JOURNAL OF AMERICAN MEDICAL SCIENCE & RESEARCH

Original Research Article
ISSN: 3041-5578
Journal homepage: https://medical.researchfloor.org/

Knowledge, Attitude and Practice Survey on Awareness, Risk Factors, Screening and Prevention of Cervical Cancer among Women in India

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ABSTRACT

Background*-Cervical cancer remains a major public health concern among women, particularly in developing countries such as India. Although it is largely preventable through Human Papillomavirus (HPV) vaccination, regular screening, and early diagnosis, inadequate awareness regarding its risk factors, symptoms, screening methods, and preventive measures continues to limit the effective prevention and control of the disease.*

Objective*-To assess the knowledge, attitudes, and practices (KAP) of women in India regarding cervical cancer, with particular emphasis on awareness of its risk factors, symptoms, HPV infection, screening methods, and preventive measures.*

Method -A c*ross-sectional questionnaire-based survey was conducted using a structured, pretested Google Forms questionnaire. The survey collected demographic information together with data on participants' knowledge, attitudes, and preventive practices regarding cervical cancer. Responses were analyzed using descriptive statistics, including frequencies and percentages.*

Results - *Most respondents were young adults aged 18–25 years (78.5%), unmarried (93.7%), graduates (59.3%), and residents of urban areas (71.7%). Although many participants had heard about cervical cancer, awareness regarding HPV as its primary cause and knowledge of screening practices remained incomplete. Moderate awareness of cervical cancer symptoms was observed; however, noticeable gaps persisted in understanding prevention strategies and translating knowledge into preventive practices. The survey also indicated an improvement in participants' awareness after completion of the questionnaire.*

Conclusion : *The study demonstrates that awareness of cervical cancer among participants was moderate but insufficient for effective prevention. Persistent knowledge gaps regarding HPV infection, screening, and preventive measures highlight the need for comprehensive health education, regular awareness campaigns, promotion of HPV vaccination, and improved access to cervical cancer screening services to encourage early detection and reduce disease burden.*

Keywords: *Cervical cancer; Human papillomavirus; HPV vaccination; Awareness; Screening.*

Citation: Khyati Bajaj, Deepal Singh, Mohammad Umar Atique, and Mohd. Arfat (2026). Knowledge, Attitude and Practice Survey on Awareness, Risk Factors, Screening and Prevention of Cervical Cancer among Women in India. *Journal of American Medical Science and Research. DOI: https://doi.org/10.51470/AMSR.2026.05.02.31*

Revised 25 June 2026
Received 23 July 2026
Accepted 27 August 2026

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Introduction

Cervical cancer remains a major public health challenge worldwide, particularly affecting women in low- and middle-income countries. It is the fourth most common cancer among women globally, with approximately 570,000 new cases and 311,000 deaths annually. India bears a substantial proportion of this burden, reporting nearly 96,000–120,000 new cases each year [1]. Although incidence rates have declined in urban areas, the disease continues to be highly prevalent among rural populations due to limited awareness and poor access to healthcare services [2]. Cervical cancer originates in the cells of the cervix, which is the lower part of the uterus connecting to the vagina. The disease typically begins in the transformation zone, where the squamous and columnar epithelium meet, making it particularly susceptible to carcinogenic changes. Normal epithelial cells gradually undergo precancerous alterations known as cervical intraepithelial neoplasia (CIN). These lesions progress over time from mild dysplasia (CIN 1) to moderate dysplasia (CIN 2) and severe dysplasia (CIN 3), eventually leading to invasive cervical cancer if not detected and treated [3].

In advanced stages, cancer may extend beyond the cervix to adjacent structures such as the uterus, vagina, pelvic walls, and even metastasize to distant organs including the lungs, liver, and bones. The prolonged natural history of cervical cancer offers a valuable opportunity for early detection, intervention, and complete prevention. Infection with human papillomavirus (HPV), particularly HPV 16 and 18 strains, causes 75% of cervical cancers globally [4]**.** The other factors involved in the occurrence of cervical cancer include promiscuous sexual habits, reproductive factors such as genital hygiene, early menarche,

The interval between menarche and first sexual intercourse, early age at marriage, high parity, other sexually transmitted infections , and smoking. The peak age of infection with HPV infection is in women after initiation of sexual activity in their 20s. Importantly, cervical cancer is one of the few cancers that can be effectively prevented through both primary and secondary prevention strategies. Primary prevention includes HPV vaccination, which has been shown to significantly reduce infection with high-risk viral strains.

