



Knowledge, Attitude, and Practice on Cervical Cancer and Screening Among Women in India: A Review

Neha Taneja¹ , Bhavika Chawla¹, Aanchal Anant Awasthi²,
 Kumar Dron Shrivastav, PhD², Vinita Kumar Jaggi³, and Rajiv Janardhanan^{1,2}

Abstract

Background: Cervical Cancer is the second most common cancer among women in the world leading to 90% deaths in low and middle income countries. About 96,922 new Cervical Cancer cases are diagnosed annually in India.

Objective: To study the knowledge, attitude and practice on Cervical Cancer and screening among women in India.

Materials and Methods: Health sciences electronic databases PubMed and Google Scholar were searched for studies published between 2012 to March 2020. Keywords used for the search were (“Cervical Cancer screening”), (“knowledge”), (“attitude”), (“practice”) AND (“India”). 19 articles were included in the review based on the eligibility criteria. Statistical software SPSS-V.23 was used for the statistical application.

Results: 7688 women were included in the study. Age of study participants ranged from 12-65 years. Overall knowledge on Cervical Cancer among women was 40.22%. Knowledge of risk factors and signs and symptoms was fairly adequate among the women. 32.68% of women knew that early age of marriage was a risk factor for Cervical Cancer followed by 23.01% women who mentioned that early age of initiation of sexual activity was a common risk factor for Cervical Cancer. Inter menstrual bleeding and foul smelling discharge was the most common sign and symptom reported in 30.75% and 28.86% women respectively. Knowledge, attitude and practice regarding Cervical Cancer screening was seen in 20.31%, 43.64% and 13.22% of women respectively.

Conclusion: Effective information, education and communication strategies are required to improve the level of awareness of women on Cervical Cancer.

Keywords

cervical cancer, screening, knowledge, attitude, practice, India

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Introduction

Globally, 570 000 cases of Cervical Cancer and 311000 deaths from the disease occurred in 2018. Cervical Cancer is the fourth most common cancer in women, ranking after breast cancer (2.1 million cases), colorectal cancer (0.8 million) and lung cancer (0.7 million).¹ It is the 2nd most leading cause of female cancer among women aged 15-44 years in India. About 96 922 new Cervical Cancer cases are diagnosed annually in India (estimates 2018).² While Cervical Cancer cases are declining in the developed world, they pose a heavy burden

¹ Laboratory of Disease Dynamics & Molecular Epidemiology, Amity Institute of Public Health, Amity University, Noida, Uttar Pradesh, India

² Laboratory of Health Data Analytics & Visualization Environment, Amity Institute of Public Health, Amity University, Noida, Uttar Pradesh, India

³ Department of Surgical Oncology (Gynecological Oncology Division), Delhi State Cancer Institute, New Delhi, India

Corresponding Author:

Neha Taneja, Amity Institute of Public Health, Amity University, Noida, UP 201304, India.

Email: drnehataneja12@gmail.com



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on developing countries, where the risk of developing Cervical Cancer is 35% greater compared to developed countries.³ About 25% of global mortality due to Cervical Cancer occurs in India.³

Cervical Cancer can be cured, because it has a long pre-invasive period. Early diagnosis and treatment of Cervical Cancer at women are crucial for reducing mortality rates.⁴ Fortunately Cervical Cancer has a long premalignant period that provides an opportunity for screening and treating before it turns to be invasive Cervical Cancer. Population-based screening with Pap smear or cytology is an important secondary preventive measure for Cervical Cancer that leads to a high-cure rate among Cervical Cancer patients. Early detection and treatment via screening can prevent up to 80% of Cervical Cancers in developed countries, where efficient screening programs are in place. In developing countries, however, there is limited access to effective, wide scale screening, leading to increased deaths due to Cervical Cancer. According to various reports, in developed countries 68%-84% of women are being screened by Pap smear, but in India this proportion is 2.6%-5% only.⁵ This is one of the main reasons that in India patients are being diagnosed at advanced stages. The main risk factor for development of Cervical Cancer is infection with human papilloma virus (HPV) types (HPV 16 and HPV 18),⁶ HPV-DNA viral load quantification and integration, and E6/E7 expression are promising biomarkers that can predict the progression of lesions to Cervical Cancer.⁷

Despite sufficient evidence supporting the use of screening as an effective intervention, there are still few large-scale screening programs being implemented in India. Knowledge about disease and early screening is the most effective measure for Cervical Cancer prevention. Lack of awareness, negative attitude, and poor practice about Cervical Cancer and screening and preventive methods are the major causes to increase the incidence of disease.

In spite of a dedicated cancer control program in place in India, screening has not been effective to decrease the burden of disease. The studies show that women have suboptimal level of knowledge of Cervical Cancer, their attitude is also favorable however the uptake of actual practice is low due to social stigma. Due to dearth of literature regarding knowledge, attitude, and practice (KAP) toward Cervical Cancer and its screening among Indian women this review was conducted. The outcome of this study provides information regarding current awareness, attitude and practice about Cervical Cancer and screening, which is helpful for designing population-based educational program leading to knowledge enhancement about Cervical Cancer and its screening.

