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Review Article

Acceptance of cervical cancer screening among women: global and Indian scenario

Rizwana Bano*, Reema Kumari

Department of Community Medicine and Public Health, King Georges's Medical University, Lucknow, Uttar Pradesh, India

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***Correspondence:**
Dr. Rizwana Bano,
E-mail: rbano186@gmail.com

ABSTRACT

Cervical cancer is the fourth most leading cause of cancer worldwide but most of the deaths have been reported from developing countries. The absence of HPV (Human papilloma virus) vaccination and cervical cancer screening program, two highly effective preventive interventions, may be to blame for this difference. Most of the countries have screening programs for cervical cancer but lack of education, Ignorance, lack of access or few other barriers have led to low acceptance of cervical cancer screening methods. One of the three components of WHO global elimination for cervical cancer strategy is to screen 70% of the women of the world by 2030 at the age of 35 and again at 45. In India cervical cancer screening prevalence is very low as of NFHS-5 (a nationally conducted family health survey). This study aims to review the cervical cancer screening acceptance across WHO regions with special focus on India. The literature search utilized PubMed, Google Scholar, and ResearchGate databases, with a period limit of January 2017 to July 2022.

Keyword: Cervical cancer, Screening, Awareness, Prevalence, Acceptance was used adding Boolean operator

INTRODUCTION

Cervical cancer is the fourth most frequently diagnosed cancer and the fourth leading cause of cancer death in women, with an estimated 604,000 new cases and 342,000 deaths worldwide in 2020.[1] The highest incidence of cervical cancers is recorded from eastern Africa (40.1%) and the lowest incidence are recorded from west Asia (4.1%). South East Asia has incidence rate of 17.8%. As of GLOBOCAN 2020, cervical cancer is the second most common cancer among women in India with an estimated incidence of 123,907 (18.3%) and mortality of 11.4%.[2]

Almost all cervical cancer cases (99%) are linked to infection with high-risk human papillomaviruses (HPV-16,18), an extremely common virus transmitted through sexual contact. Having HIV (the virus that causes AIDS) or smoking, using birth control pills for a long time (five or more years), having given birth to three or more children or having several sexual partners are some other factors that increases risk of developing cervical cancer.[3]

There are currently 4 vaccines that have been prequalified by WHO, all protecting against HPV types 16 and 18, which known to cause at least 70% of cervical cancers. The 9-valent vaccine protects against 5 additional oncogenic HPV types, which cause a further 20% of cervical cancers. Two of the vaccines also protect against HPV types 6 and 11, which cause anogenital warts.

Clinical trials and post-marketing surveillance have shown that HPV vaccines are safe and effective in preventing infections with HPV infections, high grade precancerous lesions and invasive cancer.[4]

In May 2018, director-general of the world health organization (WHO), called for action towards achieving

the global elimination of cervical cancer. In January 2019, executive board of WHO, consisting of several member states, "requested the director-general to develop, in consultation with member states and other relevant stakeholders, a draft global strategy to accelerate cervical cancer elimination, with clear goals and targets for the period 2020-2030.[5]

According to the global elimination of cervical cancer strategy 2018, 70% of women should undergo high-performance screenings by the ages of 35 and 45.[6] This review aims to estimate the prevalence of screening for cervical cancer across WHO regions and current situation in India toward achieving the same target.

LITERATURE SEARCH

Extensive literature search utilized as PubMed, Google Scholar, and ResearchGate databases, with a period limit of January 2017 to July 2022. All the relevant articles across WHO region and across India were identified. Only those studies were selected for review which had emphasised on prevalence or acceptance of any screening methods for cervical cancer.

Studies were the screened for full text and any duplication. A total of 14 studies were included for review out of which 7 were from different WHO regions and 7 were from different states of India.

OBSERVATIONS

Summarised results are given in tables on global scenario of acceptance of screening as shown in the Table 1 and Indian scenario of cervical cancer screening as shown in the Table 2.

Table 1: Studies showing global scenario of acceptance for cervical cancer screening.