Secondary prevention involves screening techniques such as the Papanicolaou (Pap) smear [5], Visual Inspection with Acetic Acid (VIA), and HPV DNA testing. These methods enable early detection of precancerous lesions, allowing timely treatment before progression to invasive cancer. However, in many parts of India, the uptake of screening services remains low due to lack of awareness, fear, social stigma, and inadequate healthcare.

Purpose of the Survey

This survey has been conducted by the students of the Medical Radiology & Imaging Technology course, Paramedical College, Faculty of Medicine, AMU Aligarh, to understand the existing knowledge, attitude, and practices of women in India regarding cervical cancer awareness, risk factors, screening, and prevention. This evaluation will help in determining the present scenario of knowledge and the gaps between awareness and actual preventive practices. It will further help in identifying behavioral patterns and barriers such as lack of awareness, fear, social stigma, and inadequate healthcare infrastructure that affect the utilization of screening services. This may lead us to make a case for targeted health education programs, HPV vaccination awareness, and screening initiatives (including Pap smear, VIA, and HPV DNA testing), especially in low-resource and rural settings, while also addressing challenges like illiteracy and poverty to encourage a culture of cervical health awareness and health-seeking behavior among females.

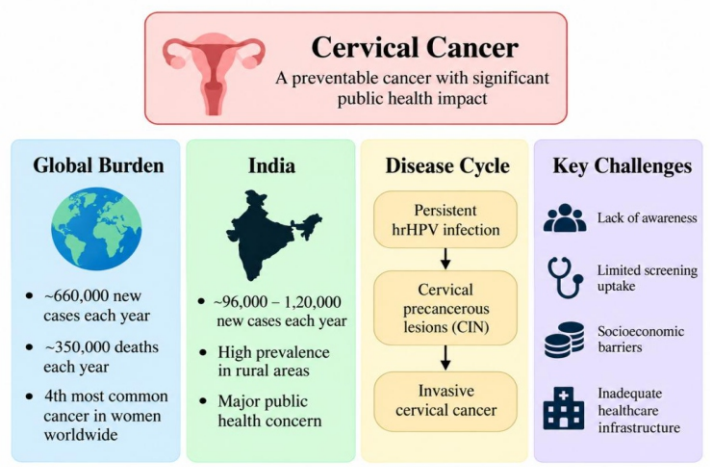

Figure 1: Overview of Cervical Cancer

Methodology

This cross-sectional study was conducted at Paramedical College, Aligarh Muslim University Campus, Aligarh. A predesigned, pretested self-administered questionnaire was used to assess knowledge of cervical cancer regarding symptoms, risk factors, screening methods, and vaccination , and attitude toward cervical cancer patients and screening tests. The questionnaire comprises four parts to gather information regarding sociodemographic characteristics of the study population, Knowledge, Attitude, and Practice (KAP) toward cervical cancer and screening. The sociodemographic details included are age, gender, location, religion, marital status, and parity, level of education, income, and usage of contraceptives.

Population and Sample Size

The target population included individuals from different sociodemographic backgrounds, comprising both rural and urban areas.

A total sample size of 205 participants was obtained using a structured questionnaire distributed via Google Forms. The sampling included respondents with varying levels of education, such as no formal education, primary, secondary, undergraduate, and graduate levels. Additionally, participants were categorized based on marital and occupational status, including students, homemakers, unemployed individuals, and self-employed individuals. This diverse representation ensured a comprehensive understanding of cervical cancer awareness across different sections of the population.

Data Collection Procedure

Data for the present study were collected using an online questionnaire designed through Google Forms. The questionnaire was distributed via email and WhatsApp to university staff, colleagues, students from various departments, family members, and students from other universities to ensure a diverse pool of respondents. Google Forms was selected as the data collection tool due to its convenience, efficiency, and ability to gather accurate data within a limited time frame. It is easily accessible to a wide range of participants, eliminating geographical barriers and enabling data collection from different locations. Additionally, this method ensures anonymity for respondents who prefer not to disclose their identity, thereby.

