A STUDY TO EVALUATE THE KNOWLEDGE, ATTITUDE AND PRACTICE ON CERVICAL CANCER AND UPTAKE OF HPV VACCINE IN BENGALURU

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ABSTRACT

Globally, cervical cancer ranks as the fourth most frequent malignancy in women. Almost all instances are caused by high-risk strains of the human papillomavirus (HPV), which is the main cause. Vaccines against HPV can lower the risk of cancer and avoid infection. Successful public health campaigns can fight this avoidable illness. Reducing the incidence of cervical cancer requires early detection and prevention. In addition to promoting and facilitating the uptake of HPV vaccinations, the study aims to assess the health-related knowledge, attitude, and practice of adults and adolescents regarding cervical cancer. 1404 participants were chosen from a selection of Bengaluru's schools, colleges, businesses, and local panchayats based on inclusion and exclusion criteria for this interventional study. Using the chi-square statistical approach, this study was examined.

An education program on cervical cancer produced impressive outcomes, increasing awareness from 11.9% to 96.8%, preventative measures from 50.5% to 98.5%, and sufficient understanding from 2.4% to 98.6%. This is an important improvement of 48% in preventative actions, 96.2% in knowledge, and 84.9% in awareness. The study found that young men, adolescent girls, and other community members had a high level of ignorance about cervical cancer. A health education program, however, increased awareness and HPV vaccination uptake. The best areas for awareness-raising and promotion include workplaces, schools, colleges, and village panchayats. Increased HPV vaccination rates, improved health outcomes, and a lower incidence of cervical cancer are all possible with this all-encompassing strategy. The first step in solving this serious health issue is public education.

Keywords: Cervical cancer, HPV (Human papillomavirus), HPV Vaccination, Screening

1. INTRODUCTION:

Cervical cancer arises in the epithelial lining of the cervix, the anatomical bridge between the uterus and vagina. Tumorigenesis is characteristically a gradual process, often initiated by a prolonged precancerous state—dysplasia—characterized by atypical cellular proliferation within the cervical epithelium. Without timely intervention, these lesions may breach the basement membrane, infiltrate stromal tissues, and metastasize locally or distantly.[1]

Molecular Pathogenesis and Lesion Progression

Malignant transformation is predicated on a stepwise continuum of cellular atypia:

- Cervical Intraepithelial Neoplasia (CIN):
  a) CIN1 (Low-grade SIL/Mild Dysplasia): Represents histologically minor deviations, frequently regressing spontaneously.
  b) CIN2/CIN3 (High-grade SIL/Moderate-Severe Dysplasia): Denotes more pronounced architectural disruptions with substantial malignant potential, necessitating vigilant observation or interventional therapy.[2]

Epidemiology:

Globally, cervical cancer stands as the fourth most prevalent malignancy in women and disproportionately contributes to cancer-related mortality within resource-limited nations.[3] Notably, disease incidence among young women has quadrupled in recent decades, with approximately 85% of global cervical cancer fatalities occurring in low- and middle-income countries, reflecting marked healthcare inequalities.[4]

Etiopathogenesis: The Pivotal Role of Human Papillomavirus (HPV)

Causally, oncogenic HPV infection, primarily subtypes 16 and 18, underpins nearly all cervical malignancies.[5] Of more than 200 known HPV genotypes, approximately 40 colonize the anogenital tract; persistent high-risk HPV infection orchestrates neoplastic evolution via integration of viral DNA, expression of E6 and E7 oncoproteins (which inactivate p53 and pRb tumor suppressors), and subsequent induction of genomic instability.

Immunological and Molecular Mechanisms -

While the majority of HPV-mediated cellular insults are intercepted and resolved by host immunity, immune evasion—especially in immunosuppressed populations—permits CIN establishment and progression. The virus exploits micro-abrasions in the squamous epithelium, integrating oncogenic DNA, and subverting cell-cycle checkpoints, thereby facilitating carcinogenesis.[6]

Risk Stratification:

Principal risk determinants encompass:
- Persistent infection with high-risk HPV genotypes
- Tobacco exposure (potentiating persistence and oncogenesis)
- Prolonged use of oral contraceptives (>5 years)
- Immunosuppression (HIV, post-transplant status)
- Early sexual debut, multiple sexual partners
- Sociodemographic disparity (lower income, restricted healthcare access)
- Poor menstrual hygiene and unskilled obstetric care[7]

Clinical Manifestations:

Pre-invasive disease is frequently asymptomatic, contributing to delays in diagnosis. Typical presentations in advanced stages include:
- Abnormal vaginal bleeding (intermenstrual, post-coital, postmenopausal)

- Pathologic vaginal discharge (variably colored, sometimes malodorous)
- Pelvic or coital pain[8]

Screening Strategies:

A dual approach employing prophylactic HPV vaccination and population-level cervical screening (cytology, HPV DNA testing, colposcopy, and biopsy as indicated) is vital for reducing incidence and mortality. Early identification and excision of premalignant lesions dramatically alter prognosis.[9]

Prevention Modalities:

- HPV Vaccination: Strongly recommended for preadolescents with extension to adults as per guidelines; vaccines (Cervarix, Gardasil, Gardasil-9) cover high-risk oncogenic types.[10]
- Behavioural Modification: Promotion of barrier contraception, reduction in sexual partners, and patient education.
- Routine Screening: Regular Pap tests and/or HPV DNA assays according to age and risk stratification.[11]

