

Cervical Cancer Screening Coverage at Tertiary Care Institutes Across India

Rakhi Rai¹, Rohini Sehgal¹, Seema Singhal¹, Vanita Suri², Poonam Shivkumar³, Latha Balasubramani⁴, Shalini Rajaram⁵, Saritha Shamsunder⁶, Rashmi Bagga², Shachi Vashist¹, Jyoti Meena¹, Archana Mishra⁶, Latika Chawla⁵, Sarita Kumari¹, Kalaivani Mani⁷, Neerja Bhatla^{1*}

Abstract

Objectives: The 70% screening coverage target proposed in the global cervical cancer elimination strategy is not achieved even at tertiary centres in India. A situational analysis was done to assess the currently existing facilities and barriers in tertiary care institutes. **Methods:** This cross sectional multicentric study was conducted from August to September 2021 in six tertiary care institutes across India. Women aged 30-49 years attending outpatient services (OPD) were invited for cervical screening. Women and health care professionals (HCPs) were administered structured questionnaires to assess knowledge, attitude and practices regarding cervical cancer screening services. **Results:** Out of 6709 eligible women who attended OPD, 1666 (24.8%; range: 19-57%) received screening. Availability of screening kits was limited to 10-25 Pap/HPV tests per day. Visual inspection with acetic acid (VIA) and HPV testing were offered only at certain centres. Colposcopy and treatment facilities were optimal at all centres. Knowledge, attitude and practices were analysed for 1800 women: 45.7% had heard of cervical cancer, 78.0% did not know that it is preventable, 75.8% never heard about screening. Common symptoms correctly identified included postmenopausal bleeding (4.8%), postcoital bleeding (5.7%), intermenstrual bleeding (5.8%) and vaginal discharge (12.4%). Risk factors were identified by minority: poor menstrual hygiene (6.6%), oral contraceptive pill use (6.4%), multiparity (4.4%), and HPV infection (3.0%). Out of 21, mean total knowledge score (MTKS) was 2.07 ± 2.67 . Out of 317 HCPs, 96.5% knew that cervical cancer is caused by HPV infection, is preceded by premalignant stage, and that it is preventable by screening and treatment (80.1%). Knowledge about screening modalities was present in 87.4% for cytology, 75.1% for VIA, 68.8% for HPV test. MTKS of HCPs was 20.88 ± 6.61 out of 32. **Conclusion:** Even at tertiary centres, limited availability of HPV tests, reluctance to implement VIA and lack of awareness among women remain the major barriers.

Keywords: Cervical cancer- screening- KAP- cytology- HPV

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Introduction

Cervical cancer is the second most common cancer in Indian women. According to GLOBOCAN 2020, India contributes 123,907 cervical cancer cases every year, with 77,348 deaths, nearly one-fourth of the global burden (Sung et al., 2021). Despite the clear and proven benefits of population-based screening programs, screening for cervical cancers in low and middle-income countries, including India, remains a challenge. The reason most often cited for low coverage is insufficient resources.

In 2016, Ministry of Health and Family Welfare (MoHFW) constituted a Non-Communicable Disease

Technical Advisory Group (NCD TAG) to operationalize the roll out for Prevention, Screening and Control of Common Non-Communicable Diseases (NCD): Hypertension, Diabetes and Common Cancers (Oral, Breast, Cervix) (NCDS, 2016). Visual inspection with acetic acid (VIA) is used as cervical screening test in this program because of its low cost and feasibility with additional advantage of immediate results and use of 'screen-and-treat' approach. Despite this, cervical screening is lagging far behind. World Health Organization (WHO) as part of its global strategy for elimination of cervical cancer as a public health problem, which was first declared in May 2018 and formally launched in November

¹Department of Obstetrics and Gynaecology, WHO CC AIIMS, New Delhi, India. ²Department of Obstetrics and Gynaecology, PGIMER, Chandigarh, India. ³Department of Obstetrics and Gynaecology MGIMS, Wardha, India. ⁴Department of Gynaecology Oncology, VN Cancer Centre, GKNM Hospital, Coimbatore, India. ⁵Department of Obstetrics and Gynaecology AIIMS, Rishikesh, India. ⁶Department of Obstetrics and Gynaecology, VMMC and Safdarjung Hospital, New Delhi, India. ⁷Department of Biostatistics, AIIMS, New Delhi, India. *For Correspondence: neerja.bhatla07@gmail.com

