaboration with school authorities was sought to facilitate data collection during scheduled class times, minimizing disruption to their studies. We selected several dates for data collection with the consultation of schools' authority. On the selected day, we conducted our data collection. Using a self-administered questionnaire we collected data from the students. We took signs for both consent and assent. As one group of our participants were minors, we took signed consent from the school's authority (principal) and signed assent form from the students (school going adolescent girls), before data collection started. We

included the students from class 5 to class 9 as the age group was 10- 14 years. We conducted our surveys for three days.

For the qualitative component, Focus Group Discussions (FGDs) were conducted with community members who have adolescent daughters. Participants for FGDs were identified through community leaders and local organizations actively working in Korail. Discussions took place in neutral, community-friendly spaces to ensure comfort and encourage open dialogue. Each session lasted 30–45 minutes, guided by a semi-structured discussion framework to explore perceptions, barriers, and motivators related to HPV vaccination. Sessions were audio-recorded with participants' consent and supplemented by detailed field notes. Before the FGD started, we ensured to obtain the consent from each participant.

This structured approach ensured diverse and representative data while maintaining ethical standards and participant comfort.

Data Analysis

Quantitative: The quantitative data were analyzed using STATA software. Descriptive statistics, including measures frequency, percentage, mean and standard deviation. were used to summarize the key characteristics of the data. Additionally, chi-square tests were employed to explore potential associations between categorical variables. These tests helped to assess the relationships between variables and determine if any significant differences existed between groups (Guetterman, 2019).

Qualitative: A thematic analysis was conducted using the BeSD framework. The analysis utilized both deductive and inductive approaches to identify key themes within the qualitative data. The deductive approach was informed by existing literature and theoretical frameworks, while the inductive approach allowed for themes to emerge naturally from the data itself. The analysis included the identification of illustrative quotes, which were used to support the identified themes and provide a deeper understanding of the qualitative findings (Shin et al., 2023).

Ethical Considerations

Informed Consent:

Participation was completely voluntary for the adolescent participants. Before starting the survey an assent was obtained from the adolescent respondents as well. All the participants were informed of their right to withdraw at any time without any consequence.

Confidentiality:

All collected data were anonymized to protect participant privacy. Identifiable information was removed from transcriptions and data is securely stored.

Ethical Approval:

Ethics approval was obtained from the Institutional Review Board (IRB) of BRAC James P Grant School of Public Health to ensure compliance with ethical standards. Approval was also sought from a guardian of the adolescent respondent to facilitate trust and cooperation.

Findings

Quantitative Findings

The study included 161 participants, with students distributed among five schools in the Korail slum. Pathshala Korail School had the highest representation, making up about a quarter of the total. Bidyasagor Model School and Glory Future Model School followed closely, comprising nearly half of the students collectively. Smaller portions attended Mayer Doa Bidyaniketon and TNT Colony School.

In terms of age, over three-quarters were above 12 years old, while 22.4% were 12 or younger. The average age was 13.17 years, with a standard deviation (SD) of 0.97. This SD indicates a narrow age range. Regarding grade levels, participants were fairly distributed: about one fourth (27.95%) were in grade 7, followed by around 20% in grade 6 and 5. The numbers declined in higher grades, with less than 15% in grade 9 and 10, likely reflecting the fewer older adolescents in the target group.

Table 1: Background information of participants.

Total = 161 (100%)			
Variable	Responses	n (%)	
Schools	Bidyasagor Model School	40 (24.84)	
	Glory Future Model School	35 (21.74)	
	Mayer Doa Bidyaniketon and High School	27 (16.77)	
	Pathshala Korail	41 (25.47)	
	Pathshala Korail TNT Colony School	18 (11.18)	
Age	12 and Under	36 (22.4)	Mean (SD) 13.17 (0.97)
	Above 12	125 (77.6)	
Class	5	31 (19.25)	
	6	33 (20.50)	
	7	45 (27.95)	
	8	30 (18.63)	
	9	13 (8.07)	
	10	9 (5.59)	

Knowledge, Attitude and Practice about the HPV Vaccine among participants

Participants who had heard about the HPV vaccine were more likely to receive it. Among the vaccinated group, every participant had heard of the vaccine, compared to slightly fewer (95.24%) in the non-vaccinated group. Only one participant who did not receive the vaccine reported being unaware of it, highlighting the strong association between awareness and vaccine uptake.

Schools played a vital role in spreading awareness about the vaccine. Every vaccinated participant identified schools as their primary source of information. Only one individual (4.76%) from the non-vaccinated group cited an alternative source.

Regarding knowledge about the HPV vaccine, about two third understood the vaccine's purpose, whereas only a quarter of non-vaccinated participants had similar knowledge. Conversely, a significant portion of non-vaccinated participants (61.90%) lacked knowledge, compared to just 17.14% of the vaccinated group. Notably, about 15% in both groups expressed uncertainty. This connection between knowledge and vaccination is reinforced by a chi² value and a p-value.

A large majority (85.71%) of vaccinated participants had talked about the vaccine with family members, compared to less than half of the non-vaccinated group. In contrast, more than half of those who did not receive the vaccine had no such discussions, highlighting the importance of familial communication. This trend is also statistically significant. Belief in the vaccine's efficacy was another strong determinant of vaccine uptake. Among vaccinated participants, an overwhelming 90.71% believed in its effectiveness, compared to just over half of the non-vaccinated group. Interestingly, nearly half of the non-vaccinated participants were unsure about the vaccine's efficacy, compared to only 8.57% in the vaccinated group. The chi² value and p-value highlight the statistical significance of this relationship.

Finally, registration for the vaccine emerged as a critical factor in determining uptake. All vaccinated participants were registered for the vaccine, whereas a majority of the non-vaccinated group (80.95%) were not. Only one fifth of non-vaccinated participants had registered, yet none received the vaccine.

Table 2: Knowledge, Attitude and Practice about the HPV Vaccine among participants.

