

ORIGINAL ARTICLE

Knowledge, Attitudes, and Perceptions Regarding HPV Vaccination Among women attending the VIA center at a District-Level Hospital in Bangladesh

DOI: 10.5281/zenodo.18548276

Rehana Pervin¹, Ferdous Jahan², Rawshon Jahan³, Mitu Debnath⁴, Noushin Zahan⁵, Affzalunessa Chowdhury⁶, Monirul Islam⁷

Received: 26 Jan 2026
Accepted: 29 Jan 2026
Published Online: 9 Feb 2026

Published by:
Gopalganj Medical College, Gopalganj,
Bangladesh

Correspondence to
Rehana Pervin

Copyright © 2025 The Insight



This article is licensed under a [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/).



ABSTRACT

Background: Cervical cancer remains a leading cause of morbidity and mortality among women in low- and middle-income countries, including Bangladesh. HPV vaccination is a proven primary preventive measure; however, uptake is influenced by community-level knowledge, attitudes, and perceptions (KAP). Understanding these factors among women attending cervical cancer screening clinics is essential to guide national prevention strategies. **Aim of the study:** This study aimed to assess the knowledge, attitudes, and perceptions regarding HPV infection and HPV vaccination among women attending the Visual Inspection with Acetic Acid (VIA) center at a district-level hospital in Bangladesh. **Methods & Materials:** A cross-sectional study was conducted among 155 women attending the VIA center of the 250-Bed General Hospital, Tangail, from January to December 2023. Participants were recruited through consecutive sampling. Data were collected via a pre-tested, semi-structured interviewer-administered questionnaire covering sociodemographic characteristics and KAP components. Descriptive statistics summarized the variables, while associations between sociodemographic factors and KAP levels were examined using chi-square and Fisher's exact tests. A p -value <0.05 was considered statistically significant. **Result:** Only 25.16% of women had ever heard of HPV, and awareness of HPV vaccination was similarly low (30.32%). Knowledge of appropriate vaccination age and availability was extremely limited ($<6\%$). Positive attitudes toward HPV vaccination were uncommon; only 10.32% agreed that it should be included in the national immunization schedule. Despite low awareness, willingness to vaccinate adolescent daughters and recommend vaccination to family members was high (94.8%). HPV vaccine uptake was poor, with only 5.16% ever vaccinated. Education showed a significant association with good knowledge ($p < 0.001$), positive attitudes ($p = 0.002$), and favorable perceptions ($p = 0.015$). **Conclusion:** The present study demonstrates substantial gaps in knowledge and awareness of HPV and its vaccine among women attending a district-level VIA center in Bangladesh, despite high expressed willingness to vaccinate. Educational interventions, improved counseling at screening clinics, and integration of HPV vaccination awareness into routine reproductive health services are urgently needed to enhance vaccine uptake and support national cervical cancer prevention efforts.

Keywords: HPV vaccination, knowledge, attitudes, perceptions, VIA center, cervical cancer prevention, Bangladesh, women's health, KAP study.

(The Insight 2025; 8(4): 888-893)

1. Assistant Professor, Department of Obstetrics & Gynaecology, Tangail Medical College Hospital, Tangail, Bangladesh (ORCID: 0009-0009-7683-4611)
2. Assistant Professor, Department of Obstetrics & Gynaecology, Tangail Medical College Hospital, Tangail, Bangladesh
3. Assistant Professor, Department of Obstetrics & Gynaecology, Tangail Medical College Hospital, Tangail, Bangladesh
4. Assistant Professor, Department of Obstetrics & Gynaecology, Tangail Medical College Hospital, Tangail, Bangladesh
5. Assistant Professor, Department of Obstetrics & Gynaecology, Tangail Medical College Hospital, Tangail, Bangladesh
6. Former Prof Shaheed Suhrawardy medical college & hospital Senior consultant, Lab Aid hospital, Dhanmondi. Dhaka, Bangladesh
7. Assistant Professor, Department of Cardiac surgery, Sir Salimullah Medical College, Dhaka, Bangladesh