Therapeutic Interventions:

Treatment algorithms integrate disease staging, patient comorbidities, and reproductive considerations:

a) Surgical options: Range from local ablative procedures (conization, cryosurgery) to radical hysterectomy and, rarely, pelvic exenteration, contingent on tumor burden and dissemination.[12]
b) Radiation Therapy: External beam (EBRT) and brachytherapy, often in synergistic combination with chemotherapy in locally advanced cases.[13]
c) Chemotherapy: Systemic agents (cisplatin, carboplatin, etc.) are utilized for both curative and palliative intents.[14]
d) Targeted Therapy: Incorporation of agents such as bevacizumab (anti-angiogenic) and antibody-drug conjugates for molecularly profiled disease.[15]
e) Immunotherapy: PD-1/PD-L1 inhibitors (pembrolizumab, nivolumab) are established for refractory or metastatic disease, harnessing host immune mechanisms to combat tumor growth.[16]

Conclusion:

Cervical cancer epitomizes preventable oncologic morbidity through the concerted application of vaccination, screening, and accessible multidisciplinary care. Addressing socioeconomic disparities and enhancing public health infrastructure remain critical for equitable disease control.

2. MATERIALS AND METHODS:

2.1 Study design:

A Prospective Interventional study.

2.2 Place of study:

The study was conducted in selected educational institutions and work places in Bengaluru.

2.3. Study criteria:

a. Inclusion criteria:

All males and females of age 9 and above were included in the study.

b. Exclusion criteria:

- Children below 9 years were excluded from the study.
- Mentally retarded people were excluded from the study.

- People who were uncomfortable and who did not consent to the study were excluded from the same.

2.4 Sample size calculation:

The sample size was calculated by this equation

$$n=4pq/d^2$$

n = sample size

p = expected proportion of subjects with the character.

q = 100-p

= 100 – 77

= 23

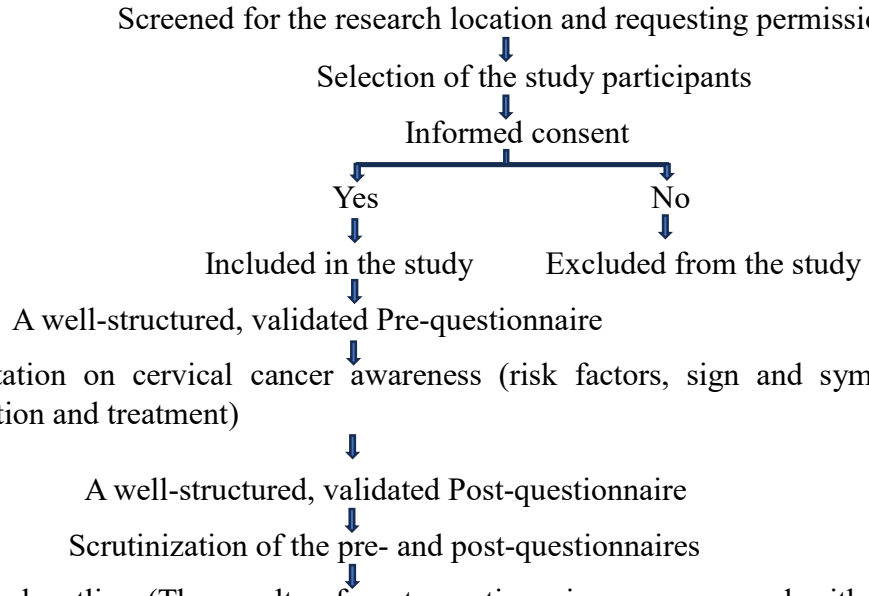
$$n = 4pq/d^2$$

$$n = \frac{4 \times 77 \times 23}{25}$$

$$n = 283.36$$

Not less than 284 subjects with precision of 5%.

2.5. Method of collection of data/study procedure:



The final outline (The results of post questionnaire are compared with the result of pre-questionnaire to determine the study population's Knowledge, Attitude and Practice).

2.6 Statistical Analysis:

The data was examined using IBM SPSS version 27, the Statistical Package for the Social Sciences, once the final data collection was finished. For categorical variables, percentages and proportions was used to express the results. Continuous data were expressed as median with interquartile range or mean with standard deviation (SD). The study's primary outcomes (understanding, prospective and behaviour on cervical health) was correlated with the independent categorical variables using the Chi-square test. A statistically significant result was defined as a p value of 0.05 or above.

2.7 Duration of the study:

The study was carried out for a duration of six months.

3. RESULTS AND DISCUSSION:

SOCIO-DEMOGRAPHICS

The study was carried out on 1404 subjects aged 9 to 60 years in selected schools, colleges, workplaces, and village panchayat in Bengaluru, Karnataka. A total of 1404 individuals participated in the study and gave a response rate of 100%.

