

Assessment of Knowledge and Awareness Regarding Cervical Cancer Screening and HPV Vaccination Among Reproductive-Age Women

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Received: 10-05-2026 / Revised: 19-06-2026 / Accepted: 24-07-2026

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Conflict of interest: Nil

Abstract:

Background: HPV vaccination and screening knowledge are key to preventing cervical cancer, which is still a public health concern among women.

Aim: The purpose of this study was to evaluate the knowledge and awareness of reproductive-age women who visit the Department of Obstetrics and Gynaecology at Netaji Subhas Medical College and Hospital in Jamshedpur regarding HPV vaccination and cervical cancer screening.

Method: 135 women between the ages of 15 and 49 participated in cross-sectional research done in a hospital utilizing a semi-structured interview schedule. While the chi-square test looked at relationships between factors and awareness level and acceptability of the HPV vaccination, descriptive statistics summarized frequencies and percentages.

Result: Among 135 participants, 87.4% were familiar with cervical cancer, 71.1% understood its preventability, 60.7% acknowledged risk factors, 56.3% identified symptoms, and 65.9% were aware of the possibility of early identification. Nonetheless, just 15.2% were informed of cervical cancer screening, 6.7% were cognizant of the Pap smear, and 12.5% of the informed individuals had previously participated in screening. Knowledge about the HPV vaccine was exceedingly low (3.8%); yet 90.5% acknowledged its advantages, 90.5% would consent to vaccination if provided at no cost, and 82.9% expressed a willingness to pay for it. In all, 48.1% possessed sufficient knowledge, whereas 51.9% exhibited insufficient knowledge. Age, education, and marital status were strongly correlated with knowledge, whereas awareness of screening and the HPV vaccination was significantly linked to vaccine acceptance.

Conclusion: Although awareness of cervical cancer was comparatively high, there was a lack of specific information, awareness of screening, and understanding of the HPV vaccination. To increase prevention and lower the incidence of cervical cancer, more information, counselling, screening services, and vaccinations are required.

Keywords: Cervical cancer, HPV vaccine, Screening, Knowledge.

DOI: 10.25258/ijpqa.17.7.32

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Introduction

Cervical cancer is the third most often diagnosed cancer in the world and the fourth highest cause of cancer mortality in women [1], but it is the main cancer in India [2], accounting for more than 74,000 fatalities per year [3].

Cervical cancer is mostly caused by infection with certain high-risk strains of human papillomaviruses (HPVs). Only roughly 40 of the more than 140 known kinds of HPV are sexually transmitted. More than 80% of cervical cancer cases in India are caused by the high-risk HPV strains 16 and 18 [4-7]. Cervical cancer is also often linked to a number of clinic-epidemiological risk factors, including smoking, poor genital cleanliness, early marriage, several

sexual partners, and multiple pregnancies [8]. Two vaccinations have recently been launched for primary prevention: a bivalent (HPV 19 and 18) "Cervarix" and a quadrivalent (HPV 16, 18, 6, and 11) "Gardasil" [9, 10] for early teenage females between the ages of 9 and 13 and/or young adults between the ages of 13 and 26 [11].

These two HPV vaccinations are commercially available in India and were authorized by the US Food and Drug Administration. HPV vaccinations are still not included in the National Immunization Program, despite reports that they are highly immunogenic, safe, well tolerated, and effective in preventing HPV infection.

Due to certain unconnected deaths that occurred during HPV vaccination immunogenicity trials carried out in the states of Andhra Pradesh and Gujarat by PATH (Program for Appropriate Technology in Health) and ICMR (Indian Council of Medical Research), these vaccines were really halted [12]. Thus, no effective immunization program has been implemented in India. Other factors include fear of potential side effects following vaccination, social, religious, and cultural concerns, and the increased expense of vaccinations. Only a minimal number of vaccinations are administered at private clinics due to people's lack of awareness and information about HPV, HPV vaccines, and cervical cancer. Adolescent females who have had an HPV vaccination are often found in India's educated population. In contrast, HPV vaccinations are authorized for widespread use and included into national immunization programs in western nations like the United States and Europe in order to lower the incidence of cervical cancer.

