

Original Research Article

Knowledge and attitude regarding cervical cancer and its screening among women and its association with socioeconomic status: perspective from Western India

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ABSTRACT

Background: Cervical cancer remains a major yet preventable cause of morbidity and mortality among women in India. Socioeconomic and educational disparities greatly influence awareness and uptake of preventive measures, especially in low and middle income countries, making it important to study their association within this context.

Methods: In this study, a cross-sectional survey was conducted among 380 women aged 25-65 years attending a tertiary care hospital. Data was collected using a structured questionnaire. Knowledge, attitudes, and perceived barriers related to cervical cancer, Pap smear screening, and HPV vaccination were assessed, with knowledge scores classified according to Bloom's criteria, and associations with socioeconomic status were measured.

Results: Of 380 participants, only 43.42% (165) of participants had heard of cervical cancer. Amongst, just 10.9% demonstrated good knowledge of its risk factors, symptoms, screening, and prevention. Attitude towards prevention was generally positive, with 63.03% of participants willing to undergo Pap smear testing and 64.24% willing to receive free HPV vaccination. Higher socioeconomic status and educational level were significantly associated with greater awareness and higher knowledge scores. Both educational level and knowledge category were associated with more favorable attitudes toward screening and prevention. Major barriers to screening noted were the absence of symptoms or perceived need, embarrassment, and a male doctor.

Conclusions: These findings demonstrate a dire need for targeted health education, improved accessibility of affordable and gender-sensitive screening services, and strengthened initiatives for cervical cancer prevention in order to reduce the morbidity and mortality associated with this disease in Indian women.

Keywords: Cervical cancer, HPV vaccine, India, Knowledge, Pap smear, Socioeconomic status

INTRODUCTION

Cervical cancer is one of the most preventable yet persistently prevalent cancers affecting women worldwide. It is the second most common cancer among women aged 15-44 in India and the fourth most common cancer among women worldwide.^{1,2} In 2020, an estimated 604,127 cases and 341,831 deaths were attributed to cervical cancer. India accounted for one-fifth of all new

cases and one-fourth of the mortality associated with cervical cancer worldwide.³

Cervical cancer is defined as a malignant tumour arising from the epithelial tissues of the cervix uteri, most often at the transformation zone between squamous and columnar epithelia.^{4,5} It is often asymptomatic or minimally symptomatic in the early stages. When symptoms occur, postmenopausal bleeding is the most frequent presentation, followed by postcoital bleeding,

intermenstrual bleeding and increased vaginal discharge.⁶ In advanced stages, patients also report pain, weakness, and poor appetite. Additional symptoms such as urinary incontinence, leg swelling, constipation, and other systemic symptoms may also be observed.⁷

Cervical cancer most often develops after persistent human papillomavirus (HPV) infection, particularly by HPV types 16 and 18, which together account for about 70% of cases.^{8,9} While most HPV infections resolve spontaneously, persistent infections can progress to cervical intraepithelial neoplasia (CIN) and can eventually lead to invasive cancer if left untreated.¹⁰

Despite the availability of preventive measures, the disease continues to be a major public health burden, particularly in low and middle income countries.¹ This ongoing burden highlights the significance of examining foundational factors such as awareness and attitude, as they directly affect whether women participate in preventive measures like screening and vaccination.^{2,11} The risk of developing cervical cancer also increases due to factors such as early sexual activity, multiple partners, coinfection with sexually transmitted infections, smoking, long-term oral contraceptive use, immunosuppression, poor nutrition, and low socioeconomic status.¹²

Socioeconomic status is a particularly important determinant of cervical cancer risk and awareness. A prominent rural-urban divide can be observed in several developing countries, including India, regarding the incidence and knowledge of cervical cancer.¹³ Women living in urban slums, tribal communities, and rural areas often show poorer knowledge of cervical cancer, its risk factors, HPV vaccination, and Pap testing, alongside significantly lower screening rates.¹ These disparities are repeatedly associated with markers of lower socioeconomic status, including low literacy, limited access to health services, and financial and logistical barriers.¹⁴ Since socioeconomic status influences both awareness and healthcare-seeking behaviour, assessing differences across socioeconomic groups becomes vital. It offers important insight into poorly resourced communities and how gaps in information can add to an otherwise preventable disease burden.^{1,13,14}

The incidence and severity of cervical cancer can be controlled effectively by vaccination, regular screening, and early diagnosis.² Vaccination against human papillomavirus (HPV) remains the most effective strategy for preventing HPV infection and the subsequent development of cervical cancer and other HPV-associated malignancies, while regular screening enables early detection of precancerous lesions before they progress to invasive disease.² The Papanicolaou smear is a common screening test used for detecting precancerous lesions and is recommended as a routine test for all women over the age of 30 for cervical cancer screening.¹¹ Due to these interventions, cases of cervical cancer are declining in the developed world. However, they still impose a significant

burden in developing countries, where the risk of developing cervical cancer is 35% higher compared to developed countries. This discrepancy suggests that the challenge extends beyond problems in infrastructure. Gaps in awareness and attitudinal barriers also play an important role in the limited uptake of preventive services in low-resource settings.¹