Authors	Study design	Place of study	Sample	Results
Akokuwebe et al[10]	Cross sectional	Africa	5903	About 35.4% of women (n=2098) have had a Pap smear test. The proportion of women who had a Pap smear test was significantly higher among those with higher educational attainment (68.7%, p=0.000), in the rich wealth index (50.1%, p=0.000),
Watson et al[11]	Cross sectional	America	10,596	81.1% of women aged 21-65 reported having a Pap test within 3 years, only 66.8% of women in the United States <10 years reported a recent screening, compared to 77.0% of those in the United States >10 years
Portero et al[12]	Cross sectional	Europe	13,619	73.18% of women between 25 and 65 years had undergone cervical cytology in past 3 years
Alnafisah et al[14]	Cross-sectional study	Qassim region (central Saudi Arabia)	2,220 (15-64 years)	Only 339 (15.3%) had ever undergone for pap smear test. Among those participants who had never had a pap smear test, only 1,075 (57.2%) indicated a willingness to undergo it in the future
Amin et al[15]	Cross-sectional study	Iran	15,975	41.6% of women aged 18 and over reported ever had a cervical cancer screening. The highest proportion was found in women aged 40-49 years. The participation rate for women aged 30-59 years was 52.1%.
Pandey et al[22]	Cross-sectional study	Ugrachandi Nala VDC, Nepal	180 (30-60 years)	Less than half (47.6%) of the respondents had ever been screened. Among those who were screened, the most common (69.6%) reason for screening was health personnel's advice, whereas the least common (2.9%) reason was family's advice.
Anwar et al[23]	Cross-sectional study	Indonesia	5397	Only 1058 (20%) women were aware of Pap smears and 297 (5.5%), of which 297 had never had the procedure.

Table 2: Studies showing Indian scenario of acceptance for cervical cancer screening.

Authors	Study design	Place of study	Sample	Results
Reichheld et al[29]	Cross-sectional	Vellore, Tamil Nadu	1033 (25-65 years)	7.1% had undergone cervical cancer screening
Siddharthar et al[30]	Cross sectional study	Puducherry	400 (18-60 years)	49 women (12.2%) were aware of pap smear as a screening method of cervical cancer
Khanna et al[31]	Cross-sectional study	Varanasi district, Uttar Pradesh	290 community health workers	Less than 10% of participants had undergone screening in the past (24, 8.3%).
Khanna et al[32]	Cross-sectional study	CHC of Ghaziabad	1088 women (>30 years)	nearly one-fourth (255, 23.4%) knew that cervical cancer can be detected early by a screening test; however, very few (32, 2.9%) could name the test of screening method.
Shankar et al[33]	Pre-test-post test	Schools in different parts of India	872 (School teachers)	Only 233 (26.7%) were aware of pap test as screening tool. The major reasons were ignorance (83.5%), lethargic attitude (29.3%), and lack of time (10.9%).
Oswal et al[34]	Cross-sectional study	North east region, India Assam, Nagaland, Meghalaya)	1400	Among all 31% participants were aware of cervical cancer. Of all the eligible participants (n=910) in the study, only six participants had undergone any cancer screening in the past
Patra et al[35]	Cross-sectional study	North-west Delhi	373	Total 201 (53.8%) were aware of cervical cancer while only 7% knew pap smear as screening method for cervical cancer.

DISCUSSION

Screening programs for cervical cancer

The difference between countries with a high incidence of cervical cancer and those with a low incidence is attributable to the success of their cervical cancer screening programmes.

As per ACS (2020) guideline cervical cancer testing (screening) should begin at age 25.

Those aged 25 to 65 should have a primary HPV test every 5 years. If primary HPV testing is not available, screening may be done with either a co-test that combines an HPV test with a Papanicolaou (Pap) test every 5 years or a Pap test alone every 3 years.

Those over age 65 who have had regular screening in the past 10 years with normal results and no history of CIN2 or more serious diagnosis within the past 25 years should stop cervical cancer screening. Once stopped, it should not be started again.

People who have had a total hysterectomy (removal of the uterus and cervix) should stop screening (such as Pap tests and HPV tests), unless the hysterectomy was done as a treatment for cervical cancer or serious pre-cancer. People who have had a hysterectomy without removal of the cervix (called a supra-cervical hysterectomy**)** should continue cervical cancer screening according to the guidelines above.

