



# Knowledge Regarding Human Papilloma Virus (HPV) and its Vaccination among Adolescent Girls in a School of Pokhara, Nepal

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## Abstract

**Introduction:** Human papillomavirus (HPV) is one of the most common reproductive tract infections responsible for a variety of cancers and other conditions in both men and women. By the age of 45, it is estimated that more than 80% of sexually active men and women will have contracted at least one HPV infection. The study's objective was to assess the knowledge regarding HPV and its vaccination among adolescent girls in a school of Pokhara, Nepal.

**Methods:** A cross-sectional study was conducted among 142 adolescent schoolgirls. The data was collected using a self-administered structured questionnaire. Data was collected within a period of two weeks. Collected data were analyzed using the SPSS Software. Descriptive statistics and inferential statistics were used for analysis.

**Results:** The mean age of respondent was  $14.46 \pm 0.896$  years. Majority (53.5%) of the respondents had poor level of knowledge whereas only (46.5%) of the respondents had good level of knowledge. Factors like age, class of the student and source of information were found to be significantly associated with the respondent's level of knowledge.

**Conclusions:** The study concluded that majority of the adolescent girls had poor level of knowledge regarding HPV and its vaccination. There is an increased need to plan nationwide awareness programs about HPV infection and vaccine.

## Introduction

Human Papillomavirus (HPV) is one of the most common sexually transmitted infections (STIs), affecting both men and women.<sup>1</sup> It comprises over 200 related viruses, which can be transmitted through intimate skin-to-skin contact, including vaginal, anal, and oral sex.<sup>2</sup> By the age of 45, more than 80% of sexually active individuals will contract at least one HPV infection.<sup>3</sup>

HPV strains 16 and 18 are responsible for about 70% of cervical cancers and many other malignancies. Other high-risk strains (31, 33, 45, 52, and 58) account for an additional 15% of cervical cancers. Meanwhile, low-risk types, such as HPV 6 and 11, primarily cause genital warts.<sup>1</sup>

Globally, HPV is the second most common infectious cause of cancer. It contributes to over half of all infection-related cancers in women and nearly 29.5% of all such cancers worldwide.<sup>4</sup> The global prevalence of HPV among women was 11.7% in 2017, distributed in Sub-Saharan Africa (24.0%), Latin America and the Caribbean (16.1%), Eastern Europe (14.2%), and Southeast Asia (14.0%). Some regions, such as West Africa and Kazakhstan, have an even higher prevalence, reaching up to

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55.8%.<sup>5</sup>

Cervical cancer is the most common disease caused by HPV, with nearly all cases linked to chronic HPV infection.<sup>6,7</sup> HPV prevalence varies depending on disease severity, from 3.9% among women with normal cytology to 69.4% among cervical cancer patients.<sup>7</sup> Factors like unsafe sexual practices, smoking, and prolonged oral contraceptive use increase the risk of persistent infections leading to cancer.<sup>8</sup>

In Nepal, HPV-related diseases are particularly concerning due to cultural practices such as polygamy, early marriages, and high birth rates.<sup>9</sup> Cervical cancer has a 14.9% incidence rate in Nepal, with an estimated 2,244 new cases annually. The prevalence of high-risk HPV types (16 and 18) in Nepalese women ranges from 2.0% (normal cytology) to 80.3% (cervical cancer cases).<sup>10</sup>

HPV vaccines can prevent approximately 90% of HPV-related cancers. Since the introduction of the HPV vaccine in 2006, infection rates among teenage girls and young adult women have declined significantly.<sup>11</sup> The World Health Organization (WHO) has prequalified several HPV vaccines, including Gardasil 9, Gardasil, Cervarix, Cecolin, and Walrinvax. All these vaccines protect against HPV types 16 and 18. In October 2024, WHO announced that Cecolin, developed by Xiamen Innovax Biotech Co. Ltd., was confirmed for use in a single-dose schedule.<sup>12</sup>

National vaccination programs with HPV have been implemented in countries like Bhutan, Thailand, Sri Lanka, and Maldives.<sup>13</sup> Nepal piloted HPV vaccination in 2016 in select districts and included it in its 2021 – 2022 Government policies.<sup>14</sup> In 2023, Nepal purchased 20,000 vaccine doses and launched a demonstration vaccination program for girls aged 14 – 15 years. Expanding on this effort, the Nepalese Government initiated a nationwide HPV vaccination campaign from early 2025 with the goal of vaccinating more than 1.68 million girls aged 10 to 14 using a single-dose schedule.<sup>15</sup>

Studies in Nepal and neighboring countries show that adolescent girls have limited knowledge of HPV and its vaccine.<sup>16,17</sup> Despite global efforts to improve HPV education, awareness remains lacking in many regions.

To address this gap, further research is needed to assess adolescent girls' knowledge of HPV and vaccination in Nepal. Therefore, the researcher is interested to assess the level of knowledge regarding HPV infection and vaccination among adolescent girls in Pokhara, Nepal.