Although a number of studies have explored knowledge, attitudes, and practices related to cervical cancer, most of the existing literature focuses on general community samples without considering differences across socioeconomic groups.^{1,13,15} There is still a clear need to improve knowledge and generate awareness in the Indian demographic.¹³ Moreover, existing literature rarely differentiates findings by socioeconomic status within specific regions across the country. This leads to key knowledge gaps regarding how socioeconomic position shapes awareness and attitude factors that directly influence screening and vaccine acceptance.^{1,13,14}

Knowledge, attitude, and perception (KAP) studies from around the world and in India show a persistent gap in awareness, misinformation about etiology and prevention, and low uptake of cervical cancer screening and vaccination. Cross-sectional surveys and reviews reveal variability in women's knowledge by education, socioeconomic status, and urban/rural residency; attitudinal barriers such as fear, stigma, low perceived risk, and structural access challenges; and practical barriers related to access, cost, and provider shortcomings.^{1,13,16} Likewise, Indian community and hospital-based KAP surveys demonstrate regional and socio-economic variability on similar findings.^{11,15,14,17,18} Further, concerns extend beyond the general population, as gaps in provider knowledge and vaccine hesitancy among health professionals may further hinder HPV vaccination efforts.^{19,20}

Socioeconomic status (SES) differences are also important determinants of cervical cancer. The updated SES framework shows the fundamental relationship between education, income, and access and what these do to drive awareness and screening behavior.²¹ Likewise, hospital-based studies demonstrate no or poor knowledge regarding cervical cancer and screening among low SES individuals.¹⁵ International research in the Latin American and Caribbean regions demonstrates similar results, noting socio-cultural factors and co-factors (smoking, multiparity, sexual behavior) as contributors to exposure to HPV, highlighting the need for equity-oriented preventive measures and frameworks that stem from context.²² Recent burden estimates in DALYs and YLLs quantify the ongoing population burden in India and emphasize the need for targeted public-health strategies.³

Beyond these methodological and sociodemographic considerations, barriers along the care continuum further exacerbate poor outcomes. Patients diagnosed at an

advanced stage frequently report high symptom burden, often due to stigma and lack of awareness that leads to delay in care seeking.⁷ Adolescents and mothers also exhibit poor understanding of HPV and its prevention methods.²³ Reviewing prevention strategy has shown that even when vaccination and screening are robust, there are limitations related to misinformation and hesitance on a systemic level.⁴ Countries with organized screening programs still experience symptomatic presentation, suggesting a need for better education and uptake universally.⁶ These findings emphasize the need to study how knowledge, attitudes, and structural barriers can cumulate to impact prevention practices for this disease in India.

METHODS

A cross-sectional hospital-based study was carried out in the Medicine Outpatient Department (OPD) and Ward of a tertiary care hospital in Gujarat between August 2025 and October 2025. The study population was determined using convenience sampling. It comprised of women between 25 to 65 years of age. Female relatives and females accompanying patients in the Medicine OPD and Ward were enrolled as participants for the study after taking informed consent. All collected data was anonymized to ensure patient confidentiality. Females with a history of cervical cancer, females with any gynecological disease, and those who did not give consent were excluded from the study.

The sample size was determined based on proportions reported in previous studies, where the level of adequate knowledge regarding cervical cancer risk factors was 55.8%, and the proportion of positive attitude was 30.2%. Using these values, with a 95% confidence interval and 80% power, the required sample sizes were calculated to be 379 and 324, respectively. To ensure adequate statistical precision, the larger of the two estimates was selected, and the final sample size was set at 380 participants.

The questionnaire was developed in accordance with the study objectives after an extensive review of the relevant literature on the topic. Pilot interviews were carried out on 20 participants, and the information obtained was used to refine the interview guide to make it culturally appropriate and sensitive. The refined, pretested questionnaire was used to conduct interviews of the participants.

The final questionnaire was divided into four main sections. The first section inquired about the socio-demographic data and parameters to assess socioeconomic status according to the Modified Kuppuswamy classification of respondents.²¹ The second section assessed the knowledge of respondents regarding cervical cancer, its symptoms, risk factors, screening, and prevention. The third section evaluated the attitude of respondents to vaccination and screening by Pap smear.

The final section explored barriers to screening from the respondents' perspective.

The data collected was entered systematically into an MS Excel sheet and analyzed. Statistical analysis was performed utilizing this data in Jamovi version 2.6.44. Knowledge regarding cervical cancer and screening was assessed through a series of questions given in the structured questionnaire. Each correct response was assigned a point, while incorrect or "don't know" responses will be given no points. Only those responses that have the answer "yes" to the question "Do you know what cervical cancer is?" were evaluated further and given an overall score. The maximum score a respondent could receive was 20, and the minimum score was 0.

