International Journal of Research and Review
[Indexed, Peer-Reviewed Journal]
Volume 13; Issue: 11; November 2026
Website: www.ijrrjournal.com
E-ISSN: 2349-9788; P-ISSN: 2454-2237

Awareness And Strategies to Improve Cervical Cancer Screening – A Review

Mitali Chakraborty[1], Mary V J[2], Kamatchi. K[3]

[1]1st year M.Sc. Nursing Student, Department of Obstetrics and Gynecological Nursing, College of Nursing, St. John's National Academy of Health Sciences, Bengaluru, Karnataka, India
[2]Associate Professor, Department of Obstetrics and Gynecological Nursing, College of Nursing, St. John's National Academy of Health Sciences, Bengaluru, Karnataka, India
[3]Lecturer, Department of Obstetrics and Gynecological Nursing, College of Nursing, St. John's National Academy of Health Sciences, Bengaluru, Karnataka, India

Corresponding Author: Mitali Chakraborty

DOI: https://doi.org/10.52403/ijrr.20261110

ABSTRACT

Background: Cervical cancer is largely preventable through human papillomavirus (HPV) vaccination, regular screening, early detection and appropriate management of precancerous lesions. Despite the availability of effective screening methods, participation remains inadequate in many populations, particularly among women who are younger, socioeconomically disadvantaged, rural, migrant or otherwise underserved. Limited awareness, misconceptions regarding cervical cancer and screening, fear, embarrassment, stigma, cultural beliefs, lack of social support and barriers related to accessibility and healthcare services contribute to poor screening uptake.

Methods: This review was supported by a comprehensive search of PubMed, MEDLINE, and CINAHL, synthesizing evidence on awareness, barriers, and interventions to improve cervical cancer screening uptake. It included systematic and scoping reviews, qualitative studies, randomized controlled trials, and observational studies. Key interventions such as health education, counselling, community outreach, reminders, mHealth, patient navigation, culturally sensitive approaches, HPV self-sampling, and health-system interventions were reviewed.

Results: The reviewed studies showed inadequate awareness and low cervical cancer screening uptake. In India, the national screening prevalence was 1.97%, ranging from 0.2% in West Bengal and Assam to 10.1% in Tamil Nadu. A review of Indian studies reported screening related knowledge, positive attitude, and practice in 20.31%, 43.64% and 13.22% of women respectively. In a Jamaican educational intervention, some knowledge improved by up to 62%, and 40.7% of women undergoing screening at six-month follow-up. In a Portuguese randomized trial, screening adherence was 39.0% with customized SMS and telephone calls increased compared with 25.7% with standard invitations. A meta-analysis found higher participation with HPV self-sampling across invitation strategies.

Conclusion: Improving cervical cancer screening requires more than providing information alone. A comprehensive, accessible and culturally appropriate approach combining health education, counselling, reminders, community outreach, patient navigation, HPV self-

sampling and health-system strengthening is needed. Nurses and other healthcare professionals have an important role in increasing awareness, addressing misconceptions, providing counselling and facilitating access to screening services.

Keywords: Cervical cancer, cervical cancer screening, awareness, health education, HPV, screening uptake, self-sampling, prevention.

