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Knowledge and attitudes regarding HPV infection and its vaccination among adolescent girls in Chandannath municipality, Jumla, Nepal

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Abstract

Introduction: Human papillomavirus (HPV) is a major global health concern and the primary cause of cervical cancer and death. This study aimed to assess the knowledge and attitudes regarding HPV infection and its vaccination among adolescent girls in Chandannath Municipality, Jumla, Nepal.

Method: A descriptive cross-sectional design was conducted among selected adolescent girls aged 13-19 years in selected schools within Chandannath Municipality, Jumla, Nepal. A proportionate sampling technique was used to select students from grades 9-12. A structured self-administered questionnaire was used to collect data. Data were entered and analysed using SPSS version 16. Data were analysed using descriptive statistics, and Chi-square tests were applied to assess associations between variables. A p-value of ≤a0.05 was considered statistically significant.

Result: Out of 422, majority of adolescent girl students, 280(66.4%), had poor knowledge of HPV infection and vaccination. Over half of the respondents, 224(52.8%), exhibited a favourable attitude toward HPV infection and vaccination. Poor knowledge was significantly associated with age 16–19 years (p=0.028), Hindu religion (p=0.021), maternal illiteracy (p=0.040), and low economic status (p=0.014). Favourable attitudes were significantly associated with age 16–19 years (p=0.012), religion (p=0.047), and father's occupation (p=0.049). A strong positive association was found between knowledge and attitude (p<0.001).

Conclusion: Two-thirds of adolescent girl students exhibited poor knowledge about HPV infection and vaccination, with notable gaps and varying attitudes observed. These findings emphasise the need for targeted educational initiatives and awareness campaigns for cervical cancer prevention.

How to cite

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Introduction

Human papillomavirus (HPV) infection is a global health concern, contributing to cervical cancer.[1,2] Each year, approximately 2,244 women are diagnosed with cervical cancer, and 1,493 women die from this preventable disease.[3] The HPV vaccination is a proven preventive measure, yet awareness and acceptance vary across regions.[3] Studies reveal only 6.6%[4] in a study from India had adequate knowledge, 47%[5] in Rukum, Nepal, and 52.7%[6] in Jimma, Ethiopia. In Ambo Town, Ethiopia, 24.9% of respondents exhibited good knowledge, and 55.6% showed favourable attitudes.[7] In Eastern UP, India, only 5.47% of adolescent girls were aware that HPV infection spreads by sexual contact.[8]

Human papillomavirus prevalence in Nepal is 8.6%, with genotypes 16 and 18 responsible for 80.3% of cervical cancers. Nepal has one of the lowest screening rates among low- and middle-income countries (LMICs).[9] Low awareness and poor attitudes toward HPV vaccination, particularly among young women, contribute to low vaccine uptake and higher cancer risk.[1] The World Health Organisation (WHO) recommends HPV vaccination for adolescent girls.[1]

This study aims to assess knowledge and attitudes regarding HPV infection and vaccination among adolescent schoolgirl students in rural Nepal, for targeted interventions on vaccination, and possibly lowering the incidence of cervical cancer.

Method

A cross-sectional study was conducted among adolescent schoolgirl students in Chandannath Municipality, Jumla, Nepal, from 01 Mar to 31 Dec 2024. Ethical approval was obtained from the Institutional Review Committee of Karnali Academy of Health Sciences (Ref: 080/081/33). Permission was secured from the Municipality Office. Consent was obtained from participants, and for <18 years, assent was sought from class teachers. Confidentiality was maintained.

The sample size of 422 was determined using a formula ($n=Z^2*pq/d^2$), where n=sample size, d=margin of error (0.05), Z=Z score related confidence interval (1.96), and p=estimated proportion (50%). Considering a 10% non-response, n=422. The study population included adolescent girls aged 13–19 years from grades 9 to 12 who were willing to participate. Students absent during data collection or who did not return consent forms were excluded.

There were eight secondary and higher secondary schools in Chandannath Municipality. Four public schools were selected using a simple random sampling technique by lottery. Based on a sampling frame of 776 students, four strata were identified according to the student distribution across the schools: Chandannath Higher Secondary School (HSS) 300(38.66%), Karnali HSS 175(22.55%), Janata HSS 160(20.62%), and Ratna Chandeshwor HSS 141(18.17%). The predetermined sample of 422 was selected proportionately from each four strata, ensuring a representative sample.