## Methods

A descriptive cross-sectional design was used to assess the level of knowledge among adolescent girls at selected school of Pokhara. The target population included female students from Classes 9 and 10, with a total of 235 students. Using

Cochran's formula, the sample size was determined to be 142. A proportionate stratified random sampling technique was used to allocate participants and the lottery method was employed for final participant selection.

A self-administered structured questionnaire was used for data collection. The questionnaire was divided into two parts. Part I covered socio-demographic information (12 items), while Part II included 18 multiple-choice questions (MCQs) and four multiple-response questions (MRQs) assessing knowledge on HPV and vaccination. Each correct response was awarded 1 point, while incorrect answers received 0 points, with a maximum possible score of 36.

The data collection process followed ethical guidelines, with approval obtained from Pokhara University's Institutional Review Committee (IRC). Written permission was sought from relevant authorities, and informed consent was obtained from the students' guardians. The questionnaires were administered in a private setting, ensuring participant confidentiality, and data was collected over a period of two weeks (2023 April 23 to 2023 March 05).

The collected data was analyzed using SPSS 23. Descriptive statistics such as frequency, percentage, mean, and standard deviation were used, while the Chi-square test was applied to determine associations between knowledge levels and demographic variables.

**Results**

**Table 1:** Demographic Characteristics of Respondents

(N = 142)

Variables	Frequency	Percent
Age (Years)		
13 - 15	130	91.55
16 - 18	12	8.45
Mean ± SD (14.46 ± 0.896)		
Religion		
Hindu	127	89.44
Buddhist	10	7.04
Christianity	4	2.82
Kirat	1	0.70
Ethnicity		
Brahmin / Chhetri	82	57.75
Dalit	13	9.15
Janajati	47	33.10
Place of residence		
Rural	11	7.75
Urban	131	92.25
Class of the student		
Class 9	68	47.89
Class 10	74	52.11
Type of family		
Nuclear	118	83.10
Joint	24	16.90

Demographic variables of the study population have been depicted in Table 1.

The socio economic status of the parents of the study population is shown in Table 2.

**Table 2:** Socio-economic characteristics of respondents

(N = 142)

Variables	Frequency	Percent
Educational level of father		
Illiterate	2	1.41
Informal education	3	2.11
Basic education	27	19.01
Secondary education	78	54.93
Higher education	32	22.54
Educational level of mother		
Illiterate	5	3.52
Informal education	3	2.11
Basic education	39	27.46
Secondary education	70	49.30
Higher education	25	17.61
Occupation of father		
Homemaker	6	4.23
Services	58	40.85
Business	43	30.28
Agriculture	13	9.15
Labour	12	8.45
Abroad	10	7.04
Occupation of mother		
Homemaker	77	54.23
Services	23	16.20
Business	31	21.83
Agriculture	7	4.93
Labour	2	1.41
Abroad	2	1.41

Tables 3 and 4 represent the information regarding administration of HPV vaccine and knowledge regarding HPV vaccine. Table 5 demonstrates knowledge regarding various domains about HPV. Table 6 represents the association of level of knowledge with selected demographic variables.

**Table 3:** Vaccine administration and information regarding HPV and its vaccination (N = 142)

Variables	Frequency	Percent
<b>HPV vaccine administration</b>		
Yes	6	4.23
No	136	95.77
<b>Source of information</b>		
Health care provider	27	19.01
School	83	58.45
Social media	82	57.75
Mass media (TV, Radio)	26	18.31
Friend/Family member	30	21.13

**Table 4:** Level of knowledge regarding HPV and its vaccination (N = 142)

Level of knowledge	Frequency	Percent
Good (> 17.11 mean score)	66	46.5
Poor (≤ 17.11 mean score)	76	53.5
Mean ± SD (17.11 ± 3.766)		

**Table 5:** Knowledge domains regarding HPV and its vaccination (N = 142)

Knowledge domains	Max. Score	Mean	SD	Mean Percentage
Concept and definition	5	2.63	0.821	52.68
Incidence and prevalence	2	1.42	0.623	71.13
Causes and risk factors	6	2.65	0.907	44.25
Clinical manifestations	2	0.56	0.636	27.82
Investigations	1	0.33	0.472	33.10
Prevention and vaccination	17	8.51	2.253	50.04
Outcome	3	1.01	0.863	33.57
Total	36	17.11	6.575	47.54

**Table 6:** Association of level of knowledge with the demographic variables (N = 142)

Variables	Level of knowledge				Chi-square	P-value
	Poor		Good			
	N	%	N	%		
Age						
13 - 15	73	56.2	57	43.8	4.286	0.038
16 - 18	3	25.0	9	75.0		
Religion						
Hinduism	68	53.5	59	46.5	0.000	0.988
Others	8	53.3	7	46.7		
Ethnicity						
Brahmin / Chhetri	43	52.4	39	47.6	0.613	0.736
Dalit	6	46.2	7	53.8		
Janajati	27	57.4	20	42.6		
Place of residence						
Rural	6	54.5	5	45.5	0.005	0.943
Urban	70	53.4	61	46.6		
Class of the student						
Class 9	44	64.7	24	35.3	6.562	0.010
Class 10	32	43.2	42	56.8		
Type of family						
Nuclear	60	50.8	58	49.2	2.006	0.157
Joint	16	66.7	8	33.3		
Occupation of father						
Services	32	55.2	26	44.8	0.107	0.743
Non-services	44	52.4	40	47.6		
Occupation of mother						
Services	12	52.2	11	47.8	0.020	0.887
Non-services	64	53.8	55	46.2		
Source of information						
Health care provider	14	51.9	13	48.1	27.663	0.000
School	38	45.8	45	54.2		
Social media	36	43.9	46	56.1		
Mass media (TV, Radio)	9	34.6	17	65.4		
Friend / Family member	8	26.7	22	73.3		

