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Knowledge of the Warning Signs and Risk Factors for Cervical Cancer among Women Attending a Tertiary Hospital

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Abstract: Cervical cancer is a major cause of death from cancer among women globally. It has a pattern of development similar to that of a sexually transmitted disease and is associated with the greater risk from the number of partners and the earlier start of sexual activity. Different incidence patterns exist worldwide due to the establishment of screening programmes in some countries and not in others. Although cervical cancer rates and death rates have generally decreased over time, recent changes in lifestyle and sexual behaviour appear to be leading to an increase in the overall risk of developing cervical cancer. Smoking and the human papilloma virus (HPV) 16/18 are now important contributors to the idea of several factors, progressive cervix uteri carcinogenesis. Thus, screening programs, HPV vaccination, and societal preventative and control measures are advised. Using a cell morphological from observation to molecular analysis, cervical cancer screening techniques have changed over time. Both liquid-based cytology and high-risk HPV genotyping are popular strategies that are commonly recommended and used worldwide. Quick, inexpensive, accurate, and practical techniques will eventually become extra prevalent. By combining big data technology and picture identification, artificial intelligence also shows pledge for the detection of carcinoma of the cervical region. In the meantime, China has achieved considerable progress in the prevention and management of cervical cancer, which could act as a template for other resource-constrained poor countries. In conclusion, even though cervical cancer poses a threat to women's health, it may be the first cancer that humans are able to eradicate with a thorough Preventive and regulating plan.

Keywords: Risk factors, Epidemiology, Cervical cancer screening, HPV, HIV

Introduction

The cancerous cervix presents a major risk to the health of women and is the second highest prevalent cancerous tumor in women over the globe. It's been established that persistent cervical cancer must be caused by an HPV infection with a high risk **[1, 2]**. A thorough strategy for preventing and controlling cervical cancer was established and put into place more quickly due to the defined etiology. Over seventy countries and worldwide Educational organizations responded favorably to the World Health Organization's (WHO) prompt May 2018 appeal in order to universal elimination regarding cervical cancer **[3-6]**. In order to set the stage for future cervical cancer prevention and management, the World Health Organization then released an international strategy on November 17, 2020, to expedite

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cervical cancer elimination as a public health concern. Consequently, 194 countries made the first commitment to eradicate cervical cancer **[7]**. In so as to clear the route taken by the eradication of carcinoma of the cervix, we examined the present situation of epidemiology, danger elements, and cervical malignancy preventive screening control at this time significant point.

Prevalence of cervical malignancy

One of the most prevalent cancers in women is cervical cancer and is therefore a very significant contributor to the number of deaths that occur each year from cancer **[8]**. About 10-40% of younger women will be diagnosed with cervical cancer over the next 30 years **[9]**. According to data obtained by the IARC (International Agency for Research on Cancer) and WHO (World Health Organization), the number of new cases of cervical cancer globally in 2008 was approximately 529,000. Of these, approximately 452,000 were from developing countries; therefore, the second highest rate of cervical cancer is found in developing countries **[10]**. On the other hand, among female cancers, cervical cancer placed ninth with 77,000 new cases in industrialized nations.

A significant contributor to the ongoing global health crisis, cervical cancer is now considered the fourth most prevalent form of cancer among female patients. In 2018, it was projected that roughly 570,000 people would receive a diagnosis of this type of cancer. The total number of deaths caused by this disease was approximately 311,000, making cervical cancer the fourth highest cancer-related death rate among females **[11]**. When examining the difference in cervical cancer mortality rates between developed nations and developing nations we find substantial discrepancies. Of the total number of deaths from cervical cancer, approximately 85% occur in countries classified as having low to lower middle level incomes. In addition, individuals living in low resource areas have nearly an 18 time higher chance of dying from cervical cancer than females who live in high income countries **[12]**.

