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Knowledge Attitude and Practice Study on Adolescent Females: A Perspective from Northwestern Uttar Pradesh

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Abstract

Background: Cervical cancer remains a significant public health challenge, particularly in India, where high-risk human papillomavirus (HPV) infections are prevalent. Despite the introduction of HPV vaccines in various countries, awareness and acceptance of vaccination among Indian females are notably low. This study aimed to assess the awareness and knowledge regarding HPV infection and its prevention among adolescent girls aged 10-19 years attending a tertiary care hospital in Northwest Uttar Pradesh. **Materials and Methods:** A cross-sectional study was conducted at Sharda Hospital, Greater Noida, enrolling 332 participants through structured questionnaires assessing sociodemographic factors, knowledge levels, and attitudes towards HPV infection, cervical cancer and HPV vaccine. Chi square test and Mann Whitney test was used to analyse the association between knowledge score and various socio demographic factors and education status and family income with acceptance of HPV vaccination respectively. **Results:** The results revealed that only 19.8% of participants achieved a satisfactory knowledge score, indicating a substantial gap in understanding the role of HPV in cervical cancer. Statistical analyses demonstrated significant associations between knowledge scores and factors such as education status, family income, and residence. The study highlighted that lower educational attainment correlated with reduced willingness to receive the HPV vaccine. **Conclusion:** The findings underscore the urgent need for targeted educational interventions to enhance awareness of HPV and promote vaccination, particularly as HPV vaccination is not yet made available free of cost in India's national immunization schedule. This research highlights the critical importance of targeted educational interventions to improve the awareness and acceptance of HPV vaccination among adolescents to reduce the burden of cervical cancer in India. Further research is warranted to address knowledge gaps and promote HPV vaccination in diverse populations.

Keywords: Human Papilloma Virus, HPV vaccine, Cervical cancer, Adolescent, Knowledge and awareness

1 Background

Globally, an estimated 662,044 cases and 348,709 deaths from cervical cancer were reported in 2022, corresponding to the fourth cause of cancer morbidity and mortality in women. Out of this 19% cases and 23% deaths occurred in India [1].

Persistent genital high risk human papillomavirus (HPV) infection is responsible for 99.7% cases of cervical cancer. The worldwide incidence of high-risk HPV infection is 10.4% and in developing countries it is as high as 36.5%. The major risk of infection is in the age group of 16-30 years, whereas cervical cancer is more common in >35 years of age [2]. Over 200 serotypes of HPV have been discovered, of which 15–20 are oncogenic. The lag period between the oncogenic HPV infection and the invasive cervical cancer is 15–20 years. Worldwide, high-risk type HPV-16 and 18 contribute over 70% of all cervical cancer cases; India also has a similar scenario with the most prevalent strain being HPV-16 in at least 50–60% and HPV-18 in at least 10–12%. Oncogenic HPV serotypes have also been implicated in the causation of anal, vulvar, vaginal, penile and oropharyngeal cancers [3]. Vaccinating against HPV constitutes the primary prevention while screening and treatment of precancerous lesions forms the secondary prevention as recommended by World Health Organisation (WHO)'s comprehensive approach to cervical cancer. The Global Strategy to Accelerate the Eradication of Cervical Cancer as a Public Health Issue recommends vaccinating girls before the age of 15 years. HPV vaccines were first made accessible and available in 2017, and from then they were made available as a regular immunization for girls in 71 countries [4]. Delhi was the first state in India to introduce HPV vaccination a part of public health program [5].

As HPV vaccination is not a part of the national immunisation schedule of India, as of now, and is not being provided free of cost, knowledge and awareness about the role of HPV infection in causation of cervical cancer and its potential prevention using the HPV vaccine, plays a crucial role in prevention of cervical cancer.

Studies in the Western countries show that adolescents have better knowledge of HPV infection and cervical cancer and their acceptance of the vaccine is also high[6]. In contrast, there is limited information on awareness and knowledge of HPV infections and vaccination among Indian adolescents since vaccine approval [7].

Therefore, this study attempted to understand the awareness and knowledge about HPV infection and its prevention among adolescent girls in tertiary care hospital in Northwest Uttar Pradesh.

2 Materials and Method

This cross-sectional study was conducted to study the knowledge, attitude, and practices toward human papillomavirus infection and vaccination among adolescent females aged 10-19 years attending outpatient department of Sharda Hospital, Greater Noida, between November 2022 to January 2023. The study was initiated after proper approval from the ethics committee. The subjects were enrolled after obtaining an assent/informed consent from them, as applicable. After explaining the objective of the study, the data was collected using pre-designed, pre-tested proformas, administered either in English or Hindi, as per the choice of the study subjects. The questionnaire had a total of 23 questions of which 6 were pertaining to sociodemographic attributes and 17 related to knowledge, attitude and practice of HPV infection, cervical cancer and HPV vaccine. Out of those 17 questions, ten were on the knowledge of HPV infection, cervical cancer and HPV vaccine, one was whether they were vaccinated against HPV and remaining six were on the attitude and practice regarding the HPV vaccine. Composite knowledge score of the participants was calculated out of those 10 questions with each correct answer marked as 1 point, while incorrect answer marked as 0 point. All correct answers of each study participant were then added, and a composite knowledge score was calculated for all participants. The data was entered in Microsoft excel worksheets and statistical analysis was performed using SPSS 25. Mann Whitney U test was used to see whether the participants place of residence has any difference in their composite knowledge score. Kruskal Wallis test was applied between the composite knowledge score and education status, age and family income to see the association. Chi square association was used to check the association between the willingness to vaccinate and the education status and monthly family income of the participants. A p value of <0.05 was taken as significant.