P-value < 0.05 is considered statistically significant

## Discussion

The findings of the study revealed that the mean age of respondent was  $14.46 \pm 0.896$  years. All the respondents were adolescent girls between the age group of 13 - 18 years and the majority (89.44%) of the respondents were Hindus. The findings of the study were consistent with the study conducted in Uganda, where the mean age was  $14 \pm 1.24$  years.<sup>18</sup> Similar study conducted in India revealed that the respondents were adolescent girls in between the age group of 13 - 18 years and majority (83.3%) of the respondents were Hindus.<sup>16</sup>

In the present study, the majority (92.25%) of the respondents were from urban area and almost half (49.30%) of the respondents' mothers had completed secondary education. The findings of the study were similar to the study conducted in South Ethiopia, where more than four fifth (84.5%) of the respondents were from urban area and majority (35.7%) of the respondents' mothers had completed secondary education.<sup>19</sup>

The present study revealed that only a few (4.23%) of the respondents had administered HPV vaccination. Similar study was conducted in Nigeria, where only (4.1%) of the respondents had received the HPV vaccine prior to the study.<sup>20</sup> However, the finding contradicted with the study conducted in Spain and Ethiopia where the vaccination uptake among the adolescent girls were 71.5% and 44.4% respectively.<sup>21,22</sup> This might be due to lack of implementation of HPV vaccination programs aimed for adolescent girls of all ages.

Regarding the source of information, the majority (58.45%) of respondents got the information regarding HPV from school while least (18.31%) of the respondents got the information from mass media (TV, Radio). The findings were in line with the study conducted in India where majority (33.3%) of the respondents had school as their source of information of HPV.<sup>1</sup> Similarly, a study conducted in Romania revealed that only (9.71%) of the respondents had heard about HPV infection from TV / radio.<sup>23</sup>

In this study out of 142 respondents, majority 76 (53.5%) of the respondents had poor level of knowledge whereas 66 (46.5%) of the respondents had good level of knowledge regarding HPV and its vaccination. The overall mean percentage was 47.54%. The findings were consistent with the study conducted by Arunachalam D et al which found that the majority of respondents (56.7%) had inadequate knowledge, with a mean percentage of 52%.<sup>16</sup>

The findings of the study were higher than the study conducted by Yohannes et al, where only (24.9%) had good overall knowledge score about HPV vaccine.<sup>24</sup> The dissimilarities may be due to difference in demographic background of the respondents and variation in sample size. The findings of the study contradicted with the study conducted by Ukumo et al, where 71.7% of the respondents had good knowledge about

the HPV vaccination.<sup>19</sup> This might be due to lack of proper awareness regarding the importance of HPV vaccination.

In the present study, there was a statistically significant association of level of knowledge with selected demographic variables like age ( $P = 0.038$ ), class of the student ( $P = 0.010$ ) and source of information ( $P = 0.000$ ). There was no association with other variables like religion, ethnicity, place of residence, type of family, occupation of father and occupation of mother. The result was well supported by the study conducted in Arba Minch Town, South Ethiopia which showed that age ( $P < 0.001$ ), grade level ( $P < 0.001$ ) and information sources ( $P < 0.001$ ) had a positive association with the knowledge level.<sup>19</sup>

On the contrary to present study, a study conducted in Kampala city, Uganda revealed that area of residence ( $P = 0.028$ ) and religion ( $P = 0.004$ ) were significantly associated with the level of knowledge of adolescent girls on HPV vaccination.<sup>25</sup>

The present study is limited to a single school in Pokhara, Nepal. Hence, generalization of the results to the Nepali population would not be rational. Hence, these results need to be verified with larger, multi centric studies. It is admirable that the HPV vaccination has been successfully incorporated into the national immunization schedule. But the findings emphasize the urgent need for targeted awareness programs to improve adolescent girls' knowledge of HPV and its vaccination, particularly regarding clinical manifestations. Schools, healthcare providers, and media should play a more proactive role in disseminating accurate information. Additionally, the Government should integrate HPV education into school curricula and public health campaigns while ensuring better vaccine accessibility and addressing misinformation to improve vaccination uptake nationwide.

## Conclusions

The study concluded that majority of the adolescent girls had poor level of knowledge regarding HPV and its vaccination. It showed that the knowledge was highest in incidence and prevalence domain and least in the clinical manifestation's domain. Factors like age, class of the student and source of information were found to be significantly associated with the respondent's level of knowledge.

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