In terms of incidence, breast cancer is diagnosed most frequently among women globally; however, cervical cancer represents an important public health problem, particularly in countries with low human development index rankings. Countries that have a low Human Development Index (HDI) still report some of the highest rates of cervical cancer incidence and mortality in the world today. Many countries (28) currently account for more than 50 percent of total cases of cervical cancer among women; moreover, cervical cancer remains the second leading cause of cancer-related deaths among women in at least 42 countries worldwide, particular in Southeast Asia and many areas of Sub-Saharan Africa. The fact that most cervical cancer deaths occur in these regions illustrates the urgent need for improved prevention, early detection, and treatment for these underserved communities **[13]**.

Cervical cancer now has the highest incidence and death rates per region across Africa **[14]** than any other region, while cervical cancer incidence and mortality is 7-10 times lower in Western Asia, Australia/New Zealand, and North America **[15]**. On an overall basis cervical cancer remains the second most common type of cancer in women **[11]**. In 2015, there were 30,500 cervical cancer fatalities and 98,900 new cases, according to National Cancer Center data **[16]**. Over the past 20 years, China's cervical cancer mortality and incidence rates have been gradually increasing **[17]**.

A joint study was conducted in China between 2004 and 2007 by researchers (including members from WHO/IARC & Cleveland Medical Center, USA) exploring how many different types of HPV exist among females aged 15 to 59 years across rural and urban parts of China. Data were collected from eight different regions within China: Xiangyuan (Shanxi) & Yangcheng County (Shanxi), Hotan Prefecture (Xinjiang Uygur Autonomous Region), Xinmi County (Henan), and three cities - Shanghai, Beijing & Shenzhen located in Guangdong Province; Shenyang located in Liaoning Province.

Studies have shown a substantial correlation between chronic high-risk HPV infection and cervical cancer development. The fourteen high-risk HPV types are 16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 68, and 73. According to a cross-sectional survey research conducted at multiple centers, the frequency of dangerous China's HPV prevalence accounts for 14.3%.The predominant kinds include HPV18 (0.8%), HPV33 (1%), HPV16 (2.9%), HPV52 (1.7%), and HPV58 (1.5%),with During adolescence and the per menopause, two peaks were seen **[19]**. HPV33 is prevalent in Asia, While HPV16 is the most prevalent type globally and the second most prevalent is HPV18, whereas infection rates with HPV52 and HPV58 are quite low. It is demonstrates that there are both similarities and differences between the HPV epidemiology in China and the world.

An intersectional multi-center investigation on Precancerous HPV genotyping and cervical cancer was then carried out by the Chinese scientific research team using data from 19 hospitals spread across seven regions (Northeast, North, Central, East, Southwest, and South China). The most prevalent strains were HPV16, 18, 31, 52, and 58.HPV types found for cervical cancer tissue, respectively, according to pathological laboratory techniques of high quality control. HPV-16 and 18 were also shown more than 84.5% of cases of cervical cancer, making it the most carcinogenic **[20]**.

The a fore mentioned studies on HPV dominating kinds from various angles offer strong scientific proof and support for next studies and applications of in vitro diagnostic technologies, preventive HPV vaccines, epidemiological studies, and studies on the health economics of the Chinese people.

Risk factors for cervical cancer

Exposure cervical cancer risk factors are associated with HPV **[21, 22]**. The advancement of it could take 20 years for invasive cancer following the HPV-induced precursor lesion **[23]**. However, Numerous other risk factors exist as well (including sexual, behavioral, and reproductive aspects) for cervical malignancies, such as having several partners in sexual activity, smoking, high parity, low socioeconomic status, and engaging in sexual activity before the age of 16 **[24, 25]**.

Sexually transmitted infections (STI)

HPV

Dangerous or carcinogenic HPV infections are the main reason for both malignant and precancerous cervical lesions. The main cause of cervical cancer is HPV16 and 18 infections. It has been demonstrated that high-risk strains, especially HPV16, are incredibly prevalent in human communities **[22]**. Intraepithelial squamous lesions arise as a result of HPV infection, which is most commonly transmitted through sexual contact. After six to twelve months most

lesions are caused by immunological intervention go away. However, a tiny proportion of these lesions still exists and has the potential to develop into cancer.