INTRODUCTION

Cervical cancer is one of the major preventable cancers affecting women worldwide. Persistent infection with high-risk human papillomavirus (HPV) is the necessary cause of almost all cervical cancers. Effective prevention therefore depends on HPV vaccination, screening for HPV infection or cervical precancer and timely treatment of women with screen-positive results. The World Health Organization (WHO) has emphasized organized screening and treatment approaches as essential components of cervical cancer elimination. HPV-DNA testing is increasingly recommended because it is objective, highly effective and suitable for self-collected samples in appropriate programmes.[1,2] Analysis of India's fifth National Family Health Survey reported a screening prevalence of 1.97% among women aged 30–49 years, ranging from 0.2% in West Bengal and Assam to 10.1% in Tamil Nadu. Screening was also associated with education, government health insurance coverage, and household wealth.[3] A review of Indian studies found that knowledge, positive attitude, and practice related to cervical cancer screening were reported in 20.31%, 43.64%, and 13.22% of women, respectively.[4] Women may fail to participate in screening because they do not understand the purpose of the test, believe that screening is unnecessary in the absence of symptoms, fear a positive result or experience embarrassment related to pelvic examination.[5,6] Other barriers include cost, distance from healthcare facilities, lack of privacy, waiting time, inconvenient services, negative healthcare-provider attitudes, cultural beliefs and inadequate support from partners or family members.[7,8] Evidence suggests that education alone may not be sufficient; effective strategies should combine accurate information with reminders, counselling, social support, improved accessibility and appropriate healthcare-system interventions.

MATERIALS AND METHOD

A comprehensive literature search was conducted in electronic database such as PubMed/MEDLINE and CINAHL supplemented by checking the reference lists of relevant reviews and primary studies. Search concepts included "cervical cancer," "cervical cancer screening," "awareness," "health education," "HPV," "screening uptake," "self-sampling," and "prevention." The reviewed evidence included systematic and scoping reviews, qualitative studies, randomized and other intervention studies, observational studies, and WHO guidance. Because this was a narrative synthesis, no pooled effect estimate was calculated.

AWARENESS OF CERVICAL CANCER AND SCREENING

Awareness is an important determinant of preventive health behavior. Women who understand cervical cancer, its risk factors, HPV infection, the purpose of screening and the benefits of early detection are more likely to recognize the importance of screening. However, several studies have demonstrated substantial gaps in knowledge.

A qualitative study among Malaysian women who had never undergone a Pap smear found limited knowledge regarding cervical cancer and the purpose of screening. Some women believed that the Pap smear was performed only to detect existing cervical cancer and therefore considered screening unnecessary when they had no symptoms. None of the participants had heard of HPV.[5] Ibadan, Nigeria, similarly identified limited awareness of screening procedures, low perceived personal risk, fear of a positive

result, and financial constraints.[6]

The review of Indian studies by Taneja and colleagues identified gaps in knowledge and screening practice, supporting the need for effective information, education, and communication strategies.[4] Awareness gaps have also been reported among female professional-college students, supporting the value of age-appropriate education before women enter screening-eligible age groups.[9] Among female health workers in Nigeria, 14.1% reported having ever undergone a Pap test, despite awareness of cervical cancer and the test being more common than actual screening use.[10]

FACTORS AFFECTING CERVICAL CANCER SCREENING UPTAKE

Lack of knowledge and misconceptions: - Limited understanding of cervical cancer and screening remains one of the most frequently reported barriers. Women may not recognize HPV as the major cause of cervical cancer or may believe that screening is required only when symptoms are present.[4-6] Improving health literacy should therefore be an essential component of cervical cancer prevention programs.

Fear, embarrassment and anxiety: - Fear of the screening procedure, fear of pain and fear of receiving an abnormal result can discourage women from attending screening. Embarrassment related to pelvic examination and concerns regarding privacy are also important barriers. These barriers have been reported across different populations, including migrant women and women surveyed in Malta.[5,7,8,11]

Cultural and social factors: - Cultural beliefs, stigma, religious misconceptions and inadequate support from spouses or family members may influence screening behavior. Migrant women may additionally experience language barriers, unfamiliarity with healthcare systems and cultural differences. Culturally sensitive education and community-based support can help overcome these barriers.[11,12]

Socioeconomic and geographical barriers: - Screening uptake is often lower among women with limited financial resources and among those living in rural or underserved communities. Indian data demonstrate substantial wealth-based inequality in cervical cancer screening.[3] Rural women may face transportation problems, long distances, limited availability of services and difficulty navigating healthcare facilities.[13]