Materials and Methods

Search Strategy

A comprehensive search of literature published from 2012 onward till March 2020 in the electronic databases PubMed and Google Scholar was conducted. We retrieved all English

language studies that contained information on knowledge, awareness, attitude and practice on Cervical Cancer and its screening in India. Articles were included if they reported quantitative data of women's knowledge, awareness, attitude or practice of Cervical Cancer and its screening in India. Primary concepts of "Cervical Cancer" "Cervical Cancer screening" "Cervical Cancer knowledge," "Cervical Cancer attitude", "Cervical Cancer awareness", "Cervical Cancer practice" were expanded to generate additional medical terms (cervix, cervical, cancer, neoplasm, cervical neoplasms, screening, and primary diagnosis of cancer) for the search. The subject search and text word search were done separately in PubMed and Google Scholar and then combined with "OR" and "AND" operators. Combined terms were used, for example, ("Cervical Cancer screening" or 'cervical screening') AND ('Cervical Cancer knowledge' or 'Cervical Cancer attitude'). Gray literature and additional articles were identified using the bibliography of included articles and some excluded review articles, along with forward citation searches.

Study Selection

Only articles that had reported quantitative evidence data of knowledge, awareness, attitude and practice of Cervical Cancer and its screening in India were included. Figure 1 shows the selection process of the articles retrieved. Our review was done according to PRISMA guidelines.⁸ The initial database search retrieved 1380 published English-language studies. 1188 studies were excluded based on title and studies conducted outside India. Of the remaining 192 studies, the abstracts were read of which 163 articles were excluded as they were either duplicate articles, were not cross-sectional study designs or published before 2012. Of the remaining 29 studies, 10 studies were excluded as they were conducted among health care professionals and provided incomplete information. 19 cross-sectional study designs conducted in diverse settings like hospitals or communities published between 2012 and March 2020 that met the inclusion criteria and focused on KAP related to Cervical Cancer and its screening was finally included for the review.^{3,9-26}

Inclusion Criteria

Cross-sectional, English language studies conducted in diverse settings like hospitals or communities of India published from 2012 till March 2020, on knowledge, awareness, attitude, practice of Cervical Cancer and its screening.

Exclusion Criteria

Case reports, case series, earlier reviews, and qualitative studies of Cervical Cancer and its screening uptake. Studies conducted in low or high-income countries other than India, articles published in languages other than English and articles conducted among health professionals.