A meta-evaluation revealed that 25 is the age with the highest frequency of HPV, This may be connected to shifts in sexual behavior **[26]**. A review of existing studies has examined the patterns of cervical cancer distribution across different regions. According to this distribution, there is an HPV breakout right after sexual activity, which is following which there is a plateau in adulthood and another peak beyond 45 **[27]**. Cervical intraepithelial neoplasia (CIN) is the result of a chronic infection with a high-risk HPV strain. One of the primary ways that HPV creates problems is through the activity of two viral oncoproteins, E6 and E7, which interfere with significant tumor suppressors' carcinogenesis.

The HPV oncoproteins E6 and E7 are responsible for a large part of the cancer-causing effects of HPV infection. E6 and E7 inactivate p53 and Rb, respectively, so cells cannot stop dividing when they should. E6 and E7 also alter the way host cells methylate DNA, as well as affecting how viral DNA is methylated. E6 and E7 also interact with other cellular proteins that will cause changes in critical biological pathways that regulate the immune response, apoptosis, cellular adhesion, genome stability, and control of cell growth **[28]**.

Immunodeficiency virus in humans (HIV)

High-risk HPV varieties are more common in women living with HIV **[29]**. Research studying the connection between HIV and cervical cancer discovered that those living with HIV had more rates of CIN and invasive cervix carcinoma, as well as more aberrant Papanicolau (Pap) tests and ongoing HPV infection with several oncogene viruses **[23]**. HIV-positive women are more likely to get cervical cancer and contracting HPV at a young age (13–18 years old). Compared to women who are not infected, HIV-positive people are found to have cervical cancer between the ages of 15 and 49 **[30]**.

Sexual and reproductive elements

Relationship partners

Factors associated with sexual behaviors are linked to cervical cancer. The association between multiple sexual partners and increased risk of developing cervical cancers was identified by researchers; these same researchers have shown in many other studies that women who have had multiple sexual partners have a greater chance of becoming infected with human papillomavirus (HPV), which increases their chance of developing cervical cancer **[32, 33]**. The meta-study found that those with several sexual partners were significantly more likely than those with few to acquire cervical illnesses, including both cervical cancer and non-cancerous cervical diseases. Even after HPV infection was taken into account, a significant risk factor for cervical cancer. Having intercourse when young is another increased risk of cervical cancer **[35]**.

Oral contraceptive (OC) pills

The fact that OC pills raise the chance of developing cervical cancer is established. An international collaborative epidemiological research of cervical cancer found that current users' relative risk rose as the length of time they used OC increased. The risk of cancer has been found to double when using OC for five years or longer (36). Additionally, according to a multi-center case-control research, women who tested positive for HPV DNA after taking OC tablets for five years or longer had a threefold increased chance of getting cervical cancer

(37). Moreover, the use of OC tablets was unmistakably connected to a greater risk of cervical cancer, especially adenocarcinoma, according to a recent meta-analysis and thorough review. The findings of the research show that OC tablet use is a distinct a potential cause of cervical cancer **[38]**.

In light of the global effort to eradicate cervical cancer, screening for the disease is now more important than HPV vaccination in terms of comprehensive prevention and control, particularly for techniques that have shown strong clinical outcomes.

An overview of cervical cancer screening procedures

Various approaches are available for screening for cervical carcinoma, including the following: HPV testing, liquid-based cytology (LBC), visual examination with Lugol's iodine and/or acetic acid (VIA / VILI), and traditional Pap sample collection methods. In developed countries, particularly in the U.S., the widespread availability of Pap smears has led to a significant decrease in cervical cancer incidence rates since the mid-1950s. A conventional Pap smears accuracy, however, may depend on a number of factors, including sample procedure, skilled workers, and the quality of the cytological chamber coloring and slide quality skills, and staff experience in cytology. Cytology's sensitivity can be as low as 30%–40% in places with little resources, while it can attain 80%–90% in industrialized countries with high requirements for circumstances of experimentation and technological competence. In 1996, the FDA (Food and Drug Administration) approved LBC for clinical use to solve the problems associated with traditional Pap smear cervical cancer screening methods. Compared to conventional Pap smear testing, LBC was much more sensitive. At the same time, developing countries have developed a methodical and efficient LBC cervical cancer screening program to ensure that cervical cancer screening can be done efficiently and consistently. With the discovery of the cause of cervical cancer, it is easier now to perform cervical cancer screening. In addition to cytology-based diagnostics, HPV testing is an integral part of the cervical cancer screening process.

