

**BARRIERS AND FACILITATORS IN IMPLEMENTING HUMAN
PAPILLOMAVIRUS VACCINATION FOR ADOLESCENT GIRLS:
QUALITATIVE INSIGHTS FROM HEALTHCARE IMPLEMENTERS IN
THE KORAIL SLUM, DHAKA, BANGLADESH**

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ABSTRACT

Introduction: Cervical cancer remains as a significant global health issue, ranking fourth among cancers among women. Low- and middle-income countries (LMICs) account for over 90% of related deaths due to limited access to prevention and treatment. The Human Papilloma (Virus) vaccine offers up to 97% protection against cervical cancer when given to women during adolescence, yet the uptake remains alarmingly low in disadvantaged communities. This study explores the qualitative insights from the implementors to identify the barriers and facilitators to HPV vaccination in the urban Korail slum in Dhaka, Bangladesh.

Method: A qualitative exploratory design was employed, involving Key Informant Interviews (KIIs) with nine healthcare implementers, including vaccinators, school principals, and field-level supervisors. Data were analyzed using thematic analysis framed by the Consolidated Framework for Implementation Research (CFIR), highlighting contextual and systemic challenges in the Korail slum setting.

Findings: The study identified significant facilitators, including high awareness among healthcare workers involved in HPV vaccination, parents and school teachers about cervical cancer prevention, free vaccine provision, and trust in schools as vaccination sites. Training programs boosted implementers' confidence, while stakeholder engagement involving local leaders, parents, and school teachers enhanced vaccine uptake. However, barriers such as misinformation among community members, the sociocultural stigma among adolescent girls and their parents, logistical constraints, and financial challenges faced by the healthcare workers impeded widespread coverage. Logistical hurdles, including the lack of male assistants and transportation support for healthcare workers, added operational inefficiencies.

Conclusion: The study highlights the need to address sociocultural barriers through tailored, community-driven strategies. Enhancing implementers' capacity, combating misinformation with culturally sensitive campaigns, and ensuring sustained logistical support are pivotal to improving vaccine uptake. These insights contribute to refining HPV vaccination programs in resource-constrained settings, aligning with global goals to reduce cervical cancer-related morbidity and mortality. Future interventions should focus on sustainable models and scaling successful practices to similar LMIC contexts.

1. INTRODUCTION

Cervical cancer is a major global public health issue, ranking as the fourth most commonly diagnosed cancer among women, with an estimated 13.3 new cases and 7.2 deaths per 100,000 women annually (eClinicalMedicine, 2023). The primary risk factor for the development of cervical cancer is infection with the human papillomavirus (HPV), with sexual transmission being the primary route of infection (Barukčić, 2018). HPV is a vaccine-preventable infection, it is safe and highly effective, offering up to 97% protection against severe cervical abnormalities and cervical cancer when administered to adolescent girls aged 12–13 years (Vorsters et al., 2022).

The burden of this disease is particularly high in low- and middle-income countries (LMICs), and they account for approximately 84% of new cervical cancer cases and 90% of related deaths (Guillaume et al., 2024). Despite bearing the highest burden of cervical cancer, access to the HPV vaccine in LMICs remains critically low (Borda et al., 2024). As of 2021, the majority of high-income countries have included the HPV vaccine in their national schedules, whereas coverage in LMICs remains significantly lower, with less than 25%, 30% in lower-middle-income, and just under 60% in upper-middle-income countries (Dorji et al., 2021). These disparities underscore the barriers that hinder the successful implementation of HPV vaccination in regions with the highest risk of cervical cancer (Tsui et al., 2024).

In South Asia, and particularly in Bangladesh, the situation mirrors the global trends. Cervical cancer is the second most common cancer among women in Bangladesh, disproportionately affecting younger women, especially those aged 15 to 44 (HPV INFORMATION CENTER, 2023). Despite the proven effectiveness of HPV vaccination in preventing cervical cancer and other HPV-related diseases, uptake in Bangladesh remains alarmingly low (Noreen et al., 2024). This alarming statistic underscores the urgent need for improved prevention strategies, such as HPV vaccination. In response, the Government of Bangladesh has initiated a nationwide HPV vaccination campaign, targeting adolescent girls. The campaign began in 2023 in Dhaka, where over 1.5 million girls were vaccinated—a promising start but still far from reaching the full eligible population (UNICEF, 2023; Reza et al., 2024). In October 2024, the Government of Bangladesh initiated the final stage of the HPV vaccination campaign in remaining areas (UNICEF, 2024).

However, awareness and knowledge regarding cervical cancer and acceptance of the HPV vaccine is remarkably low among women in Bangladesh, which might be the key barriers to HPV vaccine uptake. Dhaka has a substantial population living in urban slums, where millions reside in overcrowded, resource-constrained environments. These communities frequently struggle with limited access to healthcare, widespread poverty, and low levels of health literacy resulting into difficulties in achieving comprehensive immunization coverage in these areas (<https://pubmed.ncbi.nlm.nih.gov/24631083/>). Moreover, study says, women in the urban slum areas of Dhaka city face greater exposure to cervical cancer risk factors. Therefore, understanding the barriers and facilitators of HPV vaccine implementation, especially in high-need contexts like urban slums is important. Exploring these barriers and facilitators from the perspective of vaccine implementers, healthcare providers, and community is essential for designing effective strategies to increase vaccine uptake in these underserved settings (Adeshina et al., 2023).

Bangladesh's efforts to include HPV vaccination in its immunization schedule align with WHO recommendations, yet the implementation process continues to face significant challenges (Reza et al., 2024). Socio-cultural stigmas, misinformation about vaccine safety, logistical constraints, and gaps in awareness among healthcare providers limit vaccine acceptance and delivery (McKenzie et al., 2023). Recent studies in Bangladesh reveal that even among healthcare professionals and medical students, knowledge of HPV vaccination is limited, with only 12% reporting good vaccination practices (Chowdhury et al., 2022). This highlights the critical need to address implementers' perspectives, as their understanding and engagement are pivotal to overcoming barriers and ensuring successful program delivery.

Justification

Cervical Cancer Elimination Initiative (CCEI) is targeting 90% HPV vaccine coverage among adolescent girls, alongside enhanced screening and treatment efforts. Unfortunately, only 27% of the eligible population have received the HPV vaccine, with LMIC countries lagging due to inefficiency in the system (WHO, 2024).

Global research, such as the implementation study on HPV vaccine delivery in Mozambique, highlights adaptability in logistical complexities, resource constraints, and infrastructure weaknesses as critical factors influencing implementation performance (Soi et al.,

2018). These insights underscore the importance of tailoring vaccination strategies to address context-specific challenges, particularly in underserved settings like urban slums in Bangladesh.

Implementation research (IR) identifies the gaps in intervention and guides to development of solutions that can enhance the intervention outcomes (Ojo et al., 2021). IR has been insufficiently leveraged in efforts to enhance vaccine uptake. The consolidated framework for implementation research (CFIR) is one of the most widely cited frameworks in implementation science commonly to predict or explain key barriers and enablers to implementation outcomes (Damschroder et al., 2022). However, no studies to date have comprehensively explored the perspectives of implementers responsible for delivering HPV vaccines within the Bangladeshi context including urban slums that present unique challenges to vaccination programs due to high population density, inadequate infrastructure, socio-economic disparities, and mistrust in healthcare systems (Health & Collaborative, 2021).

To overcome these barriers, it is essential to develop new approaches that are derived from lessons learned through lived experiences of implementers (Tsui et al., 2024). By focusing on implementers' perspectives, this study will identify operational, socio-cultural, and individual-level barriers while uncovering enablers that can drive successful vaccination campaigns. Moreover, findings from this study will not only inform HPV vaccination strategies in Bangladesh but also provide valuable insights for other LMICs facing similar challenges.

