

Impact of A Cervical Cancer Screening Campaign in Identifying Precancerous Lesions Among Women Residing in Selected Urban Areas: A Cross-Sectional Descriptive Analytical Study

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ABSTRACT

Background:

Cervical cancer is a leading cause of morbidity and mortality among women in developing countries like India. Although it is preventable through early detection, the utilization of screening services remains low due to lack of awareness and various barriers.

Purpose of the Study:

The purpose of the study was to identify precancerous lesions of the cervix among women, assess reproductive and lifestyle risk factors influencing cervical cancer, determine the participation rate in cervical cancer screening, identify barriers to screening, and find the association between demographic variables and the impact of the cervical cancer screening campaign.

Material and Methods:

A quantitative cross-sectional descriptive analytic design was adopted. The study was conducted among 150 women aged 21–65 years residing in selected urban areas of Sangli Miraj Kupwad Corporation using non-probability purposive sampling. Data were collected using a self-structured questionnaire followed by Pap smear examination. After completion of the questionnaire among all 150 participants, 81 women expressed willingness to undergo the Pap smear test, and screening was conducted for these participants. For those who were not willing to undergo screening, the barriers to cervical cancer screening were identified. The Pap smear results were obtained from the pathology department and analyzed accordingly. Data analysis was performed using descriptive and inferential statistics.

Results:

The majority of women were aged 31–40 years and were married, with most belonging to the upper-lower socioeconomic class. Early marriage, early childbirth, multiparity, and tobacco use were commonly observed risk factors, while very few women had undergone prior screening or received HPV vaccination. Out of 150 participants, 54% underwent Pap smear screening, whereas 46% were not willing, and their barriers were identified. Major barriers included preference for a female doctor, fear of pain, fear of test results, and high cost. Pap smear findings revealed that 96% of women had normal cytology (NILM), while only a small proportion showed abnormal findings, including ASC-US (2%) and LSIL (1%). Among the three women with abnormal findings, two were HIV-positive and asymptomatic, attending routine check-ups. A statistically significant association was found between participation in screening and age, marital status, education, and income ($p < 0.05$), whereas occupation showed no significant association.

Conclusion:

The cervical cancer screening campaign improved screening participation and enabled early detection of precancerous cervical lesions. Fear of pain, fear of test results, preference for a female

doctor, and cost concerns were the major barriers to screening uptake. Increasing awareness and supportive screening services can improve participation among women.

Keywords: Cervical cancer, Cervical cancer screening, Pap smear, Precancerous cervical lesions, Screening participation, Screening barriers, Risk factors, Women's health, Early detection.

INTRODUCTION

Cervical cancer continues to pose a significant global public health challenge and remains one of the leading causes of illness and death among women, especially in developing nations. In spite of considerable progress in medical advancements, preventive measures, and diagnostic approaches, a large number of cases are still reported each year, mainly due to late diagnosis and inadequate utilization of screening services.¹ Cervical cancer remains a significant global public health issue, with a particularly high burden in low- and middle-income countries. As reported by the World Health Organization, around 660,000 new cases and 350,000 deaths occurred worldwide in 2022, with nearly 94% of these deaths taking place in resource-constrained settings.³ This imbalance highlights the disparities in access to organized screening programs, early detection, and appropriate treatment services.

Worldwide, cervical cancer ranks as the fourth most common cancer affecting women, with the greatest burden seen in low- and middle-income countries.³ Persistent infection with high-risk HPV strains, particularly types 16 and 18, is identified as the main causative factor.² The early stages of the disease are usually without symptoms, which often results in delayed diagnosis and poorer outcomes. Hence, enhancing community-level screening efforts and increasing awareness are essential steps toward early detection and prevention.

Screening techniques such as the Papanicolaou (Pap) smear are simple, affordable, and scientifically proven methods for detecting precancerous cervical lesions before they advance to invasive cancer.² Regular screening has been shown to markedly reduce both the incidence and mortality of cervical cancer. However, the effectiveness of such programs depends greatly on the level of awareness among women, availability of screening facilities, and their willingness to undergo screening.