2020, has recommended Human Papilloma Virus (HPV) testing of all women at age 35 and 45 years (WHO, 2020). However, HPV tests are expensive and not yet widely available everywhere in India. The Federation of Obstetrics & Gynaecological Societies of India (FOGSI) published resource-based recommendations in 2018 that provided guidance on the use of various tests (Bhatla et al., 2020). Despite these various recommendations that support the use of any available modality in any resource setting, uptake of screening in India continues to be poor, with an estimated 5% of women having received appropriate screening (Puranik et al., 2020). The proportion of screen positive women who receive treatment is also very low. Most of the research on cancers in females is concentrated on the incidence and mortality rates of cervical and breast cancers. A review of cancer screening-related literature in India revealed that the spatial perspective of cancer screening has not been explored yet (Petersen et al., 2022). The cervical cancer elimination strategy proposes 70% screening coverage of eligible women but this target is not achieved even at tertiary centres. Hence, there is a great need to undertake a situational analysis of cervical cancer screening practices in India. The objective of the study was to assess the ground reality of the likelihood of a woman receiving cervical cancer screening and the barriers to screening at tertiary care institutes of India.

Materials and Methods

A multicentric prospective, cross-sectional observational study was conducted in collaboration with World Health Organization South-East Asia Regional Office (WHO SEARO). WHO Collaborative Centre for Research (CCR) in Human Reproduction, Department of Obstetrics & Gynaecology, All India Institute of Medical Sciences, New Delhi undertook a situational analysis of cervical cancer screening practices among Indian women in the age group of 30-49 years from August to September 2021. The study involved six tertiary care teaching hospitals of India, namely; AIIMS New Delhi (AIIMS ND, Site 1), GKNM Hospital Coimbatore (GKNM, Site 2), AIIMS Rishikesh (AIIMS R, Site 3), PGIMER Chandigarh (PGIMER, Site 4), Safdarjung Hospital Delhi (SJH, Site 5) and MGIMS Wardha (MGIMS, Site 6). Ethical clearance was obtained from the Institute Ethics Committees (IEC) of all sites. The inclusion criteria were non-virgin women between 30-49 years of age and willing to give informed consent for participation. The exclusion criteria included women who were not sexually active, post-hysterectomy women and women who had undergone screening test (Pap smear/ VIA in last 3 years or HPV in last 5 years) in the past. A data capturing tool was developed by investigators with an aim to collect the information regarding the current barriers to cervical cancer screening and implementation of management protocols. The tool included Knowledge, Attitude, and Practices (KAP) form for women and healthcare professionals (HCPs) and a form for assessment of existing infrastructure (attached as supplementary files). The information desk was created in the outpatient department (OPD). Every morning, all doctors, nurses, patient care coordinators and security

guards were sensitized to direct all patients to this desk first when they reported in OPD where all personal details and screening status of women were noted. The total OPD attendance and number of eligible women in the target age group (30-49 years) was obtained from these details. Women then went to the assigned room for check-up and advice; eligible women reported back to the information desk before exit from OPD. Data regarding whether women underwent counselling and cervical cancer screening test was noted down.

KAP form was completed by women participants (eligible women between 30-49 years). A separate KAP form was completed by HCPs involved in cervical cancer screening. The total knowledge score (KS) was calculated from all the positive responses given. One score was given to each correct answer. If any of the questions had multiple correct options, each correct option was allotted one score. The maximum KS which could be achieved on the women's proforma was 21 and on the HCP proforma was 32.

Attitude of women and HCPs was assessed by a set of questions. Each question was graded as strongly agree, agree, neither agree nor disagree, disagree and strongly disagree. A score of 1-5 was given, with 5 for strongly agree and 1 for strongly disagree. The total of all answers pertaining to attitude was calculated. Questions were asked about practice of screening in the past and determined in the form of percentages. Assessment of available infrastructure for screening and treatment facilities was done. Following variables were recorded: women attending OPD and eligible women between 30-49 years, number and types of screening tests utilized, abnormal results, follow up of patients including those who were lost to follow up, number of women eligible for treatment and received treatment or were referred for treatment.