This project is important because of its uniqueness in examining the perceptions of the implementers which are often less addressed in existing literature given in prior literature. By understanding the facilitators and barriers of the vaccinators and people involved in this study aims to identify the gaps and improve vaccination uptake through innovative approaches. Examining the barriers and facilitators specific to urban slum settings will contribute to filling gaps in global and national literature. The study highlights implementers' experiences, providing practical insights to boost HPV vaccination and reduce cervical cancer in resource-limited settings.

Research question: What barriers and facilitators do implementers experience during the HPV vaccination of adolescent girls aged 10-14 in the Korail Slum of Dhaka, Bangladesh?

General Objective: To explore the barriers and facilitators encountered by implementers during the HPV vaccination of adolescent girls aged 10-14 in the Korail slum of Dhaka, Bangladesh.

Specific Objectives

1. To scrutinize healthcare implementers' perceptions of cervical cancer and the HPV vaccine, including their insights on community awareness and attitudes toward the vaccine.
2. To explore the facilitators perceived by healthcare implementers that support the effective delivery of HPV vaccination to adolescent girls aged 10–14 in the Korail slum.
3. To dig into the barriers perceived by healthcare implementers that impede the HPV vaccination process among adolescent girls in the Korail slum.
4. To explore the coping strategies healthcare implementers, employ to address challenges faced during the HPV vaccination efforts in the Korail slum.

2. METHODOLOGY

2.1 STUDY DESIGN

This study follows a qualitative exploratory design using Key Informant Interviews (KIIs) with community-level implementers such as health service providers (vaccinators), and school principals involved in the HPV vaccination rollout in Korail slum, Dhaka, Bangladesh. The qualitative approach was chosen to explore perceptions, barriers, and facilitators faced by individuals directly engaged in the vaccination program. The study aligns with the principles of implementation research, focusing on identifying practical challenges and opportunities to enhance HPV vaccination efforts in urban slum settings.

2.2 STUDY SETTING

The study setting was in Korail slum, Dhaka, Bangladesh, and at the City Corporation Health Centre, Amtoli, Mohakhali, which is located a bit farther from the Korail slum. These settings were chosen to provide a comprehensive understanding of the socio-cultural and operational barriers healthcare implementers encountered while delivering HPV vaccination to adolescent girls in a densely populated and culturally sensitive environment. Inside the Korail slum, interviews were conducted with three school principals from different schools and one paramedic who served as a vaccinator within the health center situated in the slum. .

2.3 STUDY POPULATION

The study population included community-level vaccination program implementers, such as healthcare workers (vaccinators), community health workers, and volunteers who were actively involved in the HPV vaccination rollout. A total of 9 participants were included in the study: three school principals, one field-level supervisor of healthcare workers/vaccinators, one nurse, two paramedics, and one health assistant.

"Nari Moitree" is a non-governmental organization (NGO) based in Bangladesh that focuses on women's rights and providing health services to marginalized communities. Nari Moitree was actively involved in the HPV vaccination program in Korail slum, and five participants from the organization were interviewed.

2.4 INCLUSION CRITERIA

The inclusion criteria required that participants were actively engaged in the HPV vaccination program in Korail slum during the first or second phase of the rollout, or that they had participated in the vaccination efforts for at least one working day.

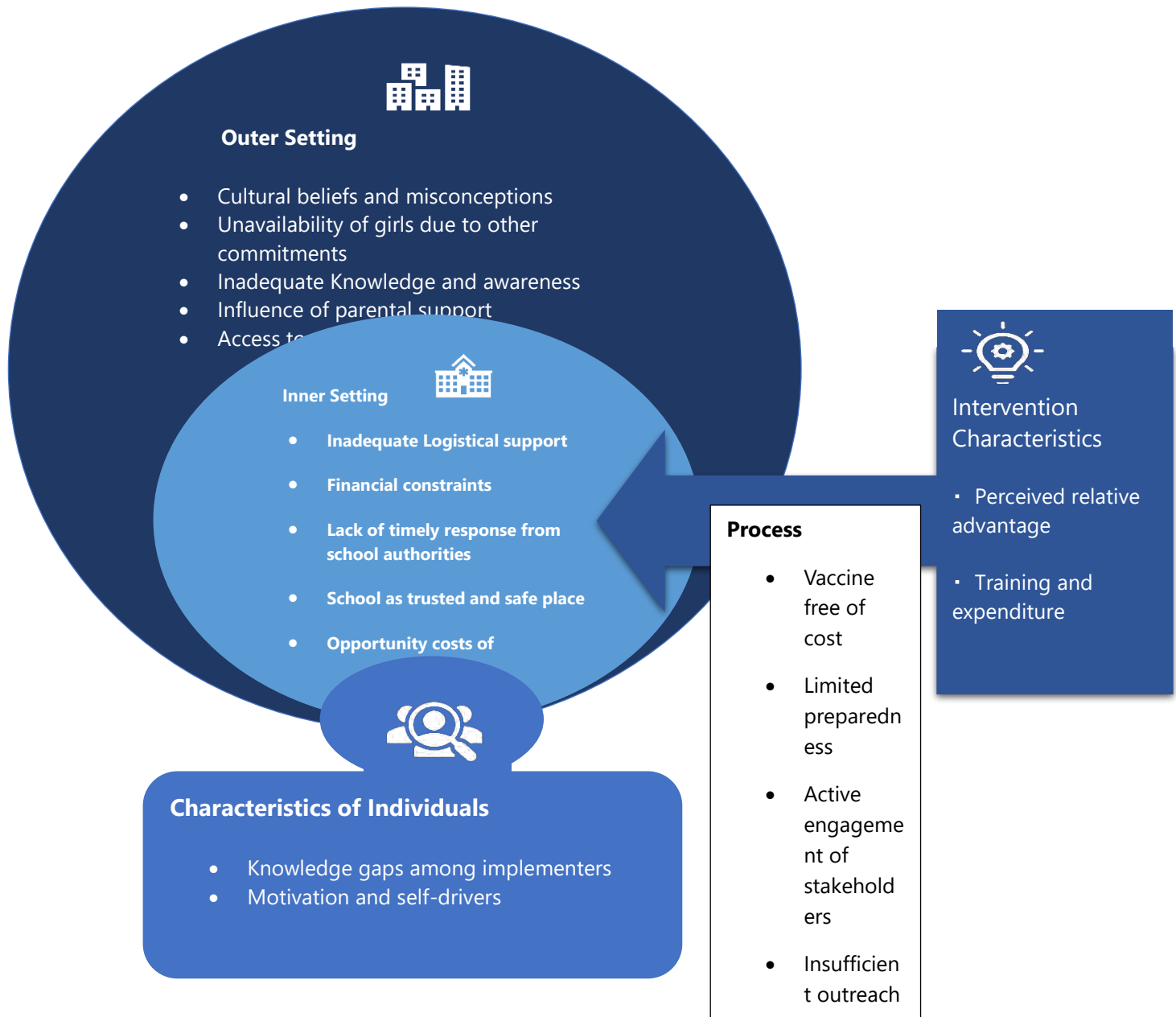
2.5 EXCLUSION CRITERIA

Individuals who were not directly involved in community-level HPV vaccination activities, those in administrative roles without direct interaction with the community regarding HPV vaccination, and those unwilling to provide informed consent were excluded from the study.