Data were collected using a pretested, self-administered questionnaire based on a literature review and expert consultants. The tool was validated by four field experts and achieved a Cronbach's alpha reliability of 0.80. The questionnaire, developed in English, was translated into Nepali by bilingual experts and back-translated to ensure consistency.[7,10]

The 22-item questionnaire had three parts: socio-demographics, knowledge about HPV infection and vaccination, and attitudes toward HPV vaccination. Knowledge was assessed by 13 questions with a total score of 15; a score of ≤6 was categorised as inadequate, and >6 as adequate. Attitude was measured by a 9-item Likert scale; scores above the median (22) were considered favourable and below it unfavourable. Data were collected from 04 Aug 2024 to 08 Oct 2024, during school breaks. Co-investigators assisted in administering the questionnaires. Data were reviewed and

analysed using IBM SPSS 16. Descriptive "mean, median, and n(%), and inferential "Chi square" statistics were used. Associations of socio-demographics and knowledge-attitudes were analysed using Chi-square, $p<0.05$ as significant.

Result

The study included 422 adolescent girl students. Among them, 239(56.6%) were aged 16–19 years, and 236(55.9%) were enrolled in secondary education. Nearly half 202(47.9%) of the participants' mothers were illiterate, compared to of fathers 89(21.1%). The majority of parents were engaged in agriculture, 238(56.4%) fathers and 290(68.7%) mothers. Most participants, 268(63.5%), belonged to Chhetri. Majority, 323(76.5%) resided in rural areas, 391(92.7%) followed Hinduism, and 297(70.4%) lived in joint families. Nearly half of the households, 192(45.5%), had a monthly income of less than Rs. 10,000, Table 1. The sources of information varied, with 229(54.3%) citing medical schools and hospitals as their primary source, followed by the internet, 88(20.9%) and books, 52(12.3%), Figure 1.

Knowledge about HPV infection and vaccination revealed that 90(21.3%) girls correctly identified that all cancers are preventable. Furthermore, 174(41.2%) correctly recognised cervical cancer as preventable. Only 120(28.4%) of participants answered the full form of HPV. Limited knowledge was observed regarding HPV transmission; 144(34.1%) incorrectly believed that sexual intercourse was unrelated to HPV transmission, 50(11.8%) correctly identified sharing food or drinks as a non-transmission method, and 177(41.9%) admitted they did not know. While 245(58.1%) recognised cervical cancer as the primary cancer associated with HPV, 313(74.2%) accurately identified sexual intercourse as a mode of transmission, Table 2a.

In this study, 304(72.0%) of adolescents were unaware of the correct vaccination regimen. Regarding prevention, 225(53.3%) correctly identified HPV vaccination as a preventive measure, but 142(33.9%) mistakenly believed it protected against all HPV types, and 209(49.5%) were uncertain. Although 202(47.9%) correctly identified that both genders should be vaccinated, misconceptions about the target population persisted. A 278(65.9%) recognised adolescents and young adults as the highest-risk group for HPV infection. Despite these findings, 270(64.0%) failed to recognise HPV vaccination as a preventive measure, Table 2b.

A majority, 363(86.0%) of adolescent girls recognised cervical cancer as a deadly disease, and 320(77.8%) acknowledged that HPV vaccination helps prevent HPV infection, reflecting a general awareness of its importance.

Additionally, 305(72.3%) believed the vaccine saves lives, and 290(68.7%) considered it safe. However, 244(57.8%) of students agreed that vaccination reduces the risk of cervical cancer, and 194(46.0%) would recommend it to others. Parental concerns about the vaccine were reported by 216(51.2%), and misconceptions persisted, with only 105(24.9%) agreeing that the vaccine prevents sexually transmitted Infections (STIs), while 185(43.8%) believed it might lead to sexual promiscuity, Table 3.

The majority of participants, 280(66.4%), demonstrated poor knowledge of HPV infection and vaccination, while only 142(33.6%) had good knowledge. Also, 223(52.8%) had a favourable attitude toward human papillomavirus infection and vaccination, while 199(47.2%) demonstrated an unfavourable attitude. The findings revealed significant associations between knowledge of HPV infection and vaccination and several socio-demographic variables, including age (16–19 years, $p=0.028$), religion ($p=0.021$), maternal education ($p=0.040$) and economic status ($p=0.014$). Similarly, a favourable attitude was significantly associated with age ($p=0.012$), religion ($p=0.047$), and father's occupation ($p=0.049$). A statistically significant relationship was observed between knowledge and attitudes ($p<0.001$), as shown in Table 4.