Results

Assessment of infrastructure

Table 1 shows the infrastructure available at each site. The supply of screening kits was suboptimal and services were provided by the examining gynaecologists or nurses during routine examination. There was no standard checklist for counselling at any centre. The treatment facilities for treatment of pre-invasive lesions like cryotherapy, thermal ablation, large loop excision of transformation zone (LLETZ) and conization were available at all the centres except at site 4 where thermal ablation was not available. Audiovisual aids to create awareness were not available at site 3 and not functional at site 1 & 4.

The training of the resident doctors for screening and treatment of cervical pre-cancers was a part of the postgraduate curriculum but there was no defined program or assessment of quality of training. Specific dedicated training programs for paramedical staff were available at 3 centres (Site 3,4,5), under ongoing research programs.

Delivery of screening services

During the study period, total of 22,407 women attended outpatient services of six participating centres,

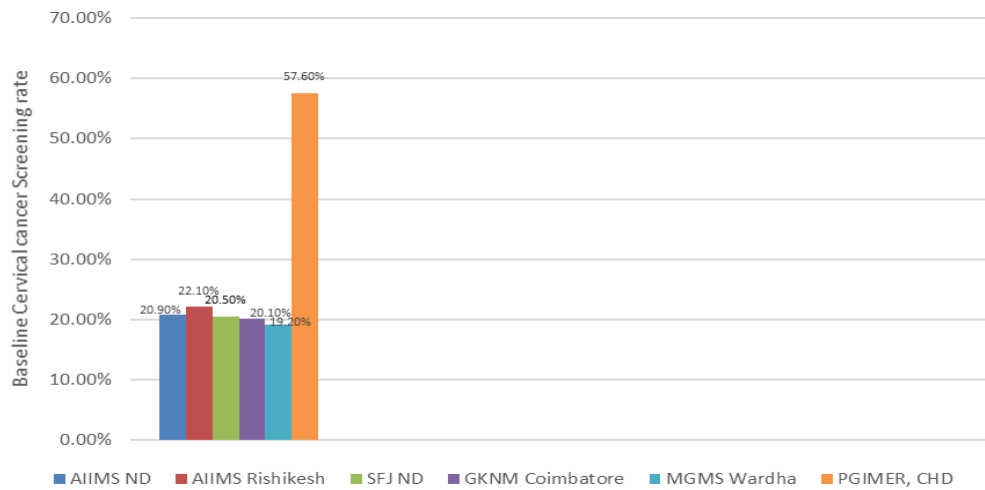


Figure 1. Screening Rate at Different Centres

out of which 29.9% (6709/22,407) were eligible for participation in the situational analysis as per the OPD registration data. The screening rates for the eligible women aged 30-49 years varied between 19-22% at different centres, except at site 4 where baseline screening rate was 57.6% (Figure 1). Out of the 3246 women counseled, only 1666 (51.3%) participated in cervical cancer screening.

The mean age was 39.2±7.4 years. Around half (51.8%) lived in rural areas; however, 84.3% women at site 1 and 62.6% at site 2 resided in urban areas. Almost 40% women at site 2 were professional. Contraceptive use was highest at site 1 (71.3%) and lowest at site 4 (6.3%). Women were educated till primary school (31.7%), 14.4% were illiterate and only 16.1% were postgraduates. The majority (98.2%) were married with parity 2 (41.2%) and housewives (86.1%).

KAP assessment of women participants

KAP forms were filled for 1800 (300 from each site) eligible women participants and total 317 HCPs who were involved in cervical cancer screening during the study period. Overall, 823 women (45.7%) had heard of cervical cancer but this varied from 8.3-94.0%. The knowledge about symptoms was low; discharge per vaginum (12.4%), postcoital bleeding (5.7%), intermenstrual bleeding (5.7%), postmenopausal bleeding (4.8%), hematuria (2.8%) and weight loss (1.4%). The various risk factors that women were aware of included poor menstrual hygiene (6.5%), prolonged oral contraceptive pill (OCP) use (6.4%), multiparity (4.4%), early marriage (4.4%), smoking (3.8%), HPV infection (3.0%), reduced immunity like HIV infection (1.1%) (Table 2). Majority of the women (n=1404, 78.0%) did not know that cervical cancer can be prevented and 1364 (75.8%) women had not even heard of cervical cancer screening.