Encouraging honest and unbiased responses. The questionnaire remained open for responses for a period of two months, following which responses were compiled and analyzed.

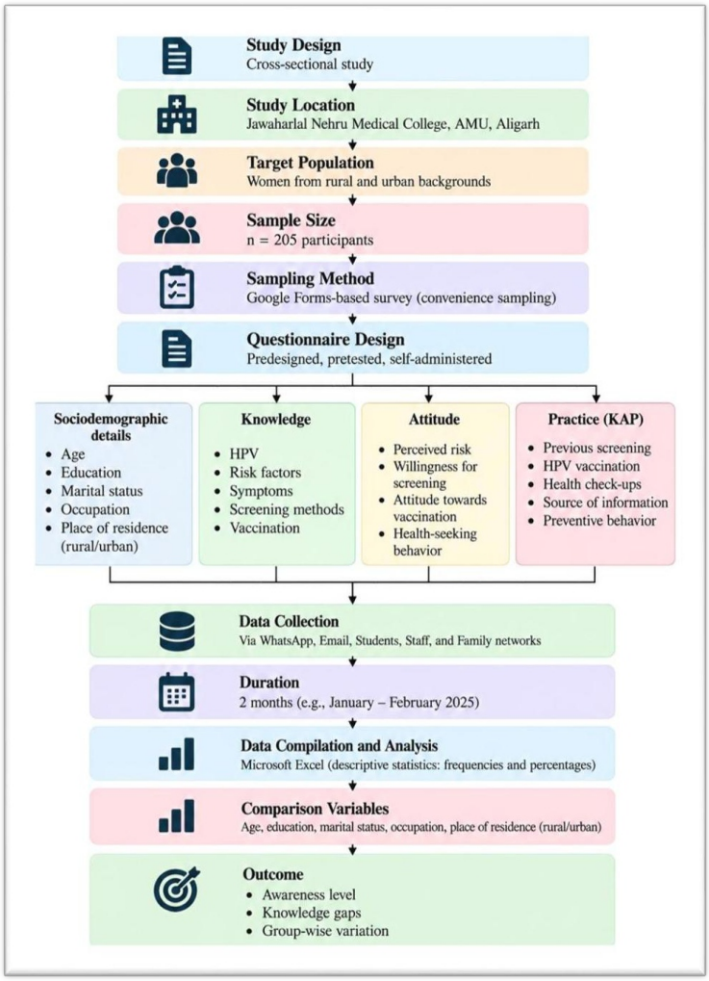

Figure 2: Research Methodology and Data Analysis

DOI: https://doi.org/10.51470/AMSR.2026.05.02.31

Data analysis

The data collected through Google Forms were compiled and analyzed using descriptive statistical methods. Responses from 205 participants were organized using Microsoft Excel. The analysis included calculation of frequencies and percentages (rates) to assess the level of awareness regarding cervical cancer. Awareness rates were determined by calculating the proportion of participants who had knowledge about cervical cancer, its causes, symptoms, prevention methods, and vaccination. Sociodemographic variables such as age, education level, marital status, and occupation were analyzed to compare awareness rates across different groups. This approach helped identify overall awareness rates, knowledge gaps, and variations among different sections of the population.

RESULTS

Distribution

1. Age Distribution Analysis (N = 205 Respondents)

The age-wise distribution of respondents revealed that many participants belonged to the 18–25 years age group, accounting for 78.5% of the total respondents. This indicates that young adults formed the dominant segment of the study population. The second-largest group consisted of respondents aged below 18 years, representing 11.7% of the total sample. Respondents in the 26–35 years age group accounted for approximately 7.0% of the participants, making them the third-largest category. The 36–45 years age group contributed a relatively small proportion, comprising approximately 1.4% of the respondents. Similarly, respondents aged above 45 years represented around 1.4% of the total sample, indicating minimal participation from older individuals. Overall, the findings demonstrate that the survey was predominantly completed by younger individuals, particularly those between 18 and 25 years of age, while participation from middle-aged and older age groups was comparatively limited.