Variable	Responses	Received HPV Vaccine n (%)	Did not receive HPV Vaccine n (%)	Total n (%)	p-value
Heard about HPV vaccine	Yes	140 (100)	20 (95.24)	160 (99.38)	0.01
	No	0	1 (4.76)	1 (0.62)	

First heard about HPV vaccine from	School	140 (100)	20 (95.24)	160 (99.38)	0.01
	Other	0	1 (4.76)	1 (0.62)	
Knowledge of HPV vaccine	Yes	96 (68.57)	5 (23.81)	101 (62.73)	0.00
	No	24 (17.14)	13 (61.90)	37 (22.98)	
	Not sure	20 (14.29)	3 (14.29)	23 (14.29)	
Discussed HPV vaccine with family	Yes	120 (85.71)	9 (42.86)	129 (80.12)	0.00
	No	20 (14.29)	12 (57.14)	32 (19.88)	
Belief in vaccine efficacy	Yes	127 (90.71)	11 (52.38)	138 (85.71)	0.00
	No	1 (0.71)	0	1 (0.62)	
	Not sure	12 (8.57)	10 (47.62)	22 (13.66)	
Registered for vaccine	Yes	140 (100)	4 (19.05)	144 (89.44)	0.00
	No	0	17 (80.95)	17 (10.56)	

Motivation towards vaccination

Among the 140 participants who had received the vaccine, schools were overwhelmingly the main influencers, cited by 95.71%. Friends played a minor role, while healthcare workers and family encouragement were negligible, contributing less than 1% each. The primary reason for vaccination was protection against disease, reported by almost all of them (135 participants). Only 4 participants mentioned school or healthcare facility requirements as the reason for vaccine uptake. Family encouragement or medical advice were almost non-existent.

Emotional responses to the vaccination varied. Before the vaccination, 43.46% (65 participants) felt nervous, while one fourth of the participants were excited and another one fourth felt scared. Post-vaccination discomfort was common among them, with exactly three fourth of the recipients citing pain. However, some expressed positive emotions such as happiness (12.5%) or

relief (3.57%). Vaccinations were conveniently provided, with 53.57% receiving them at nearby locations and 45.71% at their schools.

The vaccine providers were generally described as friendly by around 60% of participants, while 35% considered them "okay." Only a few found them rude. About half received prior information about the vaccine, while the rest did not.

Table 3: Experience of getting the vaccine.

Total = 140 (100%)		
Variable	Responses	n (%)
Who influenced your decision to get vaccinated?	Schools	134 (95.71)
	Healthcare workers	1 (0.71)
	Friends	5 (3.57)
Why did you get the vaccine?	Protection against disease	135 (96.43)
	School or healthcare facility requirement	4 (2.86)
	Family encouragement	1 (0.71)
How did you feel before getting the vaccine?	Nervous	65 (43.46)
	Excited	40 (28.57)
	Indifferent	2 (1.43)
	Scared	33 (23.57)
How did you feel after getting the vaccine?	Relieved	4 (3.57)
	Happy	14 (12.5)
	Nervous	9 (8.04)

	Painful	84 (75)
	Others	1 (0.89)
How was the vaccine provider's behavior with you?	Friendly	86 (61.43)
	Rude	1 (0.71)
	Okay	49 (35)
	Do not remember	4 (2.86)
Did you receive any information before the vaccination?	Yes	77 (55)
	No	63 (45)
Did you experience any side effects after receiving the vaccine?	Yes	92 (65.71)
	No	48 (34.29)
Did you get any incentive for receiving the vaccine?	Yes	0
	No	140 (100)
Would you recommend the HPV vaccine to your friends?	Definitely Yes	126 (90)
	Not at all	9 (6.43)
	May be	5 (3.57)

Barriers towards vaccination among unvaccinated girls

For the 21 participants who had not received the vaccine, the barriers were diverse. Fear of side effects and fear of injections were equally common, each cited by 20% of participants. Parental disapproval (13.33%) affected few girls, while peer influence accounted for some. Interestingly, 33.33% mentioned other reasons such as absence from school, not having registration cards. Parental concerns about safety were a significant factor for withholding approval for the girls.

Fear of side effects influenced one quarter of them, while lack of understanding about the vaccine's benefits was mentioned by 14.29%. Another concerning finding was that most of the unvaccinated girls (85.71%) didn't even know where to get the vaccine, highlighting a knowledge gap that needs to be addressed. Additionally, 71.43% of the girls had heard negative opinions or myths about the vaccine, which likely contributes to their hesitancy.

Despite these challenges, many of the girls suggested ways to make getting vaccinated easier. The most common suggestion (45.83%) was providing more information about the vaccine, which they felt would help them make an informed decision. Other suggestions included securing parental approval (25%) and receiving positive feedback from peers (20.83%), showing that both education and support from trusted people are crucial to overcoming barriers.

Table 4: Barriers towards vaccination among unvaccinated girls.

Total = 21 (100%)		
Variable	Responses	n (%)
What are the reasons you have not received the HPV vaccine?	Fear of side effects	6 (20)
	Parental disapproval	4 (13.33)
	Vaccine not available	1 (3.33)
	Fear of getting injection	6 (20)
	Peer Influence	3 (10)
	Others	10 (33.33)
Have you ever talked to your parents or guardians about getting vaccinated?	Yes	12 (57.14)
	No	9 (42.86)

What were the reasons for your parents/guardians not to allow you to get the vaccine?	Safety Concern	7 (33.33)
	Lack of interest	1 (4.76)
	Lack of understanding of benefits	3 (14.29)
	Fear of side effects	5 (23.81)
	Others	5 (23.81)
Do you know where you can get the HPV vaccine?	Yes	0
	No	18 (85.71)
	Not Sure	3 (14.29)

Willingness towards vaccination

Nearly half (47.62%) of the unvaccinated participants expressed interest in getting vaccinated, while 28.57% were unsure and 23.81% were not interested. The girls identified more information about the vaccine (45.83%) as the key factor that would make them feel more comfortable, followed by parental approval (25%) and positive peer feedback (20.83%). A large majority (71.43%) had heard negative opinions or myths about the vaccine, which likely contributed to their hesitancy. When asked about support that would encourage vaccination, school sessions and parental guidance (both 38.10%) were the most popular suggestions.

The table also shows that 85.71% of girls would be very likely to get vaccinated if their parents approved. Finally, 80.95% expressed interest in attending an educational session on the vaccine, indicating a strong desire for more information. This data underscores the importance of education and parental support in encouraging HPV vaccination among these girls.

Table 5: Willingness towards vaccination among unvaccinated girls.

Are you interested in receiving the vaccine if given the chance?	Yes	10 (47.62)
	No	5 (23.81)
	Maybe	6 (28.57)
What would make you feel more comfortable about getting the vaccine?	More information about vaccine	11 (45.83)
	Parental approval	6 (25)
	Positive peer feedback	5 (20.83)
	Assurance of healthcare workers	2 (8.33)
Have you heard any negative opinions or myths about the HPV vaccine?	Yes	15 (71.43)
	No	6 (28.57)
What type of support or information would encourage you to get vaccinated?	School sessions	8 (38.10)
	Community awareness programs	2 (9.52)
	Information from healthcare workers	3 (14.29)
	Parental guidance	8 (38.10)
How likely are you to get vaccinated if your parents or guardians approve?	Very likely	18 (85.71)
	Somewhat likely	3 (14.29)
Would you be willing to attend a session on HPV vaccination to learn more about it?	Yes	17 (80.95)
	No	1 (4.76)
	Maybe	3 (14.29)

Qualitative Findings

The qualitative findings provide deeper insights into the factors shaping HPV vaccine uptake. The Behavioral and Social Drivers (BeSD) framework provides a nuanced understanding of the factors influencing HPV vaccination behaviors among parents of adolescent girls in Korail slum. The findings are categorized into four themes: Thinking and Feeling, Social Processes, Motivations, and Practical Issues, each illustrating the interplay of knowledge, perceptions, and barriers within the community.