Table 1. Socio-demographics of adolescent girls surveyed for knowledge and attitudes regarding Human papillomavirus (HPV) infection and its vaccination, n=422

Variables	n(%)
Age of students	
13-15	183(43.5)
16-19	239(56.5)
Grade	
Secondary level (9,10)	236(55.9)
Higher secondary (11,12)	186(44.1)
Father education level	
Illiterate	89(21.1)
Able to read and write	43(10.2)
Primary	62(14.7)
Secondary	135(32)
Higher secondary	60(14.2)
Bachelor	25(5.9)
Master and above	8(1.9)
Mother education level	
Illiterate	202(47.9)
Able to read and write	65(15.4)
Primary	66(15.6)
Secondary	29(6.9)
Higher secondary	55(13.0)
Bachelor	5(1.2)
Father's occupation	
Agriculture	238(56.4)
Business	96(22.7)
Service	81(19.2)
Labour	7(1.7)
Mother occupation	
Agriculture	290(68.7)
House mate	61(14.5)
Business	43(10.2)
Service	28(6.6)
Ethnicity	
Chhetri	268(63.5)
Brahmin	77(18.2)
Dalit	55(13.7)
Janajati	22(5.2)
Residence	
Rural	323(76.5)
Urban	99(23.5)
Religion	
Hindu	391(92.7)
Buddhist	19(4.5)
Christian	12(2.8)
Type of family	
Joint	297(70.4)
Nuclear	125(29.6)
Family income	
Below rs.10,000	192(45.5)
Rs.10000-rs36,000	133(31.5)
Rs. 36,000-110000	57(13.5)
Above 110000	40(9.5)

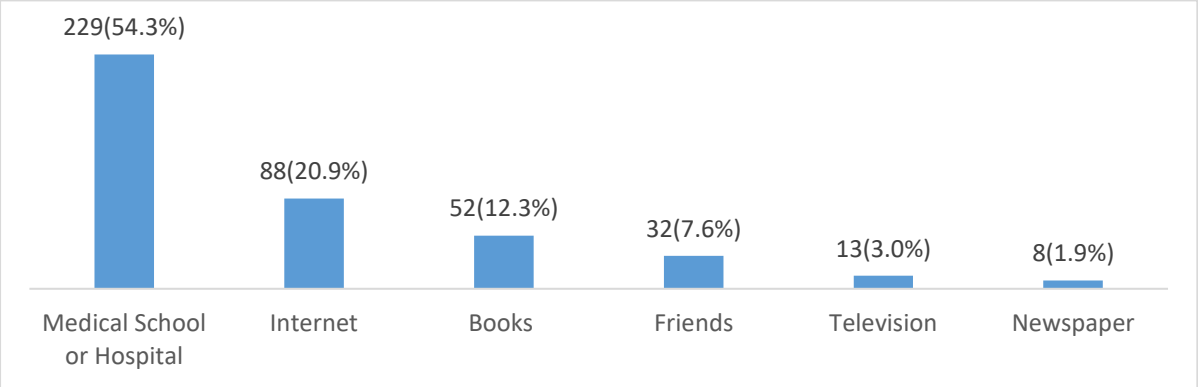

Figure 1. Source of information regarding HPV infection and its vaccination among adolescent girls surveyed for knowledge and attitudes, n=422

Table 2a. Knowledge regarding HPV Infection and vaccination among adolescent girls, n=422

Knowledge item	n(%)
All cancer is preventable	
Yes	90(21.3)
No	187(44.3)
Don't know	145(34.4)
Cervical cancer is preventable	
Yes	174(41.2)
No	39(9.2)
Don't know	209(49.5)
Full form of HPV	
Human papillomavirus	120(28.4)
Human prostate virus	29(6.9)
Human parvovirus	70(16.6)
Human pancreatic virus	40(9.5)
Don't know	163(38.6)
Not a method of transmission for HPV	
Sexual intercourse	144(34.1)
Skin-to-skin contact	37(8.8)
Sharing food or drinks	50(11.8)
Childbirth	14(3.3)
Don't know	177(41.9)
The primary cancer associated with HPV infection	
Breast cancer	20(4.7)
Prostate cancer	15(3.6)
Cervical cancer	245(58.1)
Lung cancer	11(2.6)
Don't know	131(31.8)
A method of transmission for HPV	
Air and water borne	21(5.0)
Sexual intercourse	313(74.2)
By food	31(7.3)
By examination of blood.	40(9.5)
Don't know	17(4.0)
Age typically recommended the HPV vaccine for girls	
5-7 years old	9(2.1)
9-12 years old	52(12.3)
15-18 years old	188(44.5)
21-25 years old	33(7.8)
Don't know	140(33.2)

