



# “CERVICAL CANCER AND ITS PREVENTION AMONG RURAL AND URBAN WOMEN”

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**Abstract:** Cervical cancer is a malignant disease caused by uncontrolled abnormal growth of cells in the cervix and is a major public health problem among women, particularly in low-resource settings. Information, Education and Communication (IEC) modules are effective educational strategies for improving knowledge and promoting prevention. The present study was conducted to assess the effectiveness of an IEC module on knowledge regarding cervical cancer and its prevention among rural and urban women in a selected area of Gorakhpur. The objectives were to assess pre-test and post-test knowledge levels, evaluate and compare the effectiveness of the IEC module among rural and urban women, and determine the association between post-test knowledge and selected demographic variables. A quantitative quasi-experimental pre-test and post-test comparative design was adopted. Sixty women (30 from Khatriपुर and 30 from Omkar Nagar) were selected using purposive sampling, and data were collected using a structured knowledge questionnaire. The findings revealed a significant improvement in knowledge following the IEC module. The paired t-test showed significant improvement among rural women ( $t = 4.60$ ) and urban women ( $t = 7.67$ ) at  $p < 0.05$ . The unpaired t-test ( $t = 3.24$ ) indicated greater effectiveness of IECM among urban women. The study concluded that the IEC module was effective in improving knowledge regarding cervical cancer and its prevention.

**Index Terms - Assess, Effectiveness, IEC module, knowledge, Cervical cancer, prevention, rural area, urban area, women.**

## I. Introduction

Cervical cancer is a major but largely preventable health problem affecting women worldwide, especially in low- and middle-income countries. It develops slowly from precancerous changes (CIN I–III) to invasive cancer, mainly due to persistent infection with high-risk Human Papillomavirus (HPV), particularly types 16 and 18. Common types include squamous cell carcinoma and adenocarcinoma. Early stages are usually asymptomatic, making screening essential. Methods like Pap smear, HPV

testing, and VIA enable early detection and treatment. Globally, about 600,000 cases and 340,000 deaths occur annually, with India contributing significantly due to limited screening and awareness. Lack of awareness is a major barrier to prevention and early detection. Many women have limited knowledge about HPV, screening, and vaccination, and face sociocultural barriers such as stigma, fear, and misinformation. Poor access to healthcare, especially in rural areas, further reduces screening uptake. Information, Education, and Communication (IEC) strategies play a crucial role in addressing these gaps. Through community-based education, visual aids, and involvement of health workers, IEC improves knowledge, corrects misconceptions, and encourages positive health behaviors like screening and vaccination.

## PROBLEM STATEMENT

**A comparative study to assess the effectiveness of Information Education Communication (IEC) module on knowledge regarding cervical cancer and its prevention among rural and urban women in a selected area of Gorakhpur.**

### OBJECTIVES:

- ❖ To assess the pre-test level of knowledge regarding cervical cancer and its prevention among rural and urban women.
- ❖ To assess the post-test level of knowledge regarding cervical cancer and its prevention among rural and urban women.
- ❖ To assess the effectiveness of IEC module on knowledge gain between rural and urban women.
- ❖ To find out the association between post-test knowledge scores with selected demographic variables.

## II. RESEARCH METHODOLOGY

**Research approach:** A research design is adopted as a systematic plan that outlines the progression from broad assumptions to specific methods of data collection, analysis, and interpretation, based on the nature of the research problem being addressed.

**Research design:** A quasi-experimental pre-test and post-test comparative research design was used.

**Research variable:** The study employs a quantitative research approach, wherein variables are defined as measurable characteristics that vary across individuals and contexts. The independent variable (IEC module on cervical cancer), dependent variable (knowledge level among women), and selected demographic variables are considered to guide data collection and analysis.

**Research setting:** The setting selected is Khatriyapura Village (rural) and Omkar Nagar (urban), Gorakhpur, UP, based on feasibility, proximity to Guru Shri Gorakshnath College of Nursing, and availability of samples as per inclusion and exclusion criteria.

**Population:** The study population comprises all rural and urban women eligible for cervical cancer awareness, with the target population including all such women and the accessible

population consisting of those residing in Khatripura and Omkar Nagar, Gorakhpur, who were available during the data collection period.