Those females who consented after being explained about the objective of the study were given the questionnaire as per their language choice.

3 Results

A total of 358 females attending the OPD consented to participate in the study and filled the questionnaire. Out of which 26 forms were incomplete and hence not included in the study. The demographic profile of the 332 participants analysed in the study are given in Table. 1.

Table 1: Socio demographic details of the participants

Characteristics	Categories	Number (%)
Age	10-13 years	21(6.3%)
	14-16 years	219(66%)
	17-19 years	92(27.7%)
Residence	Rural	159(47.9%)
	Urban	173(52.1%)
Education	Illiterate	97(29.2%)
	Up to 8^{th} class	40(12%)
	Up to 10^{th} class	57(17.2%)
	Up to 12^{th} class	70(21.1%)
	Undergraduate Student	68(20.5%)
Income Category of Family	Less than Rs 10,000 per month	32(9.6 %)
	Rs 10,001 - 50000/month	264(79.5 %)
	Rs 50,001 - 1,00000/month	27(8.1%)
	More than 1,00000/month	9(2.7%)

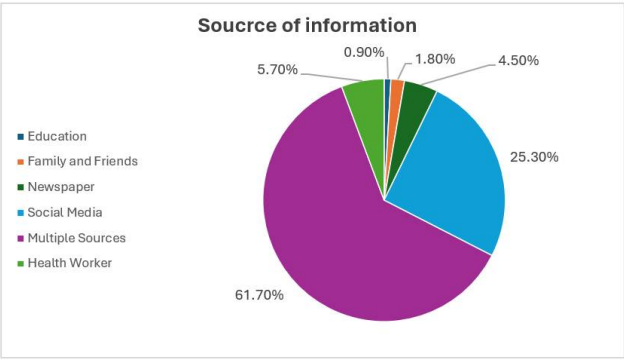

Fig. 1: Source of information regarding HPV infection, cervical cancer and HPV vaccine

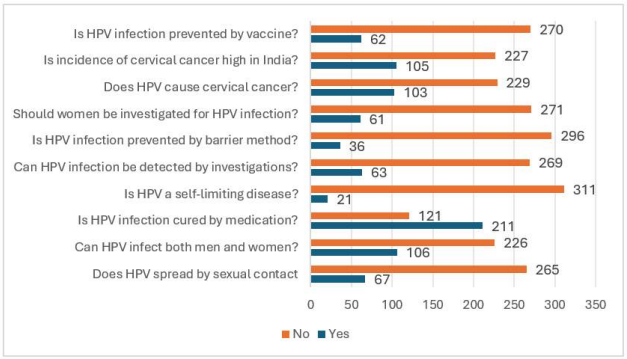

Fig. 2: Response to the knowledge based questions

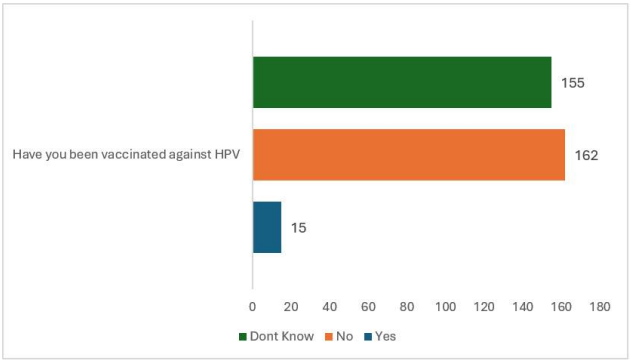

Fig. 3: Response to the practice based question

For majority of the participants the source of information was through multiple sources 205 (61.7%). Rest of the distribution is given in Fig. 1.

Only 19.8 % (n=66) of the participants scored 5 or more marks out of 10. The responses to individual questions are represented in Fig. 2 and Fig. 3. As shown in Table. 2 there was significant association between knowledge score and education status, family income and place of residence.

In order to elucidate the relationship between educational status and family income and acceptance of HPV vaccine we categorised the education status of the enrolled subjects into those who had studied till 8^{th} standard or illiterate into poor and those who studied upto 10^{th} or 12^{th} or graduation ongoing as good. The family income was also categorised as low and high with 50,000 per month being the cut off income.

As shown in Table. 3, poor educational status was significantly associated with unwillingness to

vaccinate themselves and their friends and family with HPV vaccine.