MATERIAL & METHODS:

Ethical Consideration

Ethical approval was obtained from the Institutional Ethics Committee of Bharati Vidyapeeth (Deemed to be University) College of Nursing, Sangli. Permission to conduct the study was also obtained from Sangli Civil Hospital and the concerned local authorities. Written informed consent was obtained from all participants before data collection. Participation was voluntary, and participants were informed of their right to withdraw from the study at any stage without any consequences. Confidentiality, privacy, and anonymity of the participants were maintained throughout the study. Women with abnormal Pap smear findings were appropriately counseled and referred for further evaluation and management.

Research Approach

A quantitative research approach was adopted to assess the impact of a cervical cancer screening campaign in identifying precancerous cervical lesions among women residing in selected urban areas.

Research Design

The study employed a cross-sectional descriptive analytical research design to assess reproductive and lifestyle risk factors, participation in cervical cancer screening, screening barriers, and Pap smear findings among the study participants.

Setting and Sample size and Sampling technique

The study was conducted in selected urban areas of the Sangli-Miraj-Kupwad Corporation, Maharashtra, India. The study included 150 women aged 21–65 years who met the inclusion criteria. Participants were selected using a non-probability purposive sampling technique.

Data Collection Tool, Validity, Reliability, and Data Analysis

Data were collected using an interviewer-administered self-structured questionnaire comprising sections on socio-demographic characteristics, reproductive and lifestyle risk factors, participation in cervical cancer screening, and barriers to screening. Women who were willing to undergo cervical cancer screening received a Pap smear examination under aseptic precautions at Sangli Civil Hospital. Cervical specimens were collected using a sterile Ayre's spatula and/or endocervical brush, immediately fixed on glass slides, and examined cytologically according to the Bethesda System of Classification. Women who were not willing to undergo cervical cancer screening were interviewed to identify the barriers to screening. The self-structured questionnaire was validated by 17 experts from the fields of Community Health Nursing, Obstetrics and Gynecological Nursing, Medical-Surgical Nursing, and Obstetrics and Gynecology. The Marathi translation was validated by language experts for cultural and linguistic accuracy. The reliability of the questionnaire was established prior to the main study. Section IV (Barriers to Cervical Cancer Screening) was assessed for inter-rater reliability using Spearman's rank correlation, which demonstrated a reliability coefficient of 0.90, indicating good reliability and consistency of the tool. The pilot study from 06/11/2025 to 12/11/2025 (n=15) affirmed feasibility, tool clarity, and no modification needed. The collected data were coded, entered into a master data sheet, and analyzed using the Statistical Package for the Social Sciences (SPSS) version 21. Descriptive statistics, including frequency and percentage, were used to summarize the data. Inferential statistics, including the Chi-square test, were used to determine the association between demographic variables and participation in cervical cancer screening. A p-value of <0.05 was considered statistically significant.

RESULTS

Table No. 1: Frequency and Percentage Distribution of Demographic Variables. n=150

Demographic Variable		Frequency	Percentage
Age (years)	21–30	21	14%
	31–40	50	33%
	41–50	47	31%
	51–65	32	21%
Marital Status	Married	115	77%
	Widow	30	20%
	Divorced	5	3%
Occupation	Professionals	1	1%
	Clerks	1	1%
	Skilled Workers and Shop/Market Sales Workers	1	1%

	Skilled Agricultural and Fishery Workers	27	18%
	Craft and Related Trade Workers	4	3%
	Plant and Machine Operators and Assemblers	1	1%
	Elementary Occupation	26	17%
	Unemployed	89	59%
Educational Qualification	Graduate or Postgraduate	7	5%
	Intermediate or Diploma	11	7%
	High School Certificate	25	17%
	Middle School Certificate	55	37%
	Primary School Certificate	24	16%
	Illiterate	28	19%
Monthly Income	₹59,795 – ₹79,755	2	1%
	₹39,830 – ₹59,794	21	14%
	₹23,870 – ₹39,829	63	42%
	₹7,989 – ₹23,869	58	39%
	₹0 – ₹7,988	6	4%
Socioeconomic Class	Upper Middle (Class II)	2	1%
	Lower Middle (Class III)	24	16%
	Upper Lower (Class IV)	114	76%
	Lower (Class V)	10	7%

Most women were aged 31–40 years (33%), married (77%), and belonged to the upper lower socioeconomic class (76%).