Table 1: Subject distribution based on age

Age Interval	Frequency	Percent
9-20 years	1137	81
21-30 years	56	4
31-40 years	123	8.8
41-50 years	74	5.3
50-60 years	14	1
Total	1404	100

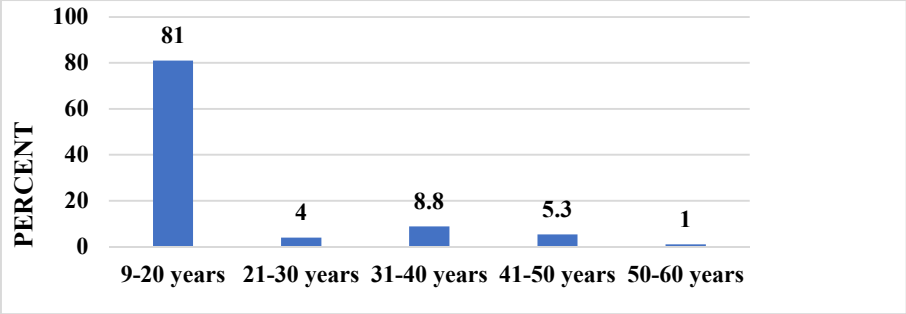


Figure 1: Subject distribution based on the age

Out of 1404 participants 1137 participants belonged to age 9-20 years (81%), 56 of them belonged to age 21-30 years (4%), 123 participants belonged to age 31-40 years (8.8%), 74 belonged to age 41-50 years (5.3%) and 14 belonged to age 51-60 years (1%).

Table 2: Subject distribution based on the gender

Gender	Frequency	Percent
Female	823	58.6
Male	581	41.4
Total	1404	100

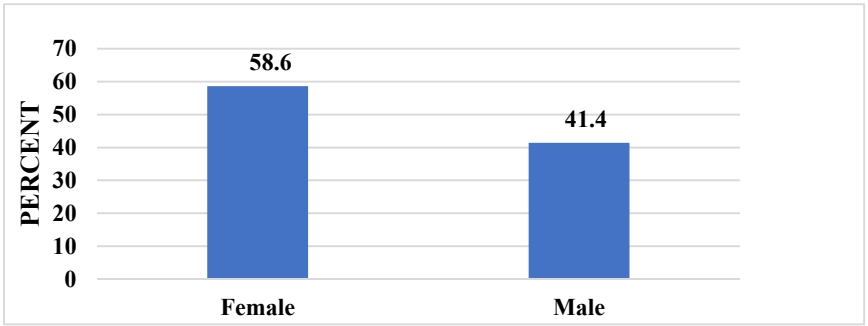


Figure 2: Subject distribution based on the gender

Out of 1404 participants, 823 participants were females (58.6%) and 581 (41.4%) participants were males.

ASSESSMENT OF KNOWLEDGE QUESTIONS

Table 3: The following table provides the knowledge assessed before and after intervention for "Have you ever heard of cervical cancer?"

Have you ever heard of cervical cancer?	Pre-Assessment		Post-Assessment	
	Frequency	Percent	Frequency	Percent
Yes	133	9.5	1364	97.2
No	1084	77.2	34	2.4
Don't Know	187	13.3	6	0.4
Total	1404	100	1404	100
Chi-square statistic = 2186.147, **p-value** < 0.001 (significant difference)				

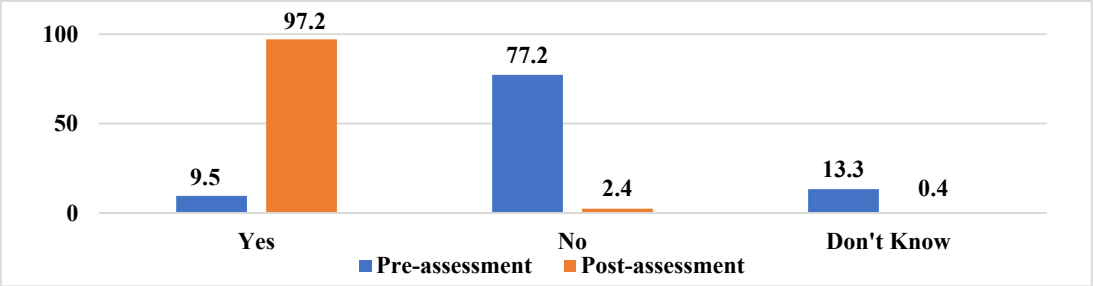


Figure 3: Pre and post-assessment of 'Have you ever heard of cervical cancer?'

About 9.5% (133) of participants in the pre-test had heard about cervical cancer, whereas the remaining participants had not. According to the post-test results, 97.2% (1364) of the participants learnt about cervical cancer.

Table 4: The following table provides the knowledge assessed before and after intervention for "What is the root cause of cervical cancer?"

What is the root cause of cervical cancer?	Pre-Assessment		Post-Assessment	
	Frequency	Percent	Frequency	Percent
Bacteria	231	16.5	24	1.7
Virus	328	23.4	1240	88.3
Fungi	296	21.1	50	3.6
Protozoa	303	21.6	44	3.1
Don't Know	246	17.5	46	3.3
Total	1404	100	1404	100
Chi-square statistic = 1203.689, **p-value** < 0.001 (significant difference)				

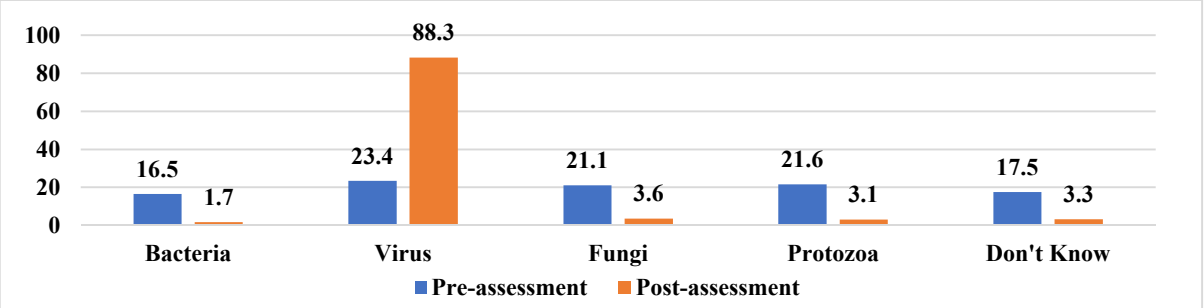


Figure 4: Pre and post-assessment of 'What is the root cause of cervical cancer?'