When women were asked about their desire to

Table 1. Baseline Infrastructure for Screening and Management of Cervical Precancerous Lesions

Parameter	AIIMS ND	GKNM	AIIMS R	PGIMER	SJH	MGIMS
	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6
Type and no of screening tests done/ day						
Pap Smear	13-15	3-8	4	15-20	20-25	15-16
Human Papilloma Virus Deoxyribonucleic acid (HPV DNA)	1-2	careHPV in community	NA	NA	NA	NA
Visual Inspection with Acetic acid (VIA)	0	3-8	6	-	12-13	7
Co-testing	2-3	-	-	-	0	-
Separate room for counselling	None	None	Table in waiting area	None	None	1
Awareness Aids						
1. Audiovisual	Yes, not operational	Yes	No	Yes	Yes	Yes
2. Flash Cards	No	Yes	No	No	Yes	No
3. Posters	No	Yes	No	Yes	Yes	Yes
No. of dedicated staff available to provide counselling	0	0	0	0	0	2

Abbreviations: VIA, Visual Inspection with Acetic acid; HPV DNA, Human Papilloma Virus Deoxyribonucleic acid

Table 2. Knowledge Assessment of Women at All Sites

Parameter	AIIMS ND Site 1 N (%)	GKNM Site 2 N (%)	AIIMS R Site 3 N (%)	PGIMER Site 4 N (%)	SJH Site 5 N (%)	MGIMS Site 6 N (%)	Total N (%)
Heard of cervical cancer	124 (41.3)	189 (63.0)	282 (94.0)	69 (23.0)	7 (2.3)	152 (50.7)	823 (45.7)
Symptoms of cervical cancer							
Postmenopausal Bleeding	08 (2.7)	40 (13.3)	0 (0.0)	11 (3.67)	0 (0.0)	28 (9.3)	87 (4.8)
Postcoital bleeding	05 (1.7)	05 (1.7)	33 (11.0)	02 (0.7)	01 (0.3)	57 (19.0)	103 (5.7)
Intermenstrual bleeding	20 (6.7)	24 (8.0)	45 (15.0)	04 (1.3)	00 (0.0)	11 (3.7)	104 (5.7)
Vaginal discharge	24 (8.0)	33 (11.0)	42 (14.0)	05 (1.7)	00 (0.0)	120 (40.0)	224 (12.4)
Hematuria	04 (1.3)	09 (3.0)	05 (1.7)	08 (2.7)	00 (0.0)	24 (8.0)	50 (2.8)
Weight loss	05 (1.7)	18 (6.0)	01 (0.3)	01 (0.3)	00 (0.0)	01 (0.3)	26 (1.4)
Risk Factors							
Multiparity	04 (1.3)	10 (3.3)	00 (0.0)	15 (5.0)	01 (0.3)	50 (16.7)	80 (4.4)
Prolonged oral contraceptives	05 (1.7)	28 (9.3)	00 (0.0)	03 (1.0)	00 (0.0)	79 (26.3)	115 (6.4)
HPV infection	07 (2.3)	26 (8.7)	18 (6.0)	03 (1.0)	00 (0.0)	00 (0.0)	54 (3.0)
Early marriage	06 (2.0)	15 (5.0)	02 (0.7)	32 (10.7)	00 (0.0)	25 (8.3)	80 (4.4)
Smoking	03 (1.0)	11 (3.67)	30 (10.0)	03 (1.0)	00 (0.0)	22 (7.3)	69 (3.8)
Poor menstrual hygiene	07 (2.3)	17 (5.7)	31 (10.3)	05 (1.7)	00 (0.0)	58 (19.3)	118 (6.5)
Reduced immunity (HIV/Transplant patients)	02 (0.7)	16 (5.3)	00 (0.0)	00 (0.0)	00 (0.0)	01 (0.3)	19 (1.1)
Heard that cervical cancer is preventable	51 (17.0)	164 (54.7)	48 (16.0)	19 (6.3)	03 (1.0)	111 (37.0)	396 (22.0)
Preventive measures for cervical cancer							
Cervical CA screening	24 (47.1)	99 (60.4)	21 (43.8)	11 (57.9)	01 (33.3)	64 (57.7)	220 (55.6)
HPV vaccination	10 (19.6)	22 (13.4)	11 (22.9)	01 (5.3)	01 (33.3)	25 (22.5)	70 (17.7)
Avoiding risk factors	02 (3.92)	02 (1.2)	00 (0.0)	01 (5.3)	00 (0.0)	18 (16.2)	23 (5.8)

HIV, Human Immunodeficiency Virus; HPV, Human Papilloma Virus

undertake screening in future, 74.0% (1000/1351) agreed for the same. However, 75.5% (1019/1351) would like to ask husband / family member for screening. 1121 (82.9%) women would like to tell others that screening is beneficial to prevent cervical cancer. However, 91.0% women felt that screening was not required as they did not have any

symptoms or complaints.