INTRODUCTION

HPV vaccination is a medical intervention in which a vaccine is administered to protect against certain types of the human papillomavirus (HPV) [1]. Globally, HPV vaccination coverage is still well below target, with about 61.6% of girls aged 9–14 receiving the first dose and only 47.6% completing the full course [2]. In Bangladesh, about 93 % of eligible girls aged 10–14 received the HPV vaccine during the nationwide campaign

[3]. The knowledge about HPV and its vaccine among women attending health centers is generally limited, despite a high willingness to vaccinate. Awareness of cervical cancer is relatively common, with 60-70% of women recognizing the disease, but detailed understanding of HPV transmission, vaccine benefits, and prevention remains low [4]. Education level, socioeconomic status, and access to information through media or school programs strongly influence knowledge and

attitudes toward HPV vaccination [5]. Vaccination rates are still low, primarily due to a lack of awareness, vaccine cost, and limited exposure to health campaigns, although acceptance rates among parents and women are high [6]. Multimedia campaigns and school-based education have shown promise in increasing motivation and vaccine uptake, but challenges remain in reaching rural and lower-income populations [7]. Risk factors influencing HPV vaccination uptake in Bangladesh include limited awareness and knowledge about HPV, cervical cancer, and the vaccine itself, especially among parents and caregivers [8]. Early marriage, poor hygiene, and limited healthcare access are also key risk factors for cervical cancer, indirectly affecting vaccination motivation and coverage in rural areas [9]. Despite a generally high willingness to vaccinate, barriers such as vaccine cost, inadequate knowledge, and insufficient exposure to health campaigns or multimedia interventions limit actual vaccine uptake [4]. Younger age, higher education, internet or social media use, and positive perceptions about vaccine benefits are associated with higher acceptance and uptake [6]. Addressing these risk factors through targeted education, affordable vaccine access, and expanded multimedia campaigns is critical to improving HPV vaccination rates and reducing cervical cancer incidence in Bangladesh [8]. The treatment of HPV-related conditions focuses primarily on early detection and management of precancerous cervical lesions to prevent progression to cancer. The national cervical cancer screening program uses VIA (Visual Inspection with Acetic Acid), and screen-positive women may be treated with LEEP (Loop Electrosurgical Excision Procedure) or thermo-coagulation [10]. Although HPV infections can clear spontaneously in many women, persistent or recurrent lesions pose a risk, making preventive measures important. Prophylactic HPV vaccines are recommended, but they do not eliminate the need for ongoing screening because not all oncogenic HPV types are covered [11]. Cost-effective strategies, including “see-and-treat” approaches and the use of affordable ablative techniques, are essential to reduce the cervical cancer burden [10]. The study aimed to evaluate the knowledge, attitudes, and perceptions concerning the HPV vaccine and identify factors influencing vaccination among women attending the VIA center at a district-level hospital in Bangladesh.

METHODS & MATERIALS

This cross-sectional study was conducted at the Visual Inspection with Acetic Acid (VIA) center of the 250-Bed General Hospital in Tangail, a major district-level healthcare facility in Bangladesh. The study was carried out over a 12-month period from January 2023 to December 2023 and targeted women attending the outpatient VIA clinic for cervical cancer screening or related services.

Inclusion & Exclusion criteria

A total of 155 women were included in the study using a consecutive sampling method.

Inclusion criteria were: (i) women attending the VIA outpatient department, (ii) providing informed consent

Exclusion criteria included: (i) women who were critically ill, (ii) those with known psychiatric illness impairing communication, and (iii) those unwilling to participate.