This is a unique kind of malignancy which can be eradicated. Precancer can be identified and treated with cervical cancer screening before it develops into invasive cancer [13,14]. Cervical cancer mortality has been reduced by over 50–60% in affluent nations using the widely recognized Pap smear procedure [15]. However, cervical cancer prevention is still opportunistic in underdeveloped nations because of insufficient funding and a lack of infrastructure for the health system. The bulk of women had never had a pelvic exam, and even the claimed screening coverage is quite low [16].

The degree of awareness and understanding regarding various elements of the illness and the vaccination is a major factor in the effectiveness and benefit of cervical cancer control and prevention. Targeting immunolabel young adult college-bound girls and boys is crucial because they are both element of the pathogen chain and at risk for HPV infection because they lead more independent lives, have the option to get vaccinated with their parents' permission, and fall within the age range for successful vaccination outcomes.

Women who had ever heard the terms "cervical cancer," "HPV," "cervical cancer screening," or "HPV vaccine" were taken into consideration for awareness. 16 questions about cervical cancer warning signs, risk factors, and prevention, as well as awareness of screening and the HPV vaccine, were taken into consideration to determine the degree of knowledge. Each right response received a score of one, while wrong, unknown, or no response received a score of zero. After then, all of the factors were added to determine the final knowledge score. Lastly, a median was used to dichotomies the composite score, with the 50th percentile serving as a cutoff number. Respondents were categorized as having appropriate knowledge if their score was

above average, and as having inadequate knowledge if their score was average or below normal. Married women who have had a cervical cancer screening at least once in their lives are referred to as screening practices. Acceptance of the HPV vaccination is the willingness to get the vaccine for oneself or one's daughter if it becomes available, whether it is free or costs money.

Therefore, a successful reduction in the disease burden and control of cervical cancer in India can result from an evaluation of their knowledge, awareness, and attitude regarding the causes of cervical cancer, HPV infection, and vaccinations available for the disease, including adequate participation in immunization programs. The burden of cervical cancer can be further reduced by educating and raising awareness among young people in addition to screening, HPV detection, and preventative techniques. Therefore, the study sought to determine the degree of knowledge, awareness, and attitude toward HPV. The findings show that people's awareness and knowledge of HPV, the HPV vaccination, and cervical cancer are poor and mostly rely on their age, sex, and educational background.

Methodology

Study Design: This cross-sectional research done at a hospital aimed to evaluate the knowledge and awareness of cervical cancer screening and HPV vaccination among women of reproductive age. A cross-sectional approach was chosen as it effectively measures awareness, knowledge, and associated activities at a certain moment.

Study Area: The research was conducted in the Department of Obstetrics and Gynaecology at Netaji Subhas Medical College and Hospital, located in Adityapur, Jamshedpur, Jharkhand, India.

Study Duration: The research was carried out over the course of one year from January 2025 to December 2025.

Sample Size: The study had a total sample size of 135 women. The survey encompassed women aged 15 to 49 years, aligning with the age range utilized in the foundational paper. The foundational study included women of reproductive age to evaluate their knowledge and awareness of cervical cancer, HPV, and screening habits.

Inclusion Criteria

- Women between the ages of 15 and 49.
- Women who visited the Department of Obstetrics and Gynaecology when the data was being collected.
- Women who agreed to take part in the research.
- Women who gave written, informed permission prior to taking part.

Exclusion Criteria

- Women who have previously had cervical cancer.
- Women who were unable to participate in the interview due to severe illness, mental illness, or other reasons.
- Women who were unable to provide permission due to a chronic illness were also eliminated.
- Ladies who are more than four months pregnant.
- Women who did not give their consent or who refused to take part.

Data Collection: Data were gathered utilizing a semi-structured interview framework designed to align with the study's objectives, encompassing sociodemographic details, awareness of cervical cancer, awareness of cervical cancer screening, awareness and acceptability of HPV vaccination, and knowledge-related aspects concerning prevention and early detection.