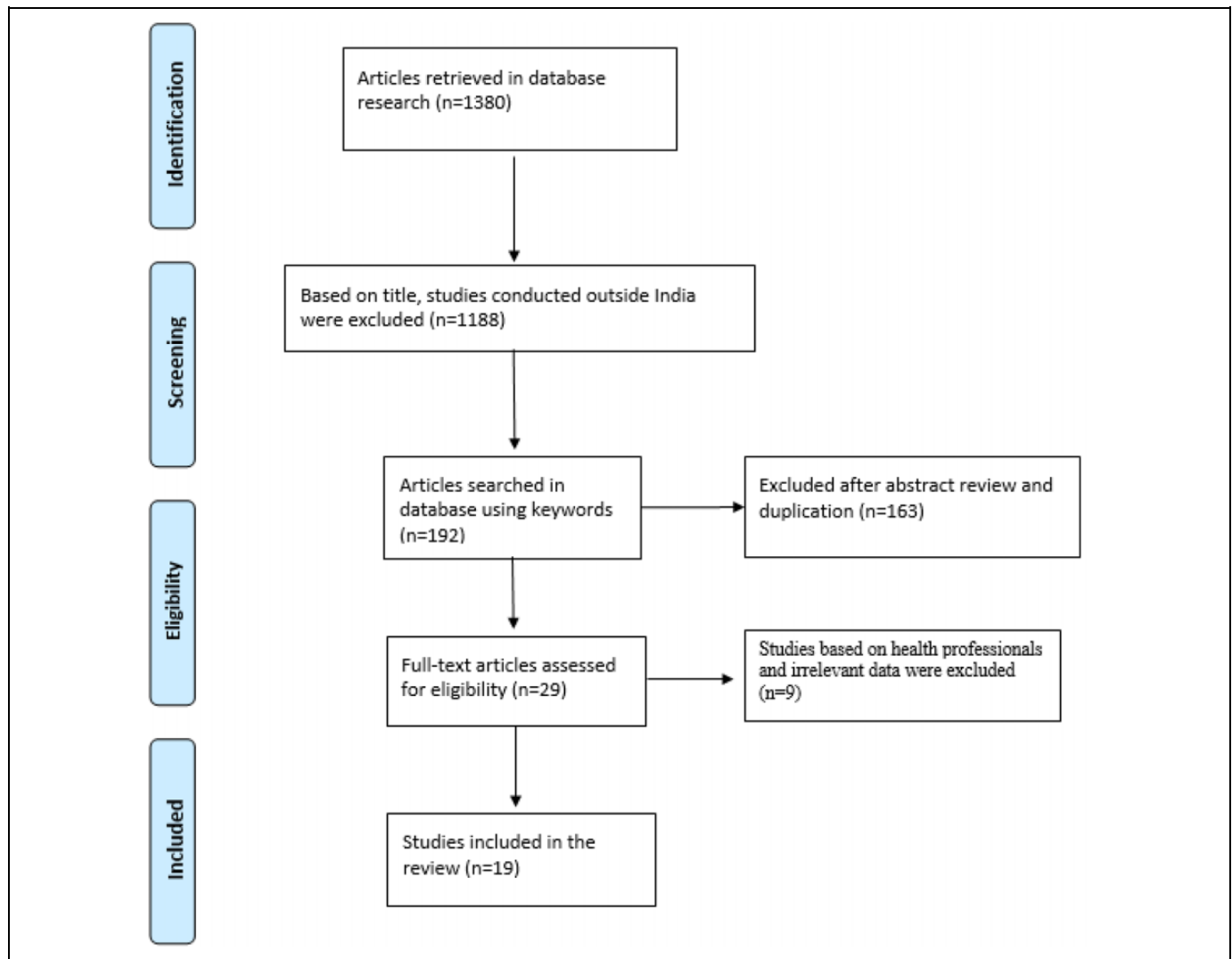


Figure 1. Summary of literature search and review process.

Data Extraction and Synthesis

We extracted the following key characteristics of the studies: lead author and country, year published, study design, sampling technique, sample size, age group and knowledge of Cervical Cancer, Cervical Cancer signs and symptoms and risk factors, screening, attitude and practice toward screening. After the removal of duplicates, primary outcome data of all articles were indexed in Microsoft Excel. Later, interpretation of textual data was extracted to a Microsoft Word document. Two authors independently carried out the literature search and identified citations for KAP on Cervical Cancer and screening independently. Full-text articles were identified and assessed for eligibility after applying the inclusion and exclusion criteria. Statistical software like SPSS-V.23 was used for statistical application.

Results

Nineteen studies that met the inclusion criteria were included in the review. These studies included total of 7688 women aged

between 12 and 65 years across 19 independent studies. The included studies were hospital and community based cross sectional studies. Majority studies were conducted in urban cities such as Delhi, Noida, Punjab, Kerala, Bengal, Lucknow, and Tamil Nadu. Majority women were married, and the illiteracy rate ranged from 5% to 66% (Table 1).

Studies included in review concluded that in India women still lack in appropriate knowledge and attitude toward Cervical Cancer and screening techniques due to low literacy rate. The articles reviewed showed that age,^{9,10,12,18} education^{3,13-20} and per capita income^{12,17,18} were significant factors independently associated with adequacy of knowledge, attitude, and practice of Cervical Cancer screening. (Table 1)

Among 19 studies reviewed, 18^{3,9-13,15-26} reported the knowledge on Cervical Cancer. The overall knowledge on Cervical Cancer among women was 40.22%. The awareness level of women regarding the risk factors was adequate. Among 19 studies 13,^{3,10,12,13,16,17,19-23,25,26} reported knowledge on risk factors. 32.68% women reported early age of marriage as the

Table-1. Characteristics of Studies Included in the Review.

Author	Study Design	Year of study	Sample Size	State	Population Characteristics	Results
S. Aswathy et al ⁹	Cross-sectional study	2012	809	Kerala-Survey conducted in Rural area	Age-15-50 years Literacy rate-64.4% Marital Status- 88.4% Married Women Socioeconomic status-59.6% belongs to lower socioeconomic status	1. Knowledge of Cervical Cancer-72.1% 2. Knowledge of PAP Smear-13%
Raychaudhuri and Mandal ¹⁰	Cross-sectional study	2012	221	Bengal-Survey conducted in Village and Urban slums	Age-15-49 years Marital Status- 88.7% married women Education-28.1% illiterate population	1. Knowledge of Cervical Cancer-87.3% 2. Knowledge of PAP Smear-9.5% 3. Knowledge of HPV Vaccine-14.5% 4. Knowledge of Risk factors- Intercourse at early age-65.5%, Non-maintenance of personal hygiene-83.3%
Ramavath and Olyal ¹¹	Cross-sectional study	2013	1000	Calcutta, Lucknow, Gwalior, Vishakhapatnam, Ahmadabad	Age-13-19 years Education-23.8% illiterate population Socioeconomic status- 9% lower socioeconomic status	1. Knowledge of Cervical Cancer-23.8% 2. Knowledge of HPV Vaccine-32.8% 3. Knowledge of HPV Vaccine-74.4% 4. Practice of HPV Vaccine-7.4%
Showket Hussain et al ¹²	Cross-sectional study	2014	1570	Delhi, Noida- Survey conducted among rural and urban schools	Age-12-22 years Education-Educated school going girls (6-11 standard) Marital Status- unmarried school going girls	1. Knowledge of Cervical Cancer-16.36% 2. Knowledge of HPV Vaccine-10.31% 3. Practice toward HPV Vaccine-11.01% 4. Knowledge of Risk Factor- HPV infection- 10.25%
Sidharthar et al ¹³	Cross-sectional study	2014	400	Puducherry- Hospital Based survey with 90% women from rural communities	Age-18-60 years Education-31.1% illiterate population	1. Knowledge of Cervical Cancer-44.5% 2. Knowledge of PAP smear-12.2% 3. Knowledge of HPV Vaccine-2.8% 4. Knowledge of Risk Factor- Multiple sexual partner- 15%, Non-maintenance of personal hygiene-7.5% 5. Knowledge of signs and symptoms- Post coital bleeding-15.3%, Post menopausal bleeding-10.3%
Kumar and Tanya ³	Cross-sectional study	2014	83	Manglore, Karnataka- Hospital based Survey	Age-30-60 years Education-10.8% illiterate population Marital Status- 92.8% married	1. Knowledge of Cervical Cancer-18.07% 2. Knowledge of screening - 14.45% 3. Practice toward PAP Smear-7.2% 4. Knowledge of Risk factor- intercourse at early age-22.9%, multiple sexual partners-15.7% 5. Knowledge of signs and symptoms-abnormal vaginal discharge-25.3%, intermenstrual bleeding-26.5%
Singh et al ¹⁴	Cross-sectional study	2014	450	Delhi- Hospital based survey, 76.1% lived in urban slums	Age-15-64 years Education-66.6% illiterate population Marital Status- Majority married women Family income-79.3% had family income less than Rs. 5000	1. Knowledge of PAP Smear-40% 2. Attitude toward screening-18.2% 3. Practice toward screening-19.6%