In the pre-test, 16.5% (231) of participants selected 'bacteria', 23.4% (328) selected 'virus', 21.1% (296) selected 'fungi', and 21.6% (303) selected 'protozoa'. In the post-test, 88.3% (1240) of the participants identified 'virus', 3.6% (50) as 'fungi', and 3.1% (44) as 'protozoa'.

Table 5: Pre and post-assessment of 'What are the risk factors for cervical cancer among the following?'

What are the risk factors for cervical cancer among the following?	Pre-Assessment		Post-Assessment	
	Frequency	Percent	Frequency	Percent
HPV infection	238	17	40	2.8
Tobacco Consumption	375	26.7	0	0
Early initiation of sexual activity	441	31.4	38	2.7
Long term use of oral contraceptives	192	13.7	72	5.1
All the above	158	11.3	1254	89.3
Total	1404	100	1404	100
Chi-square statistic = 1760.345, **p-value** < 0.001 (significant difference)				

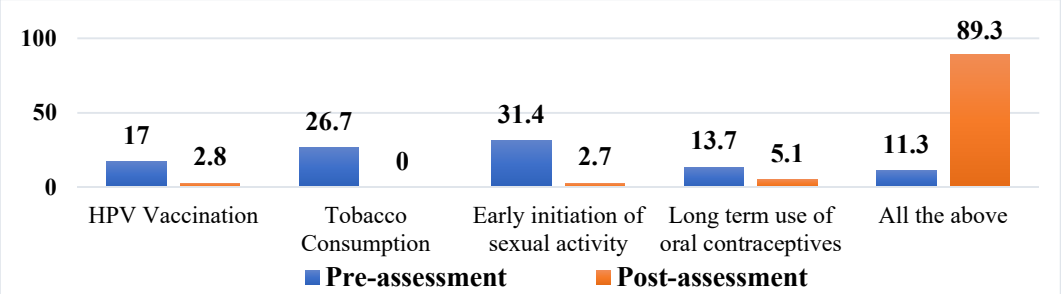


Figure 5: Pre and post-assessment of 'What are the risk factors for cervical cancer among the following?'

Based on the pre-test, the subjects had selected, Early initiation of sexual activity 31.4% (441), Tobacco Consumption 26.7% (375), Long-term use of oral contraceptives 13.7% (192), and Lack of HPV Vaccination 17% (238). The high percentage 89.3% (1254) in the post-test, suggests that most individuals have chosen multiple risk factors.

Table 6: The following table provides the knowledge assessed before and after intervention for "Can HPV infection transmit from one person to another?"

Can HPV infection transmit from one person to another?	Pre-Assessment		Post-Assessment	
	Frequency	Percent	Frequency	Percent
Yes	266	18.9	1271	90.5
No	295	21	20	1.4
Don't Know	429	30.6	36	2.6
May be	268	19.1	77	5.5
If Yes, mention how it is transmitted	146	10.4	0	0
Total	1404	100	1404	100
Chi-square statistic = 1481.110, **p-value** < 0.001 (significant difference)				

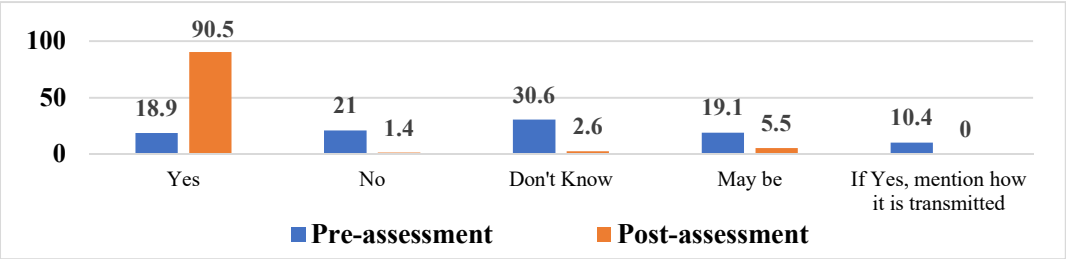


Figure 6: Pre and post-assessment of 'Can HPV infection transmit from one person to another?'

In the pre-test, 18.9% (266) of individuals believed HPV can be transmitted from one person to another, 21% (295) believed it cannot be transmitted, 30.6% (429) didn't know, 19.1% (268) thought it may be transmitted, and 10.4% (146) mentioned a transmission method (not specified). In the case of the post-test, 90.5% (1271) of individuals understood that HPV can be transmitted from one person to another, only 1.4% (20) still believed it could not be transmitted, and 2.6% (36) still didn't know.

Table 7: The following table provides the knowledge assessed before and after intervention for "Are you familiar with Pap smear test?"