2.6 TOOL DEVELOPMENT

The data collection tool was an open-ended interview guide developed based on the Consolidated Framework for Implementation Research (CFIR) domains. The guide was designed to capture the barriers and facilitators influencing the implementation of the HPV vaccination program. The tool underwent iterative revisions during the pilot phase to ensure its clarity, relevance, and alignment with the study objectives. Feedback from mentors, supervisors, and pilot sessions with peers and co-research assistants contributed to the finalization of the tool.

Consolidated framework for implementation Research v.2.0



Adapted from (Damschroder et al., 2022).

2.7 SAMPLE SIZE AND SAMPLING

Purposive sampling was used to approach the participants and they were selected based on relevant experience in the vaccination rollout. Snowball sampling was also employed to identify additional participants, ensuring a diversity of perspectives on the challenges and successes of vaccine implementation.

2.8 DATA COLLECTION

Before data collection, the research assistant (RA) underwent training and participated in a demonstration session with co-research assistants and peers. This session helped refine the interview guidelines and ensured consistency in the data collection process. A total of 9 participants were interviewed to gain comprehensive insights into the barriers and facilitators of HPV vaccination implementation. Each interview lasted approximately 20-30 minutes. A trained research assistant, fluent in Bangla, conducted the interviews. Data collection involved audio-recorded KIIs later transcribed verbatim by native Bangla-speaking transcribers.

2.9 DATA ANALYSIS

Thematic analysis was employed using both deductive and inductive approaches. A codebook was initially developed based on the study objectives and the key areas explored during the interviews. Each transcript was imported into Dedoose software, and a line-by-line coding process was used to categorize the data. The coding process was iterative, with nodes rearranging or merging to refine themes. Methodological triangulation was achieved by validating data from diverse participant categories, for example, school teachers, healthcare workers and supervisor to capture different perspectives on barriers and facilitators. The consistency and alignment of themes were ensured by iterative coding and review. The analysis involved developing a data matrix and codebook manually in MS Excel, revising the codebook as coding continued, identifying major and sub-themes, and organizing them into a table for inclusion in the results section. Representative quotes were selected from the transcripts and included in the report.

2.10 ETHICAL CONSIDERATIONS

Ethical approval for the study was obtained from the Institutional Review Board (IRB) of BRAC James P Grant School of Public Health, BRAC University. Written informed consent was obtained from all participants, ensuring they were fully informed about the study's title, purpose, risks, benefits, confidentiality measures, and their voluntary participation rights. Confidentiality was strictly maintained, with personal identifiers anonymized and securely stored. The research findings were presented in a way that ensured participant anonymity, with no identifying details included

3. FINDINGS

3.1 DEMOGRAPHICS

Nine implementors participated in the key informative interviews. Table 1 presents their characteristics. They comprised four vaccinators from a non-governmental organization (NGO) named Nari Moitree, one field-level supervisor from the City Corporation Health Centre, and three school principals from various schools in the Korail community. Five of the participants were male, and four were female. The findings from the implementation of the HPV vaccination program in the Korail slum highlight several key barriers and facilitators that influenced the vaccination uptake. These factors are analyzed under the Consolidated Framework for Implementation Research (CFIR) domains to provide an overall understanding of the vaccination program's challenges and enablers.

TABLE 1: DEMOGRAPHIC AND PROFESSIONAL CHARACTERISTICS OF KEY INFORMATIVE PARTICIPANTS

Gender	Participants (N)
Female	6
Male	3
Age	Participants (N)
30-39 years	2

40-49 years	4
50-59 years	3
Job role	Participants (N)
Vaccinator	4
School Principal	3
Field-Level Supervisor	1
Service promotor	1
Health Assistant	1
Organization	Participants (N)
Nari Moitree	5
School	3
City Corporation Health Centre	1

3.2 INTERVENTION CHARACTERISTICS

3.2.1 Perceived Relative Advantage against cervical cancer

One of the key facilitators in the uptake of the HPV vaccine is its perceived relative advantage, particularly the belief that it provides significant benefits in preventing cervical cancer. Participants viewed the vaccine as an essential tool for preventing cervical cancer, making it highly valued by healthcare workers and the community. As one participant stated, *“I gave this vaccine to my daughter because I believe in it,” (KII-1)*. This underscores the personal commitment to the vaccine’s protective benefits. Moreover, participants noted that once individuals understood that the vaccine protects against cervical cancer, they were more likely to accept it. As one of the participants explained,

“The girls understand that if they get the vaccine, they will be protected from cervical cancer. We have many cervical cancer patients in Bangladesh. Once the girls understand this, they are more interested in getting the vaccine”(KII-2).

This perception was often associated with the understanding of cervical cancer as a deadly and life-threatening disease, with one participant highlighting that *"Cervical Cancer is a deadly disease... if it happens after childbirth, there could be serious issues among mothers, and it might affect future pregnancies"* (KII-8).

In addition, trust in vaccines in general, especially following the success of COVID-19 vaccination efforts, contributed to the positive perception of the HPV vaccine. As one of the respondents remarked,

"I believe that if the kids take the vaccine, they will not fall prey to cervical cancer... because the world is progressing. Vaccines are being invented... we faced corona and believed the vaccines" (KII-7).

This established trust strengthened the value placed on the HPV vaccine, as it was perceived as part of a modern and effective health solution.

3.2.2 Scientifically proven, enhancing credibility

The credibility of the HPV vaccine was generally viewed as high among healthcare workers and vaccinators, particularly due to its foundation in extensive research, which lent its credibility among healthcare workers. One participant reflected this confidence, stating,

"Since this has been developed after extensive research, it must be good...I also gave this vaccine to my daughter because I believe in it" (KII-1). The perceived high credibility helped build trust in the vaccine among the implementors, encouraging its acceptance. As explained by a participant,

"It is scientifically proven that this vaccine can prevent a deadly disease like cervical cancer. I believe that if the kids take the vaccine, they will not fall prey to cervical cancer" (KII-7).

This scientific validation was a crucial factor in reinforcing the importance of the HPV vaccine, highlighting its capability to save lives by preventing a deadly disease. Furthermore, the rising incidence of cervical cancer in Bangladesh was another factor that enhanced the perceived credibility of the vaccine. As one participant noted,

"The HPV vaccine is given to prevent cervical cancer. Cervical cancer is caused by a variety of sexually transmitted diseases. This vaccine is given to prevent these diseases. The cancer rate in Bangladesh is rising day by day, so it's necessary to take this vaccine" (KII-9).

This concern about women's health made the vaccine an essential tool in the fight against cervical cancer, further strengthening its credibility and motivating healthcare workers to advocate for its widespread awareness and implementation.

3.3 OUTER SETTING

3.3.1. Cultural Beliefs and Misinformation

Cultural norms and the stigma surrounding vaccination, particularly the HPV vaccine, played a central role in shaping vaccine acceptance among adolescent girls and their families. Their beliefs were often rooted in misconceptions and fears related to the vaccine's potential effects on fertility and overall health which demotivated its uptake. Many participants reported that parents and community members believed that receiving the HPV vaccine could lead to infertility or other serious health issues, including death. One of the participants highlighted, *"Some children thought that girls face infertility during pregnancy for taking this vaccine."*(KII-5). Additionally, misinformation around the vaccine's safety, such as the belief that girls might become sick or even die from the vaccine, created significant resistance. As explained by one vaccinator, *"They have a misconception that girls are being sick or will be dead"*(KII-4). Such a socio-cultural barrier, fueled by misinformation and deeply held cultural beliefs, presented significant challenges to the successful deployment of the HPV vaccine.

"In 2023, the vaccination campaign was very successful, but this time, we couldn't vaccinate as many people. Why? Because when the HPV vaccination started outside of Dhaka, people came to see something negative online—people are dying or getting sick after vaccination"(KII-4).