Data Collection Procedure

Data for this study were collected using a pre-designed, semi-structured questionnaire specifically developed to assess knowledge, attitudes, and perceptions (KAP) regarding HPV and HPV vaccination. The questionnaire was formulated based on an extensive review of existing literature and previously

validated KAP instruments. It comprised four main sections: sociodemographic characteristics, knowledge about HPV infection and its vaccine, attitudes toward vaccination, and perceptions and barriers related to HPV vaccination. Prior to the main study, the questionnaire underwent content validation by a panel of public health experts and was pretested on 15 women attending a similar healthcare facility to ensure clarity, reliability, and cultural appropriateness. Necessary modifications were incorporated based on the pretest findings. Data collection was conducted by trained female interviewers through face-to-face interviews in private counseling rooms at the VIA center to ensure participant comfort and confidentiality. Each interview lasted approximately 15–20 minutes. The interviewers explained the purpose of the study, assured participants of confidentiality, and obtained informed consent before administering the questionnaire. During the process, completed questionnaires were checked daily for completeness and accuracy to minimize missing or inconsistent responses. This rigorous procedure ensured high-quality and reliable data for subsequent statistical analysis.

Statistical Analysis

Data were checked for completeness, coded, and entered into IBM SPSS Statistics version 23. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize sociodemographic and KAP variables. Associations between sociodemographic factors and KAP levels were assessed using chi-square tests or Fisher’s exact test as appropriate. Statistical significance was defined as a p -value <0.05 .

Ethical Considerations

Ethical approval for the study was obtained from the institutional ethics review committee of the 250-Bed General Hospital, Tangail. Written informed consent was obtained from all participants after explaining the study objectives, procedures, and confidentiality measures. Participation was voluntary, and respondents were assured that refusal would not affect their access to healthcare services.

RESULT

A total of 155 women attending the VIA center were included in the present study. The mean age was 33.87 ± 8.16 years, with the majority belonging to the 30–39 years age group (32.26%). Educational attainment was notably low, with 35.48% having only primary education, 29.03% completed secondary school, and 25.81% having no formal education, and just 9.68% achieved higher education. A significant majority of the participants were married (77.42%) and predominantly homemakers (58.06%), while a smaller segment was employed (25.81%) or students (12.90%). Geographically, the respondents were slightly more rural (54.84%) than urban (45.16%) (Table I).

Table – I: Sociodemographic characteristics of the study population ($n = 155$)

Variable	Frequency (n)	Percentage (%)
Age (years)		
<30	60	38.71
30–39	50	32.26
≥40	45	29.03
Mean $\pm$ SD	33.87 $\pm$ 8.16	
Education		
No formal education	40	25.81
Primary	55	35.48
Secondary	45	29.03

Higher	15	9.68
Marital Status		
Married	120	77.42
Unmarried	35	22.58
Occupation		
Homemaker	90	58.06
Employed	40	25.81
Student	20	12.90
Other	5	3.23
Residence		
Urban	70	45.16
Rural	85	54.84

Knowledge regarding Human Papillomavirus (HPV) and HPV vaccination was alarmingly deficient, with only 25.16% of participants ever having heard of HPV. Awareness of the cervical cancer vaccine was critically low at 30.32%, with only 5.16% knowing about the HPV vaccine's existence. Furthermore, merely 10.32% had received counseling from healthcare providers on this topic, and knowledge on vaccine accessibility was virtually nonexistent (1.94%), as was correct information on the suitable age for vaccination (3.23%) (Table II).

Table – II: Knowledge regarding HPV and HPV vaccination among the study population

Knowledge Item	Correct Response	Frequency (n)	Percentage (%)
Heard of HPV?	Yes	39	25.16
	No	116	74.84
HPV vaccine for both girls and boys?	Yes	8	5.16
	No	147	94.84
Heard about vaccine against cervical cancer?	Yes	47	30.32
	No	108	69.68
Aware of availability?	Yes	8	5.16
	No	147	94.84
Informed about HPV vaccine at health care center?	Yes	16	10.32
	No	139	89.68
Know where to get vaccination?	Yes	3	1.94
	No	147	94.84
	Do not know	5	3.23
Know appropriate age for HPV vaccination?	Yes	5	3.23
	No	133	85.81
	Do not know	17	10.97

Respondents demonstrated a lack of understanding regarding the connection between HPV and cervical cancer, with only 5.16% recognizing this association. Furthermore, misconceptions about vaccine effectiveness were prevalent; 65.81% believed it would eliminate cervical cancer. Support for

HPV vaccination in boys was minimal (5.16%), with a vast majority either undecided (89.68%) or disapproving of its inclusion in the national immunization schedule (81.94%), having no clear opinion (Table III).