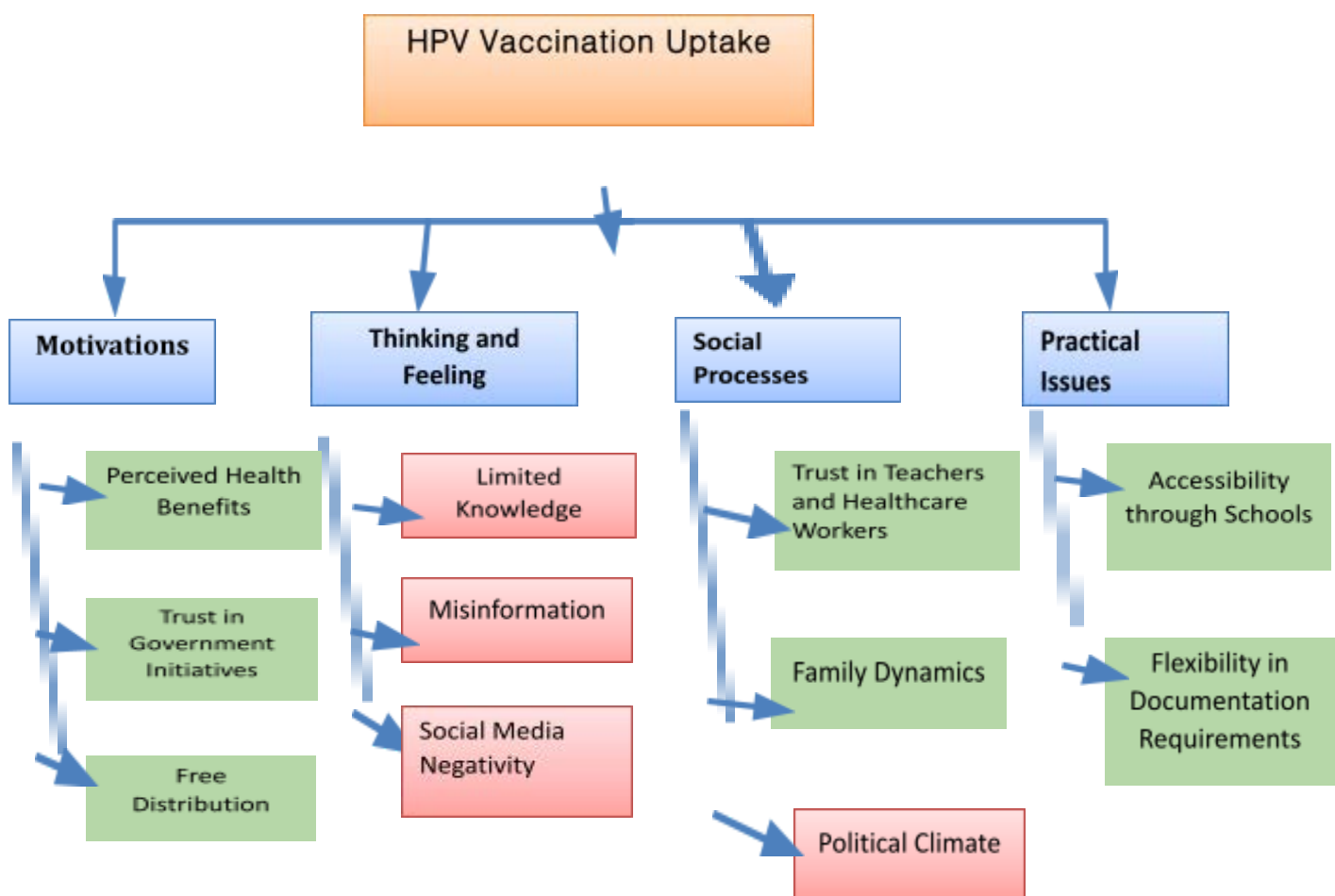


Fig-2: HPV Vaccine Uptake, Qualitative findings.

Motivations

Perceived health benefits:

The perceived health benefits of the HPV vaccine were a primary motivator for community members. Many valued its preventive role and saw it as essential for protecting their daughters. A mother expressed, *“If this vaccine protects my daughter, I want her to have it”* (FGD 2), while another emphasized, *“It’s better to prevent a disease than to cure it later”* (FGD 1).

Trust in government:

Trust in the government and its initiatives also influenced acceptance. One participant noted, *“The government introduced it, so it must be important”* (FGD 1).

Vaccine at a free of cost:

Free distribution of the vaccine was another significant factor, particularly for low-income families. Community members appreciated the financial relief this provided: *“As the government is giving it for free, we must take it. Poor people like us won’t be able to afford it later”* (FGD 2). The ease of accessing the vaccine through schools further reinforced its importance and encouraged community members to participate in the program.

Thinking and Feeling

Limited Knowledge and Understanding:

Community members in the Korail slum displayed limited knowledge about cervical cancer and the HPV vaccine. Most learned about the vaccine through their children or school announcements rather than formal health education. A mother noted, *“I first heard about cervical cancer during the school announcement”* (FGD 1), while another shared, *“There is nothing said to us about this vaccine; I came to know about it from my daughter”* (FGD 1).

Misinformation and misconception:

Misinformation and misconceptions were common. Fears about the vaccine's side effects, including infertility and long-term health complications, were frequently cited. One participant stated, *“I heard that it could make girls infertile”* (FGD 1), while another added, *“We are scared. It might harm their health in the long run”* (FGD 2).

Fear and Hesitancy:

Social media was identified as a significant source of misinformation, with participants expressing concern over negative portrayals: *“There are many negative things in social media against this”* (FGD 1). These fears created hesitancy among some Community members despite their initial trust in the vaccination program.

Social Processes

Community Trust in Teachers and Healthcare Workers:

Community trust in teachers and healthcare workers played a pivotal role in mitigating vaccine hesitancy. Teachers were frequently cited as trusted figures who reassured parents about the vaccine’s safety. A parent explained, *“The teachers recommended it, and we trust them”* (FGD 3). Another shared, *“When the schoolteacher told us, we believed it was safe”* (FGD 2). Similarly, healthcare workers addressing parents’ doubts helped increase acceptance: *“I had doubts, but the healthcare worker explained it well”* (FGD 2). These interactions underscore the importance of leveraging trusted community influencers to promote public health interventions.