This rumor, widely spread through social media and word-of-mouth, led to increased hesitancy, with some participants describing how it directly affected the vaccination process. Another participant shared,

"Last year, children went to take the vaccine with very much excitement. This year, they were a little confused; on social media, news went viral that many children became sick after taking the vaccine"(KII-6). This shows the fear that slowed the vaccine's acceptance, as the negative

information circulating outweighed the potential benefits, leading many to question whether to get vaccinated.

3.3.2 Unavailability of girls due to other commitments

The unavailability of girls due to other commitments emerged as a significant barrier to HPV vaccine uptake. Families and children, particularly in slum areas, are often faced with competing commitments that make it difficult for them to participate in vaccination campaigns. One key issue highlighted by participants was the timing of school exams, which prevented some children from attending vaccination sessions. One healthcare worker noted, *"The exam is nearby. That's why they are not willing to take the vaccines."* (KII-3).

Additionally, work responsibilities in slum areas were mentioned as another obstacle, with some non-school attending girls unable to participate in vaccination sessions due to their job commitments. As one vaccinator explained, *"In slums, children sometimes cannot come for the vaccine because they are engaged in work."* (KII-1).

Furthermore, there were instances where children were absent from school, either due to changing schools or returning to their rural homes, which reduced vaccine uptake. As remarked by a participant, *"The children who are not coming to school might have moved to another school or gone back to the village."* (KII-8).

3.3.3 Inadequate Knowledge and Awareness among adolescent girls

A significant barrier to HPV vaccine uptake was the initial lack of knowledge among adolescent girls. As one respondent noted, *"The students didn't have any idea of their own about the vaccine. After we had explained the matter to them, then they got interested"* (KII-7). This lack of awareness often led to hesitancy, but once the purpose and benefits of the vaccine were clearly discussed, the girls became more open to receiving it. Specifically, explaining that the vaccine could protect them from cervical cancer played a crucial role in shifting perceptions. As another participant shared, *"The girls realized that the vaccine would protect them and they came willingly"* (KII-2). This highlights the importance of providing clear, accessible information to adolescents about the vaccine's benefits and its protective role against a potentially life-threatening disease.

3.3.4 The Influence of Parental Support

The involvement of parents, particularly mothers, played a pivotal role in vaccine uptake. In many cases, mothers were the primary decision-makers regarding the vaccination of their daughters. One participant explained, *“Many mothers made the decision and came with their daughters”* (KII-2), indicating that once parents understood the importance of the vaccine, they took the necessary steps to ensure their children received it. This sense of parental support proved to be an effective facilitator in overcoming barriers such as misinformation and reluctance. As one participant noted:

“If we want to avoid the rumors, the importance of the vaccine has to convince the parents, and if there are any side effects of the vaccine, what can happen in the future for taking the vaccine, and what cannot happen. All of these have to be convinced When a guardian takes it seriously, then he/she will tell this thing to his/her friend sitting in a tea shop. If his/her friend tells him about any rumor, he can say, “No, no, I have heard these from a trained vaccinator. This or that happens if you give the vaccine to your daughter” -(KII-6).

This highlights the role of informed parental influence in countering misinformation and promoting trust within their family.

3.3.5 Access to Quality Training Sessions

Access to information and training played a pivotal role in facilitating the HPV vaccination campaign by enhancing healthcare workers' knowledge and confidence. Organizations such as UNICEF, GAVI, and WHO provided funding support and training sessions through the city corporation that equipped vaccination teams with the necessary skills and information to administer the vaccine effectively. The availability of comprehensive training resources was instrumental in empowering healthcare workers and improving the effectiveness of the vaccination campaign. Healthcare workers expressed the value of these sessions in preparing them for their roles. One participant shared,

“We were trained several times by the city corporation” (KII-9), highlighting the repeated efforts to ensure readiness for the campaign. Another noted, *“We received training before the campaign started”* (KII-1), indicating the timely nature of the preparation.

Moreover, the training was led by experienced professionals, which further bolstered the confidence of healthcare workers. One participant explained, *"Training was provided by a representative from North City Corporation...It was a trained doctor" (KII-2)*, emphasizing the quality of instruction.

The high level of expertise in the training process not only enhanced the workers' technical skills but also helped them build trust in the vaccination process. As one healthcare worker stated, *"But I positively told them it's good and I, myself have been trained for the city corporation" (KII-7)*, underscoring how their own training enabled them to confidently promote the vaccine to hesitant community members.

3.4 INNER SETTING

3.4.1 Inadequate Logistical Support

The HPV vaccination campaign faced considerable logistical barriers, which impeded its effective coverage and reach. Healthcare workers encountered significant operational challenges, especially during door-to-door vaccination efforts. One female healthcare worker highlighted the physical strain of carrying heavy vaccine carrier boxes without male assistants, stating:

"We don't get any male assistants. It's very hard for us nurses to carry a lot of baggage ourselves" (KII-3).

Furthermore, the need to keep vaccines in a shaded area added another layer of complexity to the logistical setup, especially in hot and challenging environmental conditions. As one worker remarked;

"The vaccine carrier box and other stuff are carried by the field workers ourselves who go into the field to administer the vaccine. It's really heavy. We are all females and we don't have a helper boy... We don't go door to door to give the vaccine.... We usually stay in one spot to administer the vaccine because it is challenging to go door-to-door. Carrying the vaccine carrier box, opening and closing it repeatedly, and managing it alone can be difficult. Additionally, no one wants to travel under the scorching sun while carrying and we shouldn't move with a carrier. Because it has to be in the shadow" (KII-3),

This logistical challenge highlights the critical need for gender-sensitive logistical support, such as providing male assistants or alternative transport options, to ensure equitable participation of female health workers and enhance the overall efficiency of vaccination campaigns.

3.4.2 Financial constraints

Financial constraints were also a major issue. Nurses and vaccinators were required to cover their own transportation costs, which added financial stress and led to demotivation among staff. One participant explained,

"While traveling to vaccination sites, our organization or city corporation doesn't bear the transportation cost, we have to bear the transportation cost...It would better for us if the organization or city Corporation gave us transportation" (KII-3).

Moreover, delays in receiving incentives for their work further exacerbated staff frustration, hindering the smooth and timely implementation, with one respondent noting,

"We haven't received the money yet. We received it last year, but the work is not finished yet this time" (KII-2).

3.4.3 Lack of timely response from school authorities

The HPV vaccination campaign encountered significant barriers in engaging with schools, leading to delays and inefficiencies in the vaccination process. One of the primary issues was the lack of timely responses from school authorities, with healthcare workers frequently facing communication breakdowns. As one participant shared,

"We communicate with the school, we don't get enough response of our letter sometime, sometimes we have to visit a school several times, but they don't show any enthusiasm" (KII-1).

This indicates the level of persistence required to overcome administrative hurdles. In certain cases, schools outright refused to participate in the vaccination campaign, citing concerns raised by parents. One healthcare worker recalled,

"The school authority called us over the phone and said that they will not take the vaccine. The reason why is, the guardians were refusing to take it" (KII-4).

The above-mentioned challenges in school engagement and communication played a significant role in slowing down the campaign, making it more difficult to reach all eligible children in a timely manner.

3.4.4 Schools as a trusted safe space

The school environment played a pivotal role in influencing the HPV vaccination campaign, facilitating its success. School was generally perceived as a safe and trusted space for administering vaccines, which greatly contributed to increasing participation. According to the implementers, parents felt more comfortable with the idea of vaccinations when they were held within the school setting, as these spaces were considered well-organized, hygienic, and familiar. One healthcare worker emphasized,

"Holding vaccination drives at schools is better because parents trust the school environment" (KII-8), reflecting the importance of a trusted and clean setting for encouraging parents to allow their children to be vaccinated.