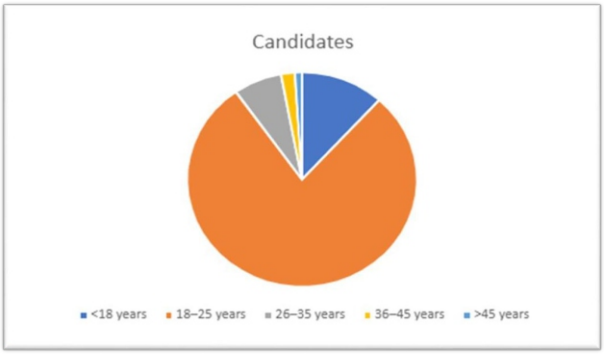

Figure 3: Age Distribution Analysis

2. Marital Status Distribution Analysis (N = 205 Respondents)

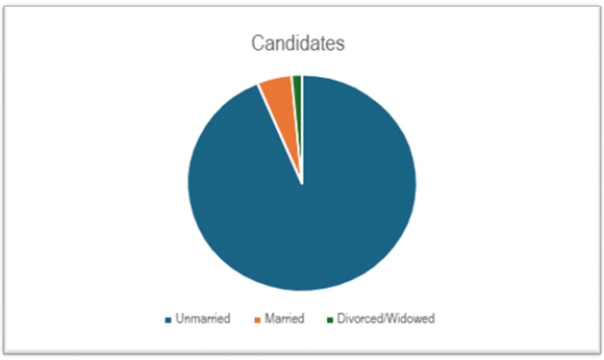

Figure 4: Marital Status Distribution Analysis

The marital status distribution of the respondents showed that the overwhelming majority were unmarried, accounting for 93.7% of the total participants. A smaller proportion of respondents were married, representing approximately 4.9% of the study population. The divorced/widowed category constituted the smallest group, accounting for approximately 1.4% of the respondents. The marital status analysis revealed that unmarried respondents formed the dominant group in the study. Since cervical cancer awareness, screening behavior, and preventive practices may vary according to marital status and reproductive health experiences, the predominance of unmarried participants suggests that the survey findings largely represent the knowledge, attitudes, and practices of unmarried young adults. The comparatively low participation of married and divorced/widowed individuals may limit the generalizability of the findings to these groups.

3. Education Level Distribution Analysis (N = 205 Respondents)

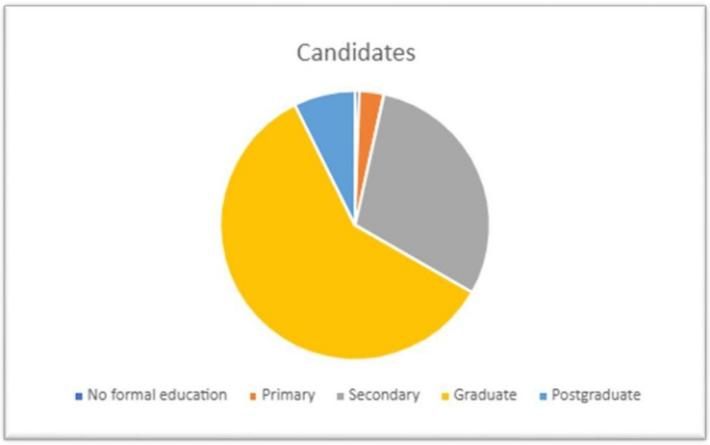

Figure 5: Education Level Distribution Analysis

The educational profile of the respondents revealed that the majority were either pursuing graduation or had already completed their graduate studies. Graduate-level respondents constituted 59.3% of the total sample, making them the largest educational group represented in the survey. The second-largest category consisted of respondents with secondary education, accounting for 29.9% of the participants. Respondents with postgraduate education represented approximately 6.9% of the total sample, indicating a moderate level of participation from individuals with higher academic qualifications. A smaller proportion of respondents had completed only primary education, accounting for approximately 2.9% of the participants. The no formal education category constituted the smallest group, representing approximately 1.0% of the respondents. The educational distribution demonstrates that most respondents possessed relatively high educational qualifications, with nearly three-fifths belonging to the graduate category. The substantial representation of graduate and secondary-educated participants suggests that the study sample was largely composed of educated individuals. This may contribute to higher levels of knowledge and awareness regarding cervical cancer, its risk factors, preventive measures, and screening practices. Conversely, the limited participation of individuals with primary or no formal education indicates that the survey findings may be less representative of populations with lower educational attainment.