Although community members trusted schools to disseminate accurate information, many were unclear about the vaccine's purpose and its role in preventing cervical cancer. Some equated the HPV vaccine with general immunizations, such as those for COVID-19, without understanding its specific benefits: *“We just knew about the vaccine, but no details, maybe something like the COVID vaccine”* (FGD 2).

Family Dynamics in Decision-Making:

Family dynamics also played a crucial role in vaccination decisions. In most cases, mothers took the lead in health-related matters, while fathers often deferred to their wives. A father remarked, *“My wife usually decides”* (FGD 3). In other instances, decisions were made collectively: *“We discussed it as a family, me, my wife, and my children, before making a decision”* (FGD 3).

Practical Issues

Accessibility and Convenience:

Accessibility was a recurring theme in the discussions. School-based vaccination programs were widely praised for their convenience. One parent stated, *“They came to the school to give the*

vaccine, which made it easy for us” (FGD 2). Community members also noted the flexibility of the program, which accommodated logistical challenges such as missing documentation. A participant shared, *“The teacher asked for my daughter’s birth certificate. I said it wasn’t ready, so they said, ‘No problem, you can get it done later’”* (FGD 3). *“There are many negative things against the HPV vaccine in social media, that’s why we are not sure about the vaccination,”* another participant added (FGD 1).

Misinformation and Limited Outreach:

Despite these advantages, barriers such as misinformation and limited community outreach persisted. A participant said, *“We only came to know about the HPV vaccine from our girls. If they don’t arrange any program for us”* (FGD 1).

Social Norms and Collective Behavior:

At the community level, collective behavior influenced individual decisions. As one parent observed, *“If more parents in the area agree, others will follow”* (FGD 1). This highlights the potential of social norms in driving vaccine uptake, provided they are supported by accurate information and trusted influencers.

Discussion

Cervical cancer continues to pose a significant health challenge, particularly in low- and middle-income countries (LMICs) like Bangladesh, where limited resources, misinformation, and socio-cultural barriers hinder access to preventive measures such as the HPV vaccine. In the densely populated Korail slum of Dhaka, where healthcare challenges are magnified, this study shed light on the knowledge, perceptions and practices of adolescent girls and their parents regarding HPV vaccination. Using the Behavioral and Social Drivers (BeSD) framework, the current research explored the factors shaping vaccine uptake qualitatively, highlighting the role of facilitators like schools and barriers such as misinformation and logistical challenges.

The findings paint a mixed picture. On the one hand, awareness of the HPV vaccine was nearly universal, with more than 99% of participants stating they had heard of it. Schools were the primary source of information, which hints the success of school-based vaccination campaigns in creating visibility, a strategy that has been pivotal in LMICs (Ebrahimi et al., 2023). But, the high level of awareness did not always translate into deeper understanding. Only 62.73% of

participants could explain the vaccine's purpose, and a substantial number either did not know or were unsure of its role in preventing cervical cancer. This gap between awareness and detailed knowledge highlights an area where interventions are urgently needed (Okunade, 2020).

The role of schools as trusted institutions stood out in this study, as they were the main drivers of vaccine uptake. Teachers emerged as key influencers, with parents relying on their recommendations to decide whether to vaccinate their daughters. This finding is consistent with research from countries like Kenya, Uganda, and South Africa, where schools have played a central role in improving HPV vaccination coverage (Lubeya et al., 2022). The convenience of accessing vaccines through school-based programs also contributed to their success. However, the study also highlighted limitations: children who missed school on vaccination days often missed their opportunity altogether. This reflects a broader challenge observed in LMICs like Ethiopia, where rigid vaccination schedules can inadvertently exclude at-risk groups (Allanson & Schmeler, 2021).

Misinformation was a recurring barrier in Korail, with 71.43% of unvaccinated participants reporting exposure to myths and misconceptions about the HPV vaccine. Among the most damaging were fears that the vaccine could cause infertility or lead to long-term health problems. Social media played a significant role in spreading these falsehoods as per current research, a pattern seen in other countries like Indonesia and the Philippines, where unregulated online content has fueled vaccine hesitancy (Keselman et al., 2022). Community members in the study frequently cited “negative things on social media” as a source of fear, underscoring the urgent need for health communication strategies that actively counter misinformation. In the study, a large majority of participants, 99.38%, were aware of the HPV vaccine, primarily through school-based education. This high awareness was linked with vaccine uptake, as nearly 87% of participants had received the vaccine. Knowledge about the vaccine’s purpose and its benefits was crucial, with two-thirds of vaccinated participants knowing what it was for, compared to only a quarter of those who hadn’t received it (Islam et al., 2021). Family discussions also played a significant role, with the majority of vaccinated participants having talked about the vaccine at home, while this was less common among the unvaccinated group.

The study also revealed some barriers to vaccine uptake, particularly for those who had not been vaccinated. Fear of side effects and concerns about injections were among the most common reasons for hesitation (Freeman et al., 2023). Additionally, many unvaccinated girls lacked knowledge about where to get the vaccine or had not discussed it with their parents. Despite these barriers, there was a strong willingness to get vaccinated if given more information, parental approval or positive peer influence. The study also highlighted that schools were pivotal in influencing decisions to get vaccinated, as they were the most trusted source of information (Lip et al., 2023). On the other hand, misinformation, especially on social media, fueled fear and hesitation, particularly regarding long-term side effects (Muhammed & Mathew, 2022). Therefore, providing clear, reliable information and engaging both parents and teachers is essential in addressing vaccine hesitancy and ensuring higher vaccine uptake. The findings suggest that while there is significant interest and motivation for HPV vaccination among adolescent girls in Korail slum, targeted educational efforts to address misinformation, involve families, and improve access are key to overcoming the barriers to vaccination.

The study also highlighted the importance of family dynamics in vaccination decisions. Mothers were often the primary decision-makers, reflecting a common pattern in patriarchal societies where women manage family health matters (Ghose et al., 2017). Fathers, while influential in some cases, were often not consulted due to work commitments or concerns about engaging in public discussions (Panter-Brick et al., 2014). This unique barrier underscores the need for culturally and contextually sensitive approaches that address both maternal and paternal concerns (Ozawa & Stack, 2013). Another critical finding was the emotional response to the vaccination process. This highlights the importance of preparing recipients and their families for potential side effects to manage expectations and reduce anxiety (Sherman, 2019). Similarly, logistical barriers such as the lack of proper documentation and the need for more flexible vaccination schedules were significant challenges (Wiot et al., 2019). Community members and participants suggested practical solutions, such as door-to-door campaigns or mobile vaccination units, which could help bridge these gaps.