Moreover, the physical setup at schools was conducive to ensuring a smooth vaccination process. With designated areas for children to rest after receiving the vaccine, the school environment provided a sense of safety and comfort.

"There is a separate, clean, and tidy environment. The children have a place to rest for half an hour after getting vaccinated. Everything is arranged" (KII-2).

This level of organization not only addressed the immediate needs of the vaccinated children but also reassured parents and guardians about the vaccine's safety. These factors contributed to the overall success of the vaccination campaign by fostering a sense of security, trust, and acceptance within the school environment.

3.4.5 Opportunity costs of implementers

The opportunity cost of implementers was found to impact vaccination campaigns. Implementers often had to prioritize the vaccination, at the expense of their routine responsibilities, such as those related to family planning. The additional burden of balancing multiple roles not only strained their capacity but also affected the quality and consistency of their services. One of the vaccinators shared the experience as follows:

“Our daily tasks involve working across the entire 20th ward, where four of us are assigned. We spread awareness about pregnancy care, child healthcare, and family planning. Additionally, we do the campaign for vaccination. If I have hospital work in the afternoon, I dedicate time after that. Otherwise, I assist through mobile communication.... the work doubles so that it creates additional pressure.... for example, when I have hospital work, I manage both. If not, I can focus on this work more smoothly.” (KII-1).

3.5 CHARACTERISTICS OF INDIVIDUAL

3.5.1 Knowledge Gaps among implementers

A significant barrier to the success of the HPV vaccination campaign was the knowledge gap about the vaccine, among the implementers. Despite efforts to improve implementers' understanding through training, healthcare workers often felt ill-equipped to address the questions and concerns raised by guardians. One healthcare worker shared,

“We don't have much knowledge about it. When guardians ask questions, I cannot answer them” (KII-6). This gap in knowledge led to difficulties in effectively communicating the benefits and safety of the vaccine, creating a barrier to building trust and increasing vaccine acceptance. However, despite inadequate comprehensive knowledge, personalized interaction served as a facilitator in encouraging vaccine acceptance. One respondent explained,

“Our staff women counsel the schoolgirls beforehand, and they get encouraged” (KII-3).

By offering support and addressing concerns on a one-on-one basis, healthcare workers helped schoolgirls understand the value of the vaccine and feel more confident in their decision to receive it.

3.5.2 Motivated and self-driven

The implementers were motivated and driven which served as important facilitators of vaccine uptake in the HPV vaccination campaign. Their motivation was boosted due to training and pre-vaccination counseling. Healthcare workers were not only equipped with the knowledge but also had the necessary tools to address vaccine hesitancy through active communication. As one participant shared, *“We ensure counseling for schoolgirls unwilling to take the vaccine” (KII-3)*, showing that healthcare workers were proactive in engaging with hesitant individuals to clarify

misconceptions and build trust in the vaccination process. Emphasizing the role of the vaccine in preventing health issues like cervical cancer helped demystify its purpose. One participant explained,

“We explained to them that it was for their own good, at this age their uterus is healthy, so if they take it, that would be good for them” (KII-4).

This not only provided them basic information but also reminded the girls about the significance of taking the vaccine at an early age to save their life from deadly disease. Building trust was also an important stage in the counseling process. The emphasis on the vaccine's affordability confidence about its safety helped to overcome concerns and encouraged uptake. One healthcare worker explained,

“The students were told that it is a good vaccine, it needs to be bought with money, and they are getting it for free. they should take it and there will be no problem by the grace of almighty. And then Finally, they were convinced. Then we provided the vaccine one by one” (KII-5).

When there was resistance, healthcare workers used an individualistic approach, ensuring that each student felt comfortable and informed before receiving the vaccine. One participant noted,

“When we go there to administer the vaccine, if we find anybody unwilling to take the vaccine, we do the counseling” (KII-3).

Such a personalized interaction not only addressed individual concerns but also provided them the opportunity to make an informed decision about their participation.

3.6 PROCESS

3.6.1 Vaccine at free of Cost

The provision of the HPV vaccine for free of cost was identified to be significant facilitator and a barrier to its uptake. Many participants regarded the free of cost of the vaccination as an important advantage, particularly for families who could not otherwise afford it. As one of the participants pointed out, *“Not everyone can afford it. The government is giving it free at cost.” - (KII-3).* This accessibility significantly removed economic barriers, extending the vaccine's reach in marginalized communities.

However, some concerns about the vaccine's affordability were observed. . There were fears that once the funding of government ends, the vaccine would become unavailable or expensive in the private market. As one participant highlighted his concern, *"There's talk of the vaccine becoming paid after this program ends, which shouldn't happen... People in our country are more likely to accept it when it's free"* (KII-8).

Additionally, the provision of the vaccine at free cost negatively fueled rumors, with some participants shared their experience on hearing rumors about the safety of the vaccine. . As remarked by another participant, *"The government is providing it for free today, that's why people are spreading rumors like this"*(KII-3).

This duality highlights both the need to combat affordability and misinformation to maximize the program's impact.

3.6.2 Limited preparation time

The HPV vaccination campaign faced significant barriers in its planning and execution stages, mainly due to limited preparation time and many people faced issues with registration. This compromised the intervention's effectiveness and efficiency. Particularly, the limited time allocated for preparation before the campaign began hampered effective implementation. The vaccination campaign was launched with little advance notice, leaving healthcare workers and organizers with limited opportunities to engage with the target population and address potential concerns. This lack of preparation time was a major drawback in engaging communities, and in the preparing for the delivery of vaccines. As one participant noted,

"We did not get much time to discuss as they said it will start on November 10-14" (KII-4).

3.6.3 Administrative and technical issues

Moreover, registration issues posed a significant barrier to the campaign's success. Many children encountered problems with their birth registrations, preventing them from receiving the vaccine despite attempts to reach a broad population. One participant mentioned,

"While we managed to cover about 90%, some were left out due to registration issues" (KII-4).

This illustrates the gap between the intended and actual vaccination coverage, with registration discrepancies leading to missed opportunities for immunization. Common problems included inaccurate or incomplete birth registration details, such as incorrect names or missing entries, complicating the vaccination process.

"Previously last year, to go to the Banani center, registration was required. There were some problems with the registration. Many children had errors in their birth registration or their names were wrong. Some children didn't have names, so many couldn't get vaccinated" (KII-8).

These registration-related challenges created significant gaps in the campaign's ability to vaccinate the intended population, which undermined the overall success of the campaign. The combination of limited time for preparation and issues with the accuracy and completeness of birth registrations highlighted critical areas for improvement in future vaccination initiatives.

3.6.4 Active Engagement of Stakeholders

Despite the challenges faced during the HPV vaccination campaign, stakeholder engagement emerged as an important facilitator in boosting vaccine uptake. In building trust and enhancing communication collaboration with local leaders, schools and parents was instrumental. These were driving factors to the success of the campaign. Local leaders, particularly councilors, played an important role in spreading accurate information about the vaccine and encouraging its acceptance within communities. One participant highlighted the vital role of local leader in reducing vaccine hesitancy, saying,

"If councilors can arrange miking to inform people that the vaccine is safe, it would help" (KII-1).

Such community-level efforts to spread awareness were seen as an effective way of dispelling myths and increasing the participation of the community in the vaccination drive. The involvement of schoolteachers was also an important factor in facilitating vaccine uptake. Teachers helped to convey the information about cervical cancer and the HPV vaccine to students. This made it easier for healthcare workers to carry out the vaccination process. As one healthcare worker stated,

"Teachers sharing the information with students makes it easier for us" (KII-4).