Table – III: Attitudes toward HPV vaccination among the study population

Attitude Statement	Response	Frequency (n)	Percentage (%)
Aware of HPV-cervical cancer link?	Yes	8	5.16
	No	139	89.68
	No response	8	5.16
Is HPV vaccine effective to prevent carcinoma cervix due to HPV infection?	Completely eliminates	102	65.81
	Slightly decreases infection	31	20.00
	No response	22	14.19
Do you think vaccine should offered to boys/Mens?	Agree	8	5.16
	Disagree	8	5.16
	No response	139	89.68
Do you think HPV vaccination should include on national immunization schedule?	Agree	16	10.32
	Disagree	12	7.74
	No response	127	81.94

Despite the low uptake of the HPV vaccine, only 5.2% reported having received it, there was significant willingness among respondents to vaccinate their daughters (94.8%) and to recommend the vaccine to others. The primary barrier to vaccination cited by unvaccinated participants was lack of

knowledge (80%), followed by perceptions of cost (5.2%) and concerns about age (5.2%). Additionally, only a small number of respondents were aware of the complete vaccine schedule (5.2%) (Table IV).

Table – IV: Perceptions and barriers regarding HPV vaccination among the study population

Perception / Barrier	Response	Frequency (n)	Percentage (%)
Have you taken HPV vaccine?	Yes	8	5.2
	No	147	94.8
Barrier to vaccination*	Lack of knowledge	124	80
	Costly	8	5.2
	Too young	8	5.2

	Unaware about availability	15	9.7
Would vaccinate adolescent daughter?	Yes	147	94.8
	No	6	3.9
	No response	2	1.3
Recommend vaccine to family?	Yes	147	94.8
	No	8	5.2
Know vaccine schedule?	Yes	8	5.2
	No	147	94.8

Among those vaccinated, completion rates were low, with several reporting only partial doses: 1 dose (1.94%), 2 doses (1.94%), and only 1.29% completed all three doses. The main

drivers for vaccination included physician recommendations (1.94%), school-based programs (1.94%), and personal initiative (1.29%) (Table V).

Table – V: HPV vaccination uptake and dose-completion patterns among the study population

Variable	Category	Frequency (n)	Percentage (%)
Vaccination status	Vaccinated	8	5.16
	Not vaccinated	147	94.84
Number of doses received (among vaccinated)	1 dose	3	1.94
	2 doses	3	1.94
	3 doses	2	1.29
Reason for vaccination (among vaccinated)	Physician recommendation	3	1.94
	School program	3	1.94
	Self-initiative	2	1.29

Associations between sociodemographic factors and KAP are shown in Table 6. Good knowledge was highest among women with higher education (60.00%) and lowest among those with no formal education (10.00%), with a significant association (p

< 0.001). Positive attitudes also varied by education ($p = 0.002$), and favorable perceptions showed a significant association as well ($p = 0.015$). No significant associations were observed across age groups for any KAP domains (Table VI)

Table – VI: Association of sociodemographic factors with KAP regarding HPV vaccination

Variable	Good Knowledge n (%)	p-value	Positive Attitude n (%)	p-value	Favorable Perception n (%)	p-value
Age (years)						
<30	18 (30.00)	0.25	15(25.00)	0.28	49(77.78)	0.57
30–39	12 (24.00)		11 (22.00)		42 (84.00)	
≥40	9 (20.00)		7 (15.56)		35 (77.78)	
Education						
No formal education	4 (10.00)	<0.001	3 (7.50)	0.002	30 (75.00)	0.015
Primary	12 (21.82)		10 (18.18)		45 (81.82)	
Secondary	14 (31.11)		16 (35.56)		35 (77.78)	
Higher	9 (60.00)		8 (53.33)		10 (66.67)	