**Sample:** The sample consists of a subset of the population selected for the study, comprising rural and urban women aged 18 to 50 years.

**Sample Size:** The sample size refers to the number of participants included in the study, which comprised 60 women (30 from rural areas and 30 from urban areas).

**Sampling technique:** In the present study, a non-probability purposive sampling technique was used, which involves selecting participants who best represent the population for the research purpose.

### **CRITERIA FOR SELECTION OF SAMPLE:**

#### **Inclusion Criteria**

- ❖ Women who belonged to the selected rural and urban areas of Gorakhpur.
- ❖ Women who were between the age group of 18 to 50 years.
- ❖ Women who were willing to participate in the study.
- ❖ Women who were available at the time of data collection.
- ❖ Women who were able to understand Hindi or the local language.
- ❖ Women who were mentally and physically capable of responding to interview questions.
- ❖ Women who had not participated in any similar study in the recent past.
- ❖ Women who did not have any serious medical or psychiatric conditions that could affect participation.
- ❖ Women who gave informed consent to participate in the study.

#### **Exclusion Criteria**

- ❖ Women who were below 18 years or above 50 years of age.
- ❖ Women who were not willing to participate in the study.
- ❖ Women who were not available at the time of data collection.
- ❖ Women who were unable to understand the local language.
- ❖ Women who were suffering from any chronic illness (e.g., diabetes, hypertension, or cardiac disease).
- ❖ Women who were mentally or physically challenged and unable to provide responses independently.
- ❖ Women who were healthcare professionals or had prior knowledge about the study topic.
- ❖ Women who were currently participating in any other research study on a similar topic.

### III. TOOLS AND TECHNIQUES

**Section A [Demographic variables]:** This section consists of items for obtaining personal and background information including The demographic variables in the study include age (in years), area of residence, educational status, occupation, monthly family income (INR), religion, marital status, number of children, age at menarche (first period), menstrual cycle regularity, average menstrual cycle length, menopause status, type of contraception used, types of sanitary items used, average number of sanitary napkins used per day, awareness about HPV vaccination, use of preventive practices, history of cervical cancer screening, history of cervical cancer in family/relatives, and previous knowledge regarding cervical cancer.

**Section B [ SELF - STRUCTURED KNOWLEDGE QUESTIONNAIRE]:** The self-structured knowledge questionnaire consists of 30 open-ended multiple-choice questions with a single correct answer. Every correct answer was accorded with a score of (1) and every incorrect/ unanswerd item was accorded with a score of (0). The maximum score on knowledge will (30).

Level of knowledge regarding cervical cancer and its prevention methods	Total Score
Inadequate knowledge	1-10
Moderate knowledge	11-20
Adequate knowledge	21-30

**TOOL VALIDITY:** A total of 5 experts consisting of 1 medical expert and 4 nursing professionals validated the tool.

**RELIABILITY:** Reliability of the structured knowledge questionnaire was established using Cronbach's Alpha method, and the calculated value of  $\alpha = 0.82$  indicated good internal consistency of the tool.

**PILOT STUDY:** A pilot study was conducted to refine the methodology using procedures similar to the main study in Sonbarsa (rural) and Rajendra Nagar (urban), Gorakhpur, among 6 women selected through convenient sampling; the results showed improvement from inadequate/moderate to moderate/adequate knowledge in the post-test, with statistically significant differences in paired and unpaired t-tests ( $p < 0.05$ ), and chi-square significance observed only for area of residence, confirming the effectiveness and feasibility of the IEC module, while pilot participants were excluded from the main study.

**DATA COLLECTION:** After obtaining permission and informed consent, 60 women (30 rural, 30 urban) were selected by purposive sampling, and data were collected in three phases: pre-test (19/11/2025–21/11/2025) using a structured questionnaire, IEC module intervention via pamphlets and verbal explanation, and post-test (25/11/2025–27/11/2025) using the same tool to assess knowledge improvement, with responses recorded for analysis.