Table 2b. Knowledge regarding HPV Infection and vaccination among adolescent girls, n=422

Statements	n(%)
The dose HPV vaccine recommended for full protection	
One dose	13(3.1)
Two doses	44(10.4)
Three doses	51(12.1)
Four doses	10(2.4)
Don't know	304(72.0)
Method is best for prevention of HPV infection	
Regular hand hygiene	25(5.9)
HPV vaccination	225(53.3)
Drink and eat hot and cold food	16(3.8)
Regular health check-up	142(33.6)
Don't know	14(3.3)
The HPV vaccine protects against all types of HPV	
Yes	143(33.9)
No	70(16.6)
Don't know	209(49.5)
Receive the HPV vaccine according to recommendations	
Only girls	195(46.2)
Only boys	25(5.9)
Both girls and boys	202(47.9)
Age group is at the highest risk of contracting HPV	
Children under 5	50(11.8)
Adolescents and young adults	278(65.9)
Middle-aged adults	84(19.9)
Elderly individuals	10(2.4)
NOT a preventive measure for HPV infection	
HPV vaccination	270(63.9)
Condom use	94(22.3)
Regular Pap smears	15(3.6)
Sharing personal hygiene items	43(10.2)

Table 3. Attitudes regarding adolescent girls toward HPV infection and vaccination, n=422

Statements	Certain n(%)	Uncertain n(%)	Disagree n(%)
Cervical cancer is a deadly disease	363(86.0)	36(8.5)	23(5.5)
The vaccination was beginning to minimise cervical cancer	224(53.1)	119(28.2)	79(18.7)
HPV vaccination helps prevent HPV infection	320(75.8)	64(15.2)	38(9.0)
Parental concern about having the HPV vaccine	216(51.2)	134(31.7)	72(17.1)
HPV vaccine saves lives and improves health	305(72.3)	68(16.1)	49(11.6)
Whether you recommend the vaccine to others	194(46.0)	101(23.9)	127(30.1)
HPV vaccination can prevent STIs	105(24.9)	150(35.5)	167(39.6)
Having the HPV Vaccine may make one sexually promiscuous	185(43.8)	145(34.4)	92(21.8)
Can you think HPV vaccine is safe?	290(68.7)	84(19.9)	48(11.4)

Table 4. Association between level of knowledge and attitude of adolescent girls toward HPV infection and vaccination, n=422

Level of Attitude	Level of knowledge		$\chi 2$(p-value)
	Good, n(%)	Poor, n(%)	
Favourable	92(41.3)	131(58.7)	12.254(0.001)
Unfavourable	50(25.1)	149(74.1)	

Discussion

This study assessed adolescent girls' knowledge and attitudes regarding HPV infection and vaccination in a rural region of Nepal. In this study, out of 422 adolescent girls, only 33.6% of participants demonstrated good knowledge of HPV infection. This aligns with findings from North-eastern Brazil (27.3%),[11] Ambo Town, Ethiopia (24.9%),[7] and Bangladesh (43.29%),[10] highlighting a consistent pattern of low awareness in low- and middle-income countries (LMICs), especially in rural settings. However, this proportion is significantly lower than those reported in India (52.4%),[13] Indonesia (50.8%),[14] and Debre Berhan City, Ethiopia (83%).[15] Such differences may stem from variations in health education systems, public health outreach, and media exposure. In the present study area, high maternal illiteracy (47.9%) and a predominantly rural population (76.5%) may limit the transfer of accurate sexual and reproductive health information to adolescents.

Attitudinal findings showed that 52.8% of participants held favourable attitudes toward HPV prevention, aligning with results from in Jimma of Ethiopia, India and Amhara, Ethiopia, (55.6%, 52.6% and 57%)[6,14,16] but remaining lower than those from India (84%),[13] Bangladesh (75.88%),[10] and Indonesia (80.2%).[14] Cultural taboos, vaccine-related myths, and hesitancy in discussing sexual health may contribute to this gap. Still, the attitude score was more favourable than that of Jimma, Ethiopia (31.4%),[6] where lower knowledge levels and limited decision-making autonomy were observed. These findings suggest that attitudes are strongly shaped by sociocultural norms, religious beliefs, and parental influence.