In the detection of high-risk HPV in biopsy specimens and exfoliated cell samples from cervical lesions, many traditional laboratory methods employing physical and biological techniques (such as restriction endonuclease cleavage patterns and hybridization methods) have now been replaced with more modern Systems that employ polymerase chain reaction (PCR) as the detection methodology **[39]**, as well as most recently next generation sequencing (NGS) tests **[40]**. Currently, the primary methods used in HPV genotyping to identify certain types are PCR-based techniques and the highly conserved L1 gene. Consensus primers that might target and amplify fragments of different sizes, such as <100 bp with SPF10 **[41]**, 455 bp or 150 bp with the GP5+/6+ system **[42]** with the MY09/11|PGMY system **[43]**, were utilized in these PCR procedures. Additionally, it's crucial to keep in mind that these techniques are still the most accurate means of identifying and characterizing clinically relevant HPV **[44-46]**.

To achieve HPV genotyping, probes of a particular type must always be utilized in addition sequencing of DNA **[46, 47]**. Additional tests might be type-specific and provide immediate detection and discrimination of specific HPV types in a "onetube" experiment. These processes use specialized detection devices in addition to beta-globin detection and real-time (RT)-PCR techniques for internal quality control. The malignant pathways of cervical cancer

are intimately associated with the Oncoprotein activity of viruses E6 and E7, which may additionally aid in the emergence of viral integration and cellular genomic alterations **[48]**. Consequently, recent findings indicate that the detection of HPV E6/E7 mRNA may serve as a promising approach for identifying cervical cancer. Furthermore, amplification using reverse transcriptase or nucleic acid sequences were used in most tests. PCR to detect E6/E7 genome fragments **[49]**. The advancement of quantitative tests that target CpG methylation has been assisted by numerous studies that have lately demonstrated a connection between high-grade cervical lesions and higher HPV CpG site methylation levels (50,51). Research indicates that NGS assays can be used to measure CpG methylation of a single molecule level, which can help comprehend Methylation's role in the development of cervical cancer (39, 50).

Objectives

1. To assess baseline awareness regarding warning signs and risk factors of cervical cancer among women.
2. To administer a structures teaching programme (STP).
3. To evaluate the effectiveness of STP by comparing pre and post test scores.
4. To examine associations between demographic variables and awareness level.

Materials and Methods

The pre experimental study was conducted at the Narayan Medical College and Hospital in September and October of 2017. We included 400 women in the gynaecology outpatient department of a rural tertiary care hospital, ages 20 to 60.

Inclusion criteria

- Women who have agreed to take part in the research
- Married women aged between 20 and 60.

Exclusion criteria

- Women who refused to take part in the study
- Women under 20 or over 60.

Research Methodology: Quantitative methodology

Design: Pre-experimental Research Design

Setting: A selected Hospital

Population: Adult women

Sample Size: 400 Adult females

Purposive sampling is the method used for sampling

Data Analysis: Descriptive and inferential statistics (mean, SD, paired t-test, chi-square test)

Results

The results of the study which involved 400 women in a particular area Jaipur region are presented in this section. To assess the efficacy of the Structured Teaching Programme (STP), data were examined using descriptive and inferential statistics.