**DATA ANALYSIS:** The collected data were analyzed according to the objectives of the study using descriptive and inferential statistics. The descriptive statistics included frequency and percentage for demographic variables and mean and standard deviation for pre-test and post-test scores, while inferential statistics involved paired t-test to assess effectiveness within rural and urban groups, unpaired t-test to compare between groups, and chi-square test to determine association between post-test knowledge and selected demographic variables.

**ETHICAL CONSIDERATION:** Ethical approval was obtained from the Dissertation Committee of the Guru Shri Gorakshnath College of Nursing, Gorakhpur, along with necessary permissions from institutional and community authorities; written informed consent was obtained from all participants, ensuring confidentiality, anonymity, and voluntary participation, with no risk involved and all data used strictly for academic purposes.

#### **IV. RESULTS AND DISCUSSION**

##### **SECTION I: Findings Related to Demographic Data:**

1. Among 60 samples, 36.67% of samples (11 samples) were in the age group of 18–28 years, 33.33% of samples (10 samples) were in the age group of 29–39 years, and 30% of samples (9 samples) were in the age group of 40–50 years in the rural group, whereas in the urban group, 40% of samples (12 samples) were in the age group of 18–28 years, 33.33% of samples (10 samples) were in the age group of 29–39 years, and 26.67% of samples (8 samples) were in the age group of 40–50 years.
2. Among 60 samples, 100% of samples (30 samples) were from the rural area and 0% of samples (0 sample) were from the urban area in the rural group, whereas in the urban group, 0% of samples (0 sample) were from the rural area, while 100% of samples (30 samples) were from the urban area.
3. Among 60 samples, 16.67% of samples (5 samples) had no formal education, 13.33% of samples (4 samples) had primary education, 53.33% of samples (16 samples) had secondary education, and 16.67% of samples (5 samples) were graduates and above in the rural group, whereas in the urban group, 3.33% of samples (1 sample) had no formal education, 26.67% of samples (8 samples) had primary education, 60% of samples (18 samples) had secondary education, and 10% of samples (3 samples) were graduates and above.
4. Among 60 samples, 100% of samples (30 samples) were unemployed, 0% of samples (0 sample) were daily wage workers, 0% of samples (0 sample) were private employees, and 0% of samples (0 sample) were government employees in the rural group, whereas in the urban group, 96.67% of samples (29 samples) were unemployed, 0% of samples (0 sample) were daily wage workers, 3.33% of samples (1 sample) were private employees, and 0% of samples (0 sample) were government employees.
5. Among 60 samples, 0% of samples (0 sample) had a monthly family income of <₹5,000, 13.33% of samples (4 samples) had a monthly family income of ₹5,001–₹10,000, 50% of samples (15 samples) had a monthly family income of ₹10,001–₹15,000, and 36.67% of samples (11

samples) had a monthly family income of >₹15,000 in the rural group, whereas in the urban group, 0% of samples (0 sample) had a monthly family income of <₹5,000, 3.33% of samples (1 sample) had a monthly family income of ₹5,001–₹10,000, 26.67% of samples (8 samples) had a monthly family income of ₹10,001–₹15,000, and 70% of samples (21 samples) had a monthly family income of >₹15,000.

6. Among 60 samples, 100% of samples (30 samples) were Hindu, 0% of samples (0 sample) were Muslim, 0% of samples (0 sample) were Christian, and 0% of samples (0 sample) belonged to other religions in the rural group. In, whereas in the urban group, 93.33% of samples (28 samples) were Hindu, 6.67% of samples (2 samples) were Muslim, 0% of samples (0 sample) were Christian, and 0% of samples (0 sample) belonged to other religions.

7. Among 60 samples, 63.33% of samples (19 samples) were married, 36.67% of samples (11 samples) were unmarried, 0% of samples (0 sample) were widow, and 0% of samples (0 sample) were divorced/separated in the rural group, whereas in the urban group, 66.67% of samples (20 samples) were married, 33.33% of samples (10 samples) were unmarried, 0% of samples (0 sample) were widow, and 0% of samples (0 sample) were divorced/separated.