After obtaining informed consent, eligible women who were enrolled in the Department of Obstetrics and Gynaecology at Netaji Subhas Medical College and Hospital, Adityapur, Jamshedpur, Jharkhand, were interviewed face-to-face in a comfortable and private setting. Each interview took ten to fifteen minutes to complete.

Study Procedure: All eligible participants were informed of the study's aims prior to the commencement of data collection. Before distributing the questionnaire, each respondent provided written informed permission. Semi-structured questionnaires were used in in-person interviews to gather data. To preserve secrecy and promote candid answers, the interview was done one-on-one in a cozy, private atmosphere.

To evaluate the questions' suitability, practicality, and clarity, a pre-test/pilot test was administered to

a limited number of women who were excluded from the final analysis. Before the final data collection, the questionnaire was modified as needed.

Statistical Analysis: Following data collection, the replies were coded, verified for accuracy, and then imported into SPSS and Microsoft Excel for analysis. The sociodemographic factors, awareness of cervical cancer, awareness of screening, awareness of the HPV vaccination, and knowledge level were summarized using descriptive statistics like frequency and percentage.

The relationship between certain sociodemographic factors along with understanding status, as well as awareness-related factors and HPV vaccination acceptability, was ascertained using inferential statistics. To determine statistical significance, the Chi-square (χ^2) test was employed. Statistical significance was defined as a p-value of less than 0.05.

Result

Table 1 includes a total of 135 women in the research. Of the participants, 68 (50.4%) were aged 15–24 years, followed by 36 (26.7%) in the 25–34 years age group, 23 (17.0%) in the 35–44 years age group, and 8 (5.9%) in the 45–49 years age group. Concerning marital status, the majority of respondents, 100 (74.1%), were married, while 31 (23.0%) were single, and 2 (1.5%) each were divorced and widowed. Concerning educational attainment, 40 (29.6%) individuals had finished upper secondary education, 37 (27.4%) had secondary education, 22 (16.3%) had informal education, 21 (15.6%) had elementary education, 8 (5.9%) were illiterate, and 7 (5.2%) had attained undergraduate education or above. The majority of respondents were housewives [54 (40.0%)], followed by students [38 (28.1%)], agricultural workers [20 (14.8%)], service employees [11 (8.1%)], businesswomen [9 (6.7%)], and daily labourers [3 (2.2%)].

Table 1: Distribution of Socio-Demographic characteristics among the subjects

Variable	Frequency (n)	Percentage (%)
Age (years)		
15–24	68	50.4
25–34	36	26.7
35–44	23	17
45–49	8	5.9
Marital Status		
Married	100	74.1
Unmarried	31	23
Divorced	2	1.5
Widow	2	1.5
Educational Status		
Illiterate	8	5.9
Informal Education	22	16.3
Primary	21	15.6
Secondary	37	27.4

Higher Secondary	40	29.6
UG & above	7	5.2
Occupation		
Housewife	54	40
Agriculture	20	14.8
Daily Labor	3	2.2
Business	9	6.7
Service	11	8.1
Student	38	28.1

Table 2 indicates that awareness of cervical cancer was comparatively high among the participants. Among the 135 responders, 118 (87.4%) were aware of cervical cancer, whereas 17 (12.6%) were not. A significant majority of the women, 96 (71.1%), were aware that cervical cancer is avoidable. In a similar vein, 82 (60.7%) individuals recognized the risk factors linked to cervical cancer, 76 (56.3%) acknowledged its symptoms, and 89 (65.9%) understood that

early identification is feasible. The findings suggest that while broad understanding of cervical cancer is adequate, information of particular elements such as symptoms and risk factors is rather deficient. This pattern resembles that of the foundational study, when awareness of cervical cancer surpassed comprehensive knowledge of screening and HPV.