Healthcare-system barriers: - Long waiting times, inconvenient appointments, limited privacy, fragmented follow-up, and negative healthcare experiences can reduce screening participation. Reviews of screening strategies emphasize that awareness campaigns are unlikely to be sufficient when services are difficult to access or when systems do not identify eligible women and support follow-up.[7,8,14]

STRATEGIES TO IMPROVE CERVICAL CANCER SCREENING

Health education and awareness programs: - Health education can improve understanding of cervical cancer, HPV, screening procedures, and the benefits of early detection. In Jamaica, a theory-based educational intervention significantly improved knowledge and intention to screen; some knowledge items improved by up to 62%, and 50 of 123 women reached at six months (40.7%) reported having undergone screening.[15] A systematic review of educational interventions identified several approaches, including individual counselling, group discussions, brochures, telephone counselling, videos, lectures, and tailored information.[16]

Individualized counselling: - Individualized, face-to-face counselling can address personal misconceptions and fears more effectively than general information alone. A study conducted in Turkey demonstrated that women receiving one-to-one education combined with an educational brochure had higher screening participation than women receiving a brochure alone or a simple invitation.[17]

Community-based education: - Community based interventions are

particularly useful for women who have limited access to healthcare facilities. Mass media combined with direct, tailored education has demonstrated greater effectiveness than relying on mass media alone.[18] Such approaches are particularly relevant for rural and underserved populations, where patient navigation, educational outreach, peer counselling and small-media interventions have been identified as useful approaches.[18]

Reminder and recall systems: - Reminder and recall systems can prompt eligible women who have not attended screening. A systematic review of interventions for young women identified reminders and other targeted approaches among the strategies evaluated.[19] In a randomized trial in Portugal, customized text messages and telephone calls followed by reminders resulted in screening adherence of 39.0%, compared with 25.7% after standard written invitations. The difference was statistically significant; text messages and reminders alone did not produce the same improvement as the multistep approach.[20]

mHealth interventions: - Mobile health (mHealth) interventions include text messages, telephone calls, and mobile applications used to provide information or reminders. A scoping review identified 12 studies, five of which reported a significant increase in screening uptake during follow-up within 12 months. The review also noted that privacy concerns and barriers such as transportation costs and inaccessible clinic appointments must be addressed alongside digital reminders.[21]

HPV self-sampling: - HPV self-sampling may improve access by allowing women to collect a sample themselves, potentially reducing embarrassment and practical barriers when validated tests and appropriate follow-up pathways are available. WHO guidance discusses self-sampling as an option within HPV-DNA screening programs.[1,2,22] An updated meta-analysis of 33 trials found that self-sampling invitations increased participation compared with usual screening invitations. The pooled participation differences were 13.2% for mail-to-all, 4.4% for opt-in, 39.1% for community mobilization and outreach, and 28.1% when offered through healthcare services. Opt-in approaches were less effective than mail-to-all approaches.[23]

Strategies for young women: - Young women may require specially designed interventions because screening uptake can decline in this age group. Evidence suggests that conventional invitation letters alone are insufficient. Reminder letters, telephone reminders, physician reminders and HPV self-sampling have demonstrated potential benefits.[19]

Strategies for rural and vulnerable women: - Rural women may face barriers such as distance, transportation, limited healthcare access, and inadequate information. Patient navigation, counselling, and community programs can improve screening awareness and access.[13] Migrant and culturally diverse women may benefit from preferred-language education and culturally appropriate interventions, with social support improving trust and acceptability.[12,31,322]

Health-system and workflow interventions: -

Screening uptake can be improved through healthcare system changes such as workflow redesign, case management, eligibility assessment, and same-day access. Organized programs show that identifying eligible women, arranging appointments, and tracking follow-up can promote equitable screening.[14,24]

Integrated prevention approach: - Cervical cancer elimination requires integrated HPV vaccination, screening, and treatment. WHO emphasizes high coverage of these interconnected components, with screening programs prioritizing under-screened, economically disadvantaged, and hard-to-reach women.[1,2,32]

Nurse-led counselling: - Nurses can improve cervical cancer screening by providing individualized education and counselling about risk factors, screening procedures, benefits and misconceptions, while addressing fear and embarrassment.