(continued)

Table-1. (continued)

Author	Study Design	Year of study	Sample Size	State	Population Characteristics	Results
Montgomery et al ¹⁵	Cross-sectional study	2015	202	Karnataka	Age-25-45 years	<ol style="list-style-type: none"> 1. Knowledge of Cervical Cancer-15% 2. Practice toward PAP Smear-5% 3. Knowledge of HPV Vaccine-36%
Bansal et al ¹⁶	Cross-sectional study	2015	400	Bhopal- Hospital based survey	Age-15-45 years Education-17.5% illiterate population Marital Status-77.5% married women Mean family income-Rs.4905	<ol style="list-style-type: none"> 1. Knowledge of Cervical Cancer-65.5% 2. Attitude toward screening-76.2% 3. Practice toward screening-9.5% 4. Knowledge of Risk factor- intercourse at early age-16.5%, Continuous use of OCP's 22.5%, multiple sexual partners-27.7% 5. Knowledge of signs and symptoms-intermenstrual bleeding-29.2%, fowl smelling discharge- 23%
Arunadevi and Prasad ¹⁷	Cross-sectional study	2015	200	Tamil Nadu- Hospital based survey	Age- 21-50 years	<ol style="list-style-type: none"> 1. Knowledge of Cervical Cancer-38% 2. Knowledge of HPV Vaccine- 6.5% 3. Knowledge of Risk factors- non maintenance of personal hygiene- 20%, multiple sexual partners-32% 4. Knowledge of signs and symptoms- abnormal vaginal discharge-24%
Elamurugan et al ¹⁸	Cross-sectional study	2016	200	Puducherry	Age- 20-60 years Marital status- 85.5% women were married Education-1.5% population was illiterate	<ol style="list-style-type: none"> 1. Knowledge of Cervical Cancer-86% 2. Knowledge of Screening-84% 3. Attitude toward screening-72% 4. Practice toward screening- 25%
Pattupara et al ¹⁹	Cross-sectional study	2016	400	Rishikesh- Survey was conducted among women visiting hospital OPD	Age-18-65 years	<ol style="list-style-type: none"> 1. Knowledge of Cervical Cancer-7% 2. Knowledge of Screening 3.25% 3. Knowledge for Risk factor- intercourse at early age-1.5%, continuous use of OCP's- 2.5% 4. Knowledge of signs and symptoms- abnormal vaginal discharge-2.75%, post menopausal bleeding-2.75%
Bathija et al ²⁰	Cross-sectional study	2016	200	Hubli, Karnataka- Survey conducted in Urban Slums	Age-15-45 years Education-30% illiterate population Marital Status- 83.5% Married population Socioeconomic status- 54% lower socioeconomic status	<ol style="list-style-type: none"> 1. Knowledge of Cervical Cancer-15% 2. Knowledge of PAP Smear-2% 3. Knowledge of HPV Vaccine-0.5% 4. Knowledge of risk factor- non maintenance of personal hygiene-67%, multiparity-16%, intermenstrual bleeding-72% 5. Knowledge of signs and symptoms-48%
Varughese et al ²¹	Cross-sectional study	2016	304	Ludhiana, Punjab	Age-25-45 Education-50.3% illiterate population Marital Status-92.8% married women Socioeconomic status-84.2%	<ol style="list-style-type: none"> 1. Knowledge of Cervical Cancer-28.9% 2. Knowledge of PAP Smear-4.3% 3. Knowledge of HPV Vaccine-6.6% 4. Knowledge of risk factor-7.9%

(continued)

Table-1. (continued)