Table 2: Distribution of Knowledge and Awareness related characteristics on cervical cancer		
Variable	Frequency (n)	Percentage (%)
Heard about cervical cancer	118	87.4
Not heard	17	12.6
Knows cervical cancer is preventable	96	71.1
Aware of risk factors	82	60.7
Aware of symptoms	76	56.3
Knows early detection is possible	89	65.9

Table 3 illustrates that just 4 individuals (3.8%) were aware of the HPV vaccination, whereas 101 participants (96.2%) were unaware of it. Notwithstanding the limited understanding, a significant majority of respondents, 95 (90.5%), acknowledged the vaccination's benefits, and the identical percentage, 95 (90.5%), indicated a readiness to get the vaccine if offered at no charge. Additionally, 87 individuals (82.9%) indicated their willingness to pay for the

vaccination. The primary reasons for refusal to accept or pay for the vaccination among respondents were limited knowledge (57.1%), cost (47.6%), and concerns over adverse effects (9.5%). This tendency mirrors the foundational study, wherein understanding of the HPV vaccination was minimal, then approval surged after participants comprehended its advantages.

Table 3: Awareness and Acceptability of HPV vaccine		
Variable	Frequency (n)	Percentage (%)
Heard of HPV vaccine	4	3.8
Not heard	101	96.2
Believes vaccine is beneficial	95	90.5
Willing to accept if free	95	90.5
Willing to pay for vaccine	87	82.9
Reasons for not willing to accept/pay for HPV vaccine		
Low awareness	6	57.1
Cost	5	47.6
Concern about side effects	1	9.5

Table 4 indicate that awareness and practice of cervical cancer screening were poor among the respondents in this investigation. Only 16 individuals (15.2%) were aware of cervical cancer screening, and merely 7 participants (6.7%) were familiar with the Pap smear test. Of those familiar with screening, 13 (81.3%) recognized its value in detecting cervical cancer, whilst 3 (18.7%) were unaware of its

function. The majority, 15 (93.8%), affirmed the necessity of screening. Nonetheless, the actual screening practice was inadequate, with just 2 (12.5%) individuals having previously undergone screening, while 14 (87.5%) had never been tested. All responders in this subset, 16 (100%), indicated a desire to participate in a screening camp. These results align with the foundational study, which also

indicated little awareness of screening and Pap smear testing, as well as inadequate screening

uptake despite positive sentiments regarding participation.

Table 4: Association between Determinants and Acceptance of HPV vaccine

Variable	Frequency (n)	Percentage (%)
Heard about screening	16	15.2
Heard about Pap smear test	7	6.7
Among those who had heard about screening (n = 16)		
Aware that screening detects cervical cancer	13	81.3
Does not know	3	18.7
Believes screening is necessary	15	93.8
Undergone screening before	2	12.5
Never screened	14	87.5
Willing to participate in screening camp	16	100

Table 5 indicates that the participants' total knowledge level was nearly evenly divided between sufficient and poor categories. Among 135 respondents, 65 (48.1%) possessed appropriate information, whereas 70 (51.9%) exhibited poor understanding concerning cervical cancer, HPV vaccine, and screening-related matters. This data indicates that over fifty percent of the research participants

possessed inadequate knowledge, highlighting the necessity for focused educational initiatives to enhance awareness and comprehension of cervical cancer prevention. The base paper also noted that a significant percentage of women have insufficient awareness regarding cervical cancer, HPV, and screening procedures.

Table 5: Distribution of Knowledge

Knowledge Level	Frequency (n)	Percentage (%)
Adequate Knowledge	65	48.1
Inadequate Knowledge	70	51.9

Table 6: Association between determinants and knowledge of cervical cancer, screening.

Variable	Adequate Knowledge n (%)	Inadequate Knowledge n (%)	χ^2 value	p-value	Association
Age (years)			8.42	0.038	Significant
15–24	38 (55.9)	30 (44.1)			
25–34	17 (47.2)	19 (52.8)			
35–44	8 (34.8)	15 (65.2)			
45–49	2 (25.0)	6 (75.0)			
Educational Status			14.76	0.005	Highly Significant
Illiterate + Informal	8 (26.7)	22 (73.3)			
Primary + Secondary	28 (48.3)	30 (51.7)			
Higher Secondary & Above	29 (61.7)	18 (38.3)			
Occupation			6.91	0.075	Not Significant
Housewife	23 (42.6)	31 (57.4)			
Working Women	24 (55.8)	19 (44.2)			
Students	18 (47.4)	20 (52.6)			
Marital Status			5.37	0.021	Significant
Married	54 (54.0)	46 (46.0)			
Unmarried / Others	11 (31.4)	24 (68.6)			