Are you familiar with Pap smear test?	Pre-Assessment		Post-Assessment	
	Frequency	Percent	Frequency	Percent
Yes	67	4.8	1379	98.2
No	1135	80.8	16	1.1
Don't Know	202	14.4	9	0.6
Total	1404	100	1404	100
Chi-square statistic = 2454.843, **p-value** < 0.001 (significant difference)				

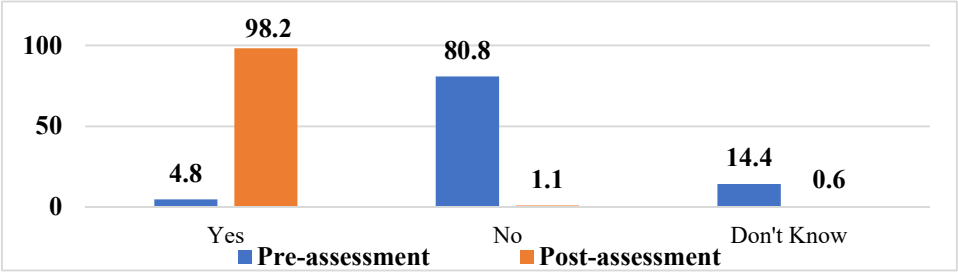


Figure 7: Pre and post-assessment of 'Are you familiar with Pap smear test?'

In the pre-test, only 4.8% (67) of individuals were familiar with the Pap smear test, 80.8% (1135) were not familiar, and 14.4% (202) didn't know. In the post-test, 98.2% (1379) of individuals became familiar with the Pap smear test, only 1.1% (16) remained unfamiliar, and 0.6% (9) still didn't know.

Table 8: The following table provides the knowledge assessed before and after intervention for "What would be the recommended age to receive HPV vaccine?"

What would be the recommended age to receive HPV vaccine?	Pre-Assessment		Post-Assessment	
	Frequency	Percent	Frequency	Percent
1-5 years	475	33.8	112	8
9-26 years	303	21.6	1218	86.8

25-30 years	626	44.6	74	5.3
Total	1404	100	1404	100
Chi-square statistic = 1210.214, **p-value** < 0.001 (significant difference)				

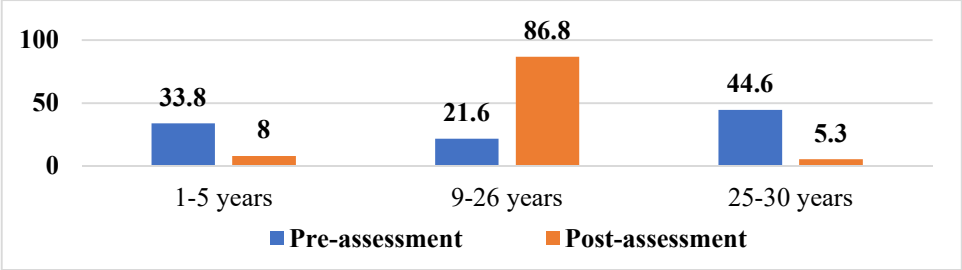


Figure 8: Pre and post-assessment of 'What would be the recommended age to receive HPV vaccine?'

In the pre-test, 33.8% (475) believed the recommended age is 1-5 years, 21.6% (303) believed it's 9-26 years, and 44.6% (626) believed it's 25-30 years. In the case of the post-test, 8% (112) still believed the recommended age was 1-5 years, 86.8% (1218) correctly understood that the recommended age is 9-26 years, and 5.3% (74) still believed it was 25-30 years.

Table 9: The following table provides the knowledge assessed before and after intervention for "Are you aware of any HPV vaccine which is available in India?"

Are you aware of any HPV vaccine which is available in India?	Pre-Assessment		Post-Assessment	
	Frequency	Percent	Frequency	Percent
Yes	93	6.6	1196	85.2
No	910	64.8	72	5.1
Don't Know	268	19.1	94	6.7
May be	118	8.4	32	2.3
If Yes, mention it	15	1.1	10	0.7
Total	1404	100	1404	100
Chi-square statistic = 1792.898, **p-value** < 0.001 (significant difference)				

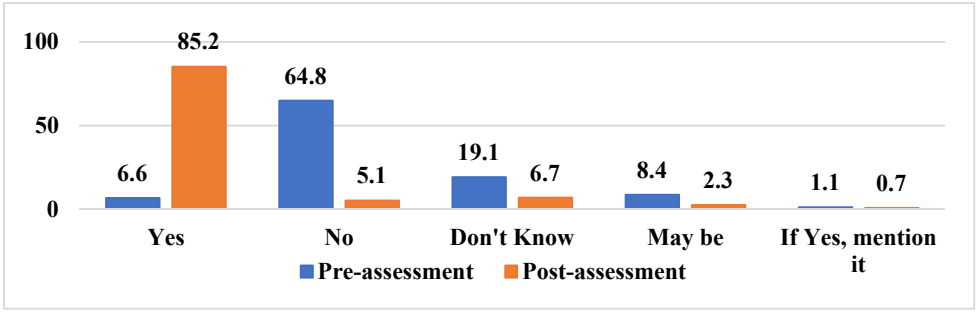


Figure 9: Pre and post-assessment of 'Are you aware of any HPV vaccine which is available in India?'

In the pre-test, only 6.6% (93) were aware of HPV vaccines available in India, 64.8% (910) were not aware, 19.1% (268) didn't know, 8.4% (118) thought maybe, and 1.1% (15) mentioned a specific vaccine (not specified). Whereas in the post-test, 85.2% (1196) became aware of HPV vaccines available in India, only 5.1% (72) remained unaware, 6.7% (94) still didn't know.