Regarding vaccination awareness, 53.3% identified HPV vaccination as a preventive measure against cervical cancer, but only 34.1% recognized sexual contact as the primary mode of transmission. These figures mirror those from Karachi, Pakistan (25.0%),[17] reflecting widespread gaps in comprehensive sexuality education. In contrast, a study in Hong Kong found that 86.7%,[18] of adolescents understood the vaccine's purpose, likely due to more robust education systems and youth-friendly communication. In our context, 43.8% of participants believed the vaccine promoted promiscuity—a common misconception in conservative societies that may deter uptake. While 86.0% acknowledged cervical cancer as deadly, only 53.1% believed HPV vaccination could reduce the risk. This was lower than the 72.9% reported in Ambo Town, Ethiopia.[7] Furthermore, just 46.0% were willing to recommend the vaccine, with many citing parental objections (51.2%) and concerns about encouraging promiscuity (43.8%). These figures indicate a disconnect between understanding disease severity and confidence in preventive measures. Additionally, only 24.9% of participants knew the vaccine also helps prevent sexually transmitted infections (STIs), indicating prevalent misconceptions about its broader benefits.

An analysis of information sources revealed regional disparities. Most girls in this study relied on medical institutions (54.3%), followed by the internet (20.9%) and books (12.3%). In contrast, a study from Eastern Uttar Pradesh, India,[8] found books to be the dominant source (80.64%). This suggests differences in access to educational materials, literacy levels, and digital resources across regions.

Statistical analysis revealed significant associations between knowledge and variables such as age (p=0.028), religion (p=0.021), maternal education (p=0.040), and economic status (p=0.014). Similarly, attitudes were influenced by age (16–19 years, p=0.012), religion (p=0.047), and father's occupation (p=0.049). A strong correlation between knowledge and attitude (p=0.001) further suggests that improved awareness can positively shape perceptions and behaviour regarding HPV prevention.

This study was limited to a single rural area, reducing its generalizability. Self-reported data may involve bias, and the cross-sectional design cannot establish causality. It also did not explore the influence of teachers, health workers, or media.

Findings highlight the need for age-appropriate, culturally sensitive school-based education and

parental involvement. Engaging healthcare providers and media can improve awareness and reduce vaccine hesitancy. These insights can inform national HPV vaccination strategies.

Conclusion

The study reveals that two-thirds of the participants had poor knowledge about HPV infection and vaccination, despite a majority recognising that the HPV vaccine can prevent infection and, in turn, cervical cancer. Significant gaps in understanding were evident, with persistent misconceptions about transmission methods and vaccine benefits. Socio-demographic factors such as younger age, lower maternal education, and lower economic status were found to negatively influence both knowledge and attitudes toward HPV and its vaccination. These findings underscore the critical need for targeted interventions, including tailored education programs, school-based initiatives, community outreach, and the use of digital platforms, to correct misconceptions and promote more informed acceptance of HPV vaccination.

Author contribution

Concept design: ST, NT, Literature Search: YBR, RMG, SKS, SJ, Data Collection: ST, NT, YBR, RMG, SKC, ML, LJS, Draft manuscript: ST, NT, YBR, SJ, ML, LJS, Final Manuscript and Accountability: All

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Conflict of interest

None

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Supplementary material

The data and supplementary material that support the findings of this study are available from the corresponding author upon reasonable request.

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Questionnaire/tools

Karnali Academy of Health Science
Informed Consent Form

Code No.- ____

Namaste, I am xxx I am here for a study on **"Awareness and attitude regarding HPV infection and its vaccination among adolescent girls of Chandannath Municipality, Jumla."** This study has gained ethical approval from Institutional Review Board of KAHS.

Please be advised that participation in this study is strictly voluntary and you have full right to withdraw from the study at any time without fear and without giving any reason. The decision to withdraw will not affect in your study during school. Your individual response will be kept confidential and will not be exposed to anyone. Data, you provide, will be used for the purpose of research only.
In participating in this study, you will need to answer some questions and you can answer based on your feelings about it. It will take 20-30 minutes to complete questionnaire. Your valuable answer will be help in finding awareness and attitude regarding HPV infection and its vaccine among adolescent girls of Chandannath Municipality, Jumla.