Participants scoring 16-20 (between 80 and 100%) points were considered to have good knowledge showing a comprehensive understanding of all aspects of cervical cancer and its screening. Participants scoring between 12-15 (between 60 and 79%) points indicated moderate knowledge, with some correct answers but also certain gaps and inaccuracies. Scores of 0-11 (less than 60%) points reflected poor knowledge of the participants and indicated limited understanding as well as significant misconceptions. Therefore, overall knowledge was categorized using Bloom's cutoff points.¹⁵ Participants who answered "yes" in at least two out of three attitude questions were considered as having a positive attitude, while those who said "no" in two out of three questions were categorized as having a negative attitude.

The socioeconomic status of the participants was assessed using the Modified Kuppuswamy scale updated for the year 2024. The limits of the monthly income were rounded off to the nearest 500. Participants were classified into upper (i.e., upper), upper-middle and lower-middle (i.e., middle), upper-lower (i.e., poor), and lower (i.e., very poor) classes using relevant information.²¹

The chi-square test was performed to determine the association between socioeconomic and demographic variables with knowledge and attitude levels. A p value of <0.05 was considered statistically significant. Barriers to screening for cervical cancer were expressed in the form of percentages.

RESULTS

A total of 380 participants were interviewed. Table 1 outlines the socio-demographic parameters of the 380 participants included in this study. The participants were distributed in different socioeconomic classes according to the Modified Kuppuswamy socioeconomic status scale 2024, as shown in Table 1. The mean age of the study group was 39.12±10.76 years (range: 25-65 years), and the most frequent age was 25. Of the 380 participants, 353 (92.89%) were married at some point in their lives. The age range of females at the time of

marriage was 10-33 years, with 18 being the most common age.

Table 1: Socio-demographic parameters of participants (n=380).

		No. of participants, N (%)	95% Confidence Interval (%)
Age (years)	25-34	146 (38.42)	33.5 to 43.3
	35-44	102 (26.84)	22.4 to 31.3
	45-54	83 (21.84)	17.7 to 26.0
	55 and above	49 (12.89)	9.5 to 16.3
Marital status	Single	23 (6.05)	3.7 to 8.5
	Married	330 (86.84)	83.4 to 90.2
	Divorced/separated	4 (1.05)	0.03 to 2.1
	Widowed	23 (6.05)	3.7 to 8.5
Number of children	0	54 (14.21)	10.7 to 17.7
	1 to 2	216 (56.84)	51.9 to 61.8
	3 to 5	105 (27.63)	23.1 to 32.1
	>5	5 (1.32)	0.2 to 2.5
Education	No education	82 (21.57)	17.4 to 25.7
	Primary school (class 1 to 5)	84 (22.10)	17.9 to 26.3
	Secondary school (class 6 to 10)	176 (46.31)	41.3 to 51.3
	College/University	38 (10.00)	7.0 to 13.0
Occupation	Homemaker/Unemployed	231 (60.78)	55.9 to 65.7
	Retired	3 (0.78)	-0.1 to 1.7
	Student	5 (1.31)	0.1 to 2.5
	Working	141 (37.10)	32.2 to 42.0
Socioeconomic Status (SES)	Upper class (I)	1 (0.26)	-0.3 to 0.8
	Upper middle class (II)	53 (13.94)	10.5 to 17.4
	Lower middle class (III)	127 (33.42)	28.7 to 38.2
	Upper lower class (IV)	182 (47.89)	42.9 to 53.0
	Lower class (V)	17 (4.47)	2.4 to 6.6
	Student	5 (1.31)	0.1 to 2.5
	Working	141 (37.10)	32.2 to 42.0
Socioeconomic status (SES)	Upper class (I)	1 (0.26)	-0.3 to 0.8
	Upper middle class (II)	53 (13.94)	10.5 to 17.4
	Lower middle class (III)	127 (33.42)	28.7 to 38.2
	Upper lower class (IV)	182 (47.89)	42.9 to 53.0
	Lower class (V)	17 (4.47)	2.4 to 6.6

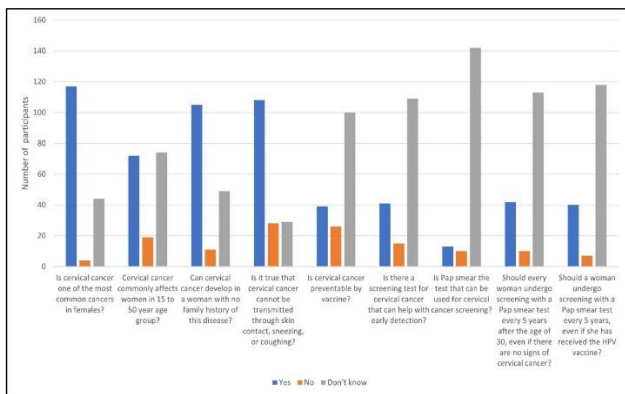


Figure 1: Knowledge of cervical cancer and its screening among participants (n=165).