Despite these barriers, the study also identified strong motivators for vaccine uptake. Protection against disease was the most frequently cited reason, with 96.43% of vaccinated participants

mentioning it. The fact that the vaccine was provided for free also played a crucial role, particularly for low-income families who otherwise might not have been able to afford it. This finding is consistent with studies in Uganda and Nigeria, where financial incentives or free services have been shown to boost participation in public health programs (Lubeya et al., 2022). Parents' trust in government-backed initiatives further strengthened their willingness to vaccinate their daughters, illustrating the importance of maintaining public trust in health campaigns (Ozawa & Stack, 2013). The implications of these findings are clear: to improve HPV vaccination rates in Korail slum and similar settings, a multifaceted approach is needed. Education campaigns must go beyond raising awareness to address the knowledge gaps that persist despite high levels of familiarity with the vaccine. These campaigns should be culturally tailored and delivered through trusted channels like schools, healthcare providers, and community leaders (Handtke et al., 2019). Parents in this study emphasized the need for clear, accessible information about the vaccine's benefits and safety, suggesting that media campaigns and community announcements could play a role in dispelling myths and misinformation. Policy changes are also critical. Integrating HPV vaccination into routine immunization schedules could ensure broader and more consistent access. At the same time, school-based programs should be expanded to include follow-up mechanisms for children who miss vaccination days. Mobile vaccination units or flexible community-based programs could help reach families who are unable to access school-based services due to logistical or socio-political challenges (Crocker-Buque et al., 2017).

Limitations

One significant challenge was reaching adequate participants. The qualitative part of this study aimed to hold four Focus Group Discussions (FGDs)—two with mothers and two with fathers. However, it was a challenge to organize the FGDs with male participants from Korail slum. Initially, it was planned to include two separate discussions with fathers of adolescent girls, but due to several obstacles, we could only hold one. A key challenge was that most of the men worked outside the slum during the day, which made it difficult for them to attend. On top of this, the political situation in Bangladesh, particularly after the July Revolution, made male participants hesitant to join group discussions. Many fathers were worried that attending might

make them seem politically involved or that they could be watched by local leaders. One father shared, "Talking to strangers or gathering in groups feels risky these days" (FGD 3). These fears led to lower participation and reluctance to engage fully with the researchers. As a result, we ended up holding only two FGDs with mothers and one with fathers.

Recommendations

This study highlights both the progress made and the challenges that remain in increasing HPV vaccination rates among adolescent girls in underserved communities like Korail slum. While schools have proven to be effective vehicles for raising awareness and delivering vaccines, significant gaps in knowledge, logistical barriers, and socio-political dynamics continue to hinder broader uptake. Addressing these issues will require a holistic approach that integrates education, community engagement, and structural reforms. Building on the strengths highlighted in this study, like trust in schools and the recognized health benefits of vaccination, policymakers and healthcare providers can create lasting strategies to lower cervical cancer rates and enhance overall public health. These findings not only offer actionable recommendations for Korail but also have broader implications for similar LMIC settings where resource constraints and cultural barriers pose significant challenges.

Also, the fact that the study focused on just one urban slum means the findings may not apply to other areas, like rural locations or smaller informal settlements. Expanding the research to include a broader range of settings would give us a fuller understanding of HPV vaccination behaviors across Bangladesh. These challenges emphasize the need for alternative strategies to involve more male participants in future public health campaigns, ensuring that all voices are heard and considered.

Engaging fathers in vaccination efforts represents another opportunity for intervention. Future campaigns should explore ways to create safe spaces for male engagement, perhaps through smaller, informal group discussions or one-on-one outreach by trusted community figures. Addressing fathers' concerns could help create a more supportive family environment for vaccination decisions. Future research could delve deeper into these findings to examine how education and outreach programs influence vaccine uptake over time. Studies could also examine

the effectiveness of different communication strategies in combating misinformation, particularly on social media platforms. Additionally, understanding the perspectives of fathers and other influential family members in more depth could provide valuable insights for designing family-centered interventions.

Conclusion

This study provides valuable insights into the knowledge, perceptions, and practices around HPV vaccination among adolescent girls and their parents in the Korail slum of Dhaka. Despite a good level of awareness and trust in schools as key facilitators for vaccination, numerous challenges remain, including misinformation, logistical barriers, and socio-political factors that continue to hinder vaccine uptake in the community.

While school-based vaccination efforts have been successful in reaching adolescent girls, it's clear that more needs to be done at the community level to ensure no one is left out. Mothers, who often make key health decisions in the family, are central to increasing vaccine acceptance. But engaging fathers is just as important, especially in creating a more supportive atmosphere for vaccination. To tackle logistical barriers, practical solutions such as using community announcements, social media campaigns, and mobile vaccination units could help bring the vaccine to those who might otherwise struggle to access it.

In conclusion, improving HPV vaccination rates in underserved communities like Korail requires a holistic approach. By combining education, better outreach, and support for structural challenges, we can ensure that more people get vaccinated, reducing cervical cancer risks and improving overall health outcomes. Public health efforts must take into account the socio-political landscape, collaborating with local leaders to build trust and make vaccination programs more accessible and effective for everyone.

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Annex

Knowledge, Perceptions and Practices regarding HPV Vaccination Among Adolescent Girls and Parents of Korail Slum in Dhaka

Appendix A

Guideline for Quantitative Data Collection :

Sl.No.	Questions	Responses
Section 1: Knowledge about HPV vaccination		
1 khv_1	Have you ever heard about the HPV vaccine?	☐ Yes 1 ☐ No 0

2 khv_2 khv_2oth (for specification)	Where did you first hear about the HPV vaccine?	☐ School 1 ☐ Healthcare provider 2 ☐ Parents/Guardians 3 ☐ Friends 4 ☐ Media 5 (TV, social media, etc.) ☐ Other 99 (Specify: _____)
3 khv_3	Do you know what the HPV vaccine is used for?	☐ Yes 1 ☐ No 0 ☐ Not sure 88
4 khv_4	Have you ever discussed HPV or the HPV vaccine with friends or family?	☐ Yes 1 ☐ No 0
5 khv_5	Do you believe vaccines are generally helpful for health?	☐ Yes 1 ☐ No 0 ☐ Not sure 88
6 khv_6	Have you registered for this?	☐ Yes 1 ☐ No 0
7 khv_7	Have you received the HPV vaccine?	☐ Yes 1 ☐ No 0
If 7 no answer is “Yes”, then answer the questions from number 8 to 16		
8 khv_8 Khv_8oth (for specification)	Who influenced your decision to get vaccinated? (Select all that apply)	☐ Parents/Guardians 1 ☐ School 2 ☐ Healthcare workers 3 ☐ Friends 4 ☐ Other 99 (Specify: _____)
9 khv_9 Khv_9oth	What were the reasons for you to get the vaccine?	☐ Protection against disease 1 ☐ Requirement by school or clinic 2 ☐ Recommended by doctor or nurse 3