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4. Area of Residence Distribution Analysis (N=205 Respondents)

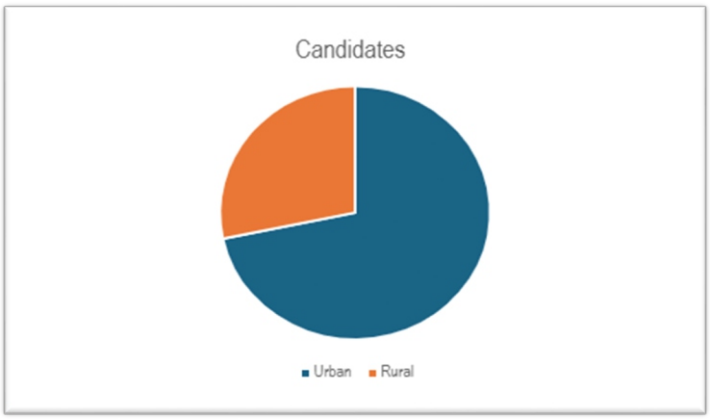

Figure 6: Area of Residence Distribution Analysis

The distribution of respondents according to their area of residence revealed that most participants belonged to urban areas. Out of 205 respondents, 71.7% were from urban regions, whereas 28.3% of the respondents belonged to rural areas. The findings indicate that the study population was predominantly represented by individuals residing in urban settings. The higher participation from urban respondents may be associated with better accessibility to healthcare facilities, educational resources, and health-related information. However, the comparatively lower representation of rural participants suggests that awareness levels and perceptions related to cervical cancer among rural populations may require further attention through community-based health education programs.

5. Awareness Regarding Human Papillomavirus (HPV) as a Primary Cause of Cervical Cancer (N = 205 Respondents)

The respondents were assessed regarding their knowledge about Human Papillomavirus (HPV) as the primary cause of cervical cancer. The results showed that 43.4% of participants were fully aware that persistent HPV infection is the main cause of cervical cancer.

Meanwhile, 41.5% of respondents had heard about HPV but did not have clear knowledge regarding its association with cervical cancer. A smaller proportion of participants (15.1%) were not aware of the relationship between HPV infection and cervical cancer. The findings indicate that although a considerable number of respondents had knowledge about HPV, many participants lacked complete understanding of its role in cervical cancer development. This highlights the need for further awareness programs focusing on HPV infection, its prevention, and the importance of HPV vaccination and regular screening practices.

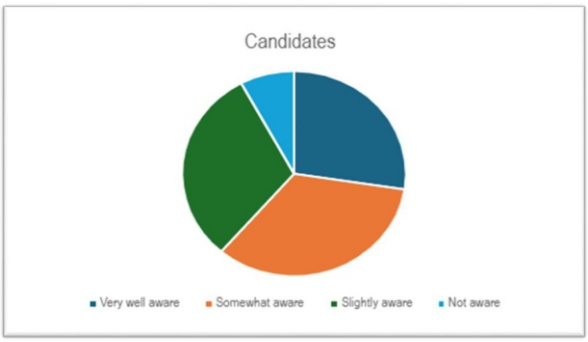

Figure 7: Awareness Regarding Human Papillomavirus as a Primary Cause of Cervical Cancer

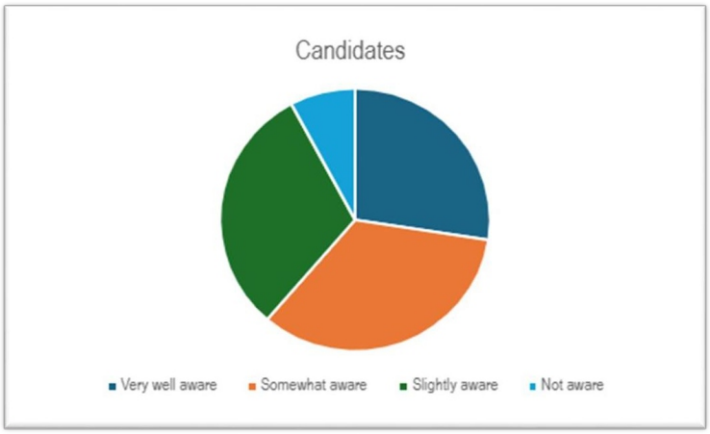

Figure 8: Self-Rated Awareness About Cervical Cancer Before the Survey

that most respondents had some level of awareness regarding cervical cancer; however, a significant proportion lacked detailed knowledge about the disease. The presence of participants with limited or no awareness emphasizes the importance of continuous health education initiatives to improve understanding of cervical cancer, risk factors, preventive measures, and early detection methods.