Of the 380 women interviewed, 165 (43.42%) were familiar with the term cervical cancer. These 165 women

were subsequently assessed for their knowledge regarding cervical cancer, its epidemiology, transmission, and prevention, as shown in Figure 1.

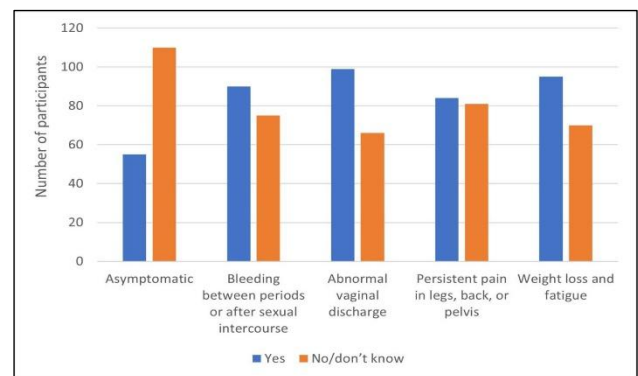


Figure 2: Knowledge of the participants regarding symptoms of cervical cancer.

The 165 participants were also questioned regarding their knowledge of symptoms and risk factors associated with cervical cancer (Figure 2 and 3). The most commonly recognized symptom was abnormal vaginal discharge, followed by weight loss and fatigue, whereas asymptomatic presentation was the least recognized. Similarly, poor genital hygiene emerged as the most frequently identified risk factor.

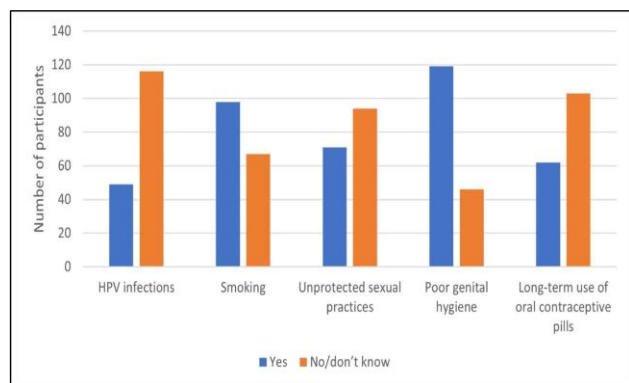


Figure 3: Knowledge of the participants regarding risk factors associated with cervical cancer.

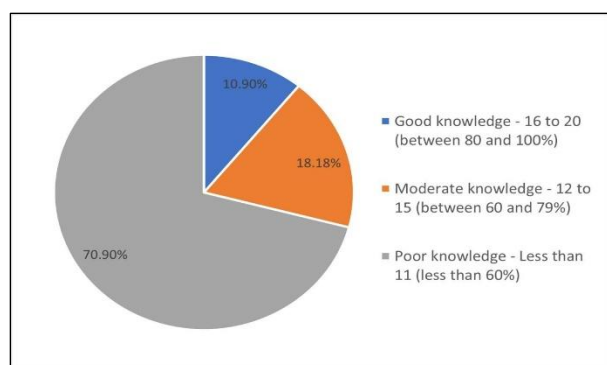


Figure 4: Knowledge score of participants based on Bloom's criteria.

Participants were assessed across several knowledge domains, including epidemiology, transmission, symptoms, risk factors, screening, and preventive measures regarding cervical cancer. The individual score from all the questions was then summed to derive a total knowledge score, which was categorized according to Bloom's cut-off criteria (15). 70.90% of the participants demonstrated poor knowledge with limited understanding as well as significant misconceptions. Only 18.18% and 10.90% of the participants showed moderate and good knowledge, respectively (Figure 4).

All 165 women were also interviewed to assess their willingness to undergo screening and undertake prevention practices regarding cervical cancer (Table 2). The majority of the women had a positive attitude towards HPV vaccination as well as the Pap smear test.

A chi-square analysis was performed to assess the relationship between socioeconomic status (SES) and key knowledge indicators. SES showed a statistically significant association with awareness of the term cervical cancer ($p < 0.001$), with correct responses decreasing from higher to lower socioeconomic groups.

Socioeconomic status (SES) was also significantly associated with awareness of the availability of a screening test for early detection ($p = 0.032$). However, when the upper and upper-middle classes were combined into a single group, and the upper-lower and lower classes were similarly merged to account for small cell sizes, the association between SES and awareness of screening was no longer statistically significant, suggesting that the initial significance may have been influenced by sparse data in some SES categories. In contrast, SES did not show a significant association with knowledge of vaccine-based prevention ($p = 0.141$).