		☐ Family encouragement ⁴ ☐ Other 99 (Specify: _____)
10 khv_10 khv_10oth (for specification)	How did you feel before getting the vaccine?	☐ Nervous 1 ☐ Excited 2 ☐ Indifferent 3 ☐ Scared 4 ☐ Other 99 (Specify: _____)
11 khv_11 khv_11oth (for specification)	How did you feel after getting the vaccine?	☐ Relieved 1 ☐ Happy 2 ☐ Indifferent 3 ☐ Nervous 4 ☐ Painful 5 ☐ Other 99 (Specify: _____)
12 khv_12 khv_12oth (for specification)	Where did you get your vaccine?	☐ The school I read in 1 ☐ A nearby place 2 ☐ A distant place 3 ☐ Home 4 ☐ Other 99 (Specify: _____)
13 khv_13 khv_13oth (for specification)	How was the vaccine provider's behavior with you?/ How's the environment of the vaccination centre?	☐ Friendly 1 ☐ Rude 2 ☐ Okay 3 ☐ I don't remember 4 ☐ Other 99 (Specify: _____)
14 khv_14	Did you receive any information before the vaccination?	☐ Yes 1 ☐ No 0
15 khv_15 khv_15oth (for specification)	Did you experience any side effects after receiving the vaccine?	☐ Yes 1 (Specify: _____) ☐ No 0

16 khv_16 khv_16oth (for specification)	Did you get any incentive for receiving the vaccine?	☐ Yes 1 (Specify: _____) ☐ No 0
17 khv_17	Would you recommend the HPV vaccine to your friends?	☐ Yes, definitely 1 ☐ Maybe 88 ☐ No, not at all 0
If 7 no answer is “No”, then answer the questions from number 18 to 27		
18 khv_18 khv_18oth (for specification)	What are the reasons you have not received the HPV vaccine? (Select all that apply)	☐ Fear of side effects 1 ☐ Parental disapproval 2 ☐ Vaccine not available 3 ☐ Fear of getting an injection 4 ☐ Peer influence 5 ☐ Other 99 (Specify: _____)
19 khv_19	Have you ever talked to your parents or guardians about getting vaccinated?	☐ Yes 1 ☐ No 0
20 khv_20 khv_20oth (for specification)	What were the reasons for your parents/guardians not to allow you to get the vaccine?	☐ Concerns about safety 1 ☐ Not interested in the vaccine 2 ☐ Lack of understanding of its benefits 3 ☐ Fear of side effects 4 ☐ Other 99 (Specify: _____)
21 khv_21	Do you know where you can get the HPV vaccine?	☐ Yes 1 ☐ No 0 ☐ Not sure 88
22 khv_22	Are you interested in receiving the vaccine if given the chance?	☐ Yes, definitely 1 ☐ Maybe 88 ☐ No 0

23 khv_23 khv_23oth (for specification)	What would make you feel more comfortable about getting the vaccine?	- o More information about the vaccine 1 - o Approval from parents/guardians 2 - o Positive feedback from friends 3 - o Assurance from healthcare workers 4 - o Other 99 (Specify: _____)
24 khv_24 khv_24oth (for specification)	Have you heard any negative opinions or myths about the HPV vaccine?	- o Yes 1 (Specify: _____) - o No 0
25 khv_25 khv_25oth (for specification)	What type of support or information would encourage you to get vaccinated?	- o School sessions 1 - o Community awareness programs 2 - o Information from healthcare providers 3 - o Parental guidance 4 - o Other 99 (Specify: _____)
26 khv_26	How likely are you to get vaccinated if your parents or guardians approve?	- o Very likely 1 - o Somewhat likely 2 - o Not likely 0
27 khv_27	Would you be willing to attend a session on HPV vaccination to learn more about it?	- o Yes 1 - o Maybe 88 - o No 0

Appendix B

Guideline for Qualitative Data Collection through FGDs

Domain	Questions
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General	
	Do you know about cervical cancer?- please tell us something about it. (source of knowledge)
Knowledge on HPV vaccination	
	What do you know about the HPV vaccine? Where have you learned about it (e.g., schools, health clinics, media)? Recently the govt. has launched the HPV vaccination. Please tell us your perception regarding HPV vaccination (source of information, understanding about the purpose of HPV vaccine)
Perceptions and beliefs	
	As you are a father/ mother of an adolescent girl, what is your perception about the importance of HPV vaccination in preventing cervical cancer?- Please explain it. (benefits) How do you make healthcare decisions for your child, especially regarding vaccines? How confident are you in your decision-making about whether to vaccinate your child against HPV?
	Do you have any concerns about HPV vaccination? - please describe it.
	In your society, are there any myths or misconceptions about HPV vaccination that you think, actually prevent many adolescents from taking the vaccine?
Influencing factors	
	Who do you discuss with before making health decisions, especially about HPV vaccination for your daughter (e.g., husband/wife, elders in family, community leaders, healthcare workers)-Please tell us about it.
	Did you attend any meetings or programs about HPV vaccination which helped you to make the decision about your daughter's vaccine uptake? - Please describe it. (school program or community meetings conducted by implementers).
	Please tell us about the motivating factors or challenges that you faced in accessing the HPV vaccination for your daughter (don't know about the site where it is given, cost, availability, distance, registration).
Recommendations	
	What do you think about the support and changes that would be helpful for overcoming the barriers- please explain it. (free vaccine programs, community awareness campaigns, workshops, school sessions, healthcare talks)
Reflections and Closing Thoughts	
	Do you think the HPV vaccination initiative is worthwhile? Why or why not?