Author	Study Design	Year of study	Sample Size	State	Population Characteristics	Results
Patra et al ²²	Cross-sectional study	2017	373	Delhi- resettlement colony	Age-30-60 years Education- 65% illiterate population Marital Status- Married women Mean Income- Rs.764	<ol style="list-style-type: none"> 1. knowledge of Cervical Cancer-53.88% 2. knowledge of PAP smear as a screening technique- 4.02% 3. Positive attitude toward screening-24.125% 4. Knowledge of risk factors- non maintenance of personal hygiene-28.68% 5. Knowledge of signs and symptoms- Post menopausal bleeding-24.12%, intermenstrual bleeding-21.44%
Narayana et al ²³	Cross-sectional study	2017	403	Anantpur District, Andhra Pradesh- Hospital based survey	Age-30-39 years Education-51.8% illiterate Marital Status-89% married women	<ol style="list-style-type: none"> 1. Knowledge of Cervical Cancer-74.6% 2. Practice toward screening-13.4% 3. Knowledge HPV Vaccine-74.6% 4. Knowledge of risk factors- intercourse at early age-36.2%, multiple sexual partners- 38.4% 5. Knowledge of signs and symptoms-Post coital bleeding-20.6%, intermenstrual bleeding-48.3%
Nelson et al ²⁴	Cross-sectional study	2018	100	South Tamil Nadu- Survey was conducted among the women of rural area in South Tamil Nadu	Age-25-50 years Literacy rate was 100% Socio-economic status-Only 28% belonged to lower middle class family	<ol style="list-style-type: none"> 1. Knowledge of Cervical Cancer-68% 2. Knowledge of Screening-47% 3. Practice toward screening-8%
Ahlawat et al ²⁵	Cross-sectional study	2018	200	Delhi- Survey was conducted in Urban Slums	Age-15-45 years Education-5.5% illiterate population	<ol style="list-style-type: none"> 1. Knowledge of Cervical Cancer-56.6% 2. Knowledge of screening- 44% 3. Knowledge of risk factor-intercourse at early age-42%, multiparity-36.5% 4. Knowledge of signs and symptoms- post menopausal bleeding-40%, intermenstrual bleeding-47%
Reichheld et al ²⁶	Cross-sectional study	2020	175	Vellore, Tamil Nadu- Survey conducted among urban health center	Age-25-65 years Education-28.4% illiterate population Marital status-77.6% married population Socioeconomic status-70.4% lower socioeconomic status	<ol style="list-style-type: none"> 1. Knowledge of Cervical Cancer-53.14% 2. Knowledge of PAP Smear-13.1% 3. Knowledge of HPV Vaccine-0.6% 4. Knowledge of Risk factors-multiparity-3.4%, multiple sexual partners-4% 5. Knowledge of signs and symptoms-post menopausal bleeding-5.7%, intermenstrual bleeding-14.9%

