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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 com6pared 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].

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

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

HPV is a DNA virus from papilloma virus family with over 100 identified types, which are categorized as high, intermediate and low risk types, according to their association with genital tract infection. Among which certain high-risk types, notably HPV-16 and HPV-18, responsible for nearly 70% of cervical cancer cases globally. After HPV-16/18,the six most common HPV types are the same in all world region, namely 31,33,35,45,52 and 58 ; these account for an additional 20 Cancers worldwide[11].

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

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

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Need Of Study

Cervical cancer is one of the most significant public health concerns affecting women in India today. Globally, it is the fourth most common cancer among women, but in India, it ranks as the second most frequent cancer affecting women aged 15 to 44 years[14].

According to the latest estimates, India alone accounts for nearly one-fourth of the global burden of cervical cancer, with approximately 123,000 new cases diagnosed and over 77,000 deaths reported every year. This means that every eight minutes, one woman in India dies due to cervical cancer — a disease that is largely preventable with early vaccination and screening[15].

Countries that have implemented national HPV vaccination programs have shown remarkable declines in the incidence and mortality of cervical cancer. Unfortunately, in India, the uptake of the HPV vaccine remains extremely low, particularly in rural and semi-urban regions. While urban pockets may have better access to awareness campaigns and vaccination drives, rural communities still lag far behind due to deep-rooted social beliefs, lack of awareness, and restricted access to reliable healthcare information[17].

To break this cycle, it is essential to first understand the level of knowledge residents have about the HPV vaccine and the factors that influence this knowledge. Demographic factors such as age, gender, education, occupation, marital status, and socio-economic condition play an important role in shaping people's health behaviors and attitudes. Gathering local data on these factors is key to designing health interventions that are context-specific and effective[20].

Materials and Methods:

A descriptive study was conducted on 70 residents aged 18 to 45 yearsand above to assess their knowledge regarding the Human PapillomaVirus vaccine. The population was selected by using a non-probabilityconvenience sampling method, which allowed easy access to participantsfrom the selected rural communities. Data was collected through a self-structured questionnaire designed to evaluate knowledge in key areassuch as vaccine eligibility, dosage, timing, screening, and preventionmethods. The collected data was analysed using both descriptive andinferential statistics to ensure accurate interpretation of the results.

Results :

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

Section 1 : Socio demographic profile of the study subjects.

Section2: Association between Knowledge regarding HPV vaccine and selected socio demographic variables.

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Section : 1

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

(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

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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

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

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

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

Knowledge was assessed through 30 questions. Responses revealed:

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

(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

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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

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

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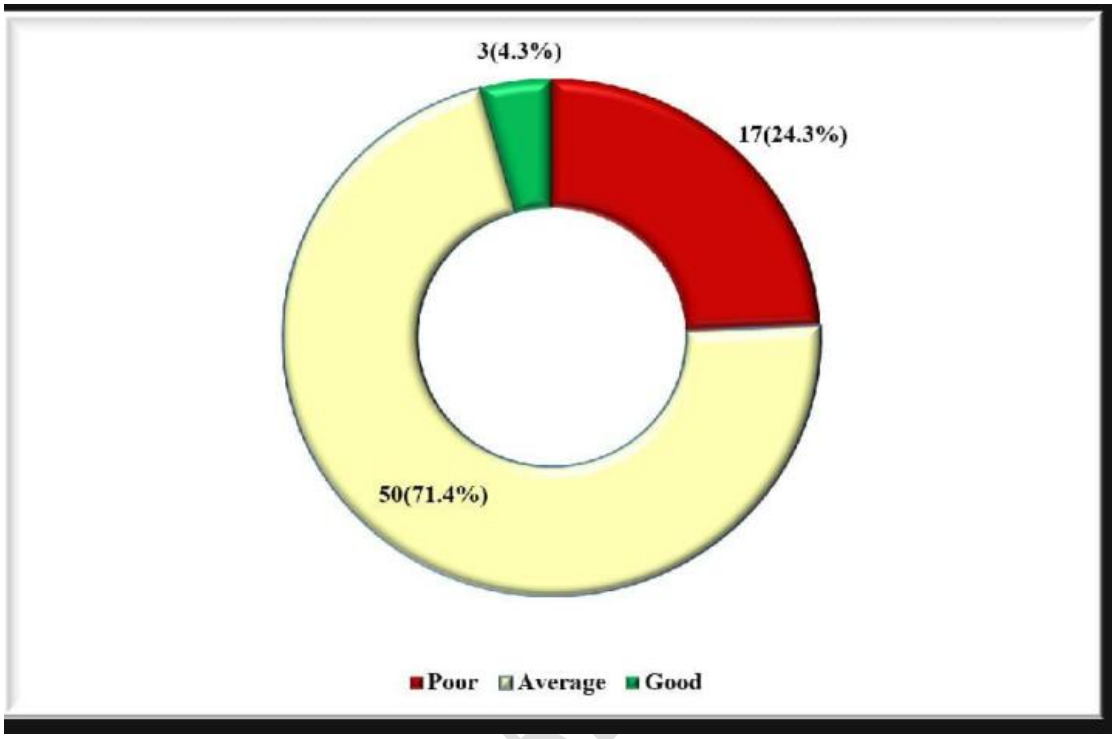
Fig.2 Categories of score for knowledge regarding HPV vaccine



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

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Section: 2

Table 2.1 :- Association between Knowledge regarding HPV vaccine and selected socio demographic variables

(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)	

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	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)	

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

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

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

No statistically significant association was observed between knowledge level and 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

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

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

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

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

Discussion:

Our study shows that while some residents had a basic idea aboutHPV, overall knowledge of the HPV vaccine was still quite limitedparticularly regarding the right age for vaccination, availablegovernment benefits, and appropriate screening. Similar patternshave been reported earlier: Ghosh et al. (2023) found only 5% ofrural women in North India aware of the vaccine, while Pal et al.(2024) reported just 22% of Indian women knew its purpose and correct timing. These findings highlight a serious nationwideknowledge gap that requires urgent attention.We observed no significant differences across age, gender,education, marital status, occupation, or income, suggesting thatpoor awareness is widespread. However, prior exposure toinformation, especially via television, mobile phones, or healthworkers, was associated with noticeably better knowledge. Thisaligns with Swarnapriya et al. (2015), who emphasized the impactof credible sources and targeted awareness campaigns. Overall, ourresults underscore the pressing need to utilize mass media, digitalplatforms, and community health workers to improveunderstanding and actively encourage preventive health behaviour.

Conclusion:

The study reveals an urgent need for improving awareness andknowledge about the HPV vaccine in rural Punjab. While generalknowledge remains moderate, critical

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areas such as eligibility,vaccination schedules, and screening remain poorly understood.Demographics did not influence knowledge significantly; however,those exposed to prior information—especially throughelectronic media and health workers—were better informed. Thefindings underscore the role of nurses as educators in thecommunity and the importance of leveraging media, community health programs, and school-based interventions to spread awareness and combat misinformation.

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