The active involvement of teachers and school administration s ensured that students gained the relevant information about the vaccine. This contributed to greater awareness and acceptance. Altogether, the contribution of local leaders and teachers played a crucial role in fostering trust and collaboration. This led to increased participation and more effective vaccine distribution. As discussed before, stakeholder engagement at the community and school levels served as facilitator for the HPV vaccination campaign, enabling healthcare workers to navigate challenges and increase vaccine uptake.

3.6.5 Insufficient outreach activities

The expected implementation coverage for the HPV vaccination campaign was compromised by insufficient promotional activities and limited outreach strategies. The participants noted that the campaign could not reach to wider audience this year due to lack of effective promotion. One respondent expressed, *"We feel that this time the promotional activities are less" (KII-4)*, highlighting the need for a more and more proactive approach to inform the community. The absence of strategies such as public announcements through loudspeakers or the distribution of leaflets was seen as a missed opportunity to engage more individuals. One healthcare worker explained,

"We usually have to choose a location to promote the issue effectively, because some areas are very crowded. If we do promotional activities in the morning, some people might not see it." (KII-8).

This indicates that the outreach activities are limited to specific times, such as mornings, and are further constrained by the challenge of crowded areas, which reduces the visibility and reach of the campaign.

4. DISCUSSION

This study used the Consolidated Framework for Implementation Research (CFIR), to explore the factors that were key barriers and facilitators during the implementation of the HPV vaccination program in the Korail slum of Dhaka, Bangladesh. The findings highlighted awareness of cervical cancer prevention, free vaccine provision, training, and expertise of healthcare workers as significant facilitators. On the other hand, misinformation, financial and logistical issues, social stigma, and administrative barriers were identified as significant challenges, reflecting systemic

and contextual barriers unique to this setting. These findings not only align with existing literature but also provide context-specific insights that enhance our understanding of HPV vaccination challenges in resource-constrained slum settings.

One significant facilitator identified was raising awareness of cervical cancer and the vaccine's preventive health benefits against cervical cancer. This is consistent with global evidence showing that increased awareness significantly boosts vaccine acceptance (de Martel et al., 2017; Krokidi et al., 2023; Thanasis et al., 2022; Yacouti et al., 2022). This underscores that increased awareness motivates individuals to adopt preventive health practices and promotes community advocacy. This creates an effect of enhanced vaccination across a broader population.

Misinformation and rumors through social media emerged as significant barriers, with myths about children falling ill, becoming infertile, and side effects following vaccination, particularly widespread. Studies based in Ethiopia and South Asia have found that misinformation is a significant barrier to vaccine uptake (Dera et al., 2023; Rajkhowa et al., 2023). Misconceptions like girls becoming infertile after taking vaccination were prevalent and vaccine safety was questioned, mirroring findings from South Asia and Northern Nigeria (Rajkhowa et al., 2024; Yusuf et al., 2024). These challenges align with global literature on vaccine hesitancy, particularly in patriarchal societies, where fears of infertility and safety concerns are major obstacles to vaccine acceptance.

This study gives a deeper understanding of how these beliefs are widespread in urban slum settings, where misinformation spreads rapidly and trust in healthcare interventions remains fragile. For instance, many parents said that the vaccine could affect their daughters' reproductive health, which was due to misinformation about the potential benefits of the vaccine. To overcome these barriers, it is critical to undertake culturally appropriate awareness campaigns to encourage people to get vaccinated. These results support existing literature from Bangladesh (Hopkins et al., 2023), showing the need for Culturally appropriate health advocacy Fluttering Message Appropriate Vaccine Hesitancy. But unlike general vaccine resistance, this research found that concerns about fertility were specifically grappled by adolescent girls, being subject to familial and social pressure. This present study also emphasizes the role of social communication: local formalizations of school authority and informal authority of community leaders and guardians dealing with misinformation.

Different from previous research works, which mainly encourage the use of mass communication campaigns, this study brings out the ability of a community centered approach in restoring public confidence in vaccination programs. For example, involving school teachers, principals, and frontline healthcare workers in communication and spreading awareness helped clarify rumors and misconceptions in this context. This approach differs from previous studies, such as the case study of UNICEF-supported interventions for COVID-19 vaccines in Iraq, Zambia, India, and Ghana (Hopkins et al., 2023) which focused on community collaboration and capacity building for community leaders, school teachers, local volunteers, and health workers, suggests that localized, community-led strategies are more effective in building trust and handling vaccine hesitancy at the community level.

Affordability played an important role in the HPV vaccination program, with the availability of free vaccines serving as both a facilitator and a possible barrier. Providing the vaccine for free was a key factor in accessibility, particularly in disadvantaged communities where financial constraints limited healthcare utilization. This finding aligns with a systematic review about the determinants and uptake of HPV vaccination, which highlighted financial barriers as a key factor contributing to vaccine uptake in South Asia (Noreen et al., 2024). Availability of free vaccines or subsidizing vaccines reduced economic disparities and expanded the reach of the program to disadvantaged populations, reflecting the importance of removing cost-related barriers in vaccination efforts (Wang et al., 2019). However, concerns were also raised about the future cost of the vaccine once the funding ends for the government programs. Participants feared that the vaccine might become excessively expensive in private markets, potentially reducing the progress achieved through the campaign. Similarly, a study in northern Nigeria revealed that parents were hesitant to vaccinate their children if the vaccine was free or subsidized (Yusuf et al., 2024). Additionally, the findings indicate that the availability of free vaccines also fueled rumors about the vaccine's safety, with some community members questioning why such an *"important"* vaccine was being offered at no cost. This underscores the dual-edged nature of affordability; while it enhances coverage and access, it can also negatively cause mistrust when combined with inadequate public awareness campaigns.

In order to overcome these challenges' policymakers should ensure sufficient funding to vaccination programs and keep the costs affordable in the long run. Furthermore, the inclusion of

HPV vaccination in routine immunization schedules can help normalize the vaccine and reduce reliance on ad-hoc campaigns. Further research should be conducted on other sustainable financial approaches, to make sure that the cost of these immunizations remains low, even when there are no funding coming from external sources or government support.

Logistical and financial limitations, including insufficient transportation support and limited resources for healthcare workers, significantly hindered the program's effectiveness. This finding aligns with the challenges documented by a systematic review of barriers in HPV implementation emphasizing the need for increased government and organizational investment to overcome similar obstacles in LMICs (Ver et al., 2021).

However, this study contributes to the literature by highlighting the disproportionate burden female healthcare workers face, who encounter physical and financial challenges during vaccine distribution. As observed, the lack of male assistants caused additional physical strain on female staff, while the absence of transportation support led to financial hardships. These findings align with other studies that emphasize the gendered dimensions of healthcare work and the imbalance of women in lower positions of healthcare, which have not been properly addressed in health policy and research (Feletto & Sharkey, 2019). The findings also resonate with a scoping review on experience of women healthcare workers during disease outbreaks like COVID-19 which identified several challenges faced by women such as increased workload, mental and physical illnesses (Morgan et al., 2022). These issues not only slowed the efficiency of vaccine delivery but also demotivated healthcare workers, potentially impacting their long-term participation in such initiatives. .

