

Knowledge regarding Human papilloma virus vaccine among residents of selected villages of Rajpura, District Patiala, Punjab

Abstract:

Cervical cancer is a major cause of cancer-related morbidity and mortality among women in India, despite being largely preventable through early detection and HPV vaccination. This study assesses the knowledge regarding the HPV vaccine among residents of selected villages of Rajpura, District Patiala, Punjab. A descriptive research design was used to evaluate knowledge levels and their association with selected demographic variables.

The study included 70 residents aged 18 to 45 years and above, selected through non-probability convenience sampling. Data were collected using a socio-demographic performa and a self-structured knowledge questionnaire, and analyzed using descriptive and inferential statistics. The findings showed that only 35.7% of participants had heard of the HPV vaccine. Most participants (71.4%) had average knowledge, 24.3% had poor knowledge, and only 4.3% demonstrated good knowledge. Major gaps were observed in areas such as vaccine eligibility, dosage, timing, and screening methods. No significant association was found between knowledge levels and demographic variables, but prior awareness and source of information had a significant impact ($p < 0.05$). The study highlights limited awareness of the HPV vaccine in rural communities. Strengthening health education and nurse-led community outreach programs is essential to improve knowledge and support India's goal of eliminating cervical cancer by 2030.

Introduction:

Cancer is a disease characterized by the uncontrolled growth and spread of abnormal cells, which can invade nearby tissues and spread to other parts of the body, leading to significant morbidity and mortality globally. Cancer is not a single disease but comprises a large group of diseases with over 100 different types affecting various body organs and tissues ¹.

Globally, various types of cancer contribute to the disease burden, including lung cancer which is the most commonly diagnosed cancer among men, with an estimated 2.2 million new cases i.e., 11.4% of all cancers and 1.8 million deaths i.e., 18% in 2020, making it the leading cause of cancer-related deaths worldwide. Prostate cancer is the second most common cancer in men, with 1.4 million new cases i.e., 7.3% and is the most frequently diagnosed cancer among men in 112 countries, although it causes fewer deaths compared to lung cancer. Colorectal cancer ranks third globally, with 1.9 million new cases i.e., 10.0% and 935,000 deaths, affecting both men and women and contributing significantly to the global cancer burden ².

41 Among women, breast cancer has surpassed lung cancer as the most commonly
42 diagnosed cancer globally, with 2.3 million new cases i.e., 11.7% and 685,000 deaths
43 in 2020 . Cervical cancer remains a significant cause of cancer-related mortality
44 among women, particularly in low- and middle-income countries around 85%, with
45 604,000 new cases and 342,000 deaths globally in 2020, making it the fourth most
46 common cancer in women ³.

47 Unlike many cancers, Cervical cancer often affects women during their productive
48 years, with incidence rising between 30–34 years and peaking at 55–65 years, with a
49 median age of diagnosis around 38 years .Estimates suggest that more than 80% of
50 sexually active women will acquire a genital HPV infection by the age of 50,
51 reflecting the widespread nature of HPV as a precursor to cervical cancer.

52 HPV is a DNA virus from papilloma virus family with over 100 identified types,
53 which are categorized as high, intermediate and low risk types, according to their
54 association with genital tract infection. Among which certain high-risk types, notably
55 HPV-16 and HPV-18, responsible for nearly 70% of cervical cancer cases globally.
56 After HPV-16/18,the six most common HPV types are the same in all world region,
57 namely 31,33,35,45,52 and 58 ; these account for an additional 20 Cancers
58 worldwide¹¹.

59 The U.S. Food and Drug Administration (FDA) approved the first quadrivalent HPV
60 vaccine i.e., Gardasil® in 2006, providing protection against HPV types responsible
61 for approximately 70% of cervical cancers. Subsequently, a bivalent vaccine i.e.,
62 Cervarix® was approved in 2009, offering protection specifically against high-risk
63 HPV types 16 and 18. These vaccines are most effective when administered before
64 the onset of sexual activity, with the recommended schedule of three doses ideally
65 completed within six months.

66 Despite the availability of effective vaccines, awareness and access to HPV
67 vaccination in India remain uneven, especially in rural and low-income communities
68 where the burden of cervical cancer is highest. Recent policy developments, including
69 the launch of India's first indigenously developed quadrivalent HPV vaccine
70 "Cervavac" under the National Immunization Programme, aim to close this gap by
71 providing low-cost or free vaccination to adolescent girls.