DISCUSSION

This research paper examined the current literature on knowledge, attitude, and practice toward Cervical Cancer and its screening among women in India. The low uptake of Cervical Cancer screening can be attributed to a number of factors, including low level of knowledge and awareness, low level of perceived risk, delayed signs and symptoms in initial stage, social stigma associated with cancer, fear of cancer, cost. The findings of the present study demonstrate that a substantial proportion of respondents were younger women, with approximately 78.5% of the participants belonging to the 18–25 years age group. This age distribution is likely attributable to the use of an online survey methodology (Google Forms), which tends to be more accessible among younger, technologically proficient individuals. A comparatively higher level of awareness was observed. Izetbegovic S et al. reported that HPV related cancers are preventable by vaccination. HPV vaccine decreases the incidence of premalignant lesions by 70 to 90% [6].

Among younger participants may be explained by their greater . The assessment of respondents' self-rated awareness about cervical cancer before the survey showed varying levels of knowledge among participants. Most respondents (33.8%) reported that they were somewhat aware of cervical cancer, followed by 30.9% who reported being slightly aware. Around 27.5% of participants considered themselves very aware of cervical cancer, while 7.8% of respondents reported that they were not aware of cervical cancer before participating in the survey. The findings suggest engagement with educational content disseminated through social media platforms, academic institutions, and internet-based health information resources. Increased digital literacy and frequent exposure to health-related campaigns may have further contributed to their knowledge and awareness regarding cervical cancer. A study done in rural Kerala also found that 74.20% of their study population knew that cervical cancer could be detected by a screening test, but only 5.8% could name Pap smear as a screening modality for the same [7].

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Nevertheless, the present study has certain limitations. Participation among women aged above 35 years was relatively low, even though the incidence and risk of cervical cancer increase with advancing age. However, women above 35 years were underrepresented, limiting the generalizability of the findings. Future studies should ensure better representation of older women.

The distribution of marital status revealed that most respondents (93.7%) were unmarried. This finding is particularly significant, as married women are more likely to interact with reproductive healthcare services, including gynecological consultations and cervical cancer screening programs. Consequently, they may possess greater awareness and knowledge regarding cervical cancer and its preventive measures.

The predominance of unmarried respondents in the present study highlights a potential gap between cervical cancer screening awareness and its actual uptake and practice. Furthermore, married women are often exposed to reproductive health information during antenatal and postnatal healthcare visits, which may contribute to increased awareness of cervical cancer and other reproductive health conditions. Therefore, the overrepresentation of unmarried participants may have influenced the overall findings of the study and should be considered when interpreting the results. Therefore, future research should include a more balanced marital profile. The National Program for Prevention and Control of Cancer, Diabetes, CVD, and Stroke was launched in 2010 to decrease mortality associated with NCDs [8].

The assessment of self-rated awareness further demonstrated that while most participants considered themselves somewhat aware (33.8%) or slightly aware (30.9%) of cervical cancer, only 27.5% reported being very aware. This finding revealed an important gap between perceived and actual knowledge. Many respondents may have been familiar with the term "cervical cancer" without possessing detailed knowledge regarding its symptoms, risk factors, screening modalities, and prevention strategies.

The study also found differences based on area of residence to better understand awareness and screening practices across different population groups. This study revealed that peers and partners are a major source of information about cervical cancer screening for the study population [9].

Educational attainment emerged as an important determinant of awareness. More than half of the respondents (59.3%) were graduates, while an additional proportion had completed postgraduate education. Although higher education is generally associated with better health literacy, considerable knowledge gaps were still identified. This indicates that formal education alone silence. It revealed that 71.7% of respondents resided in urban areas, whereas only 28.3% belonged to rural settings. Urban residents generally have better healthcare infrastructure, improved access to educational resources, and greater exposure to health promotion activities. In contrast, rural populations often experience challenges such as limited healthcare facilities, financial constraints, transportation difficulties, and cultural stigmas associated with gynecological diseases. These findings highlight the need for targeted community-based awareness. One of the most important findings of the study was related to awareness regarding Human Papillomavirus (HPV), the primary etiological agent responsible for cervical cancer.