Education level demonstrated a strong and statistically significant association with all three knowledge variables. Awareness of the term cervical cancer differed markedly across educational groups ($\chi^2 = 99.4$, $p < 0.001$), with the highest awareness among college/university-educated participants (92.1%) and substantially lower levels among those with no formal schooling or only primary education (~17%). Knowledge that cervical cancer is preventable by vaccination was also significantly associated with education ($\chi^2 = 17.3$, $p = 0.008$), with nearly half of the college-educated participants (45.7%) responding correctly, compared to only 7.1% correct responses among those without education. Similarly, educational level was significantly associated with awareness of a screening test for early detection ($\chi^2 = 14.0$, $p = 0.030$). Participants with higher education (45.7%) showed greater awareness of screening availability, while awareness was lowest among those with no education (14.3%).

Another chi-square analysis examining socioeconomic status (SES) and overall knowledge level based on Bloom's criteria was performed. A statistically significant association ($\chi^2 = 30.8$, $p < 0.001$) was observed wherein good and moderate knowledge were most commonly seen in the upper-middle class, where 30% of participants fell into each category. In contrast, poor knowledge predominated in the lower-middle and upper-lower socioeconomic groups, with over 75-80% of participants scoring in the poor category. These findings indicate that higher socioeconomic status is associated with better overall knowledge of cervical cancer, as demonstrated in Table 3.

A significant association was also observed between educational status and overall knowledge level based on Bloom's criteria ($\chi^2 = 15.6$, $p = 0.016$) (Table 4). Participants with college or university education had the highest proportion of good (17.1%) and moderate (37.1%) knowledge scores. In contrast, individuals with

lower educational attainment, particularly those with only primary schooling or no formal education, showed

predominantly poor knowledge levels, with more than 70% scoring in the poor category.

Table 2: Attitude of participants towards cervical cancer screening and prevention.

	Yes, N (%)	No, N (%)
Do you think that early detection and better treatment are possible with the help of cervical cancer screening?	134 (81.21)	31 (18.79)
If you had access to the HPV vaccine for free, would you consider getting it?	106 (64.24)	59 (35.76)
Would you get screened for cervical cancer with a Pap smear test?	104 (63.03)	61 (36.97)

Table 3: Assessment of knowledge according to the Modified Kuppuswamy socioeconomic status scale 2024.

Knowledge level	Upper (I), N (%)	Upper middle (II), N (%)	Lower middle (III), N (%)	Upper lower (IV), N (%)	Lower (V), N (%)	P value
Good	0 (0.0)	12 (30.0)	4 (6.0)	2 (3.8)	0 (0.0)	<0.001
Moderate	0 (0.0)	12 (30.0)	7 (10.4)	10 (18.9)	1 (25.0)	
Poor	1 (100.0)	16 (40.0)	56 (83.6)	41 (77.4)	3 (75.0)	

Table 4: Assessment of knowledge according to the education level of the participants.

Knowledge	College/University, N (%)	Secondary school (6–10), N (%)	Primary school (1–5), N (%)	No education, N (%)	P value
Good	6 (17.1)	8 (7.8)	2 (14.3)	2 (14.3)	0.016
Moderate	13 (37.1)	14 (13.7)	1 (7.1)	2 (14.3)	
Poor	16 (45.7)	80 (78.4)	11 (78.6)	10 (71.4)	

Table 5 summarizes the relationship between participants' sociodemographic characteristics, knowledge levels, and their attitudes toward cervical cancer screening. As indicated, age, marital status, and

socioeconomic status were not significantly associated with attitude ($p > 0.05$). While negative attitudes were somewhat more frequent among older women and those in lower socioeconomic groups, these variations were not statistically significant.

Table 5: Assessment of attitude regarding cervical cancer screening and prevention according to the socio-demographic parameters and knowledge scores.

		Negative attitude, N (%)	Positive attitude, N (%)	P value
Age (years)	25-34	19 (25.68)	55 (74.32)	0.370
	35-44	16 (36.36)	28 (63.64)	
	45-54	8 (24.24)	25 (75.76)	
	55 and above	6 (42.86)	8 (57.14)	
Marital status	Single	1 (6.67)	14 (93.33)	0.119
	Married	45 (33.10)	91 (66.90)	
	Divorced/Separated	0 (0.00)	3 (100.00)	
	Widowed	3 (27.28)	8 (72.72)	
Education	No education	8 (57.14)	6 (42.86)	0.027
	Primary school (class 1-5)	4 (28.57)	10 (71.42)	
	Secondary school (class 6-10)	32 (31.37)	70 (68.62)	
	College/University	5 (14.29)	30 (85.71)	
Socioeconomic status (SES)	Upper (I)	1 (1.00)	0 (0.00)	0.103
	Upper Middle (II)	6 (15.00)	34 (85.00)	
	Lower Middle (III)	23 (34.32)	44 (65.67)	
	Upper lower (IV)	18 (34.00)	35 (66.00)	
	Lower (V)	1 (25.00)	3 (75.00)	
Knowledge regarding cervical cancer and screening	Poor	40 (34.18)	77 (65.81)	0.043
	Moderate	8 (26.67)	22 (73.33)	
	Good	1 (5.56)	17 (94.44)	

In contrast, education level showed a clear and significant association with attitude ($p=0.027$). Participants without formal education demonstrated a higher proportion of negative attitudes, whereas women with college or university education largely displayed positive attitudes. A similar pattern was observed for knowledge regarding cervical cancer and its screening, which was also significantly associated with attitude ($p=0.043$). Women with good knowledge had the highest proportion of positive attitudes. Overall, these results highlight the crucial role of education and awareness in shaping women's attitudes toward cervical cancer screening.