Stakeholder engagement, particularly the involvement of local leaders, school teachers, and parents, was identified as an important facilitator of vaccine uptake. This finding aligns with the importance of community-driven approaches in public health intervention (Abdullah et al., 2022). Such engagement not only facilitated the vaccination outreach but also community trust. However, this study uniquely highlights the crucial role of parents, particularly mothers, in overcoming vaccine hesitancy. In many cases, informed mothers actively encouraged their daughters to receive the vaccine as they were found to be the decision-makers in the family. This demonstrates the power of parental influence in driving health behaviors. This is consistent with findings in the literature on the influence of parents in vaccination decisions which state that

positive parental influence escalates vaccine uptake (Carhart et al., 2018; Wijayanti et al., 2023). Unlike previous studies that focus primarily on healthcare workers and educators, this research underscores the potential of family-centered approaches to strengthen community support for vaccination programs.

Although the study provides valuable insights, several limitations should be acknowledged. The short two-month timeline and the limited five-day data collection period restricted the scope of diverse stakeholder engagement. Budget constraints limited the scale of logistical and promotional activities. Additionally, the reliance on research assistants due to the lead researcher's non-native Bangla proficiency may have introduced linguistic and cultural biases, potentially affecting data interpretation. Future studies should address these limitations by adopting longer timelines, higher budgets, and integrating of local expertise to yield more comprehensive and robust findings.

These strategies address the immediate challenges and provide the way for more equitable and effective vaccination efforts. Future research should focus on assessing the long-term impact of these recommendations and exploring innovative approaches to scale successful interventions across similar LMIC contexts. These efforts will play a crucial role in bridging existing gaps and achieving the global goal of equitable HPV vaccine coverage.

6. CONCLUSION

The present paper aims to explore the facilitators and barriers that affect the implementation of the HPV vaccination in the Korail slum of Dhaka, Bangladesh. The targeted key facilitators were also found to have very useful roles in promoting vaccine uptake within the community. However, there are significant barriers that acted as hindrances to the expansion of the program. Overall, whereas previous successful v campaigns including COVID-19 have been accomplished in Bangladesh, this study points out the fact that scraping challenges hindering HPV vaccination requires a special approach. Community-driven awareness and engagement strategies are essential factors in handling misinformation, and rumors and building trust. Additionally, ensuring better support and addressing logistical challenges faced by healthcare workers and efficient administrative systems is essential for ensuring operational efficiency and comprehensive vaccine coverage. This research highlights the significance of applying implementation science to

tackle and address these challenges. The ultimate aim is to ensure equitable access to vaccines and reduce morbidity and mortalities associated with cervical cancer.

6.1 Recommendations and Implications

Using the above results, several important recommendations can be made to optimize HPV vaccination. In particular, the first communication strategies should be developed with the help of the use of contextualized and culturally sensitive campaigns. In this case, getting influential characters including teachers, community leaders, and health caregivers is befitting for the task of passing information. It can be therefore useful in handling misinformation and rumors and increasing vaccine uptake. Furthermore, using group workshops, peer discussions, and announcements through loudspeakers will cover the broader population. It is also essential to strengthen logistical support from the city corporation by offering transportation allowances, disbursing payment timely for the health workers, providing male assistants for health care workers, and implementing efficient registration systems. These measures can help minimize errors and ensure comprehensive vaccine coverage.

In the context of these findings, future research should aim to evaluate the sustained impact of HPV vaccination programs and the acceptability of the vaccine in the community. Thus, experimenting with innovative and sustainable approaches to engaging communities to build trust is of particular importance. There is therefore a need to have policies reform if the gaps in the system will be closed and if any vaccination activities are going to be sustained. The strengthening of health care infrastructure by timely and timely remuneration, training, and provision of logistical support for CHW at the community level should be given a higher priority. Schools and educational institutions should include education about sexual and reproductive health including HPV in the curriculum. In addition, policy recommendations should stress on integration of the HPV vaccine into the EPI schedule. Moreover, monitoring and evaluation systems should be developed to track vaccination progress, identify barriers, and implement data-driven solutions for continuous improvement,

The findings of this study hold significant implications for policymakers, healthcare implementors, and researchers. Addressing the identified challenges and capitalizing on the facilitators, the HPV vaccination program can be refined to encourage coverage and effectiveness.

This can contribute to the global cervical cancer elimination targets. Additionally, the strategies proposed in this study offer a valuable framework for designing and executing similar public health interventions in other resource-constrained settings. This highlights the importance of adopting contextually tailored, community-centered approaches to ensure equitable and sustainable health outcomes.

REFERENCES

- Abdullah, M., Ahmad, T., Kazmi, T., Sultan, F., Afzal, S., Safdar, R. M., & Khan, A. A. (2022). Community engagement to increase vaccine uptake: Quasi-experimental evidence from Islamabad and Rawalpindi, Pakistan. *PLoS ONE*, 17(12 December), 1–16. <https://doi.org/10.1371/journal.pone.0274718>
- Adeshina, O. O., Nyame, S., Milner, J., Milojevic, A., & Asante, K. P. (2023). Barriers and facilitators to nationwide implementation of the malaria vaccine in Ghana. *Health Policy and Planning*, 38(1), 28–37. <https://doi.org/10.1093/heapol/czac077>
- Banik, R., Naher, S., Rahman, M., & Gozal, D. (2022). Investigating Bangladeshi Rural Women’s Awareness and Knowledge of Cervical Cancer and Attitude Towards HPV Vaccination: a Community-Based Cross-Sectional Analysis. *Journal of Cancer Education*, 37(2), 449–460. <https://doi.org/10.1007/s13187-020-01835-w>
- Barukčić, I. (2018). Human Papillomavirus—The Cause of Human Cervical Cancer. *Journal of Biosciences and Medicines*, 06(04), 106–125. <https://doi.org/10.4236/jbm.2018.64009>
- Borda, H., Bloem, P., Akaba, H., Guillaume, D., Willens, V., Jurgensmeyer, M., Muralidharan, K., & Limaye, R. (2024). Status of HPV disease and vaccination programmes in LMICs: Introduction to special issue. *Vaccine*, 42(S2), S1–S8. <https://doi.org/10.1016/j.vaccine.2023.10.062>
- Carhart, M. Y., Schminkey, D. L., Mitchell, E. M., & Keim-Malpass, J. (2018). Barriers and Facilitators to Improving Virginia’s HPV Vaccination Rate: A Stakeholder Analysis With Implications for Pediatric Nurses. *Journal of Pediatric Nursing*, 42(2018), 1–8. <https://doi.org/10.1016/j.pedn.2018.05.008>
- Damschroder, L. J., Reardon, C. M., Widerquist, M. A. O., & Lowery, J. (2022). The updated Consolidated Framework for Implementation Research based on user feedback. *Implementation Science*, 17(1), 1–16. <https://doi.org/10.1186/s13012-022-01245-0>
- de Martel, C., Plummer, M., Vignat, J., & Franceschi, S. (2017). Worldwide burden of cancer attributable to HPV by site, country and HPV type. *International Journal of Cancer*, 141(4), 664–670. <https://doi.org/10.1002/ijc.30716>
- Dera, M., Wondimagegnehu, A., & Asfaw, Z. G. (2023). Determinants for hesitancy in human papillomavirus (HPV) vaccine uptake among school girls in Jimma Town, Ethiopia. A mixed approach: quantitative and qualitative. *Reproductive Health*, 20(1), 1–13. <https://doi.org/10.1186/s12978-023-01711-y>
- Dorji, T., Nopsopon, T., Tamang, S. T., & Pongpirul, K. (2021). Human papillomavirus vaccination uptake in low-and middle-income countries: a meta-analysis. *EClinicalMedicine*, 34, 100836. <https://doi.org/10.1016/j.eclinm.2021.100836>
- eClinicalMedicine. (2023). Global strategy to eliminate cervical cancer as a public health problem: are we on track? *EClinicalMedicine*, 55, 101842.