Evidence suggests that nurse-led interventions, including counselling, education, reminders and patient navigation, can improve screening uptake, cancer knowledge and early-detection beliefs.[25]

Digital health interventions: - Digital health approaches can help reach hard-to-reach women through tailored digital messages, online platforms and mobile-based communication. A recent 2026 trial protocol is evaluating tailored and generic digital interventions to improve cervical cancer screening knowledge, attitudes and practices among women in health-resource-limited areas.[26]

Follow-up and referral: - Timely follow-up of women with abnormal screening results and appropriate referral for further evaluation, colposcopy and treatment are essential to ensure continuity of care. Nurses can support follow-up by providing clear instructions, appointment reminders, referral guidance and tracking women until completion of recommended care.[1]

DISCUSSION

This narrative review highlights persistent gaps between awareness and actual screening participation. In India, the reported national prevalence of screening among women aged 30–49 years was 1.97%, with substantial state-level variation.[3] The Indian knowledge, attitude, and practice review likewise found that only 20.31% of women had knowledge of screening, 43.64% had a positive attitude, and 13.22% reported screening practice.[4] These figures are drawn from different sources and measures and should not be treated as directly interchangeable.

International findings illustrate how screening uptake varies by population and service context. In two hospital-affiliated clinics in Botswana, 72% of respondents reported having ever had a Pap smear; this clinic-based estimate should not be generalized to the entire national population.[29] In a nationwide household survey in Nepal, 39 of 829 women (4.7%) reported ever undergoing cervical smear testing.[30] Among female health workers in a tertiary institution in Nigeria, 14.1% reported a previous Pap test.[10] Together, these studies show that professional awareness, service availability, and actual uptake are not necessarily equivalent.

Evidence supports combining educational interventions with practical access measures. The Jamaican intervention improved knowledge and intention to screen, although fewer than half of the women reached at six months reported screening.[15] The Portuguese trial showed higher adherence when customized text messages and telephone calls were used as part of a multistep reminder strategy.[20] Meta-analysis also supports HPV self-sampling as a way to increase participation among under screened women, with effectiveness varying by the delivery strategy.[23] Reviews focused on lower socioeconomic groups and Indian awareness initiatives reinforce the need to design programmes for the barriers faced by specific populations.[27,28]

Implementation and long-term delivery remain important challenges. A South Asian systematic review found that sustainability and coverage were reported in only a minority of included studies, limiting the evidence available on whether programmes are maintained and reach their intended populations.[31] Cervical cancer elimination strategies therefore need coordinated vaccination, screening, and treatment pathways, while adapting delivery to local health-system capacity and community needs.[32]

CONCLUSION

Cervical cancer screening is essential, but low awareness and barriers such as fear, embarrassment, stigma, cost and limited access reduce screening uptake. Evidence shows that health education, counselling, reminders, community outreach, mHealth, patient navigation and HPV self-sampling can improve participation. Therefore, screening programs should adopt accessible, culturally sensitive and multicomponent strategies, with nurses playing a key role in education, counselling, referral and

continuity of care.

Declaration by Authors

Acknowledgement: None
Source of Funding: None
Conflict of Interest: No conflicts of interest declared.

Creative Commons Attribution License 4.0
This is an open-access article published under the terms of the Creative Commons Attribution 4.0 International License (CC BY 4.0).
https://creativecommons.org/licenses/by/4.0