This study also explored the perceived barriers that prevented women from undergoing cervical cancer screening. Participants were asked about various factors that might discourage them from seeking a Pap smear test. The most frequently reported barriers included the absence of symptoms and a lack of perceived need for screening, followed by concerns related to embarrassment, anticipated pain, and limited time. Additional obstacles such as high cost and inadequate facilities were reported less commonly. These findings are illustrated in Figure 5.

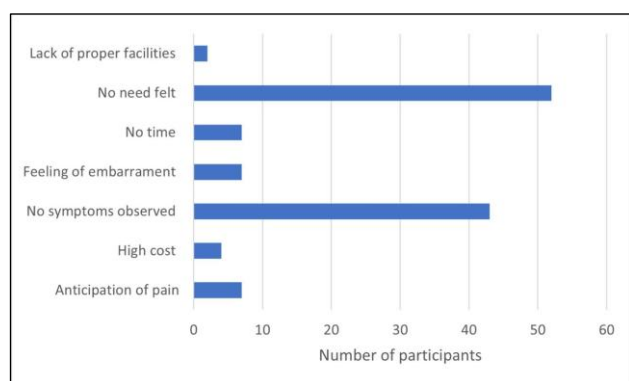


Figure 5: Common barriers to cervical cancer screening.

In addition to these barriers, 116 out of 165 women stated that they would avoid screening if the Pap smear were to be performed by a male doctor, indicating a strong preference for female healthcare providers during intimate examinations and emphasizing the significant influence of provider gender on screening acceptance.

DISCUSSION

Cervical cancer remains a major public health challenge in India. In 2020, cervical cancer was the second most common cancer in both incidence (18.3%) and cancer mortality (18.7%) among women in India, with a 5-year prevalence of 18.8%. It remains a significant health concern due to its persistently high absolute number of patients.³ The Indian government has had a National Programme for Prevention and Control of Non-communicable Disease since 2010, but only 1.9% of women have been covered for cervical cancer screening.¹⁷

Ramamoorthy et al, 2024 projected the burden of cervical cancer in India for 2025 estimated to be 1.5 million DALYs, with 1.4 million DALYs contributed by YLLs.³ This study assesses the knowledge of cervical cancer, its epidemiology, risk factors, symptoms and attitude towards HPV vaccine and Pap smear and barriers to cervical cancer screening amongst the general population. Further, associations of sociodemographic parameters were investigated with attitude and knowledge.

This study highlights an overall lack of knowledge regarding knowledge of cervical cancer, its epidemiology, risk factors, and symptoms, with 70.90% and just 10.90% of participants having poor and good knowledge, respectively. Similar studies have shown extremely low awareness levels in India, with one by Pattupara et al, 2016, reporting that only seven percent of women attending OPD at a tertiary care hospital had knowledge about cervical cancer.^{1,24} Similarly, Gandhi et al, 2024 reports 83% of rural women in Gujarat having poor knowledge about cervical cancer, with only 27% having heard of cervical cancer.¹⁸

The current study depicted that 43.42% of women had known of the term cervical cancer before. A similar study of women attending obstetrics and gynecology OPD in a tertiary care hospital in South India shows 74.6% of women knew the term cervical cancer with most of them having heard it from the media.¹⁵ A study amongst healthcare workers reported 90.6% of workers were aware of cervical cancer.¹⁹ This disparity in awareness rates demonstrates an evident gap in knowledge between healthcare workers and the general population.

Only 29.7% of participants were aware of HPV infection as a risk factor, while 72.12% knew poor genital hygiene as a risk factor. Further, a majority of women were aware of smoking as a risk factor and were either unaware of denied unprotected sex and long-term use of oral contraceptive pills as risk factors. A similar survey in urban slums reported promiscuity, smoking and tobacco use as the most commonly known risk factors, while HPV infection was the least known with less than 15% aware of it.²³ A study amongst people visiting a tertiary care hospital also showed similar results, where smoking and prolonged OCP use were recognised only by 25% and 35.71% as risk factors.²⁴

A general awareness about symptoms and signs of cervical cancer was noted, with abnormal vaginal discharge, weight loss, and fatigue as the commonly recognised ones, while asymptomatic presentation was only recognized by 33.3% of participants. A review of knowledge studies reports adequate knowledge about signs and symptoms, with intermenstrual bleeding and foul-smelling discharge as the most commonly recognized symptoms, while lower abdominal pain was the least reported one.¹

While 24.9% of participants knew that a screening test exists, only 7.9% knew about Pap smear. Similar results are seen in other studies, with a study in the tribal population of South India reporting only 2% of women having knowledge of Pap smear, while a hospital-setting study reported 76.9% of women being aware of screening methods but just 2% aware of Pap smear.^{1,15} This finding demonstrates a clear knowledge-specific gap about Pap smear - a fundamental, cost-effective, and accurate screening tool.