Only 11.3% women had undergone screening in past. The various reasons for low uptake of screening were lack of knowledge (56.1%), nobody advised them to undergo test (13.5%), fear of being detected with cancer (10.0%) and fear of getting examined (1.7%). Nominal cost was

Table 3. Association of Knowledge Score and Attitude with Demographic Factors

Demographic factor	No of women (N)	Mean±SD knowledge score	Median knowledge score	P value	Mean±SD attitude score	Median attitude score	P value
Place of living				0.0116			0.0000
Rural	933	1.76±2.59	0 (0-3)		28.68±18.63	38 (0-41)	
Urban	867	2.3±2.72	1 (0-4)		31.23±17.57	38 (26-44)	
Education				0.0001			0.0001
Illiterate	260	0.75±1.39	0 (0-1)		30.45±17.78	38 (20-40)	
Primary	570	1.45±2.17	0 (0-2)		27.26±19.45	38 (0-42)	
Secondary	401	2.50±2.86	1 (0-4)		25.28±19.82	34 (0-43)	
Graduate & above	569	3.50±3.12	3 (1-6)		33.42±16.22	38 (32-46)	
Occupation				0			0.0000
Housewife	1549	1.83±2.56	1 (0-3)		28.77±18.57	38 (0-42)	
Professional	251	3.52±2.87	3 (1-5)		36.94±13.45	40 (35-46)	
Socioeconomic Status				0.0001			0.0001
Upper	72	2.30±3.22	1 (0-3)		29.11±18.34	38 (16-46)	
Upper Middle	344	1.92±2.59	1 (0-3)		27.25±18.90	38 (0-41)	
Lower Middle	482	2.19±2.94	1 (0-3)		25.97±18.45	35 (0-40)	
Upper Lower Middle	660	2.55±2.60	2 (0-5)		34.89±15.11	40 (33.5-45)	
Lower	242	0.66±1.45	0 (0-1)		28.21±20.97	40 (0-46)	

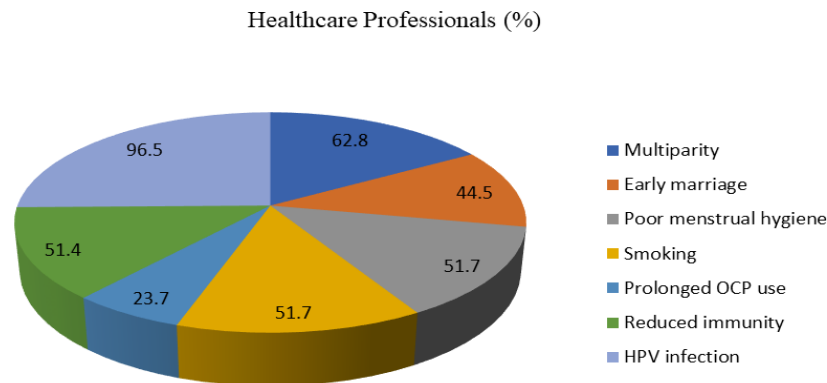


Figure 2. Knowledge Assessment of Risk Factors amongst HCPs

charged from the women for screening at 3 sites (Site 2,3,4), free at other sites.

KAP Assessment of healthcare professionals

KAP questionnaires were completed for 317 health care professionals (115 from Site 1, 41 from Site 2, 31 from Site 3, 48 from Site 4, 53 from Site 5 and 29 from Site 6) belonging to different cadres: 196 (61.8%) were doctors, 77 (24.2%) were nurses and 44 (13.8%) were paramedical workers. The mean age was 32.3±8.7 years; majority (90.5%) were females. Assessment of knowledge about risk factors is depicted in Figure 2, 306 (96.5%) knew that HPV infection is the main causative agent for cervical cancer. Amongst symptoms of cervical cancer, the common symptoms known were postcoital bleeding (78.6%), postmenopausal bleeding (63.0%) and intermenstrual bleeding (52.7%).

Around three-fourths (73.5%) of HCPs knew that the appropriate age to start screening in India is 30 years. Majority (94.0%) knew that cervical precancerous lesions are treatable if detected in time but knowledge about modalities of treatment was variable. Awareness about cryotherapy as a treatment modality was present in 81.3% HCPs, thermal ablation in 62.2%, LLETZ in 68.5% HCPs and cold knife conization in 47.6%.

Knowledge score (KS) of Women and HCPs

The mean total KS of women participants and HCPs was calculated using the pre designed proforma. KS for women participants was only 2.07± 2.67 out of 21, reflecting that women had very little knowledge of cervical cancer, its symptoms, risk factors and screening. The maximum KS for HCPs was 32 as per the proforma. The mean total KS (Table 5) of all the centres was 20.88±6.61, range being 15.32 to 31.03 which indicates that HCPs had variable knowledge of cervical cancer, its symptoms & risk factors, screening and HPV vaccination which need to be augmented. More than 90% HCPs have positive attitude towards cervical cancer screening. The maximum score of 32 for HCP was observed at site 6.

Association of knowledge score and attitude with demographic factors

Shows association of KS and attitude with sociodemographic factors. Urban living, higher education,

working women and higher socioeconomic status were associated with higher knowledge and attitude.

On correlation with demographic factors, urban living (urban vs. rural, 66.7% vs. 33.3%; p=0.000), higher education (illiterate vs. higher education 5.4% vs. 94.6%) and housewives (housewife vs. professional 77.9% vs. 22.1%, p 0.001) and higher socioeconomic status had an impact on acceptance to undergo cervical screening.

Discussion

Cervical cancer screening has been proven to reduce mortality due to cervical cancer and the incidence of cervical cancer has come down markedly in the west due to rigorous screening programs (WHO, 2020). However, it has still not reached women to the extent required to achieve the goal of cervical cancer elimination (70% target) in India. Despite various efforts by WHO, Government of India and various activities by different organizations like Federation of Obstetric and Gynaecological Societies of India (FOGSI), Asia-Oceania Research Organisation in Genital Infection and Neoplasia (AOGIN India), Indian Society of Colposcopy and Cervical Pathology (ISCCP), several other NGOs, screening uptake remains low. Tertiary healthcare facilities are mostly overcrowded because of the availability of advanced medical facilities under one roof for the complex cases referred from all over the country. The clinicians and pathologists are overburdened. Cancer screening in such circumstances might take a back seat. However, it is of utmost importance to analyse the situation and barriers to take remedial measures to enhance cervical screening at tertiary care institutes to continue their role as torch bearers and hopefully set an example for the rest of the healthcare facilities to follow.

In our study, the screening rates for the eligible women aged 30-49 years varied between 19-22% at different centres, far below the 70% target, except at PGIMER where the rate was 57.6%, probably due to dedicated efforts of the department along with the cytopathologist over the years. According to 2021 India factsheet, cervical cancer screening coverage was only 3.1% (HPV Information Centre, 2021). A study conducted by Reichheld (2020), in south India revealed that only 7.1%

women underwent cervical cancer screening. As per NFHS-5 data, cervical cancer screening rate in India was 1.9% (2.2% urban and 1.7% rural) (NFHS-5, 2019-2021). In a study by Gakidou (2008) screening rate is around 19% in LMICs. The screening rates in the current study were higher than these reports, as the study was conducted at apex teaching institutes with cervical cancer screening protocols in place.

The tertiary care institutes are role models for Indian health care system, where young doctors are trained to serve using latest advancements in the field of medicine. However, during assessment of available infrastructure for cervical screening, the current study astonishingly observed that the number of screening tests performed per day were very less due to limited availability of screening kits (cytology and HPV) with limited performance of VIA. Due to overcrowded outpatient departments with a focus on providing treatment are the norm in tertiary care centres. Screening services are not given due importance, explaining the sub-optimal screening rates observed by us. Paramedical staff are available in Gynaecology OPD of tertiary centres only for family planning services, or for time-bound research activities. Dedicated training programs for screening were not in place. This highlights the need to undertake dedicated efforts by all the stakeholders. The findings from our study show the importance of screening in all stakeholders including medical, paramedical and administrative personnel.

The knowledge about symptoms and risk factors for cervical cancer was very low amongst the women. In a study by Reichheld et al., (2020), less than 50% were aware of cervical cancer, 84.6% had poor knowledge, with knowledge score ranging from 0 to 13 with a mean score of 3.47, similar to our findings. The risk factors known to women differ in various studies. The main risk factors known were poor menstrual hygiene (5.7%), early sexual intercourse (4.6%), cigarette smoking (4.6%) and multiple pregnancies (>5) (3.4%). In the present study, known risk factors were multiparity (4.4%), prolonged OCP use (6.4%) and early marriage (4.4%). Awareness about HPV as the causative agent was as low as 3%. Levels of screening can improve only when awareness of the disease and screening tests improve. Our study shows lack of awareness in our women which needs to be addressed in the first instance.

Lack of knowledge about cervical cancer is the main barrier for seeking screening services by women. In a study by Simo et al., (2021) 39.04% had heard about cervical cancer, 27.6% heard of risk factors, only 2.6% knew about relationship of HPV to cervical cancer and 31.5% had heard about cervical screening test. The majority reported lack of knowledge about screening as a cause of not getting screening test done (68.9%). In a study by Armo et al., (2019) conducted in a tertiary care institute of Chhattisgarh India, only 8.1% had heard of cervical cancer screening, which was lower than our study where 24.2% women were aware. This highlights the rising awareness about cervical cancer. Another study by Sindhumol et al., (2020), showed that 42% women had knowledge about cervical cancer, symptoms, and screening methods. These variations could be due to

differences in the profile of population included in these studies. Additionally, almost all the studies highlighted that even women who are aware of the importance of cervical cancer screening do not undergo screening tests themselves. Self-sampling which is more woman friendly may prove to be an important tool to improve screening coverage. In the study Armo et al., (2019), only 2% had undergone previous screening, similar to our study where only 11.2% had past screening experience. Several studies had shown that given the opportunity, women would like to get themselves screened. In the current study also 74.0% would like to get themselves screened. Similarly, 57.1% of respondents showed positive attitude towards screening after thorough information about cervical screening in a study by Armo et al., (2019). These findings reflect an urgent need to empower women with knowledge to change their attitude towards screening.

Our current study highlights a wide gap between knowledge and action related to cervical cancer screening service delivery among the HCPs. Knowledge did not convert into self-screening in the study by Sharma (2019), who did a KAP study about cervical cancer screening amongst nurses. 95.9% of nurses had good knowledge of risk factors and importance of Pap test, 93.9% had positive attitude towards Pap smear screening but as high as 69.4% did not get Pap smear done for themselves as they did not feel the need for the same. Similarly, another study by Tadesse (2022), 60.6% had heard about cervical cancer, 71.7% had positive attitude towards screening and 2.2% were screened for cervical cancer. The reasons cited for low screening practice were lack of information, absence of symptoms and being non decisive. These observations highlight the need to spread awareness among HCPs, so that they can get themselves screened, counsel women and motivate them for screening.

KS was better in women belonging to urban areas and with education similar to our study (Table 3) although the positive attitude towards cervical cancer screening was less in women with higher education. A systematic review on the barriers to the uptake of cervical cancer screening in low and middle income countries done by Peterson et al., (2022) determined the barriers including lack of awareness and knowledge about cervical cancer and its screening, cultural and religious barriers, unsupportive families, community misconceptions as social barriers, poor resources, policy and programmatic factors at health system level, limited access to healthcare and gender bias which ignores the health needs of the women. Similar barriers were found in another study done by Dsouza et al., (2020) too.

With WHO's call to countries to implement the 90-70-90 targets for global elimination of cervical cancer, our study shows that even in tertiary healthcare hospitals, cervical cancer screening is not given a priority. Dedicated manpower and training specific to improving screening services may offer a solution to improve screening rates amongst women visiting tertiary care centres. However, our findings highlight the need to sensitize the tertiary care institutes to implement measures urgently to promote screening services despite busy schedules. The strength of our study is that it was a prospective and multicentric study

giving us a reasonable picture of the state of screening services throughout the country and the findings can be generalized to all similar LMICs. However, the main limitation is its limited duration.

In conclusion, the situation of cervical cancer screening service delivery even at tertiary care teaching institutes of India is suboptimal despite being well equipped with trained doctors and treatment facilities. PGIMER, Chandigarh had a higher screening rate due to longstanding well-coordinated efforts of gynaecologists and pathologists. Hence, with dedicated attempts and perseverance, various interventions need to be put in place to overcome the identified barriers to screening. These interventions may be easier to be done in tertiary care hospitals in the first instance and perhaps later rolled out to community settings to win the battle of cervical cancer elimination.