Section-I

Table 1: Distribution of Frequency and Percentage of Demographic Factors **(n = 400)**

S. No.	Demographic variable	Frequency (f)	Percentage (%)
1	**Age in years**		
	20-25 years	132	33.00%
	26-30 years	128	32.00%
	31-35 years	92	23.00%
	Above 35 years	48	12.00%
2	**Marital Status**		
	Unmarried	248	38.00%
	Married	152	62.00%
	Widow	0	0.00%
	Divorced	0	0.00%
3	**Religion**		
	Hindu	124	31.00%
	Muslims	128	32.00%
	Christians	120	30.00%
	Others	28	07.00%
4	**Education status**		
	No formal education	0	0.00%
	Primary education	0	0.00%
	Secondary education	184	46.00%
	Higher secondary	168	42.00%
	Graduation	216	42.00%
5	**occupation**		
	Private employee	212	53.00%
	Govt. employee	188	47.00%
6	**Income per month**		
	10000-19000	24	07.00%
	20000-29000	144	36.00%
	30000-39000	196	49.00%
	Above 39000	32	08.00%
7	**No. of deliveries**		
	one	08	02.00%
	two	72	18.00%
	Three	244	61.00%
	four	44	11.00%
	More than four	32	08.00%
8	**How do you know about cervix cancer**		
	Health professional	36	10.00%
	Television & news paper	270	67.50%
	Neighbours	94	23.50%
9.	**Family history of cervix cancer**		
	Yes	124	31.00%
	No	276	69.00%
10	**Dietary pattern**		
	Vegetarian	212	53.00%
	Non-vegetarian	188	47.00%

Section-II

Evaluate women's pre-existing and post-existing knowledge scores on cervical cancer by mean, mean percentage, and SD.

Table 2: Evaluate women's pre-existing knowledge score in relation to cervical cancer by mean, mean percentage, and SD. **(N=400)**

Level of pre-existing knowledge score of adolescent girls	Frequency (f)	Percentage (%)	Mean	Mean %	SD
Poor	224	56.00	5.25	1.312	2.473
Average	168	42.00	8.952	2.23	2.436
Good	08	02.00	13.0	3.25	2.444

According to Table no 2 which evaluates the prior knowledge score of women's, the frequency of having a low knowledge score was 224 (56%) with a mean of 5.25 (1.312%) and SD of 2.473. The mean knowledge frequency is 8.952 (2.23%), the SD is 2.436, and the average is 168 (42%). The frequency of good knowledge is 8 (2%), mean 13 (3.25%), and SD 2.444. women with the greatest previous knowledge scores had inadequate knowledge of cervical cancer.

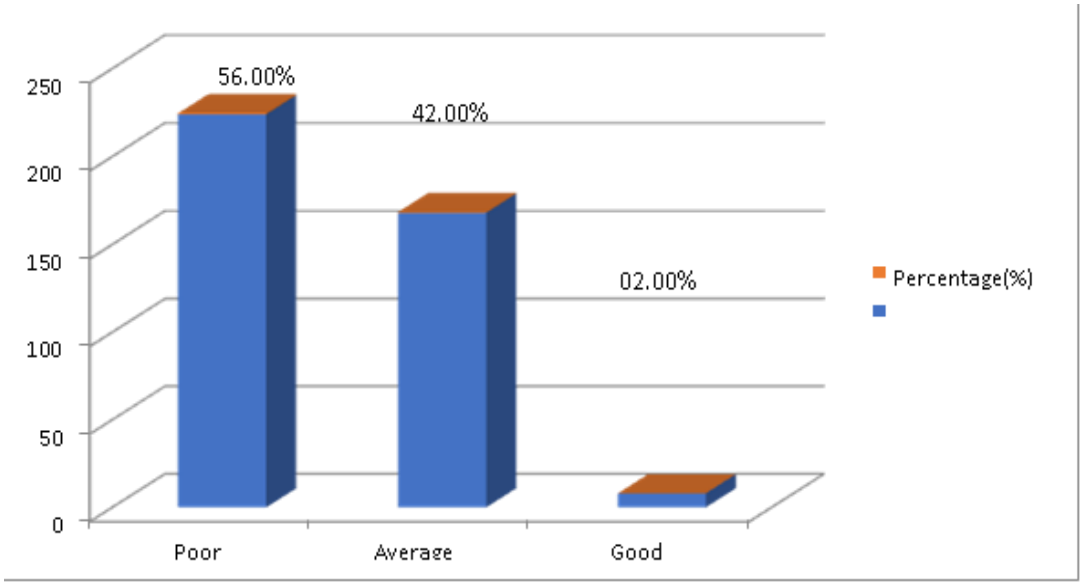

Fig. 1: Pre-existing knowledge score of adolescents.