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73 **Need Of Study**

74 Cervical cancer is one of the most significant public health concerns affecting women
75 in India today. Globally, it is the fourth most common cancer among women, but in
76 India, it ranks as the second most frequent cancer affecting women aged 15 to 44
77 years¹⁴.

78 According to the latest estimates, India alone accounts for nearly one-fourth of the
79 global burden of cervical cancer, with approximately 123,000 new cases diagnosed
80 and over 77,000 deaths reported every year. This means that every eight minutes, one
81 woman in India dies due to cervical cancer — a disease that is largely preventable
82 with early vaccination and screening¹⁵.

83 Countries that have implemented national HPV vaccination programs have shown
84 remarkable declines in the incidence and mortality of cervical cancer. Unfortunately,
85 in India, the uptake of the HPV vaccine remains extremely low, particularly in rural
86 and semi-urban regions. While urban pockets may have better access to awareness
87 campaigns and vaccination drives, rural communities still lag far behind due to deep-
88 rooted social beliefs, lack of awareness, and restricted access to reliable healthcare
89 information¹⁷.

90 To break this cycle, it is essential to first understand the level of knowledge residents
91 have about the HPV vaccine and the factors that influence this knowledge.
92 Demographic factors such as age, gender, education, occupation, marital status, and
93 socio-economic condition play an important role in shaping people's health behaviors
94 and attitudes. Gathering local data on these factors is key to designing health
95 interventions that are context-specific and effective²⁰.

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97 **Materials and Methods:**

98 A descriptive study was conducted on 70 residents aged 18 to 45 years and above to
99 assess their knowledge regarding the Human PapillomaVirus vaccine. The population
100 was selected by using a non-probability convenience sampling method, which allowed
101 easy access to participants from the selected rural communities. Data was collected
102 through a self-structured questionnaire designed to evaluate knowledge in key
103 areas such as vaccine eligibility, dosage, timing, screening, and prevention methods.
104 The collected data was analysed using both descriptive and inferential statistics to
105 ensure accurate interpretation of the results.

106 **Results :**

107 The analyzed data were organized according to the objectives and presented under the
108 following sections.

109 **Section 1 :** Socio demographic profile of the study subjects.

110 **Section 2:** Association between Knowledge regarding HPV vaccine and
111 selected socio demographic variables.

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Section : 1

Table 1.1 :- Frequency and Percentage Distribution of subjects according to sample characteristics

117 (N=70)

S. No.	Variables	Frequency (F)	Percentage (%)
1.	Age(years)		
	18-27	30	42.9
	28-37h	15	21.4
	38-47	15	21.4
	48 or above	10	14.3
2.	Gender		
	Male	29	41.4
	Female	41	58.6
3.	Education		
	Illiterate	2	2.9
	Primary school	13	18.6
	Metric	20	28.6
	Secondary school or above	35	50.0
4.	Marital Status		
	Unmarried	26	37.1
	Married	42	60.0
	Widowed	1	1.4
	Divorced	1	1.4
5.	Occupation		
	Student	19	27.1
	Unemployed	6	8.6

S. No.	Variables	Frequency (F)	Percentage (%)
	Employed	18	25.7
	Homemaker	27	38.6
6.	Monthly Income		
	Less than 10,000/-	31	44.3
	10,000/- to 20,000/-	30	42.9
	21,000/- to 40,000/-	8	11.4
	41,000/- or above	1	1.4
7.	Heard about HPV Vaccine		
	Yes	25	35.7
	No	45	64.3
8.	Source of Information		
	Newspaper, books, and journals	5	7.1
	TV, radio, mobile/cell phone	14	20.0
	Friends, relatives and health workers	6	8.6

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119 This table describes the data regarding the socio-demographic profile of participants
120 (70) in this study.

121 A total of 70 residents took part in the study, providing valuable insights into the
122 community's awareness of the HPV vaccine. Among them, the largest proportion
123 (42.9%) were young adults aged between 18 and 27 years. The majority of
124 participants were women, making up (86%) of the group. Half of the respondents had
125 completed least secondary education, showing a moderate level of formal schooling in
126 the villages. Most of the residents (60%) were married, and homemakers formed the
127 largest occupational category, representing (38.6%) of the participants. Nearly half
128 (44.3%) reported a monthly income of less than ₹10,000, highlighting modest
129 economic conditions. Importantly, only about one-third (35.7%) of the residents had

130 ever heard about the HPV vaccine, indicating a significant gap in awareness that
 131 needs to be addressed through education and community outreach.