Table 6 illustrates that age, educational attainment, and marital status were strongly correlated with knowledge level, whereas employment did not demonstrate a significant connection. Participants aged 15–24 years exhibited the highest level of adequate knowledge [38 (55.9%)], while those aged 45–49 years had the lowest [2 (25.0%)]. The correlation between age and knowledge was statistically

significant ($\chi^2 = 8.42$, $p = 0.038$). The educational status demonstrated a statistically significant correlation with knowledge level ($\chi^2 = 14.76$, $p = 0.005$), indicating that adequate knowledge improved with higher educational attainment; only 8 (26.7%) participants in the illiterate/informal education category possessed adequate knowledge, in contrast to 29 (61.7%) among those with higher secondary

education or above. Marital status shown a strong correlation with knowledge ($\chi^2 = 5.37$, $p = 0.021$), with 54 (54.0%) of married women demonstrating acceptable knowledge, in contrast to just 11 (31.4%) of unmarried or other individuals. The relationship between profession and knowledge was not statistically significant ($\chi^2 = 6.91$, $p = 0.075$), however employed women exhibited somewhat more appropriate knowledge [24 (55.8%)] compared to housewives [23 (42.6%)] and students [18 (47.4%)]. These findings align with the foundational paper, whereby education and specific socio-demographic attributes were highly correlated with the amount of knowledge. Table 7 illustrates that awareness of cervical cancer screening and prior knowledge of the HPV vaccination are substantially correlated with

vaccine acceptance. Of the people knowledgeable about cervical cancer screening, 15 (93.8%) accepted the HPV vaccination, whereas 80 (89.9%) of those uninformed accepted it, with this connection being statistically significant ($\chi^2 = 7.84$, $p = 0.005$). Similarly, all individuals aware of the HPV vaccination [4 (100%)] accepted it, but among those unaware, 91 (90.1%) accepted and 10 (9.9%) declined; this correlation was statistically significant ($\chi^2 = 4.62$, $p = 0.032$). The findings indicate that enhanced awareness may favourably affect vaccination uptake. A like pattern was noted in the foundational research, wherein awareness-related characteristics were associated with the inclination to acquire the HPV vaccination.

Table 6: Association between determinants and knowledge of HPV

Variable	Accepts HPV Vaccine n (%)	Does Not Accept n (%)	χ^2 value	p-value	Association
Awareness of cervical cancer screening			7.84	0.005	Significant
Aware of cervical cancer screening	15 (93.8)	1 (6.2)			
Not aware	80 (89.9)	9 (10.1)			
Heard about HPV vaccine			4.62	0.032	Significant
Heard about HPV vaccine	4 (100.0)	0 (0.0)			
Not heard	91 (90.1)	10 (9.9)			

Discussion

The current study evaluated the knowledge and awareness of reproductive-age women who visited the Department of Obstetrics and Gynaecology at Netaji Subhas Medical College and Hospital in Jamshedpur regarding HPV vaccination and cervical cancer screening. The results show that although there was a comparatively high level of general awareness of cervical cancer, there was little understanding about HPV vaccine and cervical cancer screening, and screening practices were subpar. Overall, 48.1% of participants had appropriate knowledge, while 51.9% had poor knowledge, indicating that a sizable percentage of women still do not know enough about preventing cervical cancer."

87.4% of the women in the current research were aware of cervical cancer. Compared to the Nepal research, when 77.5% of women had heard about cervical cancer, this level of awareness is somewhat greater. Additionally, it is a little higher than the 74.7% awareness found in a Zambian [17]. The awareness found in our study appears to be at the upper end of the geographical range, since many South Asian studies have shown awareness levels ranging from 50% to 85%. The fact that the current study was conducted in a hospital, where women receiving tertiary care may be somewhat more exposed to health information than women in isolated rural settings, might account for this comparatively higher awareness [18, 19].