People who have been vaccinated against HPV should still follow these guidelines for their age groups.[7]

WHO recommendations

For the general population of women

HPV DNA detection in a screen-and-treat approach starting at the age of 30 years with regular screening every 5 to 10 years.

HPV DNA detection in a screen, triage and treat approach starting at the age of 30 years with regular screening every 5 to 10 years.

For women living with HIV

HPV DNA detection in a screen, triage and treat approach starting at the age of 25 with regular screening every 3 to 5 years.[8]

Cervical cancer screening in LMICs (Low middle-income countries)

Economical concerns exist regarding universal implementation by governments, but studies show the cost-effectiveness of combining HPV vaccination with cervical cancer screening with visual inspections with

acetic acid (VIA) every 5 years. Indeed, several of the LMICs like Bhutan, Nepal, Thailand, Maldives, and Brazil are far ahead of India in HPV vaccination.

Strong advocacy exists on the theory that a decrease in cervical cancer rates is already happening because of socioeconomic improvement and there is no additional benefit of HPV vaccine.[9]

Cervical cancer screening across WHO regions

Africa

Cervical cancer (CC) is the cancer with the most incidents and the leading cause of cancer mortality among women in South Africa. A study by Akokuwebe et al analysed data from the 2016 South Africa demographic health survey which focused on 5903 women (15-49 years) resulted in the mean age at cervical cancer screening uptake among women in South Africa, 40.8 years. A majority of the women (39.3%) were aged 45 years and above and 54.6% of them resided in urban settlements. About 35.4% of women (n=2098) have had a Pap smear test, with 66.5% of them who had a Pap smear test resided in Western Cape province. The proportion of women who had a Pap smear test was significantly higher among those with higher educational attainment (68.7%, p=0.000), in the rich wealth index (50.1%, p=0.000), and those with health insurance cover.

Pap smear testing was found to be more prevalent among women aged 45+ years, were in the white population group, had higher education, were divorced, and had health insurance cover. The predominance of Pap smear test was 14% higher among women who are working in the professional/formal sector (AOR; 1.38, 95% CI; 1.14-1.69). The uptake of Pap smear test was also higher among women aged 35-44 years.[10]

America

Although marked declines have been observed in incidence rates worldwide, cervical cancer continues to disproportionally affect women in Latin America and the Caribbean (LAC), relative to most other regions. As of GLOBOCAN 2020, cervical cancer is the fourth most common cancer in females in North America and Fourth most common cancer in females of LAC region.

One study (Watson et al) used data from the 2015 U.S. National health interview survey (NHIS) to examine recent cervical cancer screening. NHIS is a cross-sectional household survey conducted in person in English or Spanish and representative of the civilian, noninstitutionalized US population. Overall, 81.1% of women aged 21-65 reported having a Pap test within 3 years, in accordance with recommendations. Non-Hispanic Asian and Hispanic women had lower percentages of Pap test within 3 years (73.5% and 76.9, respectively) than non-Hispanic white and non-Hispanic black women (82.6% and 84.5%, respectively). Only 66.8% of women in the United States <10 years reported a recent screening, compared to 77.0% of those in the United States >10 years. About 1/3 of women up to date on Pap testing reported having a co-test at their most recent screening.[11]

Europe

With 58,169 new cases per year cervical cancer is at 9th position in females of Europe (GLOBOCAN 2020). The incidence of cervical cancer has declined over time in Western Europe, particularly in Spain, which has one of the lowest age-standardized indices partly due to the high coverage of cytological screening programs. Portero et al conducted a cross-sectional study of 13,619 women aged 25-65 who participated in the 2017 Spanish National Health Survey and the 2020 European health survey for Spain. Result showed that 73.18% of women between 25 and 65 years had undergone cervical cytology in past 3 years. This finding was very similar to the cytology uptake value previously reported in Spanish women and may be due to the growing efforts by the Spanish health system to raise awareness of the benefits of screening for cervical cancer.[12]

Eastern Mediterranean region

Cancer incidence is rising in this region, which poses a concern because it causes a heavy illness burden, premature deaths, and rising healthcare expenses in the majority of the world's nations. There is a significant disparity in cancer control strategy and implementation between and within the nations. Twelve (or 55%) of the 22 nations have independent, comprehensive national cancer control strategies, and six (or 27%) have non-communicable disease plans that cover cancer.[13]

A document, “Early detection of cancers common in the Eastern Mediterranean Region,” guiding policy-makers on how to prioritize and differentiate between appropriate early detection approaches was published in 2017.