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134 **Knowledge was assessed through 30 questions. Responses revealed:**

135 **Table 1.2 :- Distribution of sample based on knowledge regarding HPV vaccine**

136 (N=70)

S. No.	Parameter	Correct	
		F	%
1.	What does HPV stand for?	41	58.6
2.	How is HPV infection spreads?	36	51.4
3.	What is the main risk factor of HPV infection?	38	54.3
4.	What other cancers can be caused by HPV infection?	35	50.0
5.	What is the maximum age limit for receiving the HPV vaccine?	32	45.7
6.	Which age group is currently eligible for free HPV vaccination under the government scheme?	20	28.6
7.	What is the best time of vaccination?	26	37.1
8.	How is the HPV vaccine administered?	28	40.0
9.	What is the early sign of HPV infection?	27	38.6
10.	Which test is commonly used for initial screening for cervical abnormalities?	17	24.3
11.	Which test is used for detecting high risk HPV strains in cervical screening?	34	48.6
12.	What is HPV vaccine?	38	54.3
13.	Why is HPV vaccine given?	25	35.7
14.	Which people should get the HPV vaccine?	45	64.3
15.	What is the right age to get HPV vaccine?	24	34.3
16.	How many doses needed for children aged 9-14 years?	33	47.1
17.	What is the time gap between the two doses of HPV vaccine?	31	44.3

S. No.	Parameter	Correct	
		F	%
18.	How many doses needed for children aged 15 years or above?	27	38.6
19.	Which HPV vaccine is most comprehensive lowering the highest number of HPV strains?	25	35.7
20.	How can the risk of HPV infection be reduced?	34	48.6
21.	What measures can be used to prevent HPV infection?	30	42.9
22.	What is the main hazard of HPV infection for females?	42	60.0
23.	What is the main hazard of HPV infection for males?	29	41.4
24.	Who should avoid getting the HPV vaccine?	32	45.7
25.	If the women is found to be pregnant after receiving the first dose of HPV vaccine they should?	18	25.7
26.	How is the HPV vaccine being administered under the government scheme?	42	60.0
27.	What is the approximate cost of Cervavac per dose under the government scheme?	19	27.1
28.	Which Indian state first introduced the HPV vaccine under a public health program?	25	35.7
29.	Which is the best method for spreading awareness about HPV vaccination in rural communities?	47	67.1
30.	What is the most common reason for community resistance to HPV vaccine is often due to?	41	58.6