DISCUSSION

Cervical cancer remains a leading cause of cancer-related morbidity and mortality among women in low- and middle-income countries, including Bangladesh, despite the availability of effective preventive strategies such as HPV vaccination [12]. In the present study, we sought to assess the knowledge, attitudes, and perceptions regarding HPV vaccination among women attending a VIA center at a district-level hospital, recognizing that understanding these factors is critical for designing interventions that enhance vaccine uptake and reduce cervical cancer burden. Our findings revealed substantial gaps in awareness and understanding of HPV and its vaccination. Only 25.16% of participants reported having heard of HPV, and merely 5.16% were aware that the vaccine is recommended for both girls and boys. Similarly, a population-based survey among ever-married women reported markedly low cervical cancer knowledge, with only 20% of urban and 5% of rural respondents aware of any preventive vaccine, despite an exceptionally high willingness to be vaccinated (93.9–99.4%) [4]. Awareness regarding the availability of the HPV vaccine and the recommended age for vaccination was notably inadequate in the present study, with only 5.16% and 3.23% of participants, respectively, demonstrating accurate knowledge. This pattern aligns closely with evidence from other low- and

middle-income settings, where poor awareness consistently emerges as a major impediment to vaccine uptake [13]. In Bangladesh, prior research among women attending primary healthcare facilities similarly found that only a minority recognized the HPV vaccine or understood its role in preventing cervical cancer [14]. Evidence from Uganda also reflects this gap, as fewer than 10% of adolescent girls had completed the full vaccination series, largely due to insufficient knowledge of vaccine availability and eligibility criteria [15]. Parallel findings from Iran further demonstrate that most women of reproductive age possess inadequate understanding of HPV infection and the importance of vaccination [16]. Attitudes toward HPV vaccination similarly reflected low awareness of the HPV-cervical cancer link, with only 5.16% of participants acknowledging this connection. Interestingly, despite low knowledge levels, the majority (65.81%) believed the vaccine could “completely eliminate” the risk of cervical carcinoma, suggesting a misperception of vaccine efficacy. Similar findings were reported by Chew et al. (2021), who found that many female university students in Malaysia assumed the vaccine offered complete protection against cervical cancer despite inadequate understanding of HPV and its risks [17]. Likewise, a population-based study in Bangladesh demonstrated low detailed knowledge of cervical cancer and

HPV, yet most women expressed willingness to receive the vaccine, highlighting the gap between knowledge and perceived vaccine benefits [4]. Comparable patterns have been documented in other low- and middle-income countries, where positive attitudes toward vaccination coexist with inadequate understanding of its preventive scope [18,19]. Perceptions and barriers regarding HPV vaccination were prominently observed in the present study. Insufficient knowledge was identified as the primary impediment, affecting 80% of participants, whereas actual vaccine uptake remained exceedingly low at 5.16%. Notably, a substantial proportion of participants expressed willingness to vaccinate their adolescent daughters and to recommend the vaccine to family members (94.8%), indicating that positive behavioral intentions exist and could potentially translate into action if adequate information and accessible vaccination services are provided. These findings are consistent with prior evidence from Bangladesh and other contexts. A population-based survey reported that, despite minimal awareness of cervical cancer and HPV, willingness to receive the HPV vaccine was remarkably high, reaching 99.4% for self-vaccination and 91.8% for adolescent daughters [4]. Similarly, a nationwide study among parents of eligible girls revealed low vaccine awareness (~22%) but high acceptance (86.6%) [6]. A school-based study in Dhaka further demonstrated that, although knowledge regarding HPV and its vaccination was limited among parents and teachers, nearly all respondents indicated willingness to vaccinate [11]. Beyond Bangladesh, a mixed-methods study of adolescent girls in Kampala, Uganda, revealed low levels of HPV vaccine knowledge, negative perceptions, and under-ten-percent vaccine completion, yet identified awareness and access as key barriers [15]. Analysis of sociodemographic factors revealed that educational attainment significantly influenced participants' knowledge, attitudes, and perceptions regarding HPV vaccination. Participants with higher education demonstrated markedly greater knowledge (60.0%) and more positive attitudes (53.3%) compared with those without formal education (10.0% and 7.5%, respectively). These results are consistent with prior studies showing a robust association between education and vaccine awareness. In Saudi Arabia, educational level was significantly associated with both knowledge and attitude [20]. Similarly, in Bangladesh, medical students and healthcare professionals with advanced education exhibited more favorable attitudes toward vaccination [21]. In Malaysia, university students enrolled in health-related disciplines showed significantly higher knowledge and more positive perceptions compared with peers in non-health-science programs [22].