Al Nafisah et al conducted a cross sectional study in Qassim region of central Saudi Arabia in sample of 2,220 (15-64 years.) women, that showed only 339 (15.3%) had ever undergone for pap smear test. Among those participants who had never had pap smear test, only 1,075 (57.2%) indicated the willingness to undergo it in future.[14]

Amin et al reported cross-sectional analysis of the 2016 nationwide STEPS survey in Iran. Data on cervical cancer screening in addition to demographic and socio-economic factors from 15,975 women aged 18 and above were analysed. Overall, 41.6% of women aged 18 and over reported ever had a cervical cancer screening. The highest proportion was found in women aged 40-49 years. The participation rate for women aged 30-59 years was 52.1%.[15]

Riaz et al in a cross-sectional, questionnaire-based study conducted by approaching 450 females in the out-patient department (OPD) of a tertiary care hospital in Karachi, Pakistan from June 2019 to November 2019. Of the 388 females interviewed, 199 (51.3%) were aware of the term cervical cancer, and 68 (34.2%) knew about Pap smear as a screening test; only 80 (40.2%) women were familiar with HPV vaccination as prophylaxis against cervical cancer. The practice of screening and prevention was found to be remarkably low (2.1% and 1.8% respectively).[16]

Western Pacific region

Australia has three population screening programs: the national cervical screening program (NCSP), breast screen Australia and the national bowel cancer screening program (NBCSP). Since introduction of the NCSP, the cervical cancer incidence has halved, with an approximate 60% decrease in mortality. In 2017, testing for HPV every 5 years starting at age 25 replaced Pap smear as principal screening test. Screening participation rate approximates 57%, but is lower for aboriginal and Torres strait Islander women, women in remote areas, and women with lower socio-economic status.[17]

In China, cervical cancer screening started since 1990s, although late compared with Western countries, China still achieved great breakthroughs. The national health and family planning commission of China and China Women's Federation launched cervical cancer and breast cancer screening program for women aged 35-64 years old in rural areas in 2009, which was also one of the major public health service projects in China organized by national government. Different screening and management strategies have been set up for various resource-level regions.[18] Up to 2017, the project has offered cervical cancer screening for 73.99 million women. In July 2019, the State council issued the "healthy China action (2019-2030)" plan, emphasizing the need to move forward the diagnosis and treatment and optimize the allocation of medical resources, from the treatment-centered to the health-centered, and to improve health level of the whole people. The program also clearly points out that cervical cancer screening coverage rate needs to reach more than 80% by 2030.[19]

South East Asian region

Cervical cancer is a significant public health problem in the WHO South-East Asia Region. The Region accords high importance to the prevention of cervical cancer. In 2015, the Sixty-eighth session of the regional committee for South-East Asia in Dili, Timor-Leste, adopted a resolution (SEA/RC68/R5) on cancer prevention and control as the way forward in the context of comprehensive NCD prevention and control.

The roadmap for cervical cancer prevention in the SEA Region is elaborated in the regional strategic framework for the comprehensive control of cancer cervix, a regional vaccine action plan (2016-2020) ,and the action plan for the prevention and control of NCDs in South-East Asia 2013-2020.[20]

Bhutan, Maldives, Sri Lanka and Thailand have introduced the HPV vaccine nationally, and screening and treatment of pre-cancers have been initiated in all member countries of SEA region.[21]

Low screening coverage in the region is a result of insufficient screening capacity, and most locations have limited access to high-quality pathology, treatment, and palliative care services.