Although 43.4% of respondents correctly identified HPV as the leading cause of cervical cancer, a considerable proportion either had incomplete knowledge (41.5%) or were entirely unaware (15.1%) of this association. This lack of awareness is concerning because understanding HPV is essential for promoting HPV vaccination and regular screening. Comprehensive educational campaigns addressing HPV transmission, vaccination, and its role in cervical cancer prevention are therefore necessary.

Increased programmed and improved screening accessibility in rural areas. Therefore, healthcare providers should prioritize rural populations when designing cervical cancer prevention strategies. One of the recent sources reported that the global frequency of the most prevalent HR-HPV genotypes detected in cervical cancer specimens is HPV-16 (up to 83. 8%) and HPV-18 (41%) [10]. Did not necessarily lead to screening behaviors. Fear of diagnosis, embarrassment associated with gynecological examinations, lack of physician recommendation, and poor knowledge about available screening services continue to discourage women from participating in screening programs. Addressing these barriers requires coordinated efforts from healthcare professionals, educational institutions, policymakers, and community leaders.

The findings of the present study also reinforce the importance of HPV vaccination as a primary preventive measure. The World Health Organization (WHO) has identified HPV vaccination, screening, and timely treatment as the three pillars for the global elimination of cervical cancer. However, vaccine uptake in India remains limited because of inadequate awareness, cost concerns, and limited accessibility. Integrating HPV vaccination into school health programmes and community-based initiatives could improve vaccine acceptance and coverage among adolescent girls.

Overall, the findings of this study are consistent with previous national and international research demonstrating that although awareness regarding cervical cancer is gradually improving, considerable deficiencies remain in knowledge, attitudes, and preventive practices. The study highlights the need for sustained public health efforts aimed at increasing awareness regarding HPV, promoting vaccination, enhancing accessibility to screening services, and addressing sociocultural barriers that impede healthcare utilization.

In conclusion, cervical cancer continues to represent a major public health challenge in India despite being one of the most preventable forms of cancer. Bridging the gap between awareness and action through targeted educational interventions, strengthened screening programs, and improved healthcare accessibility will be essential in reducing the burden of cervical cancer and achieving long-term improvements in women's health outcomes across the country.

Conclusion

The present study showed that the respondents had a moderate level of awareness regarding cervical cancer. Most participants had some knowledge about cervical cancer, but important gaps were still observed regarding its causes, symptoms, prevention, and screening. The findings showed that awareness about Human Papillomavirus (HPV), the primary cause of cervical cancer, was not satisfactory, as many respondents had heard about HPV but were not aware of its role in causing cervical cancer. Knowledge regarding the common symptoms of cervical cancer was comparatively better, with 71.4% of the respondents correctly identifying the major symptoms.

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However, 24.6% of the respondents were not sure about the symptoms, indicating that there is still a need to improve public awareness. The survey also had a positive impact on the respondents, as 52.9% reported that their awareness increased significantly, while 43.6% reported a slight increase after completing the survey. These findings suggest that awareness of programmes and educational activities can help improve knowledge about cervical cancer.

Overall, the study highlights the need to continue creating awareness about cervical cancer, its risk factors, symptoms, prevention, and screening so that people can make informed decisions and seek medical advice at an early stage.

Recommendations

Cervical Cancer Education: Basic information about cervical cancer, its causes, symptoms, prevention, and screening should be included in health education programmes. Conduct Regular Awareness Programs: Seminars, workshops, and awareness campaigns should be organized regularly to improve knowledge about cervical cancer among the public. Increase Awareness about HPV: More efforts should be made to improve public understanding of HPV and its role in causing cervical cancer . Promote Screening Awareness: People should be informed about the importance of cervical cancer screening and early detection through health education activities. U se Digital Educational Materials: Educational information can be shared through online platforms and social media to reach a larger number of people. Future Studies: Further studies should be carried out to assess changes in awareness after educational programs and to identify the remaining knowledge gaps regarding cervical cancer.

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