Consent: In signing this consent form, I state that I have read and understood the above-mentioned information. I state that all my questions have been answered to my satisfaction. By signing this form, I have not waived any of my legal rights in a research study.
I hereby agree to take part in the study. Y/N
I do not agree to take part in the study. Y/N

_____ _____
Signature Date

APPENDIX B
Karnali Academy of Health Science
Self-Administered questionnaire

Research Title: "Awareness and attitude regarding HPV infection and its vaccine pregnancy among adolescent girls of Chandannath Municipality, Jumla."

Objective: The objective of this study is to identify the awareness and attitude regarding HPV infection and its vaccine pregnancy among adolescent girls of Chandannath Municipality, Jumla."

Directions for Use:
After receiving written informed consent, researcher will give the questionnaire and put (√) sign on the given response or write the given answer in the given space.

Date of Interview: _____ **Code No.: _____**

PART I: Socio-demographic Characteristics

1. Age (Please specify in years) ……
2. Religion (Please specify) …….
3. Type of family
    a. Single
    b. Joint
4. Education status of father
    a. Illiterate
    b. Literate
    c. If literate, please specify level of education completed……
5. Educational status of mother
    a. Illiterate
    b. Literate

    If literate, please specify level of education completed…….
6. Father Occupation
    a. Agriculture
    b. Business
    c. Services
    d. Others (Please Specify)…….
7. Mother Occupation
    a. Agriculture
    b. Business
    c. Services
    d. Homemaker
    e. Others (Please Specify)…….
8. Ethnicity/Race
    a. Brahmin
    b. Chhetri
    c. Dalit
    d. Buddhist
    e. Others:……
9. Socioeconomic status……
    a. Residential Location:
    b. Rural
    c. Urban

Part II: Awareness related question

10. All cancer is preventable?
    a. Yes

b. No
c. Don't known

11. Cervical cancer is preventable?
    a. Yes
    b. No
    c. Don't know
12. Is there any vaccine available for cervical cancer?
    a. Yes
    b. No
    c. Don't know
13. What does HPV stand for?
    a. Human Papillomavirus
    b. Human Prostate Virus
    c. Human Parvovirus
    d. Human Pancreatic Virus
14. Which of the following is NOT a method of transmission for HPV?
    a. Sexual intercourse
    b. Skin-to-skin contact
    c. Sharing food or drinks
    d. Childbirth
15. What is the primary cancer associated with HPV infection?
    a. Breast cancer
    b. Prostate cancer
    c. Cervical cancer
    d. Lung cancer
16. At what age is the HPV vaccine typically recommended for girls?
    a. 5-7 years old
    b. 9-12 years old
    c. 15-18 years old
    d. 21-25 years old
17. How many doses of the HPV vaccine are recommended for full protection?
    a. One dose
    b. Two doses
    c. Three doses
    d. Four doses
18. Which of the following is a preventive measure for HPV infection?
    a. HPV vaccination
    b. Condom use
    c. Regular Pap smears
    d. Sharing personal hygiene items
19. The HPV vaccine protects against all types of HPV Infection.
    a. Yes
    b. No
    c. Don't know
20. Which of the following is a potential consequence of untreated HPV infection?
    a. Common cold
    b. Genital warts
    c. Athlete's foot
    d. Strep throat
21. Who should receive the HPV vaccine according to recommendations?
    a. Only girls
    b. Only boys
    c. Both girls and boys
    d. Only adults
22. Which age group is at the highest risk of contracting HPV?
    a. Children under 5
    b. Adolescents and young adults

c. Middle-aged adults
d. Elderly individuals

23. What are the sources of knowledge and information on HPV vaccination?
    a. Medical school teaching
    b. Friend
    c. Newspaper
    d. Books
    e. Internet
    f. Television

Part II: Attitude related to HPV infection and vaccine

SN	Statement	Favourable	Unfavourable
1	Cervical cancer is a deadly disease		
2	The vaccination was beginning to minimise cervical cancer		
3	HPV vaccination helps to prevent HPV infection		
4	Parental concern about having the vaccine		
5	HPV vaccine saves lives and improves health		
6	Whether you recommend the vaccine to others or not		
7	Having the HPV Vaccine may become sexually promiscuous		
Overall attitude			