LIMITATIONS

This study has several limitations. Its cross-sectional design restricts causal inference, and the single-center, hospital-based sample may limit generalizability. Self-reported responses are subject to recall and social desirability bias. Additionally, the small proportion of vaccinated participants constrained deeper analysis of determinants of vaccine uptake and completion.

CONCLUSION AND RECOMMENDATIONS

The present study demonstrates substantial deficiencies in knowledge, awareness, and access related to HPV vaccination among women attending a district-level VIA center in Bangladesh, despite generally favorable attitudes and willingness to vaccinate. Education emerged as a key determinant of informed perceptions, underscoring the need for targeted community-based health literacy interventions. Strengthening provider-led counseling, enhancing public awareness, and integrating HPV vaccination into national

preventive programs are essential to improve uptake. These strategies are critical to reducing the cervical cancer burden and advancing equitable women's health in Bangladesh.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee.

REFERENCES

1. National Library of Medicine. Human papillomavirus (HPV) vaccine [Internet]. MedlinePlus. Available from: <https://medlineplus.gov/druginfo/meds/a615028.html>
2. Han J, Zhang L, Chen Y, Zhang Y, Wang L, Cai R, Li M, Dai Y, Dang L, Chen H, Zhu L. Global HPV vaccination programs and coverage rates: a systematic review. *EClinicalMedicine*. 2025 Jun 1;84.
3. UNICEF. 93 per cent eligible girls get vaccinated against Human Papilloma Virus across Bangladesh [Internet]. UNICEF; 2024 Dec 11. Available from: <https://www.unicef.org/bangladesh/en/press-releases/93-cent-eligible-girls-get-vaccinated-against-human-papilloma-virus-across>
4. Islam JY, Khatun F, Alam A, Sultana F, Bhuiyan A, Alam N, Reichenbach L, Marions L, Rahman M, Nahar Q. Knowledge of cervical cancer and HPV vaccine in Bangladeshi women: a population based, cross-sectional study. *BMC women's health*. 2018 Jan 11;18(1):15.
5. Sultana S, Nishan MN, Akter A, Rahman D, Yasmin F, Hawlader MD. Knowledge and willingness towards human Papillomavirus vaccination among the parents and school teachers of eligible girls in Dhaka, Bangladesh: A school-based cross-sectional study. *Journal of virus eradication*. 2025 Mar 1;11(1):100590.
6. Hawlader MD, Eva FN, Khan MA, Islam T, Monisha UK, Chowdhury I, Ara R, Meem NE, Hossain MA, Goutam A, Zerin T. Acceptance of Human Papillomavirus (HPV) vaccine among the parents of eligible daughters (9–15 years) in Bangladesh: A nationwide study using Health Belief Model. *Plos one*. 2024 Nov 8;19(11):e0310779.
7. Agha S, Francis S, Bernard D, Fareed A, Azad K, Qadri F. Effects of a multimedia campaign to increase human papillomavirus vaccine acceptance in Dhaka, Bangladesh. *Human Vaccines & Immunotherapeutics*. 2025 Dec 31;21(1):2447105
8. Banik R, Naher S, Rahman M, Gozal D. 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*. 2022 Apr;37(2):449-60.
9. Taher AA, Ahmed A, Alam MJ, Roy SR, Islam M, Rahman ML, Akhi MZ, Jui IJ. Major Risk Factor for Cervical Cancer in Rural Area How to Reduce its incidence Along Mortality Rate. *IAR Journal of Medicine and Surgery Research*. 2024 Dec 12;5(6):140-9.
10. Nessa AS, Chowdhury SB, Fatima PA, Kamal MO, Sharif MO, Azad AK. Cervical cancer screening program in Bangladesh. *Bangladesh Journal of Obstetrics & Gynaecology*. 2018;33(1):63-73.
11. Sultana CS. Human Papilloma Virus Vaccine for Cervical Cancer Prevention. *Journal of Bangladesh College of Physicians and Surgeons*. 2021 Mar 9;39(2):123-31.
12. Reza S, Dewan SM, Islam MS, Shahriar M. Response of Bangladesh to the World Health Organization call to eliminate cervical cancer as a public health issue: An observational report. *Health Science Reports*. 2024 Jun;7(6):e2178.
13. Xu MA, Choi J, Capasso A, DiClemente RJ. Improving HPV vaccination uptake among adolescents in low resource settings: sociocultural and socioeconomic barriers and facilitators. *Adolescent Health, Medicine and Therapeutics*. 2024 Dec 31:73-82.
14. Eva FN, Khan MA, Islam T, Monisha UK, Meem NE, Hossain MA, Goutam A, Zerin T, Alam N, Nath R, Sifat S. Awareness of HPV vaccine and its socio-demographic determinants among the parents of eligible daughters in Bangladesh: a nationwide study. *Heliyon*. 2024 May 30;10(10).
15. Bitariho GK, Tuhebw D, Tigaiza A, Nalugya A, Ssekamatte T, Kiwanuka SN. Knowledge, perceptions and uptake of human papilloma virus vaccine among adolescent girls in Kampala, Uganda; a mixed-methods school-based study. *BMC pediatrics*. 2023 Jul 17;23(1):368.