Table 3: Evaluate women post-existing knowledge score on cervical cancer by mean, mean percentage, and standard deviation. **(N=400)**

Level of post existing knowledge score of women	Frequency (f)	Percentage (%)	Mean	Mean %	SD
Poor	64	16.00%	5.25	1.313%	4.355
Average	96	24.00%	11.167	2.792%	4.343
Good	240	60.00%	16.45	4.113%	4.323

According to Table 3, women with low post-existing knowledge scores had a frequency of 64 (16%), mean of 5.25 (1.313%), and SD of 4.355. The mean knowledge frequency is 11.167 (2.792%), the SD is 4.343, and the average is 96 (24%). The frequency of good knowledge is 240 (60%) with a mean of 16.45 (4.113%) and SD of 4.323. Most women who took the post-existing knowledge test had some knowledge of cervical cancer.

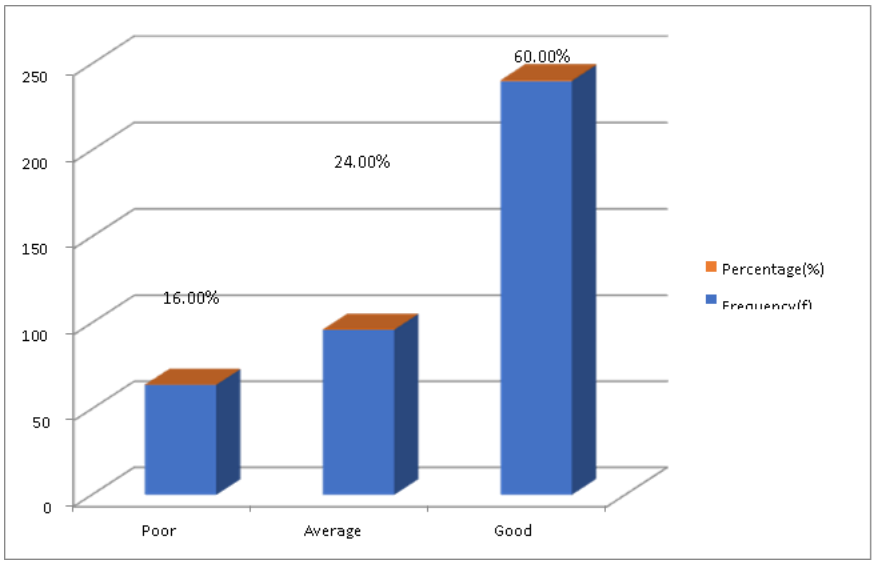

Fig. 2: Post-existing knowledge score of women

Section-III

Table 4: Comparison of the pre and post existing knowledge scores of women regarding cervical cancer by mean, mean percentage, and SD. **(N=400)**

Level of Knowledge	Pre-existing Level of Knowledge					Post-existing Level of Knowledge				
	Frequency (f)	%age	Mean	Mean %	SD	Frequency (f)	%age	Mean	Mean %	SD
Poor	224	56.00	5.25	1.312	2.473	64	16.00	5.25	1.313	4.355
Average	168	42.00	8.952	2.238	2.436	96	24.00	11.167	2.792	4.343
Good	08	02.00	13.00	3.25	2.444	240	60.00	16.45	4.113	4.323

According to Table No. 4, the majority of preexisting knowledge scores for women regarding cervical cancer was low. Post-existing knowledge about cervical cancer is well-known by the majority women.

Conclusion

Study participants had a good awareness of cervical cancer symptoms but a low awareness of risk factors. High awareness can be translated into real advantages by targeted measures, such as expanding access to HPV vaccination, population-based cervical screening, and diagnostic services.

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