<https://doi.org/10.1016/j.eclinm.2023.101842>

- Feletto, M., & Sharkey, A. (2019). The influence of gender on immunisation: Using an ecological framework to examine intersecting inequities and pathways to change. *BMJ Global Health*, 4(5), 1–10. <https://doi.org/10.1136/bmjgh-2019-001711>
- Guillaume, D., Waheed, D. E. N., Schleiff, M., Muralidharan, K. K., Vorsters, A., & Limaye, R. J. (2024). Global perspectives of determinants influencing HPV vaccine introduction and scale-up in low- and middle-income countries. *PLoS ONE*, 19(1 January), 1–19. <https://doi.org/10.1371/journal.pone.0291990>
- Health, T. I., & Collaborative, S. (2021). Inequity of healthcare access and use and catastrophic health spending in slum communities: A retrospective, cross-sectional survey in four countries. *BMJ Global Health*, 6(11), 1–11. <https://doi.org/10.1136/bmjgh-2021-007265>
- Hopkins, K. L., Underwood, T., Iddrisu, I., Woldemeskel, H., Bon, H. B., Brouwers, S., De Almeida, S., Fol, N., Malhotra, A., Prasad, S., Bharadwaj, S., Bhatnagar, A., Knobler, S., & Lihemo, G. (2023). Community-Based Approaches to Increase COVID-19 Vaccine Uptake and Demand: Lessons Learned from Four UNICEF-Supported Interventions. *Vaccines*, 11(7). <https://doi.org/10.3390/vaccines11071180>
- HPV INFORMATION CENTER. (2023). Bangladesh Bangladesh. *Plastics and Rubber*, 1(September), 156–162. https://hpvcentre.net/statistics/reports/BGD_FS.pdf
- Krokidi, E., Rao, A. P., Ambrosino, E., & Thomas, P. P. M. (2023). The impact of health education interventions on HPV vaccination uptake, awareness, and acceptance among people under 30 years old in India: a literature review with systematic search. *Frontiers in Reproductive Health*, 5(May). <https://doi.org/10.3389/frph.2023.1151179>
- McKenzie, A. H., Shegog, R., Savas, L. S., Healy, C. M., Shay, L. A., Preston, S., Coan, S., Teague, T., Frost, E., Spinner, S. W., & Vernon, S. W. (2023). Parents' stigmatizing beliefs about the HPV vaccine and their association with information seeking behavior and vaccination communication behaviors. *Human Vaccines and Immunotherapeutics*, 19(1), 1–9. <https://doi.org/10.1080/21645515.2023.2214054>
- Morgan, R., Tan, H. L., Oveisi, N., Memmott, C., Korzuchowski, A., Hawkins, K., & Smith, J. (2022). Women healthcare workers' experiences during COVID-19 and other crises: A scoping review. *International Journal of Nursing Studies Advances*, 4(October 2021), 100066. <https://doi.org/10.1016/j.ijnsa.2022.100066>
- Noreen, K., Naeem Khalid, S., Murad, M. A., Baig, M., & Khan, S. A. (2024). Uptake and determinants of HPV vaccination in South Asia: a systematic review and meta-analysis. *Frontiers in Public Health*, 12(December), 1–13. <https://doi.org/10.3389/fpubh.2024.1453704>
- Ojo, T., Kabasele, L., Boyd, B., Enechukwu, S., Ryan, N., Gyamfi, J., & Peprah, E. (2021). The Role of Implementation Science in Advancing Resource Generation for Health Interventions in Low- and Middle-Income Countries. *Health Services Insights*, 14. <https://doi.org/10.1177/1178632921999652>
- Rajkhowa, P., Patil, D. S., Dsouza, S. M., Narayanan, P., & Brand, H. (2023). Evidence on

- factors influencing HPV vaccine implementation in South Asia: A scoping review. *Global Public Health*, 18(1). <https://doi.org/10.1080/17441692.2023.2288269>
- Rajkhowa, P., Pundir, P., Dsouza, S. M., Patil, D. S., Narayanan, P., & Brand, H. (2024). Factors influencing HPV vaccine implementation in South Asia: a scoping review protocol. *Systematic Reviews*, 13(1), 1–5. <https://doi.org/10.1186/s13643-023-02415-x>
- Reza, S., Dewan, S. M. R., Islam, M. S., & Shahriar, M. (2024). Response of Bangladesh to the World Health Organization call to eliminate cervical cancer as a public health issue: An observational report. *Health Science Reports*, 7(6), 1–6. <https://doi.org/10.1002/hsr2.2178>
- Soi, C., Gimbel, S., Chilundo, B., Muchanga, V., Matsinhe, L., & Sherr, K. (2018). Human papillomavirus vaccine delivery in Mozambique: Identification of implementation performance drivers using the Consolidated Framework for Implementation Research (CFIR). *Implementation Science*, 13(1), 1–12. <https://doi.org/10.1186/s13012-018-0846-2>
- Thanasas, I., Lavranos, G., Gkogkou, P., & Paraskevis, D. (2022). The Effect of Health Education on Adolescents' Awareness of HPV Infections and Attitudes towards HPV Vaccination in Greece. *International Journal of Environmental Research and Public Health*, 19(1). <https://doi.org/10.3390/ijerph19010503>
- Tsui, J., Shin, M., Sloan, K., Martinez, B., Palinkas, L. A., Baezconde-Garbanati, L., Cantor, J. C., Hudson, S. V., & Crabtree, B. F. (2024). Understanding Clinic and Community Member Experiences with Implementation of Evidence-Based Strategies for HPV Vaccination in Safety-Net Primary Care Settings. *Prevention Science*, 25(Suppl 1), 147–162. <https://doi.org/10.1007/s11121-023-01568-4>
- Ver, A. T., Notarte, K. I., Velasco, J. V., Buac, K. M., Nazareno, J., Lozañes, J. A., Antonio, D., & Bacorro, W. (2021). A systematic review of the barriers to implementing human papillomavirus vaccination programs in low- and middle-income countries in the Asia-Pacific. *Asia-Pacific Journal of Clinical Oncology*, 17(6), 530–545. <https://doi.org/10.1111/ajco.13513>
- Vorstes, A., Bosch, F. X., Poljak, M., Waheed, D. e. N., Stanley, M., & Garland, S. M. (2022). HPV prevention and control – The way forward. *Preventive Medicine*, 156(January). <https://doi.org/10.1016/j.ypmed.2022.106960>
- Wang, J., Ploner, A., Sparén, P., Lepp, T., Roth, A., Arnheim-Dahlström, L., & Sundström, K. (2019). Mode of HPV vaccination delivery and equity in vaccine uptake: A nationwide cohort study. *Preventive Medicine*, 120(June 2018), 26–33. <https://doi.org/10.1016/j.ypmed.2018.12.014>
- Wijayanti, K. E., Schutze, H., Phail, C. Mac, & Ivers, R. (2023). Exploring Parents' Decisions Regarding HPV Vaccination for Their Daughters in Jakarta, Indonesia: A Qualitative Study. *Asian Pacific Journal of Cancer Prevention*, 24(11), 3993–3998. <https://doi.org/10.31557/APJCP.2023.24.11.3993>
- Yacouti, A., Elkhoudri, N., El got, A., Benider, A., Hadrya, F., Baddou, R., Forster, A., & Mouallif, M. (2022). Awareness, attitudes and acceptability of the HPV vaccine among female university students in Morocco. *PLoS ONE*, 17(4 April), 1–10. <https://doi.org/10.1371/journal.pone.0266081>