REFERENCES

1. World Health Organization. WHO guideline for screening and treatment of cervical pre-cancer lesions for cervical cancer prevention. 2nd ed. Geneva: World Health Organization; 2021.
2. World Health Organization. New recommendations for screening and treatment to prevent cervical cancer [Internet]. Geneva: World Health Organization; 2021 Jul 6. Available from: https://www.who.int/news/item/06-07-2021-q-and-a-screening-and-treatment-cervical-pre-cancer-lesions-for-cervical-cancer-prevention
3. Muthuramalingam MR, Muraleedharan VR. Patterns in the prevalence and wealth-based inequality of cervical cancer screening in India. BMC Womens Health. 2023; 23:337. doi:10.1186/s12905-023-02504-y.
4. Taneja N, Chawla B, Awasthi AA, et al. Knowledge, attitude, and practice on cervical cancer and screening among women in India: a review. Cancer Control. 2021; 28:10732748211010799. doi:10.1177/10732748211010799.
5. Wong LP, Wong YL, Low WY, Khoo EM, Shuib R. Knowledge and awareness of cervical cancer and screening among Malaysian women who have never had a Pap smear: a qualitative study. Singapore Med J. 2009;50(1):49-53.
6. Ndikom CM, Ofi BA. Awareness, perception and factors affecting utilization of cervical cancer screening services among women in Ibadan, Nigeria: a qualitative study. Reprod Health. 2012; 9:11. doi:10.1186/1742-4755-9-11.
7. Lim JNW, Ojo AA. Barriers to utilisation of cervical cancer screening in Sub Sahara Africa: a systematic review. Eur J Cancer Care (Engl). 2017;26(1):e12444. doi:10.1111/ecc.12444.
8. Deguara M, Calleja N, England K. Cervical cancer and screening: knowledge, awareness and attitudes of women in Malta. J Prev Med Hyg. 2021;61(4):E584-E592. doi:10.15167/2421-4248/jpmh2020.61.4.1521.
9. Manikandan S, Behera S, Naidu NM, et al. Knowledge and awareness toward cervical cancer screening and prevention among the professional college female students. J Pharm Bioallied Sci. 2019;11(Suppl 2): S314-S320. doi: 10.4103/JPBS.JPBS_21_19.
10. Gharoro EP, Ikeanyi EN. An appraisal of the level of awareness and utilization of the Pap smear as a cervical cancer screening test among female health workers in a tertiary health institution. Int J Gynecol Cancer. 2006;16(3):1063-1068. doi:10.1111/j.1525-1438.2006.00579. x.
11. Ozturk NY, Hossain SZ, Mackey M, et al. HPV and cervical cancer awareness and screening practices among migrant women: a narrative review. Healthcare (Basel). 2024;12(7):709. doi:10.3390/healthcare12070709.
12. Maar M, Wakewich P, Wood B, et al. Strategies for increasing cervical cancer screening amongst First Nations communities in Northwest Ontario, Canada. Health Care Women Int. 2016;37(4):478-495. doi:10.1080/07399332.2014.959168.
13. Atere-Roberts J, Lee Smith J, Hall IJ. Interventions to increase breast and cervical cancer screening uptake among rural women: a scoping review. Cancer Causes Control. 2020;31(11):965-977. doi:10.1007/s10552-020-01340-x.
14. Bonuck K, Angier H, McCrimmon S, et al. A scoping literature review on evidence-based strategies to increase cervical cancer screening. J Prim Care Community Health. 2023; 14:21501319231220994. doi:10.1177/21501319231220994.
15. Coronado Interis E, Anakwenze CP, Aung M, Jolly PE. Increasing cervical cancer awareness and screening in Jamaica: effectiveness of a theory-based educational intervention. Int J Environ Res Public Health. 2016;13(1):53. doi:10.3390/ijerph13010053.
16. Saei Ghare Naz M, Kariman N, Ebadi A, et al. educational interventions for cervical