16. Fathi PS, Sofian M, Almasi-Hashiani A, Sadat Larijani M, Ashrafian F, Ramezani A. Insufficient knowledge of Human Papillomavirus among reproductive-aged women from Arak, Iran. *BMC Women's Health*. 2025 May 19;25(1):238.
17. Chew KT, Kampan N, Shafiee MN. Perception and knowledge of human papillomavirus (HPV) vaccine for cervical cancer prevention among fully vaccinated female university students in the era of HPV vaccination: a cross-sectional study. *BMJ open*. 2021 Dec 1;11(12):e047479.
18. Osueke N, Udeze S, Ogundoyin O, Eze M, Oyekola I. Knowledge, attitude and human papillomavirus vaccination among market women in North-Central Nigeria. *Discover Social Science and Health*. 2025 Oct 23;5(1):151.
19. Chellapandian P, Myneni S, Ravikumar D, Padmanaban P, James KM, Kunasekaran VM, Manickaraj RG, Puthota Arokiasamy C, Sivagananam P, Balu P, Meesala Chelladurai U. Knowledge on cervical cancer and perceived barriers to the uptake of HPV vaccination among health professionals. *BMC women's health*. 2021 Feb 12;21(1):65.
20. Turki YM, Alqurashi J, Turki Sr YM. Knowledge, attitudes, and perceptions towards human papillomavirus (HPV) vaccination among adult women in primary health care centers in Makkah, Saudi Arabia. *Cureus*. 2023 Aug 26;15(8).
21. Chowdhury S, Ara R, Roy S, Tanvir SM, Eva FN, Neela TM, Moonmoon AA, Sifat S, Zamila M, Hawlader MD. Knowledge, attitude, and practices regarding human papillomavirus and its' vaccination among the young medical professionals and students of Bangladesh. *Clinical and experimental vaccine research*. 2022 Jan 31;11(1):63.
22. Tusimin M, Yee CL, Razak NZ, Zainol MI, Minhat HS, Rejali Z. Sociodemographic determinants of knowledge and attitude in the primary prevention of cervical cancer among University Tunku Abdul Rahman (UTAR) students in Malaysia: preliminary study of HPV vaccination. *BMC public health*. 2019 Nov 5;19(1):1454.