Pandey et al in a cross-sectional study Ugrachandi Nala VDC, Nepal 180 (30-60years) revealed that less than half (47.6%) of the respondents had ever been screened. Among those who were screened, the most common (69.6%) reason for screening was health personnel's advice, whereas the least common (2.9%) reason was family's advice.[22]

The Indonesian family life survey (IFLS) is a longitudinal household survey in Indonesia containing information from questionnaires, as well as physical and laboratory examinations Anwar et al performed a cross-sectional analysis of data of 5397 cancer-free Indonesian women aged 40 and older. Only 1058 (20%) women were aware of Pap smears and 297(5.5%). In the analysis, age, ethnicity, urban residence, marital status, education level, household expenditure, physical activity, openness, extroversion, agreeableness, neuroticism, insurance, distance to healthcare providers, menopausal status, age at menarche, comorbidity score, parental deaths of cancer, overweight, were associated with awareness of Pap smears among them had undergone at least one Pap smear in their lifetime.[23]

Cervical cancer is the 2nd most common cancer among women in Thailand, with an estimated 8,622 new cases in 2018. Opportunistic cytology-based screening for cervical cancer has been ongoing since 1985. In 2005, the ministry of public health and national health security office began providing nationwide cervical screening at 5-year intervals to all Thai women aged 35-60 years, the ministry of public health agreed to move forward to a paradigm change of "National cervical cancer screening 2020" starting in October 2020, by implementing primary HPV screening with partial genotyping for HPV 16 and 18 for all Thai women aged 30-60 years at 5-year intervals.[24]

India

For database of cancer cases, national cancer registry program (NCRP) was initiated in 1982 by Indian council of medical research (ICMR) which gives a picture of the magnitude and pattern of cancer in India.[25]

NCCP (National cancer control program) was launched in 1975-76 with the objectives of prevention, early diagnosis and treatment of cancer. During 2010, the program was integrated with National program on prevention and control of diabetes, cardiovascular disease, cancer and stroke (NPCDCS).

Under NPCDCS (National program for control of diabetes, cancer and stroke), opportunistic screening at CHC, District hospital and tertiary centres is recommended. At PHC level, early recognition of warning signs of common cancer as oral, breast and cervix and referral at higher center is recommended.[26]

In 2016 the ministry of health and family welfare of India recommended cervical cancer screening using visual inspection with acetic acid every 5 years for women aged 30-65 years (as per WHO guidelines). Despite the availability of effective low-cost screening options in India, limited access to screening and treatment services, diagnosis at a later stage, and low investment in health care infrastructure all contribute to the high number of deaths.[27]

As of NFHS-5 (2019-2020), a nationally representative survey conducted at the district level, screening prevalence for cervical cancer among adults (age 30-49 years) was very low (1.9%). In urban region it was 2.2% while in rural region only 1.7% had ever undergone for screening of cervical cancer.[28]

In India, one study from Vellore, Tamil Nadu reveals only 7.1% had undergone cervical cancer screening in the past.[29] Another study from Puducherry shows 12.2% were aware of pap smear as a screening method of cervical cancer.[30] In Varanasi, Uttar Pradesh a study on community health workers reveals that less than 10% of participants had undergone screening in the past.[31] In Ghaziabad nearly one-fourth (23.4%) knew that cervical cancer can be detected early by a screening test however very few (2.9%) could name the test of screening method.[32] One study done in schools teachers across India shows that only 26.7%are aware of pap test as a screening tool. The major reason was ignorance (83.5%), lethargic attitude (29.3%) and lack of time (10.9%).[33]

Another study conducted in North east Region (Assam, Nagaland, Meghalaya) shows that among all participants (n=1400) 31% were aware of cervical cancer however only 6 participants had undergone screening in the past.[34] In Delhi, the capital of India data from one study shows that only 53.8% of participants were aware of cervical cancer while only 7% knew pap smear as screening method for cervical cancer.[35]

CONCLUSION

This review indicates that there is a lack of knowledge about cervical cancer screening procedures, particularly in India. The majority of women were unaware of cancer screening procedures, and those who were quite reluctant to use them. Those who had previously received screening, mostly on the recommendation of medical professionals. It is necessary to raise awareness of cervical cancer, its risk factors, warning signs, and the advantages of early identification in order to increase the number of cases that are reported voluntarily. The majority of cases are only discovered through opportunistic screening.

To increase knowledge in the community and within the targeted population, such as high-risk groups, educational intervention is required. The use of screening camps may boost the frequency of cervical cancer screenings. Teachers, local leaders from the community, and community health professionals might be targeted for educational interventions to advance the community's knowledge.

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