	Is there any other feedback or questions you would like to share?
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Appendix C

Codebook for FGD Data Analysis Using BeSD Framework

<u>Domains</u>	<u>Themes</u>	<u>Findings</u>	<u>Quotes (Source)</u>
Thinking & Feeling	Limited Knowledge	Awareness of HPV and cervical cancer is limited, often learned from children or schools.	“I first heard about cervical cancer during the school announcement.” (FGD 1) “There is nothing said to us about this vaccine, I came to know about it from my daughter.” (FGD 1) “We just knew about the vaccine, but no details, maybe something like covid vaccine.” (FGD 2) “We don’t know much. Since the vaccine is good, they gave it. We learned about it later.” (FGD 3) “My daughter first told me about this.” (FGD 3)
	Trust in Sources of Information	Trust in teachers and healthcare workers significantly influences vaccine acceptance.	“The teachers recommended it, and we trust them.” (FGD 3) “When the schoolteacher told us, we believed it was safe.” (FGD 2) “I know the headmaster of my daughter; he told me about this. As he said, it's safe, so I believe him.” (FGD 3)
	Perceived severity	Cervical cancer is seen as fatal, but there is little	“It sounds dangerous, but we don't see people talking about

		community discussion about it.	it in our community.” (FGD 1) “From cervical cancer nobody recovers.” (FGD 1)
	Misconceptions and fears	Fears about infertility and health risks hinder vaccine uptake.	“I heard that it could make girls infertile.” (FGD 1) “We are scared. It might harm their health in the long run.” (FGD 2) “There are many negative things in social media against this.” (FGD 1)
Social Processes	Community Influence	Teachers and healthcare workers help to mitigate vaccine related dilemmas and encourage vaccine uptake.	“At first, I was a little scared, but after consulting the teacher, I felt reassured.” (FGD 3) “I had doubts, but the healthcare worker explained it well.” (FGD 2)
	Decision Making	Vaccine decisions are often made collectively within families.	“My wife usually decides.” (FGD 3) “We discussed it as a family, me, my wife and my children; before making a decision.” (FGD 3)
Motivations	Perceived Benefits	The vaccine is seen as beneficial for health, and free distribution motivates acceptance, among poor families.	“We agreed because it is good for the children’s health.” (FGD 2) “The government introduced it, so it must be important.” (FGD 1) “As govt. is giving it for free, we must take it. Poor people like us won’t be able to afford it later.” (FGD 2)
	Belief in prevention	Parents believe in the value of prevention and are more likely to vaccinate to protect their children.	“If this vaccine protects my daughter, I want her to have it.” (FGD 2) “It’s better to prevent a disease than to cure it later.” (FGD 1)

Practical Issues	Access to vaccination	School-based vaccination programs make it easier for families to access the vaccine.	“The teacher asked for my daughter’s birth certificate. I said it wasn’t ready, so they said, ‘No problem, you can get it done later.’” (FGD 3) “They came to the school to give the vaccine, which made it easy for us.” (FGD 2)
	Community Recommendations	Increased awareness through media and community outreach is needed to combat misinformation.	“Miking from mosques and community centers would also help.” (FGD 1) “More information should be shared through TV or social media.” (FGD 1) “Announcements should be made in schools, and letters should be sent to parents.” (FGD 3) “If more parents in the area agree, others will follow.” (FGD 1) “If they explain it well, more people will agree to vaccinate.” (FGD 1)
	Barriers to Acceptance	Lack of information and negative portrayals on social media are barriers to vaccination.	“Some people don’t know about it, while others don’t trust it because they didn’t receive enough information.” (FGD 3)

Appendix D

D.i: Consent form for headmasters to conduct census in schools.

Serial no. :

Information Sheet

Title of Study: “Knowledge, Attitude and Perception on HPV Vaccine Uptake Among Residents of Korail Slum in Dhaka”

Introduction: Greetings, My name is Sheikh Mohammad Rafi Akash, and I am from the BRAC James P Grant School of Public Health, BRAC University. We are conducting a study on "Knowledge, Attitude and Perception on HPV Vaccine Uptake Among Residents of Korail Slum in Dhaka" in collaboration with the Centre of Excellence for Science of Implementation and Scale-Up.

Aim: The purpose of the study is to explore knowledge, attitude and perceptions regarding HPV vaccine uptake among adolescent girls (10-14 years) and community members of Korail slum of Dhaka.

Justification of participation: This participation is essential to understand the community's views on HPV vaccination. This will help us gather information to improve public health strategies for HPV vaccination in similar communities.

Procedure: We are seeking your permission for the following topics:

1. If you allow, we would like to conduct a survey through self reported questionnaires related to knowledge, facilitators and barriers of HPV vaccination among adolescent girls. The survey will be about fifteen to twenty minutes long. During the survey, female research assistant from our team will be present to answer any questions your student has. We assure you that one woman will be present in the classroom during the survey.

2. We want to conduct a group discussion among the mothers or fathers of the selected students in the school/madrassa premises, which can take about an hour. Mothers/Fathers who will participate in the discussion will be honoured with snacks after the discussion. If you allow, we will contact you if you are selected for this group discussion.

We are willing to take pictures of classrooms during the survey that will only be shared in the report. Your student's face can not be recognizable in the picture.

Benefits and risks of participation: There are no direct benefits or financial or other harms to participation in this study. Participating in this research is unlikely to cause you any economic, social, physical or emotional harm. However, if you or your student do not want to participate in this study, there will be no harm to your girls' education and there will be no problems in school. We hope you will agree because the information you provide will assist in improving the vaccination program in the future.

Confidentiality and anonymity: All personal identifiers collected in this study will be de-identified and kept confidential and only authorized researchers will have access to it. The Institutional Review Board of BRAC James P Grant School of Public Health, BRAC University, has the authority to access all the research records. Nonetheless, you can be assured that your and your student's name and other confidential and identifiable information (address, telephone number) will not be disclosed.

Nature of participation: Participating in this research is completely optional and voluntary. You have the right to know about the procedures, risks and benefits of the study. Even if you decide to participate, you may change your mind later and leave the study at any time.

Contact: If you have any questions, I will be happy to reply now, or you can contact us at the following number at any time: Sheikh Mohammad Rafi Akash, Phone: +8801701062661, email: sheikhmohammad.rafi.akash@g.bracu.ac.bd. For ethical concerns, can contact the Institutional Review Board: + 801993379512. Email: irb-jpgsph@bracu.ac.bd

Consent Form

Title of the study: “Knowledge, Attitude and Perception on HPV Vaccine Uptake Among Residents of Korail Slum in Dhaka”

If you agree to participate in this study, please confirm by putting your signature/thumbprint. Whatever decision you make, you will not be harmed.

Thank you for your cordial cooperation.

Do you give consent that your student to participate in the classroom survey?	Yes	No
If yes, please provide your name and contact number: Name: Phone number:	Yes	No
Do you want to participate in the group discussion at school/madrasah?	Yes	No
Do you give permission to take photos of your student?	Yes	No
Do you give permission to share the findings?	Yes	No
Can we contact you in the future for further queries related to this topic?	Yes	No
Do you have any questions?	Yes	No
If yes, state the question:		

Researcher's name:	Headmaster's/Teacher's name:
Researcher's signature:	Headmaster's/Teacher's signature:
Date:	Date:

D.ii: Assent form for participants of census.