Table 2: Association of Composite knowledge score with socio demographic factors

Variable	Categories	Composite Knowledge Score Mean (SD)	P value
Age	10-13 years	1.9(1.6)	0.233
	14-16 years	2.3(2.4)	
	17-19 years	3.10(3.17)	
Education Status	Illiterate	1.11(1.22)	**0.000(<0.05)**
	Up to 8 th std	1.13(2.06)	
	Up to 10 th std	3.86(3.07)	
	Up to 12 th std	3.16(2.09)	
	Undergraduate	3.3(3.4)	
Residence	Rural	1.28(1.37)	**0.000(<0.05)**
	Urban	3.65(2.99)	
Family Income	Less than 10,000/month	1.22(0.96)	**0.007(<0.05)**
	10,001 - 50,000/month	2.47(2.5)	
	50,001 - 1 lakh/month	3.5(3.2)	
	More than 1 lakh/month	5.3(4.3)	

Mann Whitney Test was used between composite knowledge score and residence. Kruskal Wallis Test was applied between composite knowledge score and Education status, Age and Family Income. SD - Standard Deviation, std-standard.

Table 3: Association between Education status and Family Income and acceptance of HPV vaccine

Question: Would you vaccinate yourself against HPV				
		Yes	**No**	**P value**
Education category	Poor	7	130	**0.000 (<0.05)**
	Good	107	88	
Income Category	Low	99	197	0.327
	High	15	21	
Question: Would you encourage your friends and family to get vaccinated against HPV				
		Yes	**No**	**P value**
Education category	Poor	6	131	**0.000 (<0.05)**
	Good	106	89	
Income Category	Low	97	199	0.350
	High	15	21	

Chi square test was applied to find out the association between the education status and income category with the willingness to vaccinate self and others.

4 Discussion

India is a middle-income country with 686 million females, out of which 386 million belong to the 15-49 years category who are more vulnerable to cervical cancer [8]. The HPV vaccine is recommended between 9 to 14 years of age in girls as part of IAP immunization policy. The development of cervical cancer following primary HPV infection is around 15-20 years. This study targeted the adolescent female population as they can be later motivated for HPV vaccination and will constitute towards the primary prevention against cervical cancer.

In our study, out of the 332 participants majority were between the ages of 14 and 16 years; (66%, n=219) had an urban background (52.1%, n=173) had a monthly family income of 10,001 to 50,000 (79.8%, n=264). 29.1% (97) were illiterate as many reported to dropping out from school during COVID pandemic and not rejoining.

In our study, 61.7% (205) had received information from multiple sources including newspaper, social media, heath worker, family and friends as compared to study conducted in Thailand found that health professionals were the most common sources of information [9].

In a study by Charakorn C, on young Thai females despite participants' limited information, the HPV vaccine was widely accepted. This was in contrast to our study where only 34.35% (114) agreed to vaccinate self only 33.7% (112) agreed to do so for friends and family [10].

Shrestha Chaudhary et al. found that 43.29% of young medical professionals had good knowledge score (>60%) and 11.82% of respondents had started or completed their HPV vaccination series as compared to 19.8% and 4.5% respectively in our study which included adolescent females from general population, who did not have any medical background. In their study, 95.37% thought the HPV vaccine was effective as compared to 6% in our study [11].

In another study of 693 females aged 16-40 years of all backgrounds, the pre-education awareness was found to be 20.63% similar to our study [12].

In their study, 68 (69.39%) respondents indicated that they were not aware about cervical cancer similar to our study where 68.3% participants were not aware of the high incidence of cervical cancer in India [13].

In a study involving 1088 females above 30 years; 61.8% knew regarding cervical cancer ,3.8% were aware of HPV vaccine. The odds ratio of poor knowledge was high in women of lower education level, poor income group and rural background similar to our study [14].

Despite consistently low levels of knowledge about cervical cancer, HPV, and the HPV vaccine, a systemic review different Sub-Saharan African (SSA) countries showed high rates of willingness as well as acceptance towards HPV vaccine. Health facilities, nationwide campaigns, and school-based efforts all contributed to the very high success rate of the HPV vaccine pilot program in six African countries [15]. A quasi experimental study, involving 17-24 year old females of 240 girls also showed 86% agreed and 58.3% initiated the HPV vaccination series following an educational intervention [16].

The strength of our study was that it targeted the adolescent population where HPV vaccination is advocated. Understanding how much our target population is aware helps us plan awareness sessions as well as strengthen vaccination drive. Since in our study the maximum percentage of participants had stated multiple sources as their mode of gaining information regarding HPV infection, cervical cancer and HPV vaccine; mass awareness if propagated through multiple sources rather than any one, will have more impact and cater to a larger population.

The limitation of our study was that the sample size was small, and majority of the population had poor literacy which could have confounded the findings. Further studies need to be targeted to the adolescent age group of diverse backgrounds, to identify the knowledge gaps and bottlenecks, to enhance the HPV vaccination coverage and prevent cervical cancer.

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