Author Contribution Statement

All the authors have contributed in protocol development, data collection, data analysis, preparation of manuscript and review of manuscript.

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Conflict of Interest Statement

The authors state that there is no conflict of interest.

References

- Armo M, Khunte V, Sainik S, Kanniga GR, Jatwaret N (2019). Awareness and practices of cervical cancer screening among women in Rajnandgaon district, central India: health education is the need of the hour. *Int J Reprod Contracept Obstet Gynecol*, **8**, 1-5.
- Bhatla N, Singhal S, Saraiya U, et al (2020). Screening and management of preinvasive lesions of the cervix: Good clinical practice recommendations from the Federation of Obstetrics and Gynaecologic Societies of India (FOGSI). *J Obstet Gynaecol Res*, **46**, 201-14.
- Dsouza JP, Van Den Broucke S, Pattanshetty S, Dhoore W (2020). Exploring the Barriers to Cervical Cancer Screening through the Lens of Implementers and Beneficiaries of the National Screening Program: A Multi-Contextual Study. *Asian Pac J Cancer Prev*, **21**, 2209-15.
- Gakidou E, Nordhagen S, Obermeyer Z (2008). Coverage of cervical cancer screening in 57 countries: low average levels and large inequalities. *PLoS Med*, **5**, e132.
- Kumar H, Tanya S (2014). A Study on Knowledge and Screening for Cervical Cancer among Women in Mangalore City. *Ann Med Health Sci Res*, **4**, 751-6.
- Human Papillomavirus and Related Diseases Report. India. HPV

Information centre (2021). https://hpcvcentre.net/statistics/reports/IND_FS.pdf.

- Mehrotra R, Yadav K (2022). Cervical Cancer: formulation and Implementation of Govt of India guidelines for screening and management. *Indian J Gynecol Oncol*, **20**, 1-8.
- National Family Health Survey. Government of India. http://rchiips.org/nfhs/factsheet_NFHS-5.shtml.
- Operational Guidelines for Prevention, Screening and Control of Non Communicable Diseases: Hypertension, Diabetes and Common Cancers (Oral, Breast, Cervix) [https://dghs.gov.in/WriteReadData/userfiles/file/Publication/Operational Guidelines on Prevention, Screening and Control of Common NCDs_1](https://dghs.gov.in/WriteReadData/userfiles/file/Publication/Operational%20Guidelines%20on%20Prevention,%20Screening%20and%20Control%20of%20Common%20NCDs_1.pdf).
- Petersen Z, Jaca A, Ginindza TG, et al (2022). Barriers to uptake of cervical cancer screening services in low-and-middle-income countries: a systematic review. *BMC Womens Health*, **22**, 486.
- Puranik A, Shreenidhi SM, Rai SN (2020). Spatial evaluation of prevalence, pattern and predictors of cervical cancer screening in India. *Public Health*, **178**, 124-36.
- Reichheld A, Mukherjee PK, Rahman SM, David KV, Pricilla RA (2020). Prevalence of cervical cancer screening and awareness among women in an urban community in South India—a cross sectional study. *Ann Global Health*, **86**, 30.
- Sharma JC, Popli S, Anand T (2019). Barriers to Cervical Cancer Screening in India: A Knowledge Attitude Gap Analysis of Nurses in a Tertiary Hospital in Northern India. *Epidem Int*, **4**, 1-8.
- Simo RT, Tchakounte CK, Kamdje AHN, et al (2021). Cervical Cancer Awareness and Detection of Precancerous Lesions at Two District Health Centres in the West Region of Cameroon *Asian Pac J Cancer Care*, **6**, 263-9.
- Sindhumol PK (2020). Knowledge and practice regarding cervical cancer screening among women attending OPD of a tertiary care centre. *JMSCR*, **8**, 502-4.
- Sung H, Ferlay J, Siegel RL, et al (2021). Global cancer statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin*, **71**, 209-49.
- Tadesse A, Segni MT, Demissie HF (2022). Knowledge, Attitude, and Practice (KAP) toward cervical cancer screening among Adama Science and Technology University female students, Ethiopia. *Int J Breast Cancer*, Article ID 2490327, 1-9.
- Global strategy to accelerate the elimination of cervical cancer as a public health problem. Geneva: World Health Organization; 2020. License: CC BY-NC-SA 3.0 IGO.



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