Information Sheet

(Survey among adolescent girls ageing 10-14 years) serial no.

Title of Study: "Knowledge, Attitude and Perception on HPV Vaccine Uptake Among Residents of Korail Slum in Dhaka"

Introduction: Greetings, My name is Sheikh Mohammad Rafi Akash, and I am from the BRAC James P Grant School of Public Health, BRAC University. We are conducting a study on "Knowledge, Attitude and Perception on HPV Vaccine Uptake Among Residents of Korail Slum in Dhaka " in collaboration with the Centre of Excellence for Science of Implementation and Scale-Up.

Aim: The purpose of the study is to explore knowledge, attitude and perceptions regarding HPV Vaccine uptake among adolescent girls (10-14 years) and community members of Korail slum of Dhaka.

Justification of participation: Your participation is essential to understand the community's views on HPV vaccination. This will help us gather information to improve public health strategies for HPV vaccination in similar communities.

Procedure: We have already taken your teacher's/headmaster's consent regarding your participation in the study. If you allow, we would like to conduct a survey through self reported questionnaires related to knowledge, facilitators and barriers of HPV vaccination among adolescent girls. The survey will be about fifteen to twenty minutes long. During the survey, female research assistant from our team will be present to answer any question of you. We assure you that one woman will be present in the classroom during the survey. We are willing to take pictures of classrooms during the survey that will only be shared in the report. Your daughter's face can not be recognizable in the picture.

Benefits and risks of participation: There are no direct benefits or financial or other harms to participation in this study. Participating in this research is unlikely to cause you any economic, social, physical or emotional harm. However, if you do not want to participate in this study, there will be no harm to your education and there will be no problems in school. We hope you will agree because the information you provide will assist in improving the vaccination program in the future.

Confidentiality and anonymity: All personal identifiers collected in this study will be de-identified and kept confidential and only authorized researchers will have access to it. The Institutional Review Board of BRAC James P Grant School of Public Health, BRAC University, has the authority to access all the research records. Nonetheless, you can be assured that your name and other confidential and identifiable information (address, telephone number) will not be disclosed.

Nature of participation: Participating in this research is completely optional and voluntary. You have the right to know about the procedures, risks and benefits of the study. Even if you decide to participate, you may change your mind later and leave the study at any time.

Contact: If you have any questions, I will be happy to reply now, or you can contact us at the following number at any time: Sheikh Mohammad Rafi Akash, Phone: +8801701062661 , e-mail: sheikhmohammad.rafi.akash@g.bracu.ac.bd. For ethical concerns, can contact the Institutional Review Board: + 801993379512. Email: irb-jpgsph@bracu.ac.bd)

Assent Form

Title of the study: Knowledge, attitude, and behavioral and social factors associated with the uptake of HPV vaccine among the girls studying in the educational institutions of Bangladesh

If you agree to participate in this study, please confirm by putting your signature

Thank you for your cordial cooperation.

Do you give permission to share your findings?	Yes	No
Do you give permission to take photos?	Yes	No
Do you give permission to share the photos?	Yes	No
Do you have any questions/clarifications for us?	Yes	No
If so, state the question-		

SL No.	Name of the participant	Age (years)	Class	Section	Roll	Signature/ Fingerprint and date:

School/Madrasah:			
Field Research Assistant's Name:	Signature and Date:		
Supervisor's Name:	Signature and Date:		

D.iii: Consent form for FGD participants.

Serial no. : FGD -

Information Sheet

Title of Study: “Knowledge, Attitude and Perception on HPV Vaccine Uptake Among Residents of Korail Slum in Dhaka”

Introduction: Greetings, My name is Sheikh Mohammad Rafi Akash, and I am from the BRAC James P Grant School of Public Health, BRAC University. We are conducting a study on "Knowledge, Attitude and Perception on HPV Vaccine Uptake Among Residents of Korail Slum in Dhaka" in collaboration with the Centre of Excellence for Science of Implementation and Scale-Up.

Aim: The purpose of the study is to explore knowledge, attitude and perceptions regarding HPV vaccine uptake among adolescent girls (10-14 years) and parents of Korail slum of Dhaka.

Justification of participation: This participation is essential to understand the community's views on HPV vaccination. This will help us gather information to improve public health strategies for HPV vaccination in similar communities.

Procedure: We are seeking your permission for the following topics:

1. We want to conduct a group discussion among the mothers or fathers of the selected students in the school/madrassa premises, which can take about an hour. Mothers/Fathers who will participate in the discussion will be honoured with snacks after the discussion. If you allow, we will contact you if you are selected for this group discussion.
2. We are willing to take pictures of sessions during the discussion that will only be shared in the report. Your face can not be recognizable in the picture.

Benefits and risks of participation: There are no direct benefits or financial or other harms to participation in this study. Participating in this research is unlikely to cause you any economic, social, physical or emotional harm. However, if you or your student do not want to participate in this study, there will be no harm to your girls' education and there will be no problems in school. We hope you will agree because the information you provide will assist in improving the vaccination program in the future.

Confidentiality and anonymity: All personal identifiers collected in this study will be de-identified and kept confidential and only authorized researchers will have access to it. The Institutional Review Board of BRAC James P Grant School of Public Health, BRAC University, has the authority to access all the research records. Nonetheless, you can be assured that your and your student's name and other confidential and identifiable information (address, telephone number) will not be disclosed.

Nature of participation: Participating in this research is completely optional and voluntary. You have the right to know about the procedures, risks and benefits of the study. Even if you decide to participate, you may change your mind later and leave the study at any time.

Contact: If you have any questions, I will be happy to reply now, or you can contact us at the following number at any time: Sheikh Mohammad Rafi Akash, Phone: +8801701062661,

e-mail: sheikhmohammad.rafi.akash@g.bracu.ac.bd. For ethical concerns, can contact the Institutional Review Board: + 801993379512. Email: irb-jpgsph@bracu.ac.bd

Consent Form

Title of the study: “Knowledge, Attitude and Perception on HPV Vaccine Uptake Among Residents of Korail Slum in Dhaka”

If you agree to participate in this study, please confirm by putting your signature/thumbprint. Whatever decision you make, you will not be harmed.

Thank you for your cordial cooperation.

Do you want to participate in the group discussion at school/madrasah?	Yes	No
Do you give permission to take photos during discussion?	Yes	No
Do you give permission to share the findings?	Yes	No
Can we contact you in the future for further queries related to this topic?	Yes	No

Details of Participants :

Serial no.	Name	Age	Occupation	Phone no.	Signature
01					
02					
03					
04					
05					
06					
07					

08					
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Researcher's name:
Researcher's signature:
Date: