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A cross-sectional study of knowledge and barriers in uptake of cervical cancer screening

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Abstract

More than 90% of instances of cervical cancer in women occur in developing nations, making it the second most frequent malignancy in women globally. About 15% of cancer-related fatalities worldwide are attributed to India, primarily in rural regions. This harmful condition can be effectively prevented by developing awareness campaigns and offering early Screening as a viable management option. From January 1, 2024, to June 30, 2024, a prospective questionnaire-based survey was carried out among women. Students made up the majority of the research population. There were 340 ladies among them. The majority of the 292 women (86%) who have not attended Screening gave a variety of excuses. Of the 48 women who showed up for the test, 23 (or 47.9%) had different symptoms and were receiving treatment. Three of these individuals were found to have cervical cancer. Obstacles were noted, including a weak economy, cultural legacies, ignorance, a shortage of women in the testing facilities, etc. Pap smear testing facilities must be available to all medical professionals and primary healthcare facilities.

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INTRODUCTION

Cervical cancer is one of the most prevalent cancers globally, coming in fourth among gynecological malignancies overall in terms of both incidence and mortality. Adenocarcinoma (AC), which makes up 10–25% of cervical tumors, is the second most common histotype after squamous cell carcinoma (SCC). Tumors are discovered at an earlier stage in a rising number of cases, even though most cases—especially in developing nations—are found at an advanced stage.

Numerous pathological factors have been proposed as prognostic indicators for early-stage

illness, with the ability to stratify patients into different risk categories. These factors include tumor size, histotype, lympho-vascular space invasion (LVSI), depth of stromal invasion, and lymph node status. However, considering the elevated death and recurrence rates associated with cervical cancer, the aforementioned prognostic variables remain largely insignificant and offer substandard predictive classification for recurrence. Consequently, to improve the clinical classification of patients with cervical cancer, new criteria that can provide more prognostic information are required [1].

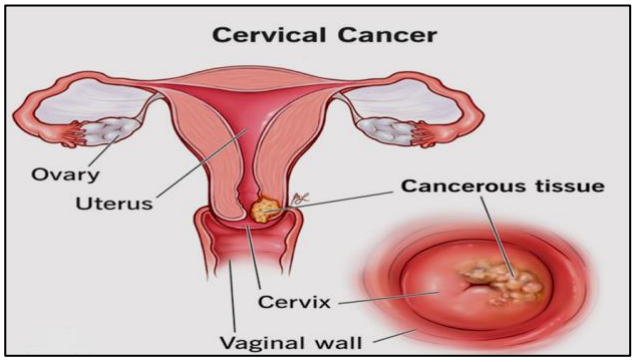

Figure 1 Cancerous tissues forming in the cervix

Uterine cervical carcinoma (UCC) staging is renowned for its imprecision, as it is the only clinically staged gynecological malignancy. Rarely does the genuine extent and the clinical assessment's concordance exceed roughly 55%. A portion is due to examiner expertise, although even the most skilled cannot determine the tumor's progression in every case without using specialized methods, such as examining the tissue specimen. The assessment of parametrial invasion presents a challenge that we have seen on occasion [2]. This is because parametrial invasion is highly correlated with both the survival rate and the recurrence of tumors. It is also significantly associated with other findings such as high histological grade, deep cervical invasion, lymphovascular space invasion, large tumor size, advanced stage, uterine or vaginal involvement, and pelvic or para-aortic lymph node metastases. The challenge of accurately assessing histology is determining what constitutes parametrial invasion vs non-parametrial invasion. This is primarily due to the imprecise definition of the term "parametrium" and the potential difficulty of precisely defining the histological boundary. These factors contribute to the frequent

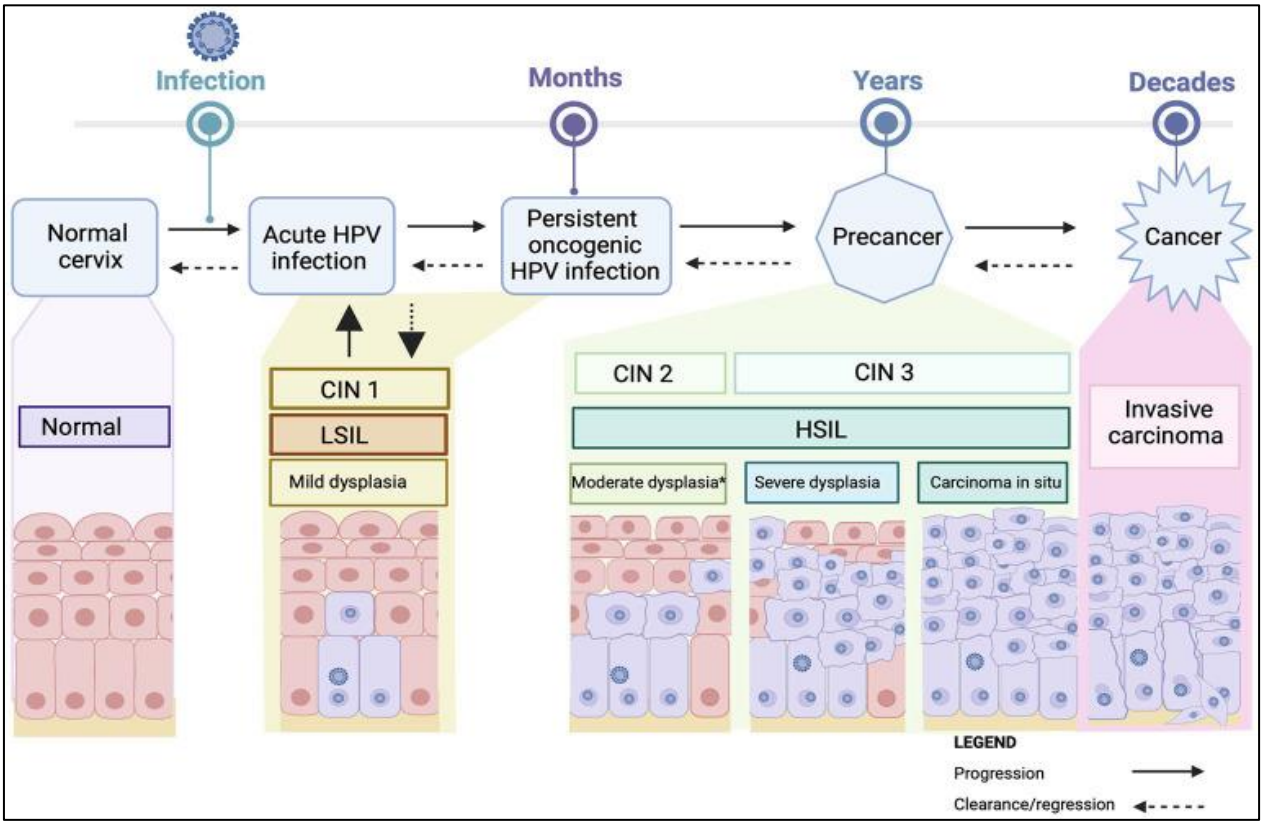

Figure 2 Cervical Carcinogenesis

Table 1 Incidence and Mortality of Cervical Cancer

	Incidence	Mortality	Five-year prevalence percentage
India	22.0	12.4	72.0
South East Asia	16.3	8.0	67.9
World	14.0	6.8	59.6

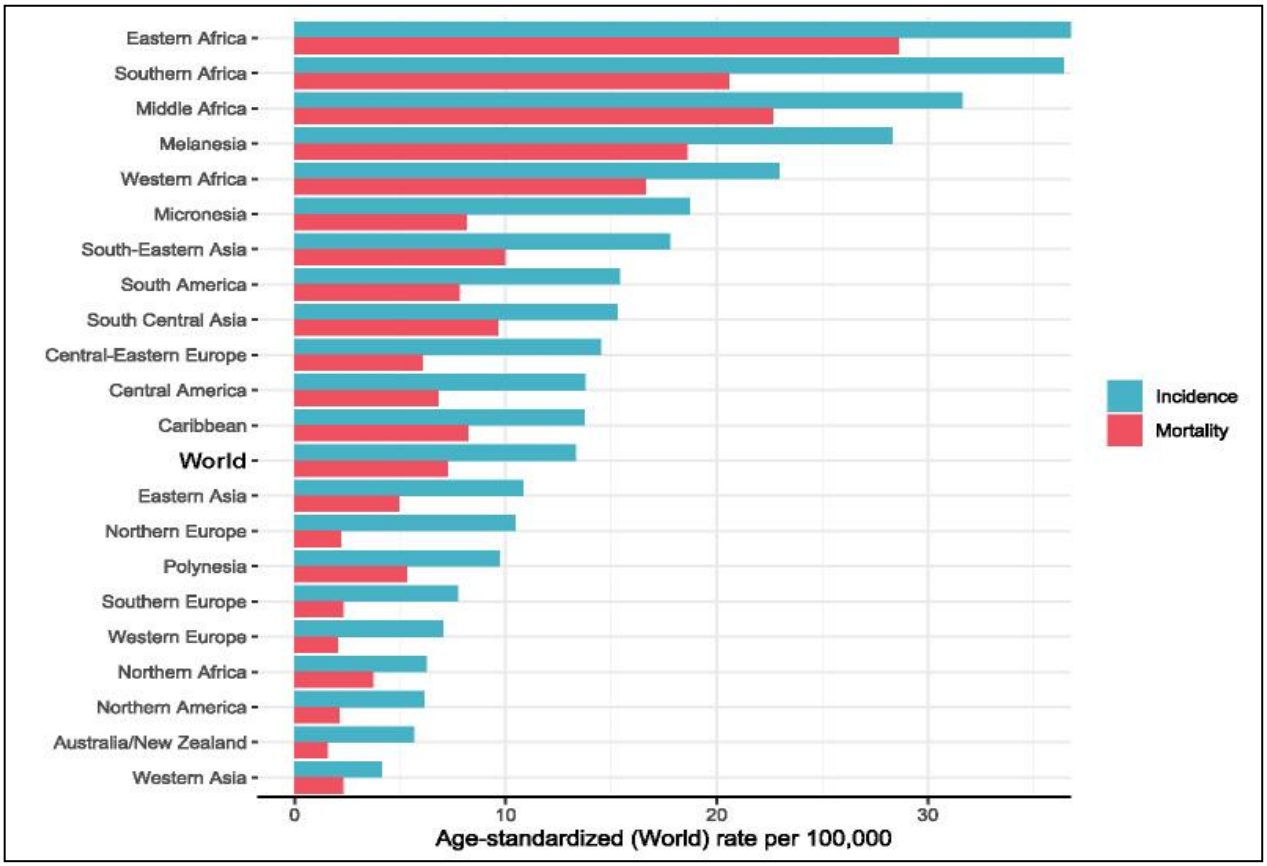

Figure 3 Age-standardized (World) incidence and death estimates for cervical cancer per 100,000 people

disagreement among pathologists regarding the presence or absence of parametrial invasion in uteri with severely invasive UCC close to the parametrium [3].

The principal source of Indian cancer surveillance data

The National Cancer Registry Programme (NCRP) was started in 1981 by the Indian Council of Medical Research (ICMR). Three hospital-based cancer registries (HBCRs) were established in Chandigarh, Dibrugarh, and Thiruvananthapuram, while three population-based cancer registries (PBCRs) were established in Bangalore, Chennai, and Mumbai. The most recent three-year report (2012-2014) includes data from 17 HBCRs and 27 PBCRs. The trends in cervical cancer incidence rates in a subset of PBCRs [4].

Human papillomavirus and cervical cancer

Human papillomavirus (HPV), primarily genotypes 16 and 18, is responsible for 70–80% of cervical cancer cases worldwide. In India, the prevalence of HPV is 10–37% in women without gynecological morbidities and 88–97% in women with cervical cancer. Women from lower socioeconomic strata, those with less education, and those who have more children are more likely to develop cervical cancer [5].

Incidence:

Cervical cancer is the second most common cause of cancer-related deaths among Indian women, with age-standardized incidence and mortality rates of 22 and 12.4 per 100,000 women per year, respectively. India accounts for twenty-five

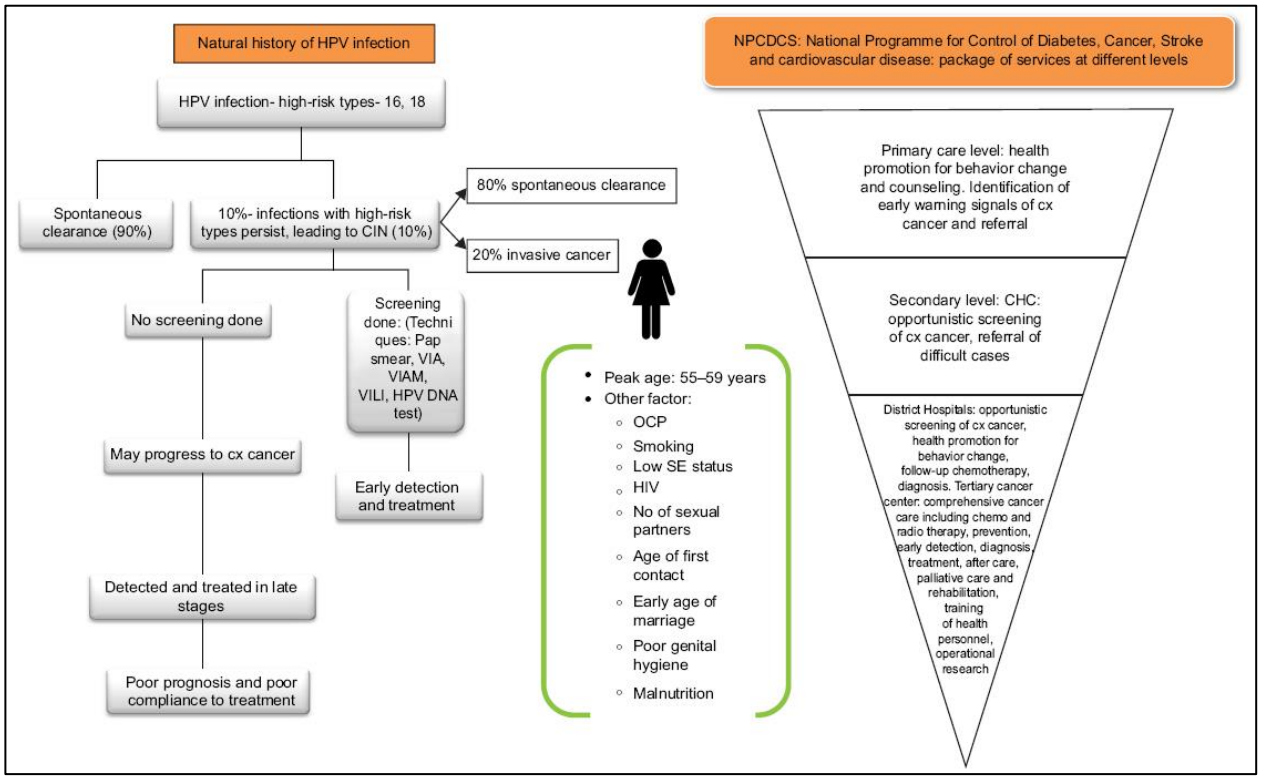

Figure 4 Epidemiology of Cervical Cancer

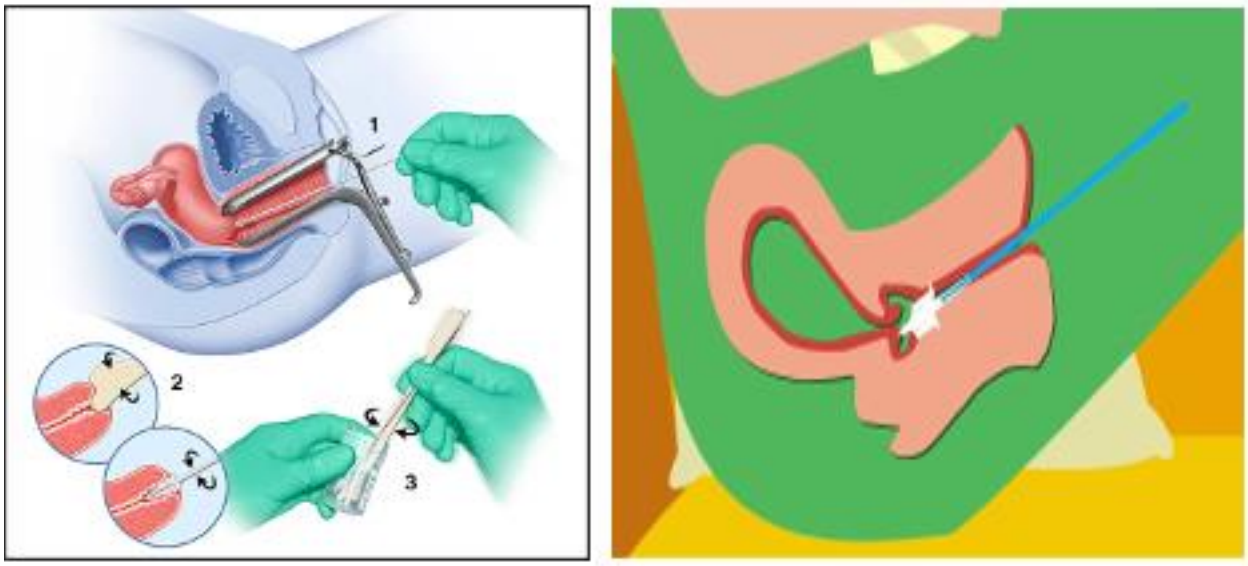

Figure 4 Pap Test and HPV DNA Test

percent of all cervical cancer-related deaths worldwide. This difference is caused by insufficient access to prompt treatment and ineffective Screening. The stage of diagnosis has a significant impact on the overall 5-year relative survival rate of 46% for all cervical cancers in India; survival rates for advanced-stage disease can be as low as 74%, while those for localized cancer can reach 73.2% [6].

Epidemiology of Human Papilloma Virus in Cervical Cancer

One sexually transmitted illness is HPV infection. High-risk HPV infection (hrHPV) is one of the most prevalent sexually transmitted viruses in the world. It is currently thought to be a prerequisite for the development of all forms of cervical cancer as well as precancerous intraepithelial lesions. Cervical cancer is primarily caused by persistent

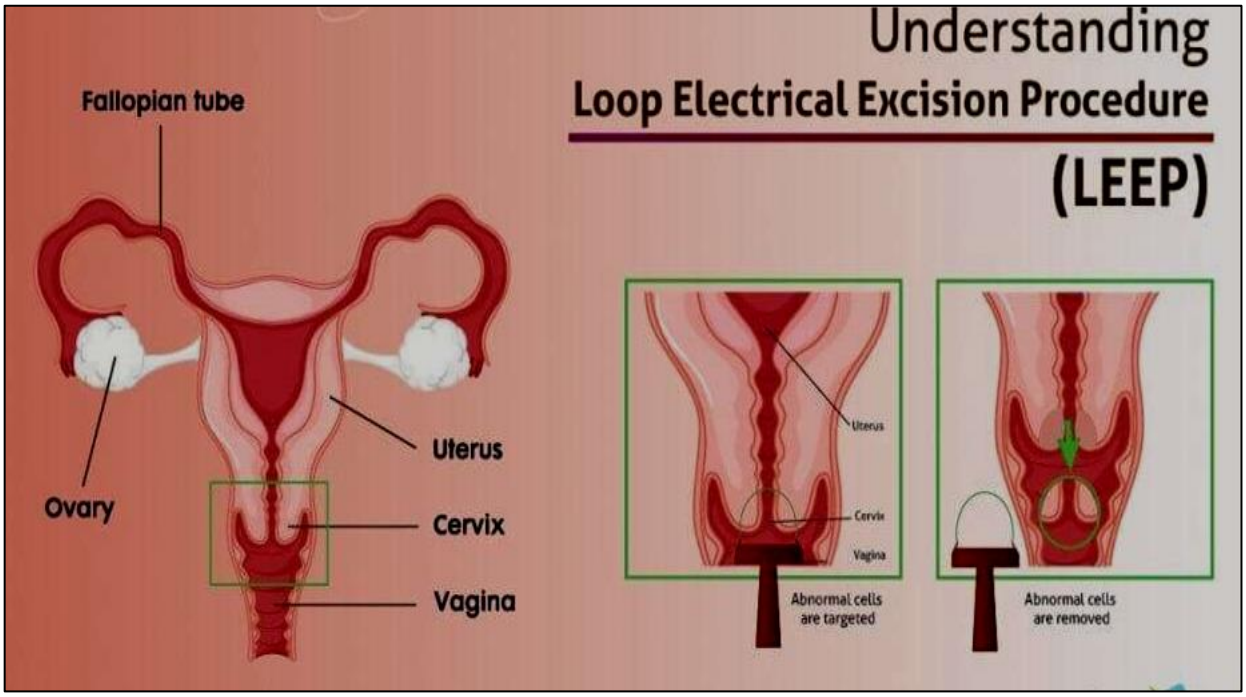

Figure 6 Electrical wire loop procedure

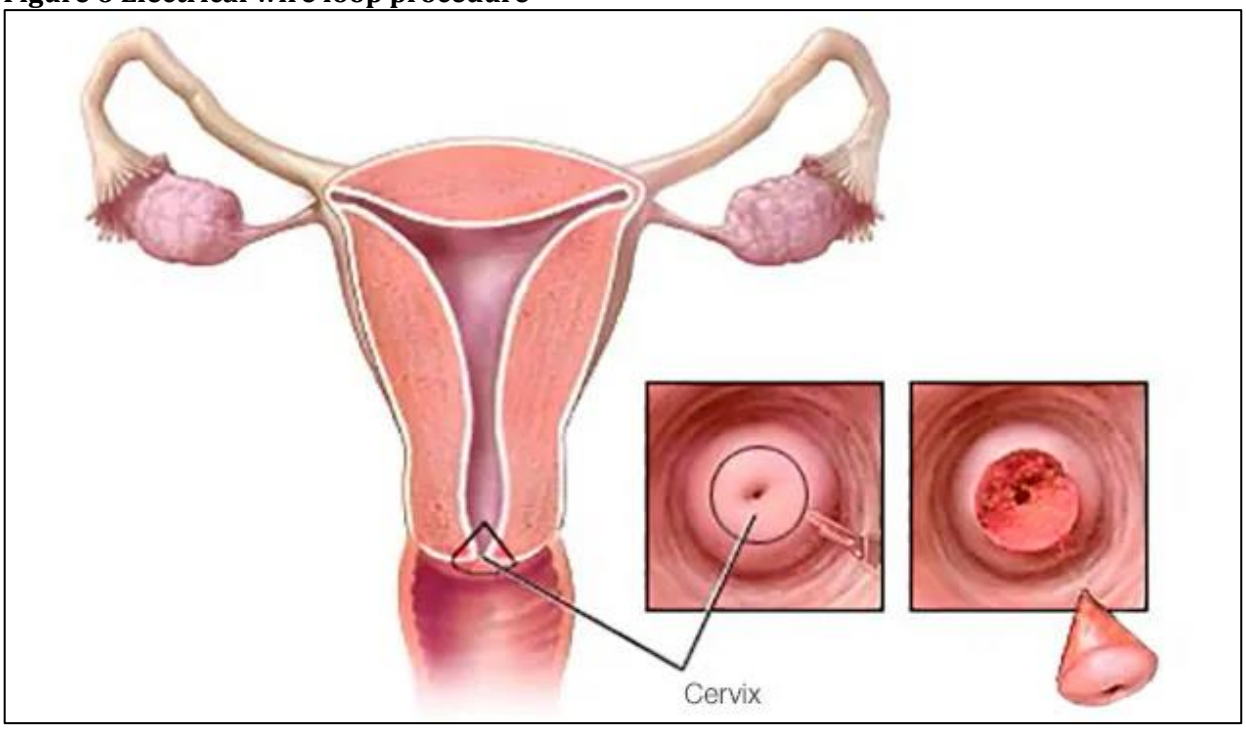

Figure 7 Cone Biopsy

infection with 15 hr HPV strains; roughly 70% of cases are caused by HPV-16 and HPV-18 infections. Ninety-five percent of squamous-cell carcinomas tested positive for HPV DNA were identified as HPV Types 16, 18, 48, 31, 33, 52, 58, and 35 in a study of eleven case-control studies.

The human papillomavirus, or HPV-16, is thought to be responsible for over 50% of cervical cancer cases. Multiple HPV types account for more than one-fourth of all HPV infections, and concurrent multiple (type) infections are frequent. The stages that lead from HPV transmission, viral persistence, and the advancement of these chronically infected

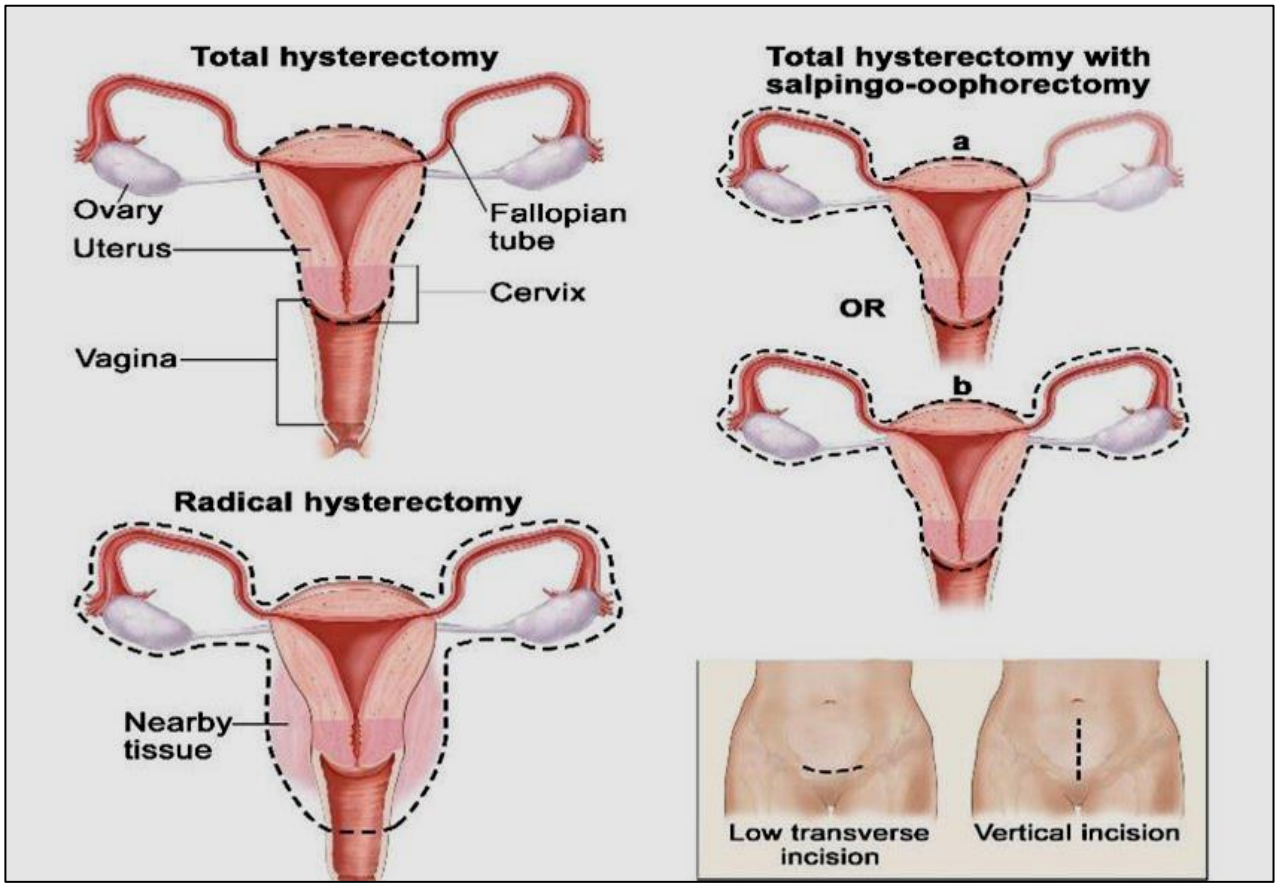

Figure 8 Type of Surgery for Cervical Cancer

Table 2 Socio Demo Graphic Details of the Respondents

Age group	Occupation	Marital status	Total	Percentage %
16-20	Students, daily wagers	Unmarried, married	248	36%
20-30	Students, employees, homemakers, daily wagers	Unmarried, married	132	19.4%
30-40	Employees, homemakers, daily wagers	Married,	69	9.8%
40-50	Employees, homemakers, daily wagers	Married, widows	119	16.8%
50-60	Employees, homemakers, daily wagers	Married, Widows	115	16.4%
60-70	Employees, homemakers, daily wagers	Married, Widows	12	1.4%

cells to precancer and invasion are what cause HPV infection to develop into cervical cancer [7].

Cervical cancer prevention: primary and secondary measures

Within the framework of the National Programme for Prevention and Control of Cancer, Diabetes, CVD, and Stroke of the National Health Mission, the Indian government has started screening all women between the ages of 30 and 64 for cervical cancer every five years through visual inspection using acetic acid. Broad programmatic guidelines and a screening and management algorithm have been made available by the Operational Framework of Management of Common Cancers (see below). This aligns with the World Health Organization's suggested approach for treating precancerous lesions in conjunction with secondary prevention [8].

Screening [9]

Screening tests help identify precancerous cells that have the potential to become cervical cancer as well as cervical cancer itself. The majority of medical organizations advise starting precancerous changes and cervical cancer screening at age 21. Every few years, the tests are typically repeated.

Screening tests include:

Pap test: A medical professional will scrape and brush cells from the cervical cavity during a Pap test. Subsequently, the cells undergo microscopic examination in a laboratory to find any abnormalities. Cervical cancerous cells can be identified via a Pap test. Furthermore, it can locate cell alterations that raise the possibility of cervical cancer. Precancerous cells are another term for these sometimes.

HPV DNA test: Cervical cells are tested for infection with any of the HPV strains that are most likely to cause cervical cancer as part of the HPV DNA test.

Diagnosis [10]:

A complete examination of your cervix is probably the first step in the testing process for people who may have cervical cancer. A colposcope is a specialized magnifying equipment used to look for cancerous growths.
A cervical cell sample is taken for laboratory analysis by the physician during the colposcopic examination. To obtain the sample, it might require:

Punch biopsy: This pinches off tiny segments of cervical tissue with a sharp instrument.

Endocervical curettage: It takes a tissue sample from the cervix using a delicate brush or a tiny, spoon-shaped curet tool.
You may be scheduled for additional testing if the findings of these tests raise concerns. These could consist of:

An electrical wire loop obtains a tiny tissue sample using a thin, low-voltage electrified wire. This is often carried out in a physician's office. You are given medication to numb the area to minimize any discomfort during the treatment. Another name for this test might be a loop electrosurgical excision technique or LEEP.

Cone biopsy: This process, or conization, enables your doctor to extract cervical cells from deeper levels for examination. A hospital is the usual setting for a cone biopsy. To ensure you are unconscious during the surgery, you could be given medication to induce sleep.

Cervical Cancer Treatment

For cervical cancer, there are various therapy options. The optimum course of treatment for cervical cancer depends in large part on the cancer stage or the extent of the disease within the body. Additional elements, like your preferences In addition to general health, treatments such as radiation, chemotherapy, surgery, or a combination of the three may be employed.

Surgery

Surgery is the usual course of treatment for small cervical cancers that haven't spread outside of the cervix. Which operation is ideal for you will depend on the size and stage of your cancer as well as if you would like to explore getting pregnant in the future [11].

Radiation therapy

Radiation therapy targets cancer cells with high-powered energy beams. Protons, X-rays, or other sources may provide the energy. When treating cervical malignancies that have spread outside of the cervix, radiation therapy and chemotherapy are frequently used in tandem. If there is a higher chance that the cancer will return following surgery, it can also be used.

Radiation therapy can be given:

External beam radiation therapy, as it is known externally. The bodily part that is afflicted is exposed to a radiation beam.

Referred to as brachytherapy internally. Usually, for a brief period, a radioactive material-filled device is inserted into your vagina.

Both on the exterior and interior [12].

Chemotherapy [13]

Chemotherapy kills cancer cells using potent medications. Low doses of chemotherapy are frequently used in conjunction with radiation therapy for cervical cancer that has spread outside of the cervix. This is because the treatment may amplify the effects of the radiation. It may be necessary to provide higher dosages of chemotherapy to assist in managing the symptoms of really advanced cancer. Chemotherapy might be used to lessen the tumor before surgery.

Targeted therapy

Drugs known as "targeted therapy" target particular compounds in cancer cells. Targeted treatments have the ability to kill cancer cells by inhibiting these substances. Chemotherapy and targeted therapy are typically given together. For advanced cervical cancer, it can be possible.

Immunotherapy

Immunotherapy is a medical treatment that stimulates your immune system to eliminate cancerous cells. Your immune system targets bacteria and other foreign cells to prevent illness. Cancer cells avoid the immune system to survive. Immunotherapy aids in the immune system's ability to identify and eliminate cancerous cells. When previous treatments fail and the cancer is advanced, immunotherapy for cervical cancer may be tried.

METHODOLOGY:

Study Design: A survey with a prospective questionnaire

Study Period: This study was carried out over six months, from January to June 2024.

Study Site: In Nellore

Materials: Forms for consent, data collection (I and II), patient education pamphlets, posters, multimedia, questionnaire forms I and II, risk assessment questionnaire, and feedback form are examples of awareness aids.

Inclusion Criteria: All women above 14 should be included to raise awareness.

Exclusion Criteria: Women who have had a total hysterectomy. Women whose cervical cancer history is positive.

Data Collection: The intended course of action for the work is as follows: A patient data collection form and questionnaire were created to include individuals who meet the requirements. This helped gather all the data needed for the study and encouraged women to participate in the screening program by identifying several obstacles to getting screening tests, such as Pap smears.

Study Method:

The research was carried out in Nellore. A pilot research evaluated the patient information booklet and questionnaire's comprehension and readability. All of the patient's information is recorded in a data-collecting form that was created. Appropriate information on cervical cancer was provided to patients. Patients received patient education pamphlets regarding cervical cancer. Videos and informational pamphlets were also given to patients and illiterate individuals who declined to participate in the trial. [14] The participants in the study who indicated their readiness to participate were given a self-administered questionnaire. After evaluating the self-administered questionnaire, the individuals were given a risk assessment questionnaire. Risk evaluation was given to patients with a good family history, married subjects, or completed family members. [15] Patients will be notified of their risk level after completing an online risk assessment tool. Patients were counseled on appropriate screening practices. Those who underwent Screening gave their consent. Patients who knew they were at risk were encouraged to get screened, which the doctor then did, and they were given advice on changing their lifestyle. A survey was dispersed at random to determine the study's more successful outcomes. It was noted that the knowledge levels differed. The data was analyzed using descriptive analysis, Likert's scale, Chi-Square, and P-test.

The study population's female participants revealed the following barriers.

Of the 695 female participants, 266 (40.2%) were students, and 248 (36%) were in the 16–20 age group. A portion of the married population also fell into this age group; of these, 60 were employed; the remaining individuals were single and pursuing their education, totaling 185. Of the 20–30 age group students, 132 (19.4%) were homemakers, 17 were employed, and 18 were used daily. Of the students, 45 were married, 86 were single, while the largest employers, 43 were in the 30–40 age group. Of the total number of employees, 43 were in the 30–40 age group, consisting of 9 homemakers and 21 daily wage workers [16]. The 40–50 age group has an equal distribution of 119 (16.8%) homemakers, while the 50–60 age group had a high number of homemakers (81), with the remaining 34 being daily wage earners, some of whom were married and widowed (115/16.4%). The 60–70 age group had a high number of widows, with a total of 12 (1.4%) [17].

Table 3 Distribution of Symptom Frequency and Screening Practices Among Women

Age	Symptoms			Pap Smear Underwent		
	Yes	No	Total	Yes	No	Percentage %
20-30	12(25%)	64	76	12	64	21.0
30-40	8(16.6%)	85	93	8	85	27.91
40-50	10(18.7%)	48	58	10	49	16.09
50-60	7(12.5%)	54	61	6	54	19.41
60-70	11(27%)	41	52	12	41	15.59
Total	48(100)	292	340	48	292	100

Table 4 Distribution of Symptom Frequency in Women

	Number	Percentage %
Vaginal Discharge	5	7.2
Post-coital bleeding	4	3.1
Menstrual irregularities	8	17.7
Postmenopausal bleeding	5	13.6
Hormonal imbalances	10	23.9
Other complaints	16	34.5
Total	48	100

Table 5 Results of Pap Smears in Women of Various Ages

Pap smear cytological diagnosis	20-30	30-40	40-50	50-60	60-70	Percentage %
Papillary endo-cervicitis	2 (3.1%)	-	1(3.0%)	-	-	6.25
Bacterial vaginosis	-	1(3.0%)	-	3(5.2%)	1 (2.0%)	10.41
Atrophic smear inflammatory changes	2 (3.1%)	-	1(3.0%)	-	1 (2.0%)	8.25
Inflammatory smear	-	3(6.2%)	1(2.0%)	2(4.1%)	-	12.5
Epithelial abnormalities	-	-	-	-	-	00
Candidial cervicitis	-	-	2(4.1%)	-	-	4.16
Dysplastic squamous epithelial cells	-	-	-	1(2.0%)	-	2.08
Squamous cell carcinoma differentiated	-		-	1(2.0%)	-	2.08
Squamous cell carcinoma undifferentiated	-		-	-	1(2.0%)	2.08

Of the 340 participants in the Screening, 292 did not exhibit any symptoms associated with the suspected illness. Of the total number of members, 64 (21%) are in the 20–30 age group, 85 (26.9%) are in the 30–40 age group, 48 (16.09%) are in the 40–50 age group, 54 (18.41%) are in the 50–60 age group, and 41 (15.59%) are in the 60–70 age group. Forty-eight patients who had confirmed positive symptoms underwent risk assessment. Of these 48 patients, 12 individuals (or 25%) in the 20–30 age range had pap smears performed, while 64 others had not. 8 (16.6%) of the thirty to forty-five individuals of the age group have had pap smears performed, whereas 85 (26.91%) have not. Forty-eight people (16.09%) have not had a pap smear test performed, whereas ten members (18.7%) who have performed one fall into the 40–50 age range. Fifty-four members have not had a pap smear performed, while seven (12.5%) of the members who had one fall within this age range. 41 (15.59%) individuals have not had a pap smear, whereas 11 (27%) members who fall within the 60–70 age range have had one performed [18].

Of the 340 females, 48 (13.5%) underwent the Screening. Menstrual abnormalities 8 (17.7%), vaginal discharge 5 (7.2%), post-coital bleeding 4

(3.1%), postmenopausal bleeding 5 (13.6%), hormonal imbalances 10 (23.9%), and additional problems such PCOS, infertility, back discomfort, and lower stomach pain 16 have been noted [19].

Twenty-three women (47.9%) of the 48 who came for the Screening had different symptoms. The age groupings have determined how they have been categorized. Between the 20–30 age group, 2 (3.1%) and 1 (4.0%) in the 40–50 age range were discovered. Papillary endo-cervicitis was found in 3 individuals, or 6.25 percent of the total. In the 30- to 40-year-old age group, 1(3.0%), 3(5.2%), and 1(2.0%) fell into the 50–60 and 60–70-year-old age groups. It was determined that 5 cases (10.41%) had bacterial vaginosis [20]. Atrophic inflammatory alterations were found in 4 (8.25%) cases. Two (3.1%) and one (4.0%) of the 40–50 age group members were found to be between the 20–30 age group. Six individuals, or 12.5% of the total, were found in the age range of 30–40, 1 in the 40–50, 2 in the 50–60, and 3 in the 30–40 age group. No anomalies of the epithelium were noted in the case of candidial cervicitis. Two people (4.1%) in the 40–50 age range overall. In the 50–60 age group, 1 (4.1%) had both dysplastic squamous epithelial cells and differentiated squamous cell carcinoma, whereas 1 (4.1%) in the 60–70 age group was found with the same number, meaning that it was undifferentiated squamous cell carcinoma [21].

48 patients out of 340 members had gone to Screening. Because of the obstacles, 292 members out of 340 did not go to the Screening. A maximum of 19% of patients did not show up for Screening because they were unaware of cervical cancer. Few individuals thought that getting screened costs money [22].

A total of 266 students took part in the poll out of 695 respondents. 248 (36%), 20-30, 40-50, and 60-70-year-olds were among the groups that participated in the study. The groups of 16–20, 20–30, 40–40, and 40–50 years old totaled 69 (9.8), 115 (16.4%), and 12 (1.4%) were among the groups of 16–20 years old. Of those, 340 members are screened, and 292 do not exhibit any symptoms associated with the suspected illness [23]. Of the 340 participants in the Screening, 292 did not exhibit any symptoms associated with the alleged illness. Of the total number of members, 64 (21%) are in the 20–30 age group, 85 (26.9%) are in the 30–40 age group, 48 (16.09%) are in the 40–50 age group, 54 (18.41%) are in the 50–60 age group, and 41 (15.59%) are in the 60–70 age group. Forty-eight patients who had confirmed positive symptoms underwent risk assessment. Of these 48 patients, 12 individuals (or 25%) in the 20–30 age range had pap smears performed, while 64 others had not. 8 (16.6%) of the thirty to forty-five individuals of the age group have had pap smears performed, whereas 85 (26.91%) have not. Forty-eight people (16.09%) have not had a pap smear test performed, whereas ten members (18.7%) who have performed one fall into the 40–50 age range [24]. Fifty-four members have not had a pap smear performed, while seven (12.5%) of the members who had one fall within this age range. 41 (15.59%) individuals have not had a pap smear, whereas 11 (27%) members who fall within the 60–70 age range have had one performed [25].

Forty-eight women, or 13.5% of the total, have undergone Screening. Menstrual abnormalities 8 (17.7%), vaginal discharge 5 (7.2%), post-coital bleeding 4 (3.1%), postmenopausal bleeding 5 (13.6%), hormonal imbalances 10 (23.9), and additional problems such as PCOS, infertility, back discomfort, and lower stomach pain 16 have been noted. Forty-five of them came to the Screening. The age groupings have determined how they have been categorized. Between the 20–30 age group, 2 (3.1%) and 1 (4.0%) in the 40–50 age range were discovered. Papillary endo-cervicitis was found in 3 individuals, or 6.25 percent of the total [26].

In the 30- to 40-year-old age group, 1(3.0%), 3(5.2%), and 1(2.0%) fell into the 50–60 and 60–70-year-old age groups. It was determined that 5 cases, or 10.4%, had bacterial vaginosis. There were 4 (or 8.25%) found to have atrophic inflammatory alterations. Two (3.1%) and one (4.0%) of the 40–50 and 60–70-year-old age groups were found to be separated from the 20–30-year-old group [27]. Three (6.2%) people in the 30- to 40-year-old age group, one (2.0%) in the 40–50 age group, and two (4.1%) in the 50–60 age group. In total, six (12.5%). No anomalies of the epithelium were found. A total of 2 (4.1%) are in the 40–50 age range. One person in the 50–60 age range (4.1%) had dysplastic squamous epithelial cells found in them. Out of the 50–60 age group, 1 (4.1%) differentiated squamous cell carcinoma

cases were detected [28]. Undifferentiated squamous cell carcinoma was identified in 1 (4.1%) in the 60–70 age group. Mainly, the obstacles to getting screening procedures were the subject of our investigation. Furthermore, it was shown that although most married women expressed interest in Screening, obstacles like cultural inheritance and a poor economy prevented them from attending screenings. [29] The second biggest barrier was the absence of female screeners at the facility, which was 15%. The primary hurdles were found to be fear and ignorance regarding vaginal exams, which accounted for 18% of the total. Another 10% of the reasons were things like being negative about the illness and the treatment or thinking it was a sin that needed to be detected early. [30] A smaller percentage of respondents (5%) who believed that cancer screening is expensive also expressed dissatisfaction over the unpleasant nature of the accompanying process, the fact that religious or cultural beliefs prohibit it, and the lengthy commute to the hospital; all received ratings of 8%. Everyone should be aware of the preventive steps that can lower their risk of developing this cancer, as it is a primary cause of death that is increasingly common.

CONCLUSION:

Many students participated in this study. Planning research with a bigger sample size will be more advantageous. It was also concluded that the majority of people were aware of the symptoms and risk factors related to cervical cancer. Of the 695 members, 266 members (39.9%) were aware of the HPV vaccine, whereas 429 members (60%) did not. The mortality rate can be successfully decreased and prevented with early detection. The government should take the lead in controlling and preventing these kinds of diseases in emerging nations like India, where the majority of the population lives in poverty. It needs to be obligatory that women over 30 undergo testing at least once every three years. Individuals with a positive family history should be proactive in Screening, getting vaccinated, and making other lifestyle changes. Government policy development in this area and raising public knowledge of cervical cancer are urgently needed. More considerable research in this area is also urgently required for cervical cancer prevention and control.

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Conflict of Interest

The authors declare no conflict of interest, financial or otherwise.

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