ASSESSMENT OF ATTITUDE QUESTIONS

Table 10: The following table provides the awareness assessment before and after intervention for "What do you think, HPV vaccine is safe?"

What do you think, HPV vaccine is safe?	Pre-Assessment		Post-Assessment	
	Frequency	Percent	Frequency	Percent
Yes	113	8	1355	96.5
No	403	28.7	39	2.8
Don't Know	888	63.2	10	0.7
Total	1404	100	1404	100
Chi-square statistic = 2209.003, **p-value** < 0.001 (significant difference)				

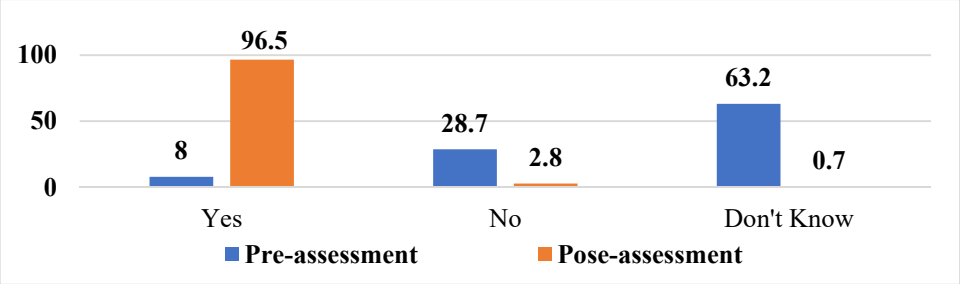


Figure 10: Pre and post-assessment of 'What do you think, HPV vaccine is safe?'

Most people were previously uncertain 63.2% (888) or believed the HPV vaccine wasn't safe 28.7% (403), with only a small fraction 8% (113) thinking it was safe. However, after the assessment, a majority 96.5% (1355) came to believe the HPV vaccine was safe, while very few still thought it wasn't safe 2.8% (39) or were unsure 0.7% (10).

Table 11: The following table provides the awareness assessment before and after intervention for "Are you afraid of getting vaccinated against HPV?"

Are you afraid of getting vaccinated against HPV?	Pre-Assessment		Post-Assessment	
	Frequency	Percent	Frequency	Percent
Yes	791	56.3	305	21.7
No	613	43.7	1099	78.3
Total	1404	100	1404	100
Chi-square statistic = 353.472, **p-value** < 0.001 (significant difference)				

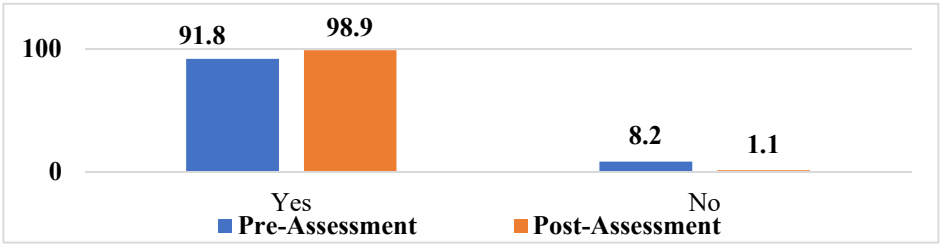


Figure 11: Pre and post-assessment of 'Are you afraid of getting vaccinated against HPV?'

Initially, more than half 56.3% (791) of the participants admitted to being afraid of getting vaccinated against HPV, while 43.7% (613) were not afraid. However, after the assessment, the proportion of participants who were afraid significantly decreased to 21.7% (305), whereas the

proportion of those who were not afraid increased to 78.3% (1099). This change in attitude was statistically significant (Chi-square statistic = 353.472, p-value < 0.001), indicating that the assessment effectively alleviated concerns and fears about HPV vaccination.

ASSESSMENT OF PRACTICE QUESTIONS

Table 12: The following table provides the practice assessment done before and after the intervention on "If the government gives free HPV vaccine to you, would you accept it?"

If the government gives free HPV vaccine to you, would you accept it?	Pre-Assessment		Post-Assessment	
	Frequency	Percent	Frequency	Percent
Yes	1289	91.8	1389	98.9
No	115	8.2	15	1.1
Total	1404	100	1404	100
Chi-square statistic = 80.657, **p-value** < 0.001 (significant difference)				

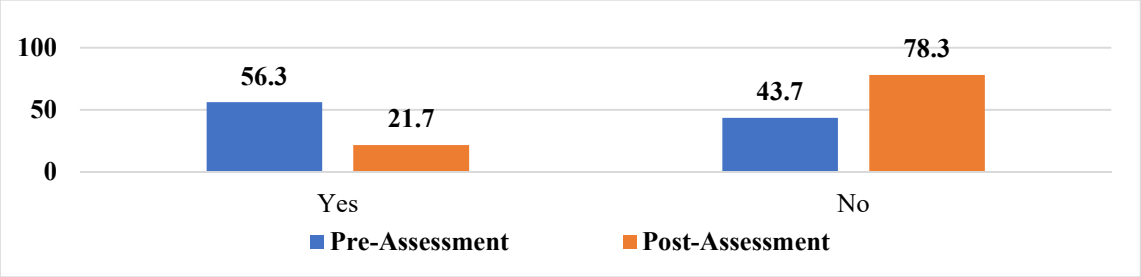


Figure 12: Pre and post-assessment of 'If the government gives free HPV vaccine to you, would you accept it?'