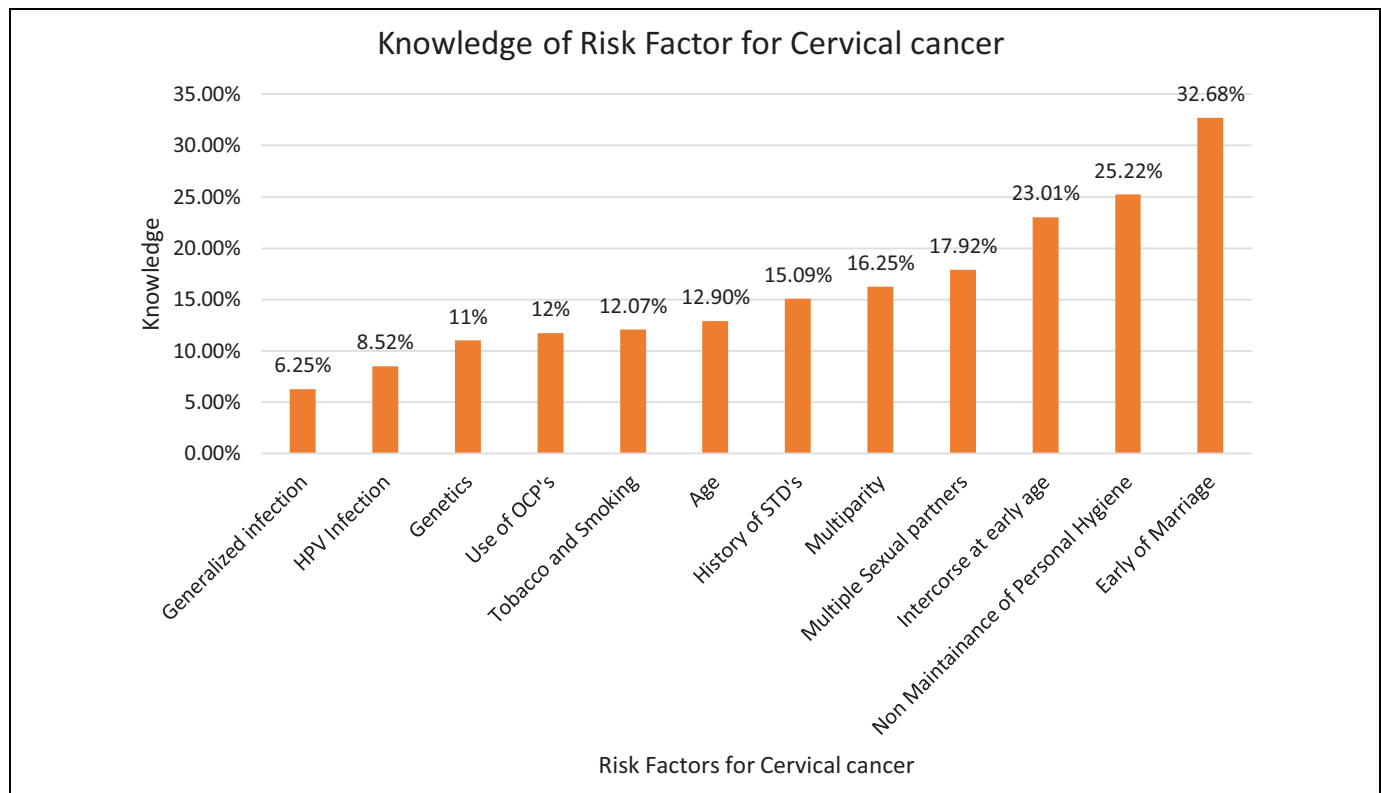


Figure 2. Distribution of knowledge of risk factors of cervical cancer.

most common risk factor followed by 23.01% women who mentioned early age of initiation of sexual activity as a common risk factor. 25.22% women mentioned that non maintenance of personal hygiene was also common risk factor for Cervical Cancer (Figure 2).

The articles reviewed showed that the awareness level of signs and symptoms was also adequate. Thirty-eight percent women told that bleeding per vagina is one of the major sign and symptom of Cervical Cancer. Inter menstrual bleeding and foul smelling discharge were the most common sign and symptom reported by 30.75% and 28.86% women, respectively (Figure 3).

Based on the review the knowledge of screening through PAP Smear was 20.31%. Positive attitude toward screening was seen in 43.64% women. 13.22% women practiced screening. Regarding knowledge and practice of HPV vaccination it was observed that, 20.14% women had knowledge on HPV Vaccine and 35.68% women had already taken HPV Vaccine (Figure 4).

Discussion

This review 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, familial obligations, and embarrassment.²⁴

The current review found that only 40.22% of population had heard about Cervical Cancer. Similar results were observed among studies conducted in developing and underdeveloped countries by Anorlu²⁷ and Yifru and Asheber.²⁸ However these results are in contrast with a study conducted among women attending Obstetrics and Gynecology Department of a hospital in South India where knowledge of Cervical Cancer was 74.6%. Another study conducted by Chande and Kassim showed that more than 3-quarters of population had heard about Cervical Cancer.²⁹ In spite of introducing National Cancer Control Programme in India, the knowledge level about Cervical Cancer was low among the participants which could probably be because the primary health care facilities are often overburdened and under resourced.¹³ Due to limited resources VIA is being offered to women for screening between 30 and 69 years of age even though cytology is considered a better screening tool.¹³ It was seen in the review that almost half of proportion of women are aware of symptoms, risk factors, and preventive measures for Cervical Cancer. This is consistent with findings from a similar study conducted in Northern Uganda by Mukama et al.³⁰ The review highlighted that early age of marriage, non maintenance of personal hygiene, and multiple sexual partners were reported as major risk factors for developing Cervical Cancer among 32.68%, 25.22%, and 23.01% women, respectively. Dhodapkar SB et al reported that risk factors for Cervical Cancer were young age at first