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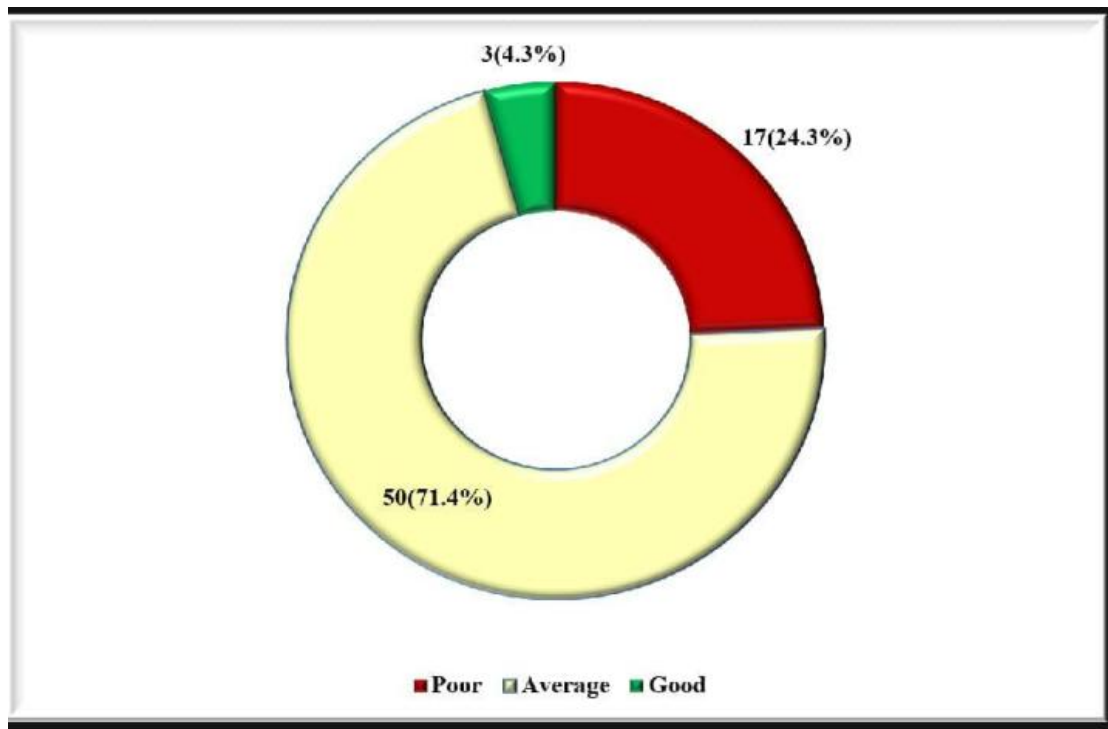
139 The data in the table showed that majority of (67.1%) participants know about the
140 awareness method and (64.3%) people know whom should get vaccinated. While over
141 half of the residents knew what HPV was (58.6%) and many were aware of its risks
142 for women (60.0%), there were big gaps in other important areas. Very few people
143 knew about the screening test for cervical problems (only 24.3%) or the actual cost of
144 the cervical vaccine under government support (27.1%). Only (28.6%) knew who can
145 get it for free, and just (34.3%) were aware of the right age for vaccination. These
146 gaps highlight the need for better communication.

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Fig.2 Categories of score for knowledge regarding HPV vaccine



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151 This figure shows the categories of knowledge scores regarding the HPV vaccine. The
152 majority (71.4%) of participants had average knowledge, (24.3%) had poor
153 knowledge, and only (4.3%) had good knowledge.

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Section: 2

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Table 2.1 :- Association between Knowledge regarding HPV vaccine and

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selected socio demographic variables

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(N=70)

S. No.	Characteristic	Frequency (F)	Knowledge			χ^2 - value
			Poor (n=17)	Average (n=50)	Good (n=3)	
1.	Age(years)		f(%)	f(%)	f(%)	
	18-27	30	6(20.0)	23(76.7)	1(3.3)	0.094 ^{NS}
	28-37	15	2(13.3)	13(86.7)	0(0.0)	
	38-47	15	7(46.7)	6(40.0)	2(13.3)	
	48 or above	10	2(20.0)	8(80.0)	0(0.0)	
2.	Gender					
	Male	29	8(27.6)	18(62.1)	3(10.3)	0.088 ^{NS}
	Female	41	9(22.0)	32(78.0)	0(0.0)	
3.	Education					
	Illiterate	2	1(50.0)	1(50.0)	0(0.0)	0.672 ^{NS}
	Primary School	13	4(30.8)	9(69.2)	0(0.0)	
	Matric	20	4(20.0)	14(70.0)	2(10.0)	
	Secondary School or above	35	8(22.9)	26(74.3)	1(2.9)	
4.	Marital Status					
	Unmarried	26	5(19.2)	20(76.9)	1(3.8)	0.533 ^{NS}
	Married	42	11(26.2)	29(69.0)	2(4.8)	
	Widowed	1	0(0.0)	1(100.0)	0(0.0)	

	Divorced	1	1(100.0)	0(0.0)	0(0.0)	
5. Occupation						
	Student	19	3(15.8)	15(78.9)	1(5.3)	0.580 ^{NS}
	Unemployed	6	1(16.7)	5(83.3)	0(0.0)	
	Employed	18	5(27.8)	11(61.1)	2(11.1)	
	Homemaker	27	8(29.6)	19(70.4)	0(0.0)	
6. Monthly Income			f(%)	f(%)	f(%)	
	Less than 10,000/-	31	4(12.9)	26(83.9)	1(3.2)	0.101 ^{NS}
	10,000/- to 20,000/-	30	12(40.0)	17(56.7)	1(3.3)	
	21,000/- to 40,000/-	8	1(12.5)	6(75.0)	1(12.5)	
	41,000/- or above	1	0(0.0)	1(100.0)	0(0.0)	
7. Heard about HPV Vaccine						
	Yes	25	1(4.0)	22(88.0)	2(8.0)	0.003 ^S
	No	45	16(35.6)	28(62.2)	1(2.2)	
8. Source of Information						
	Newspaper, books, and journals	5	1(20.0)	2(40.0)	2(40.0)	0.004 ^S
	TV, radio, mobile/cell phone	14	0(0.0)	14(100.0)	0(0.0)	
	Friends, relatives and health workers	6	0(0.0)	6(100.0)	0(0.0)	