Initially, a majority 91.8% (1289) of participants were willing to accept the free HPV vaccine offered by the government, while a small proportion 8.2% (115) declined. However, after the assessment, an even larger majority 98.9% (1389) accepted the offer, whereas only 1.1% (15) refused.

Table 13: The overall knowledge assessment before and after intervention.

Average Knowledge	Pre-Assessment	Post-Assessment
Below Average	97.60	1.40
Above Average	2.40	98.60
Chi-square test = 2596.412, **p-value**<0.001 (significant difference)		

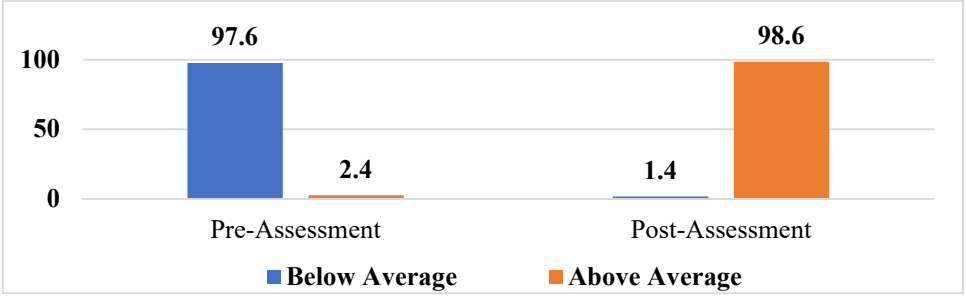


Figure 13: Pre and post-assessment of 'overall knowledge.'

In the pre-test, the vast majority 97.60% of participants had below-average knowledge, while only a small proportion 2.40% had above-average knowledge. However, after the intervention, there was a dramatic shift, with only 1.40% remaining below average and a vast majority 98.60% achieving above-average knowledge.

Table 14: The overall attitude assessment before and after intervention.

Average Attitude	Pre-Assessment	Post-Assessment
Below Average	88.10	3.20
Above Average	11.90	96.80
Chi-square test = 2039.422, **p-value**<0.001 (significant difference)		

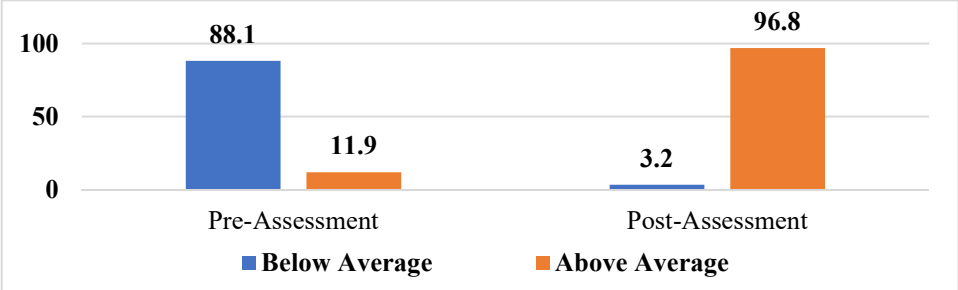


Figure 14: Pre and post-assessment of 'overall attitude'.

In the pre-test, the majority 88.10% of participants had below-average attitudes, while only a small proportion 11.90% had above-average attitudes. However, in the post-test, there was a substantial shift, with a vast majority 96.80% achieving above-average attitude levels.

Table 15: The overall practice assessment before and after intervention.

Average Practice	Pre-Assessment	Post-Assessment
Below Average	49.50	1.50
Above Average	50.50	98.50
Chi-square test = 857.613, **p-value**<0.001 (significant difference)		

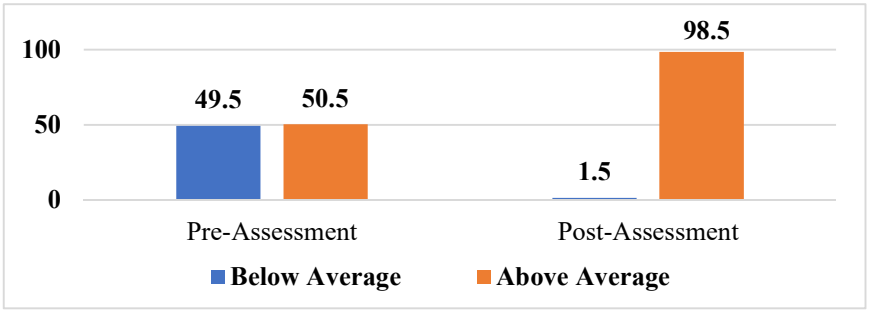


Figure 15: Pre and post-assessment of 'overall practice.

Initially in the pre-test, participants were almost evenly split, with 49.50% having below-average practice and 50.50% having above-average practice. However, after the intervention, there was a remarkable shift, with only 1.50% remaining below average and a vast majority 98.50% achieving above-average practice.

Table 16: Below table provides the distribution of the overall knowledge before and after the intervention among male and female.