cancer screening behavior of women: a systematic review. Asian Pac J Cancer Prev. 2018;19(4):875-884. doi:10.22034/APJCP.2018.19.4.875.
17. Kurt G, Akyuz A. Evaluating the effectiveness of interventions on increasing participation in cervical cancer screening. J Nurs Res. 2019;27(5): e40. doi:10.1097/jnr.0000000000000317.
18. Black ME, Yamada J, Mann V. A systematic literature review of the effectiveness of community-based strategies to increase cervical cancer screening. Can J Public Health. 2002;93(5):386-393. doi:10.1007/BF03404575.
19. Albrow R, Blomberg K, Kitchener H, et al. Interventions to improve cervical cancer screening uptake amongst young women: a systematic review. Acta Oncol. 2014;53(4):445-451. doi:10.3109/0284186X.2013.869618.
20. Firmino-Machado J, Varela S, Mendes R, et al. Stepwise strategy to improve cervical cancer screening adherence (SCAN-Cervical Cancer)—automated text messages, phone calls and reminders: population-based randomized controlled trial. Prev Med. 2018; 114:123-133. doi: 10.1016/j.ypmed.2018.06.004.
21. Bhochhibhoya S, Dobbs PD, Maness SB. Interventions using mHealth strategies to improve screening rates of cervical cancer: a scoping review. Prev Med. 2021; 143:106387. doi: 10.1016/j.ypmed.2020.106387.
22. Arbyn M, Smith SB, Temin S, et al. Detecting cervical precancer and reaching underscreened women by using HPV testing on self-samples: updated meta-analyses. BMJ. 2018;363: k4823. doi:10.1136/bmj. k4823.
23. Costa S, Verberckmoes B, Castle PE, Arbyn M. Offering HPV self-sampling kits: an updated meta-analysis of the effectiveness of strategies to increase participation in cervical cancer screening. Br J Cancer. 2023;128(5):805-813. doi:10.1038/s41416-022-02094-w.
24. Kiser K, Butler J. Improving equitable access to cervical cancer screening and management. Am J Nurs. 2020;120(11):58-67. doi: 10.1097/01.NAJ.0000721944.67166.17.
25. Li C, Liu Y, Xue D, Chan CWH. Effects of nurse-led interventions on early detection of cancer: a systematic review and meta-analysis. Int J Nurs Stud. 2020; 110:103684. doi: 10.1016/j.ijnurstu.2020.103684.
26. Jia X, Da X, Shi J, et al. Digital health interventions for cervical cancer screening among hard-to-reach women in health-resource-limited areas: protocol for a controlled trial with historical controls and two randomized intervention arms. Digit Health. 2026; 12:20552076261416317. doi:10.1177/20552076261416317.
27. Rees I, Jones D, Chen H, Macleod U. Interventions to improve the uptake of cervical cancer screening among lower socioeconomic groups: a systematic review. Prev Med. 2018; 111:323-335. doi: 10.1016/j.ypmed.2017.11.019.
28. Shankar A, Roy S, Rath GK, et al. Impact of cancer awareness drive on generating awareness of and improving screening for cervical cancer: a study among schoolteachers in India. J Glob Oncol. 2018; 4:1-7. doi:10.1200/JGO.17.00074.
29. Mingo AM, Panozzo CA, DiAngi YT, et al. Cervical cancer awareness and screening in Botswana. Int J Gynecol Cancer. 2012;22(4):638-644. doi:10.1097/IGC.0b013e318249470a.
30. Ranjit A, Gupta S, Shrestha R, et al. Awareness and prevalence of cervical cancer screening among women in Nepal. Int J Gynaecol Obstet. 2016;134(1):37-40. doi: 10.1016/j.ijgo.2015.11.019.
31. Sabeena S, Ravishankar N, Kalpana MM. Implementation strategies of cervical cancer screening in South Asia: a systematic review. Int J Gynaecol Obstet. 2024;166(2):483-493. doi:10.1002/ijgo.15366.
32. Lehtinen M, Bruni L, Elfström M, et al. Scientific approaches toward improving cervical cancer elimination strategies. Int J Cancer. 2024;154(9):1537-1548. doi:10.1002/ijc.34839.

How to cite this article: Mitali Chakraborty, Mary V J, Kamatchi. K. Awareness and strategies to improve cervical cancer screening - a review. *International Journal of Research and Review*. 2026; 13(11): 106-112
DOI: *https://doi.org/10.52403/ijrr.20261110*

******