Table No. 2: Frequency and Percentage Distribution of Reproductive and Lifestyle Risk Factors. n=150

Variable		Frequency	Percentage
Age at marriage	Below 18 years	65	43.3%
	18–25 years	80	53.3%
	Above 25 years	5	3.3%
Age at first childbirth	Not given birth	7	4.7%
	Below 20 years	129	86.0%
	20 years and above	14	9.3%
Number of pregnancies	None	8	5.3%
	1–2	56	37.3%
	3 or more	86	57.3%
Age at menarche	Below 12 years	52	34.7%
	12–15 years	97	64.7%
	Above 15 years	1	0.7%
Oral contraceptive use	Yes	17	11.3%
	No	133	88.7%
Present gynecological problem	Yes	115	76.7%
	No	35	23.3%
If Yes, Type of Present Problem (n = 115)	Abdominal pain	43	37%
	Heavy menstrual bleeding	21	18%
	Irregular menstruation	17	15%
	Leukorrhea	34	30%
Previous history of gynecological problems	Yes	27	18.0%
	No	123	82.0%
If Yes, Type of Previous Problem (n = 27)	Cervical fibroid	1	4%
	cyst at cervix	1	4%
	Infertility	3	11%

	Intramural fibroid	7	26%
	Recurrent abortion	1	4%
	Right ovarian dermoid cyst	1	4%
	Right ovary benign tumor	1	4%
	uterine prolapse	12	44%
Previous cervical cancer screening done	Yes	6	4.0%
	No	144	96.0%
Previous HPV vaccination done	Yes	1	0.7%
	No	149	99.3%
History of sexually transmitted infections (STIs)	Yes	20	13.3%
	No	63	42.0%
	Not sure	67	44.7%
Menstrual hygiene practices	Sanitary pads	38	25.3%
	Cloth (washed & reused)	112	74.7%
Smoking / tobacco use	Yes	60	40%
	No	90	60%
If Yes, Type of Tobacco Used (n=60)	Misery	50	83%
	Tobacco	10	17%
Alcohol consumption	Yes	1	1%
	No	149	99%
Family history of cancer	Yes	12	8%

	No	138	92%
If Yes, Relationship with cancer patient (n=12)	Father	4	33%
	Grandmother	2	17%
	Husband	2	17%
	Mother	1	8%
	Mother-in-law	3	25%
Visit to gynecologist for regular checkups	Yes	12	8%
	No	138	92%
If Yes, Purpose of visit (n=12)	Cyst at cervix	1	8%
	Infertility	4	33%
	Irregular menstruation	6	50%
	Uterine prolapse	1	8%

The findings revealed that most women were married between 18–25 years (53.3%) and had their first childbirth before 20 years of age (86%). More than half (57.3%) had three or more pregnancies, and the majority attained menarche between 12–15 years (64.7%). Most women had not used oral contraceptives (88.7%), had current gynecological problems (76.7%), and had no previous gynecological history (82%). Nearly all women had never undergone cervical cancer screening (96%) or received HPV vaccination (99.3%). About 44.7% were unsure of their STI status, 74.7% used reusable cloth during menstruation, and 40% reported smoking or tobacco use, while alcohol consumption was very low (1%). Most women had no family history of cancer (92%) and did not visit a gynecologist regularly (92%).

Table No 3: Frequency and Percentage Distribution of the Participation Rate in Cervical Cancer Screening n=150

Variable		Frequency	Percentage
Cervical Cancer Screening	Willing	81	54%
	Not Willing	69	46%

More than half of the women (54%) underwent cervical cancer screening, while 46% were unwilling to undergo screening.

Table No. 4: Frequency and Percentage Distribution of the Barriers to the Cervical Cancer Screening. n=69

Variable	Frequency	Percentage
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Health center located near your house	Yes	48	70%
	No	21	30%
Expensive	Yes	60	87%
	No	9	13%
Feeling that screening might be painful	Yes	63	91%
	No	6	9%
Afraid of Test Result	Yes	61	88%
	No	8	12%
Prefer a female doctor for cervical cancer screening	Yes	64	93%
	No	5	7%

The above table shows that barriers to cervical cancer screening revealed that the majority of women reported multiple concerns. Most participants (93%) preferred a female doctor for cervical cancer screening. The feeling that the screening procedure might be painful was reported by 91% of women, while 88% expressed fear of the test results. A high proportion (87%) perceived the test to be expensive. Additionally, 30% of participants reported that the health center was not located near their house.