169 S- Significant($p < 0.05$) NS-Non significant($p > 0.05$)

170 **Table 2.2 :- Association between Socio Demographic Characteristics**

Variable	χ^2 -value
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Age	0.094 / Not Significant
Gender	0.088 / Not Significant
Education	0.672 / Not Significant
Marital Status	0.533 / Not Significant
Occupation	0.580 / Not Significant
Monthly Income	0.101 / Not Significant

171 S- Significant($p < 0.05$) NS-Non significant($p > 0.05$)

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173 No statistically significant association was observed between knowledge level and
174 any demographic variable such as age, gender, education, occupation, or income.

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Table 2.3 :- Association with Awareness and Information Sources

Variable	χ^2 -value
Heard about HPV Vaccine	0.003 / Significant
Source of Information	0.004 / Significant

178 S- Significant($p < 0.05$) NS-Non significant($p > 0.05$)

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180 Residents who had heard of the HPV vaccine had significantly better knowledge se
181 ($p = 0.003$).

182 Source of information showed strong influence: (0.004) those who accessed
183 information through TV/radio/mobiles or health workers had notably higher
184 knowledge levels compared to those relying on print media.

185 The study highlights a moderate level of awareness regarding HPV vaccination
186 among residents, with limited knowledge in critical areas related to vaccine eligibility,
187 dosage, and screening procedures. While demographic variables showed no
188 significant association, prior awareness and effective sources of information were
189 strongly linked to better knowledge.

190 **Discussion:**

191 Our study shows that while some residents had a basic idea about HPV, overall
192 knowledge of the HPV vaccine was still quite limited particularly regarding the right
193 age for vaccination, available government benefits, and appropriate screening. Similar
194 patterns have been reported earlier: Ghosh et al. (2023) found only 5% of rural women
195 in North India aware of the vaccine, while Pal et al. (2024) reported just 22% of Indian
196 women knew its purpose and correct timing. These findings highlight a serious
197 nationwide knowledge gap that requires urgent attention. We observed no significant
198 differences across age, gender, education, marital status, occupation, or income,
199 suggesting that poor awareness is widespread. However, prior exposure to information,
200 especially via television, mobile phones, or health workers, was associated with
201 noticeably better knowledge. This aligns with Swarnapriya et al. (2015), who
202 emphasized the impact of credible sources and targeted awareness campaigns. Overall,
203 our results underscore the pressing need to utilize mass media, digital platforms, and
204 community health workers to improve understanding and actively encourage
205 preventive health behaviour.

206 **Conclusion:**

207 The study reveals an urgent need for improving awareness and knowledge about the
208 HPV vaccine in rural Punjab. While general knowledge remains moderate, critical

209 areas such as eligibility, vaccination schedules, and screening remain poorly
210 understood. Demographics did not influence knowledge significantly; however, those
211 exposed to prior information—especially through electronic media and health
212 workers—were better informed. The findings underscore the role of nurses as
213 educators in the community and the importance of leveraging media, community
214 health programs, and school-based interventions to spread awareness and combat
215 misinformation.