GENDER	Average Knowledge		Total
	Below Average	Above Average	
Female	819	827	1646
	49.80	50.20	100.00%
Male	571	591	1162
	49.10	50.90	100.00%
Total	1390	1418	2808
	49.50%	50.50%	100.00%
chi-square test = 0.104, **p-value** = 0.747 (no significant association)			

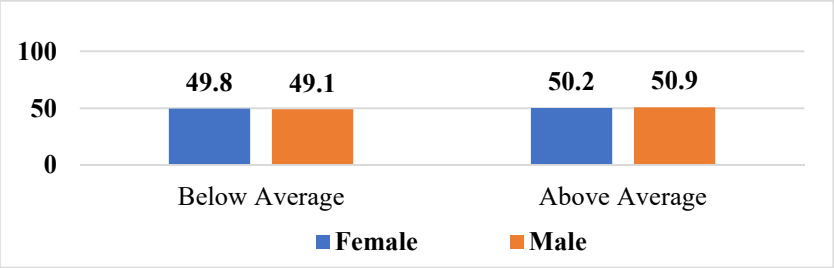


Figure 16: 'Overall knowledge before and after the intervention among males and females.'

The data shows the distribution of average knowledge levels by gender. The results indicate that among females, 49.80% (819) had below-average knowledge, while 50.20% (827) had above-average knowledge. Among males, 49.10% (517) had below-average knowledge, while 50.90% (519) had above-average knowledge. Overall, 49.50% (1390) of participants had below-average knowledge, while 50.50% (1418) had above-average knowledge. A chi-square test was conducted to examine the association between gender and knowledge levels. The results showed a non-significant association (chi-square = 0.104, p-value = 0.747), indicating that there is no statistically significant difference in knowledge levels between males and females.

QUESTIONNAIRE VALIDATION RESULT:

TABLE 17: STANDARD CRONBACH'S ALFA RANGE WITH RELIABILITY LEVEL

SL.NO	COEFFICIENT OF CRONBACH'S ALPHA	RELIABILITY LEVEL
1.	More then 0.90	Excellent
2.	0.80-0.89	Good
3.	0.70-0.79	Acceptable
4.	0.60-0.69	Questionable
5.	0.50-0.59	Poor
6.	Less than 0.59	Unacceptable

TABLE 18: AMBIGUITY STATISTICS

Cronbach's Alfa	No. of items
0.7103	26

TABLE 19:

CLARITY STATISTICS

Cronbach's Alfa	No. of items
0.714	26

TABLE 20: SIMPLICITY STATISTICS

Cronbach's Alfa	No. of items
0.713	26

TABLE 21: RELIABILITY STATISTICS

Cronbach's Alfa	No. of items
0.726	26

The reliability analysis yields strong results, with Cronbach's alpha coefficients ranging from 0.7103 to 0.726 across four dimensions: ambiguity (0.7103), clarity (0.714), simplicity (0.713), and reliability (0.726). The coefficients of 26 items measured fall within the acceptable range (0.70-0.79), indicating high reliability and effectiveness of the tool in consistently measuring these dimensions. Overall, the results confirm the tool's efficacy in evaluating ambiguity, clarity, simplicity, and reliability.

LEAFLET VALIDATION RESULT:

Baker Able Leaflet Design (BALD):

Table 22: Baker Able Leaflet Design Characteristics of the Leaflet

DESIGN CHARACTERESTICS	ENGLISH VERSION VALUE	KANNADA VERSION VALUE
Lines 50 – 89 mm long	2	2
Separation between lines	2	2
Lines unjustified	0	0
Serif typeface	0	0
Type size	1	1
First line indented	0	0

Titles lower case	2	2
Italics	3	3
Positive advice	3	3
Headings standout	3	3
Numbers all Arabic	1	1
Boxed text	2	2
Pictures	2	2
Number of colours	2	2
White space	1	1
Paper quality	1	1
TOTAL	**25**	**25**

The above table represents the Baker able leaflet design (BALD) method used to assess the layout and design characteristics of the Leaflet. BALD index is 25 for English version, and 25 for Kannada version. A leaflet scoring over 20 (out of 32) on BALD criteria was considered "good" for layout and design characteristics.

Leaflet Readability Tests:

Table 23: Leaflet Readability Tests Score

READABILITY TESTS	SENTENCES	WORDS	SYLLABLES	SCORE	GRADE
Flesch Reading-ease (FRE)	39	388	645	56.30	College
Flesch-kincaid Grade Level (FKGL)	39	388	645	10.89	High School

The above table represents the readability scores assessed using the online readability calculator FRE and FKGL. The FRE and FKGL score obtained were 56.30 and 10.89 respectively.

4. CONCLUSION:

***Bridging the Gap in Cervical Cancer Awareness and HPV Vaccination:**

This study highlights a major lack of awareness about cervical cancer and HPV prevention among adolescent girls, young women, and communities. A health education intervention significantly improved knowledge and vaccine uptake, proving education's vital role in prevention.

***Key Platforms for Awareness:**

Schools & Colleges: Reach adolescent girls and young women early.

Workplaces: Target young professionals through wellness programs.

Village Panchayats: Engage communities via local leaders.

***Recommendations:**

Integrate cervical cancer education into curricula, workplace programs, and community initiatives.

Tackle taboos with culturally sensitive communication.

Replicate the study in diverse regions to broaden impact.

***Conclusion:**

A comprehensive, education-based approach is essential to boost HPV vaccination, reduce cervical cancer incidence, and promote reproductive health.

Conflict of interest statement:

All authors contributed positively to the writing of this manuscript, and there is no conflict of interest as agreed upon in the content of this research.

Statement of ethical approval:

Ethical Committee clearance was obtained from the Institutional Ethical Committee of Sagar Hospitals, Jayanagar, Bengaluru.

Statement of informed consent:

The informed consent was obtained from all individual participants included in the study.

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