The present study reveals an overall good attitude regarding HPV vaccination and Pap smear with over 60% of participants willing to be vaccinated and undergo a Pap smear. But, only 23.63% of the participants had heard of the HPV vaccine. Gandhi et al., 2024, also reports similar results, with just 24% having heard of the HPV vaccine and 51% willing to receive the vaccine and 32% willing to be screened.¹⁸

Of the 36.97% of women unwilling to undergo a Pap smear, the major reasons were absence of symptoms and no feeling of need. An online survey-based study of highly educated women found similar results with a good attitude towards screening but poor practice, with only 94.67% of women having ever undergone screening. The common barriers reported were perception of no need and embarrassment, along with other reasons such as lack of time, lack of facilities, fear of pain, social stigma, and other reasons like 'disapproval from family/husband'.²⁵ An online web-based survey study reported 92.7% of participants were unwilling, with major concerns being unawareness about the vaccine and facilities as well as high cost.²¹ Our study also reports that 70.3% of women would not undergo a Pap smear if it was being administered by a male doctor.

A statistically significant relationship was observed between socioeconomic status, educational status, and understanding and awareness about cervical cancer and its screening. A similar association is seen in various studies as reported by Taneja et al, 2021, showing higher education and socioeconomic status related to a better awareness and understanding regarding cervical cancer and its screening.¹ A statistically significant relationship was observed between socioeconomic status, educational status, and understanding and awareness about cervical cancer and its screening. In the case of cervical cancer screening data from NFHS-5, a significant difference was noted among women in the "poor wealth index" category, where a 43% less chance of getting screened was observed (APR=0.57, 95% CI: 0.33, 0.96).

The present study assesses knowledge and attitudes regarding cervical cancer and its prevention among women accompanying patients in a tertiary care hospital. This study seeks to identify the informational and attitudinal barriers that may persist even among individuals who are regularly exposed to healthcare environments. A better understanding of how

socioeconomic status and education shape awareness and perceptions can help develop more tailored public health strategies to improve vaccine coverage, increase screening uptake, and ultimately reduce cervical cancer mortality in underserved Indian populations.

This study has few strengths. Using a cross-sectional survey approach, it evaluates how both socioeconomic status and education influence awareness and attitude within the hospital-attending general population. In this way, this study also examines whether measurable differences in awareness and attitudes are seen across socioeconomic groups. It is expected that any patterns that emerge are likely to reflect larger gaps in access to health information and preventive services.

The foremost limitation of this study is that it is a single-center study that relied on convenience sampling. Thus, the findings lack external validity and cannot be confidently generalized to the diverse population of India due to the high potential for bias. Other crucial household members are excluded, such as males or key decision-makers, who significantly influence a woman's health-seeking behaviour and screening uptake. Future researchers should undertake a large, diverse, and random sampling strategy and incorporate socio-cultural influencing factors to ensure the resulting data is more representative of the national context. Future work should focus on evaluating awareness methods, propagating organized screening initiatives, and ensuring female doctor availability in order to increase voluntary participation and reduce the preventable burden of cervical cancer.

CONCLUSION

This study examined the knowledge and attitude of women regarding cervical cancer and its screening and their association with socioeconomic status. Although almost half (43.42%) of the women had heard of cervical cancer, their detailed understanding of its symptoms, risk factors, screening, and prevention remained limited. 70.9% of the participants demonstrated poor knowledge, while only 18.18% had moderate and 10.9% had good knowledge based on Bloom's criteria.

Higher socioeconomic status and education level were significantly associated with better knowledge ($\chi^2 = 30.8$, $p < 0.001$ for SES; $\chi^2 = 15.6$, $p = 0.016$ for education) regarding cervical cancer. Overall, a major portion of the women exhibited a positive attitude towards cervical cancer screening. Positive attitude was found to be associated with higher knowledge and education level, while other demographic factors showed weaker or no associations.

These insights emphasize the importance of improving community-level education and accessibility to screening services and the need to address common barriers such as embarrassment, fear, and low perceived risk. These

findings also shed light on larger systemic issues such as the lack of adequate preventive services and structured screening programs in India.