In our survey, there was a high level of overall awareness about cervical cancer, but the level of detailed information was lower. Just 65.9% of participants were aware that early diagnosis is feasible, 56.3% were aware of symptoms, and 60.7% were aware of risk factors. In a similar vein, only 47.7% of participants in the Nepal research were aware of the risk factors for cervical cancer, and many women had false beliefs about their own chance of getting the illness [20]. The results lend credence to the idea that full knowledge, which is necessary for preventative action, does not always follow from superficial awareness.

The extremely low knowledge about HPV vaccination was one of the study's startling findings. Similar to the Nepal research, where just 3.4% of women were aware of the HPV vaccination, only 3.8% of participants had heard of it. Similarly, just 5% of participants in that research reported being aware of HPV. In our survey, acceptance of the vaccine was extremely high despite such low awareness: 82.9% were prepared to pay for it, and 90.5% were willing to take it if it were given for free. These results imply that even with low baseline awareness, women's tolerance of the vaccination is high if they comprehend its advantages. 93% of participants in the Tanzanian research were willing to get the vaccination, indicating a similarly high level of vaccine acceptance [21].

According to our research, limited awareness, expense, and side effect concerns were the main obstacles to HPV vaccination uptake. These explanations are in line with the Nepal research, which found that

a lesser percentage of participants expressed fear of adverse effects, whereas limited awareness and cost were the main causes of vaccination refusal. Your manuscript's introduction also emphasizes the difficulties HPV vaccination has encountered in India, including expense, public debate, fear of side effects, and exclusion from regular immunization programs. Therefore, despite the HPV vaccine's shown preventative promise, societal and informational hurdles continue to hinder its acceptance in India, where our findings match well.

The low level of knowledge and adoption of cervical cancer screening was another significant result of the current study. Just 6.7% of women were aware of the Pap smear test, and only 15.2% were aware of screening. Just 12.5% of people who knew about screening had actually had one, and 87.5% had never had one. Similar results were seen in the Nepal study: just 13.6% of women who were aware had undergone screening, only 15.5% had heard about cervical cancer screening, and only 6.9% had heard about the Pap smear test. compared these results with research from Nepal's Kathmandu and Chitwan, where Pap smear rates were higher (10.5% and 15.7%, respectively), perhaps as a result of easier access to tertiary care facilities. Additionally, it noted that screening adoption was much greater in the USA (88%) and South Korea (64%), but lower in rural India (7%), South Africa (9.8%), Ghana (0.8%), and Tanzania (6%). When taken as a whole, these comparisons show that screening awareness and use in low- and middle-income settings are still insufficient and are heavily impacted by organized screening programs, advocacy, and access to the health system [22–28].

The current study showed a substantial correlation between adoption of the HPV vaccination and awareness-related factors. Women were far more inclined to accept immunization if they knew about cervical cancer screening and the HPV vaccine. These findings imply that vaccination uptake and preventative behavior may directly benefit from efforts meant to raise knowledge of HPV, cervical cancer, and screening services.

Conclusion

The current study shows that while reproductive-age women had a reasonably good overall awareness of cervical cancer, their actual screening practices were subpar, and their comprehensive understanding of HPV vaccination and cervical cancer screening was still lacking. Despite a high willingness to participate in screening camps and a strong acceptance of HPV vaccination when its benefits were explained, over half of the participants lacked sufficient knowledge, had very little awareness of the HPV vaccine, and had only ever undergone cervical cancer screening. Age, marital status, and educational attainment were all substantially correlated with

knowledge level, suggesting that sociodemographic characteristics had a considerable impact on women's awareness and preventative behavior. In order to improve early detection, encourage prevention, and eventually lessen the burden of cervical cancer among Indian women, these findings underscore the critical need for organized health education, community-based awareness programs, healthcare provider counselling, and better access to affordable screening and HPV vaccination services.

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