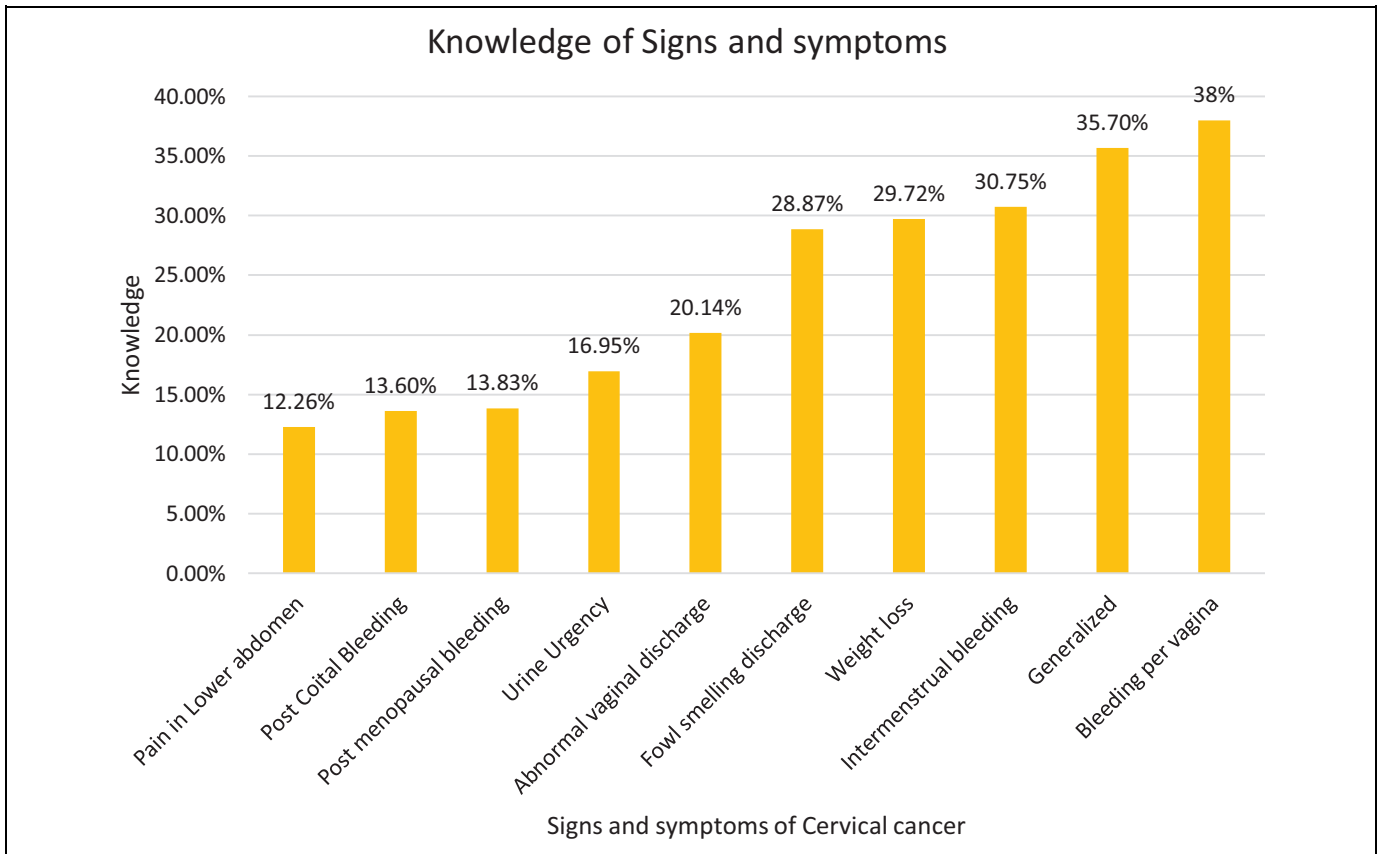


Figure 3. Distribution of knowledge of signs and symptoms of cervical cancer.

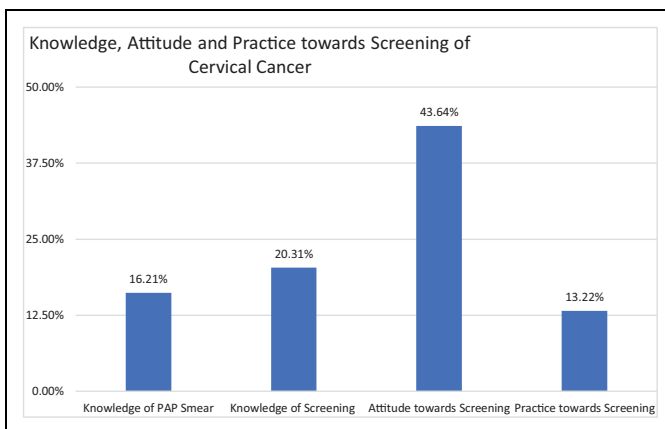


Figure 4. Knowledge, attitude and practice toward screening of cervical cancer.

intercourse, multiple sex partners, and lower socio-economic status by 13%, 48%, and 13%, respectively.³¹ Amos D Mwaka et al found that 88.3% knew Cervical Cancer risk factors as multiple male sexual partners, sexually transmitted germ or virus (82.0%).³² In a study by Shah et al only 8 (11.5%) respondents were aware of multiple sexual partners as one of the risk factors.³³ Improvement in lifestyle and personal hygiene has reduced the incidence of Cervical Cancer in recent times. The decline rates for Cervical Cancer may be partly explained by

greater awareness for genital hygiene, and visiting clinicians at pre-clinical stage.³⁴

With regard to signs and symptoms of Cervical Cancer, 38% knew bleeding per vaginum, 30.75% knew intermenstrual bleeding, 29.72% knew loss of weight, and 28.87% knew foul smelling discharge as common symptoms of Cervical Cancer. Similarly a study done by Singh et al³⁵ reported that 79% females knew vaginal bleeding between menses as symptom of Cervical Cancer and 66% knew symptom as foul-smelling vaginal discharge. A study done by Shah et al³³ found that 94.2% respondents stated vaginal discharge as one of the symptoms, 86.9% as menstrual abnormality and 66.6% as pain as symptoms. Also a study conducted by Narayana et al²³ (2017), among the 403 women who completed the survey, 64.2% had some knowledge about signs and symptoms. Lack of awareness about Cervical Cancer in women residing at rural and urban areas emphasizes the need for conducting campaigns to improve their knowledge regarding symptoms, risk factors, and preventive measures. Women who are aware about Cervical Cancer they are more likely to take up measures of prevention by seeking medical attention and early screening.³¹

Much of the literature highlighted a gap between knowledge of Cervical Cancer and actual uptake of screening among community women. While many women have heard of Cervical Cancer, fewer are aware of its symptoms, and far fewer have undergone any type of screening. Yet, many women expressed

a positive attitude and willingness to undergo screening despite the low uptake.