Table No. 5: Frequency and Percentage Distribution of Findings of the PAP Smear Test. n=81

Variable		Frequency	Percentage
Cytology Report	NILM	78	96%
	ASC-US	2	2%
	LSIL	1	1%
	HSIL	0	0%
	SCC	0	0%

Table No. 6: Analyze the association between demographic variables and the impact of the cervical cancer screening campaign in terms of the participation rate in cervical cancer screening. n=150

Table No. 6: Analyze the association between demographic variables and the impact of the cervical cancer screening campaign in terms of the participation rate in cervical cancer screening.
n=150

Variable		Cervical Cancer Screening		Chi-square test	P-value	Result
		Not Willing	Willing			
Age (years)	21-30	16	5	14.7284	0.002	Significant
	31-40	18	32			
	41-50	16	31			
	51-65	19	13			
	Total	69	81			
Marital Status	Married	49	66	0.7256	0.03	Significant
	Widow	15	15			
	Divorced	5	0			
	Total	69	81			
Occupation	Unemployed	39	50	6.9855	0.4303	Not Significant
	Elementary Occupation	15	11			
	Plant and Machine Operators and Assemblers	0	1			
	Craft and Related Trade Workers	3	1			
	Skilled Agricultural and Fishery Workers	11	16			

	Skilled Workers and Shop/Market Sales Workers	0	1			
	Clerks	0	1			
	Professionals	1	0			
	Total	69	81			
Educational Qualification	Graduate or Postgraduate	4	3	17.6374	0.0034	Significant
	Intermediate or Diploma	10	1			
	High School Certificate	12	13			
	Middle School Certificate	22	33			
	Primary School Certificate	5	19			
	Illiterate	16	12			
	Total	69	81			
Monthly Income	₹59,795 – ₹79,755	2	2	12.7345	0.012	Significant
	₹39,830 – ₹59,794	12	7			
	₹23,870 – ₹39,829	36	27			
	₹7,989 – ₹23,869	18	40			
	₹0 – ₹7,988	1	5			
	Total	69	81			

From the above table, we found all P values less than 0.05 except for occupation, which shows that there is a significant association between demographic variables (age, marital status, education, and monthly income) and participation rate in cervical cancer screening at the 5% level of significance. For variable occupation, the P value is greater than 0.05. So, there is no significant association between the demographic variable occupation and the participation rate in cervical cancer screening.

DISCUSSION

The present study found that women aged 31–40 years had the highest participation in cervical cancer screening, with age significantly associated with screening uptake, supporting the recommended focus on women aged 30–49 years.^{4,5} Married women showed significantly higher participation than widowed or divorced women, while occupation was not significantly associated with screening uptake.⁶ Higher education and monthly income were significantly associated with increased participation, indicating the influence of awareness, health-seeking behavior, and socioeconomic status.^{7,8,9}

Important reproductive and lifestyle risk factors identified were early marriage (43.3%), early childbirth (86%), multiparity, and tobacco use (40%), which are recognized risk factors for cervical

cancer.^{10,11,12,13,14,15} Previous cervical cancer screening (4%) and HPV vaccination (0.7%) were extremely low, indicating poor utilization of preventive services.^{16,17,18}

The community-based screening campaign achieved a 54% participation rate, while 46% of women were unwilling to undergo screening. This indicates a positive impact of community-based awareness but also highlights persistent barriers requiring continuous counseling and community-level motivation.^{6,7,11,4} The major barriers were preference for a female healthcare provider (93%), fear of pain (91%), fear of test results (88%), high cost (87%), and accessibility-related concerns.^{7,17,9,6} Pap smear findings showed predominantly normal cytology (NILM), with few cases of ASC-US and LSIL and no HSIL or invasive carcinoma. Two of the three women with abnormal findings were HIV-positive and asymptomatic, emphasizing the importance of regular screening among high-risk women.^{11,12} The findings are consistent with previous Indian community-based studies and highlight the importance of early detection and timely management.^{14,15}