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222 **References:**

- 223 1. National Cancer Institute. What is cancer? Available from:
224 <https://www.cancer.gov/about-cancer/understanding/what-is-cancer>
- 225 2. Sung H, Ferlay J, Siegel RL, et al. Global cancer statistics 2020. *CA Cancer J Clin.*
226 2021;71(3):209-49. Available from:
227 <https://acsjournals.onlinelibrary.wiley.com/doi/full/10.3322/caac.21660>
- 228 3. Malhotra V, et al. Cancer trends in India. *PubMed.* 2021. Available from:
229 <https://pubmed.ncbi.nlm.nih.gov/33677672/>
- 230 4. Amandeep K, Amandeep K, Amanpreet K, Krishnan A, Dilpreet K, Geetika, Handa
231 G, et al. A quasi-experimental study to evaluate the effectiveness of a planned
232 teaching programme on knowledge regarding cervical cancer among females aged
233 above 15 years in Village Manakpur, District Patiala, Punjab [BSc Nursing thesis].
234 Faridkot (India): Baba Farid University of Health Sciences; 2015.
- 235 5. World Health Organization. HPV and cervical cancer: fact sheet. Available from:
236 [https://www.who.int/news-room/fact-sheets/detail/human-papillomavirus-\(hpv\)-and-](https://www.who.int/news-room/fact-sheets/detail/human-papillomavirus-(hpv)-and-cervical-cancer)
237 [cervical-cancer](https://www.who.int/news-room/fact-sheets/detail/human-papillomavirus-(hpv)-and-cervical-cancer)
- 238 6. US Food and Drug Administration. FDA approves new vaccine for prevention of
239 cervical cancer [Internet]. 2006 [cited 2025 Jul 9]. Available from:
240 [https://www.fda.gov/news-events/press-announcements/fda-approves-new-vaccine-](https://www.fda.gov/news-events/press-announcements/fda-approves-new-vaccine-prevention.-cervical-cancer)
241 [prevention.-cervical-cancer](https://www.fda.gov/news-events/press-announcements/fda-approves-new-vaccine-prevention.-cervical-cancer)
- 242 7. World Health Organization – India. India launches HPV vaccine to prevent cervical
243 cancer [Internet]. New Delhi: WHO Country Office for India; 2023 [cited 2025 Sep
244 15]. Available from: [https://www.who.int/india/news/feature-stories/detail/india-](https://www.who.int/india/news/feature-stories/detail/india-launches-hpv-vaccine-to-prevent-cervical-cancer)
245 [launches-hpv-vaccine-to-prevent-cervical-cancer](https://www.who.int/india/news/feature-stories/detail/india-launches-hpv-vaccine-to-prevent-cervical-cancer)

- 246 8. Sung H, Ferlay J, Siegel RL, Laversanne M, Soerjomataram I, Jemal A, et al.
247 Global cancer statistics 2020: GLOBOCAN estimates of incidence and mortality
248 worldwide for 36 cancers in 185 countries. *CA Cancer J Clin*. 2021;71(3):209–49.
249 Available from: <https://acsjournals.onlinelibrary.wiley.com/doi/10.3322/caac.21660>
- 250 9. Bosch FX, Lorincz A, Muñoz N, Meijer CJLM, Shah KV. The causal relation
251 between human papillomavirus and cervical cancer. *J Clin Pathol*. 2002;55(4):244–65.
252 Available from: <https://jcp.bmj.com/content/55/4/244>
- 253 10. Drolet M, Bénard É, Pérez N, Brisson M, Ali H, Boily MC, et al. Population-level
254 impact and herd effects following the introduction of human papillomavirus
255 vaccination programmes: updated systematic review and meta-analysis. *Lancet*.
256 2019;394(10197):497–509. Available from:
257 [https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(19\)30298-3/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(19)30298-3/fulltext)
- 258 11. Bansal AB, Pakhare AP, Kapoor N, Mehrotra R, Kokane AM. Knowledge,
259 attitude, and practices related to cervical cancer among adult women: a hospital-based
260 cross-sectional study. *J Nat Sci Biol Med*. 2015;6(2):324–8. Available from:
261 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4539850/>
- 262 12. Ghosh S, Srivastava R, Mishra A. Awareness of HPV vaccine among rural
263 women: a community-based study in North India. *J Community Health*.
264 2023;48(1):102–8. Available from: <https://doi.org/10.1007/s10900-022-01042-2>
- 265 13. Pal R, Raina SK, Kumar A. Knowledge and awareness of HPV vaccination among
266 Indian women: a meta-analysis. *Asian Pac J Cancer Prev*. 2024;25(2):223–30.
267 Available from: <https://doi.org/10.31557/APJCP.2024.25.2.223>
- 268 14. Swarnapriya K, Kavitha D, Ramesh R. Awareness, attitude and acceptance of
269 HPV vaccination among medical students in India. *Int J Reprod Contracept Obstet*
270 *Gynecol*. 2015;4(6):1771–4. Available from:
271 <https://www.ijrcog.org/index.php/ijrcog/article/view/3080>

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