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ANNEXURE

Section 1: demographic information

1. Age (years): _____

2. Marital status:

- ☐ Single
- ☐ Married
- ☐ Divorced/separated
- ☐ Widowed

(If single, please skip the following questions in this section)

3. Age at the time of marriage:

4. Number of children:

- ☐ 0
- ☐ 1-2
- ☐ 3-5
- ☐ More than 5

5. Educational status:

- ☐ No education
- ☐ Primary school (class 1-5)
- ☐ Secondary school (class 6-10)
- ☐ College
- ☐ University

6. Occupation:

- ☐ Student
- ☐ Homemaker/unemployed
- ☐ Working
- ☐ Retired

7. Education of head of the family:

- ☐ Professional
- ☐ Graduate
- ☐ Intermediate/Diploma
- ☐ High school (Class 9-12)
- ☐ Middle school (Class 6-8)
- ☐ Primary school (Class 1-5)
- ☐ Illiterate

8. Occupation of head of the family:

- ☐ Managers/Senior Officials/Legislators
- ☐ Professionals
- ☐ Technicians/Associate Professionals
- ☐ Clerks
- ☐ Skilled Workers/Shop and Market Sales Workers
- ☐ Skilled Agricultural/Fishery Workers
- ☐ Craft and Related Trade Workers
- ☐ Plant and Machine Operators/Assemblers
- ☐ Unskilled Workers/Laborers (elementary occupation)
- ☐ Unemployed

9. Average monthly income of household:

- ☐ Below ₹7,000
- ☐ ₹7,000-₹20,500
- ☐ ₹20,501- ₹34,000
- ☐ ₹34,001-₹50,500
- ☐ ₹50,501-₹67,500
- ☐ ₹67,500 - ₹1,35,000
- ☐ Above ₹1,35,000

10. Number of dependents in household (including children and elderly):

- ☐ None
- ☐ 1-2
- ☐ 3-5
- ☐ More than 5

Section 2: Knowledge about cervical cancer and screening

11. Do you know what cervical cancer is?

- ☐ Yes
- ☐ No

12. Is cervical cancer one of the most common cancers in females?

- ☐ Yes
- ☐ No
- ☐ Don't know

13. Cervical cancer commonly affects women in which age group?

- ☐ Less than 15 years
- ☐ 15–50 years
- ☐ More than 50 years
- ☐ Don't know

14. Can cervical cancer develop in a woman with no family history of this disease?

- ☐ Yes
- ☐ No
- ☐ Don't know

15. Cervical cancer cannot be transmitted through skin contact, sneezing, or coughing. Yes or No?

- ☐ Yes
- ☐ No
- ☐ Don't know

16. The risk of cervical cancer can be increased by:

- ☐ HPV infections: Yes | No | Don't know
- ☐ Smoking: Yes | No | Don't know
- ☐ Unprotected sexual practices: Yes | No | Don't know
- ☐ Poor genital hygiene: Yes | No | Don't know
- ☐ Long-term use of oral contraceptive pills: Yes | No | Don't know

17. What can be the symptoms of cervical cancer?

- ☐ Asymptomatic: Yes | No | Don't know
- ☐ Bleeding between periods or after sexual intercourse: Yes | No | Don't know
- ☐ Abnormal vaginal discharge: Yes | No | Don't know
- ☐ Persistent pain in legs, back, or pelvis: Yes | No | Don't know
- ☐ Weight loss and fatigue: Yes | No | Don't know

18. Is cervical cancer preventable by vaccine?

- ☐ Yes
- ☐ No
- ☐ Don't know

19. Is there a screening test for cervical cancer that can help with early detection?

- ☐ Yes
- ☐ No
- ☐ Don't know

20. Is Pap smear the test that can be used for cervical cancer screening?

- ☐ Yes
- ☐ No
- ☐ Don't know

21. Should every woman undergo screening with a Pap smear test every 5 years after the age of 30, even if there are no signs of cervical cancer?

- ☐ Yes
- ☐ No
- ☐ Don't know

22. Should a woman undergo screening with a Pap smear test every 5 years, even if she has received the HPV vaccine?

- ☐ Yes
- ☐ No
- ☐ Don't know

Section 3: Attitudes toward cervical cancer screening

23. Do you think that early detection and better treatment are possible with the help of cervical cancer screening?

- ☐ Yes
- ☐ No
- ☐ Don't know

24. If you had access to the HPV vaccine for free, would you consider getting it?

- ☐ Yes
- ☐ No

25. Would you get screened for cervical cancer with a Pap smear test?

- ☐ Yes
- ☐ No

Section 4: Common barriers to cervical cancer screening

26. If not, what is the reason?

- ☐ Anticipation of pain: Yes | No
- ☐ High cost: Yes | No
- ☐ No symptoms observed: Yes | No
- ☐ Feeling of embarrassment: Yes | No
- ☐ Don't have time: Yes | No
- ☐ No need felt: Yes | No
- ☐ Lack of proper facilities: Yes | No

27. Would you get screened if a male doctor were performing the test?

- ☐ Yes
- ☐ No