CONCLUSION

The present study demonstrated a 54% participation rate in cervical cancer screening among women in selected urban areas of Sangli-Miraj-Kupwad Corporation. Participation was significantly associated with age, marital status, education, and monthly income, while occupation showed no significant association. Important risk factors included early marriage, early childbirth, multiparity, and tobacco use, with very low previous screening and HPV vaccination uptake. Major barriers were fear of pain, fear of test results, preference for female healthcare providers, and financial constraints. Pap smear findings showed 96% NILM, 2% ASC-US, and 1% LSIL, with no HSIL or cervical cancer; two of the three women with abnormal findings were HIV-positive and asymptomatic. The findings highlight the importance of sustained health education, accessible and affordable screening, HPV vaccination, integration of screening into routine healthcare, and targeted interventions for high-risk women to improve screening uptake and reduce cervical cancer burden.

REFERENCES:

1. Sankaranarayanan R, Basu P, Kaur P, Bhaskar R, Singh GB, Denzongpa P, et al. Current status of cancer screening in India. *Asian Pacific Journal of Cancer Prevention*. 2019;20(7):2011–2019.
2. Bosch FX, Lorincz A, Muñoz N, Meijer CJ, Shah KV. The causal relation between human papillomavirus and cervical cancer. *Journal of Clinical Pathology*. 2002;55(4):244–265.
3. Bhatla N, Aoki D, Sharma DN, Sankaranarayanan R. Cancer of the cervix uteri. *International Journal of Gynecology and Obstetrics*. 2018;143(Suppl 2):22–36.
4. World Health Organization. WHO guidelines for screening and treatment of precancerous lesions for cervical cancer prevention. Geneva: WHO; 2013.
5. Sankaranarayanan R, Ramani S, Wesley R. A practical manual on visual screening for cervical neoplasia. Lyon: International Agency for Research on Cancer; 2003.
6. Nene BM, Jayant K, Arrossi S, et al. Determinants of women's participation in a cervical cancer screening trial, Maharashtra, India. *Bull World Health Organ*. 2007;85(4):264–272.
7. Bansal AB, Pakhare AP, Kapoor N, Mehrotra R, Kokane AM. Knowledge, attitude, and practices related to cervical cancer among adult women. *J Nat Sci Biol Med*. 2015;6(2):324–328.
8. Thulaseedharan JV, Malila N, Hakama M, et al. Socio-demographic and lifestyle factors associated with cervical cancer screening. *Asian Pac J Cancer Prev*. 2012;13(11):5321–5326.
9. Mishra GA, Pimple SA, Shastri SS. An overview of prevention and early detection of cervical cancers. *Indian J Med Paediatr Oncol*. 2011;32(3):125–132.
10. International Agency for Research on Cancer. IARC Handbooks of Cancer Prevention: Cervix Cancer Screening. Lyon: IARC; 2005.
11. Joshi S, Sankaranarayanan R, Muwonge R, et al. Screening of cervical neoplasia in HIV-infected women in India. *AIDS*. 2013;27(4):607–615.

12. Pimple S, Mishra G, Shastri S. Global strategies for cervical cancer prevention and screening in HIV-positive women. *Indian J Med Paediatr Oncol*. 2012;33(2):80–86.
13. Muñoz N, Franceschi S, Bosetti C, et al. Role of parity and human papillomavirus in cervical cancer. *Int J Cancer*. 2002;98(5):771–778.
14. Sachan PL, Singh M, Patel ML, Sachan R. A study on cervical cancer screening using Pap smear test and clinical correlation. *Asian Pac J Cancer Prev*. 2018;19(4):1011–1015.
15. Gupta S, Sodhani P, Chachra KL. Cytological screening for cervical cancer in India: A review. *Indian J Med Res*. 2010;132(6):695–706.
16. Bruni L, Albero G, Serrano B, et al. Human papillomavirus and related diseases in India. *ICO/IARC Information Centre on HPV*; 2019.
17. Bhatla N, Aoki D, Sharma DN, Sankaranarayanan R. Cancer of the cervix uteri. *Int J Gynaecol Obstet*. 2018;143(Suppl 2):22–36.
18. Aswathy S, Quereshi MA, Kurian B, Leelamoni K. Cervical cancer screening: Current knowledge and practice among women in Kerala. *Indian J Med Res*. 2012;136(2):205–210.