The level of adequacy of knowledge, attitude and practice toward Cervical Cancer screening in the current review was 20%, 40.8% and 13.8%. These findings were very low as compared with similar studies in Argentina, Kuwait, N. E. Brazil.¹⁴ The review showed that only 20.3% participants had knowledge about Cervical Cancer screening. 40.2% showed positive attitude toward Cervical Cancer screening, but still there is a gap between perception and practice as it was only 13.8%. When considering PAP smear as a screening test, it was observed that only 16.21% had undergone a PAP test. It was seen that most of the women showed positive attitude toward screening. Women having knowledge of Cervical Cancer were most likely to get early detection and seeking early medical advice. Also there was positive attitude because women were willing to participate in screening programmes if provided.

Similarly in this hospital-based, cross-sectional survey done by Narayan et al (2017), prevalence of screening for Cervical Cancer was extremely low at 5.4%; it is close with the 5-year screening prevalence estimated for developing countries by the WHO (5%).²³ In contrast in a cross-sectional study among women at a primary health center in Tamil Nadu, the majority of participants were aware of Cervical Cancer (75.42%) and many believed that they were at risk (50.58%).¹³ However, only 31% had undergone a Pap smear, but 69.96% of those unscreened were willing to undergo it. Bansal et al¹⁶ also found similar results in a study of women of reproductive age who presented to the outpatient department of a hospital in Bhopal where of the 400 respondents, 65.5% had heard of Cervical Cancer, only 9.5% had ever undergone a screening test, but 76.25% favored positively or showed positive attitude to the idea of screening. In Kerala, among 809 women interviewed, three-fourths were aware that Cervical Cancer can be detected through early screening, yet a mere 6.9% had actually undergone any sort of screening test.^{15,36} Similarly in a study by Dhodapkar SB et al, none of the participants knew about the VIA method of screening. Those participants who knew that Cervical Cancer can be detected by Pap smear, only 5 (4%) had ever undergone Pap smear examination.³²

In our review it was observed that 20.14% participants had knowledge of HPV vaccination and 35.68% practiced HPV vaccination. Similarly in a study by Narayana et al²³ (2017) participants believed that early screening and HPV vaccination could prevent Cervical Cancer; yet, the majority of the women (86.6%) had never been screened. In our review it was seen that only 8% females knew HPV vaccination as a risk factor for Cervical Cancer. Governments in the LMICs and health development agencies need to make available population-based HPV vaccinations alongside awareness campaigns about the role of HPV in the etiology of Cervical Cancer. Otherwise prevention practices related to cervical HPV infections including vaccinations, delay of sexual activity and multiple male sexual partners may receive limited attention from the community.

Our study identified age,^{9,10,12,18} education,^{3,13-20} and per capita income^{12,17,18} as significant factors independently associated with adequacy of knowledge, attitude, and practice of Cervical Cancer screening consistent with many studies conducted in other parts of the world. The increase of knowledge of Cervical Cancer screening in educated women may indicate that women with better education have better communication skills and ability to absorb information.

Our review reported that there was slight increase in knowledge of women regarding Cervical Cancer with increase in time. This was shown significant in some places like study conducted in Delhi in year 2014 where only 16.36% participants had knowledge of Cervical Cancer. Similarly KAP study conducted in year 2017 and 2018 showed 53.88% and 56.80% knowledge of Cervical Cancer respectively.^{22,23} Cervical Cancer-related deaths among women in India are often due to late diagnosis of disease. The review conducted essentially demonstrates that health literacy with regard to Cervical Cancer is essentially lacking among Indian women. Health literacy including knowledge about disease and early screening is the most effective measure for Cervical Cancer prevention. Lack of awareness, negative attitude, and poor practice about Cervical Cancer and screening are the major causes to increase the incidence of disease. Despite availability of an effective and simple screening test, Cervical Cancer remains to be the most common cancer among Indian women.

Conclusion

The review concludes that although fair knowledge and a positive attitude toward Cervical Cancer and screening exists among Indian women, still there is a gap to transform it into practice. India has urgent need to develop health system capacity to ensure efficient Cervical Cancer screening program and community level efforts to improve knowledge about Cervical Cancer and screening programs. These efforts would help save thousands of young women and their families from a great calamity.

Strengths

To our knowledge, it is one of the first reviews that provides an insight into the KAP of Indian women toward Cervical Cancer and its screening and attributable demographic characteristics. It will serve as a guiding knowledge for policy makers useful to design educational program on Cervical Cancer screening and prevention to bring awareness in women and increase uptake of screening thus resulting in the decline in burden of Cervical Cancer.

Limitations

Studies from different geographical area and heterogeneity of diversified population data collected and pooled from various studies. Variations such as age range and sampling techniques

were also not uniform. Merging such data may lead to high heterogeneity which is a potential source of bias.


Declaration of Conflicting Interests

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ORCID iD

Neha Taneja  <https://orcid.org/0000-0003-3818-7993>

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