8. Among 60 samples, 40% of samples (12 samples) had no children, 46.67% of samples (14 samples) had 1–2 children, 6.67% of samples (2 samples) had 3–4 children, and 6.67% of samples (2 samples) had more than 4 children in the rural group, whereas in the urban group, 36.6% of samples (11 samples) had no children, 26.6% of samples (8 samples) had 1–2 children, 23.3% of samples (7 samples) had 3–4 children, and 13.3% of samples (4 samples) had more than 4 children.

9. Among 60 samples, 23.33% of samples (7 samples) attained menarche at 10 years, 76.67% of samples (23 samples) attained menarche at 11–13 years, and 0% of samples (0 sample) attained menarche at 14–16 years in the rural group, whereas in the urban group, 3.33% of samples (1 sample) attained menarche at 10 years, 96.67% of samples (29 samples) attained menarche at 11–13 years, and 0% of samples (0 sample) attained menarche at 14–16 years.

10. Among 60 samples, 70% of samples (21 samples) had a regular menstrual cycle and 30% of samples (9 samples) had an irregular menstrual cycle in the rural group, whereas in the urban group, 36.67% of samples (11 samples) had a regular menstrual cycle, while 63.33% of samples (19 samples) had an irregular menstrual cycle.

11. Among 60 samples, 0% of samples (0 sample) had a menstrual cycle length of <21 days, 70% of samples (21 samples) had a cycle length of 21–35 days, and 30% of samples (9 samples) had a cycle length of >35 days in the rural group, whereas in the urban group, 0% of samples (0 sample) had a menstrual cycle length of <21 days, 53.33% of samples (16 samples) had a cycle length of 21–35 days, and 46.67% of samples (14 samples) had a cycle length of >35 days.

12. Among 60 samples, 0% of samples (0 sample) had attained menopause, and 100% of samples (30 samples) had not yet attained menopause in the rural group, whereas in the urban group, 0% of samples (0 sample) had attained menopause, and 100% of samples (30 samples) had not yet attained menopause.

13. Among 60 samples, 66.67% of samples (20 samples) used no contraception, 33.33% of samples (10 samples) used condoms, 0% of samples (0 sample) used oral contraceptive pills, 0% of samples (0 sample) used IUCD (Copper-T), and 0% of samples (0 sample) had undergone tubectomy in the rural group, whereas in the urban group, 66.67% of samples (20 samples) used no contraception, 33.33% of samples (10 samples) used condoms, 0% of samples (0 sample) used oral contraceptive pills, 0% of samples (0 sample) used IUCD (Copper-T), and 0% of samples (0 sample) had undergone tubectomy.

14. Among 60 samples, 100% of samples (30 samples) used sanitary napkins, 0% of samples (0 sample) used cloth, 0% of samples (0 sample) used tampons, and 0% of samples (0 sample) used a menstrual cup in the rural group, whereas in the urban group, 100% of samples (30 samples) used sanitary napkins, 0% of samples (0 sample) used cloth, 0% of samples (0 sample) used tampons, and 0% of samples (0 sample) used a menstrual cup.

15. Among 60 samples, 100% of samples (30 samples) used 1–2 sanitary napkins per day, 0% of samples (0 sample) used 3–4 sanitary napkins per day, and 0% of samples (0 sample) used 5 or more sanitary napkins per day in the rural group, whereas in the urban group, 100% of samples (30 samples) used 1–2 sanitary napkins per day, 0% of samples (0 sample) used 3–4 sanitary napkins per day, and 0% of samples (0 sample) used 5 or more sanitary napkins per day.

16. Among 60 samples, 0% of samples (0 sample) were aware of HPV vaccination, and 100% of samples (30 samples) were not aware of HPV vaccination in the rural group, whereas in the urban group, 0% of samples (0 sample) were aware of HPV vaccination, and 100% of samples (30 samples) were not aware of HPV vaccination.

17. Among 60 samples, 0% of samples (0 sample) practiced regular health check-ups, 100% of samples (30 samples) practiced maintaining personal hygiene, and 0% of samples (0 sample) practiced HPV vaccination in the rural group, whereas in the urban group, 0% of samples (0 sample) practiced regular health check-ups, 100% of samples (30 samples) practiced maintaining personal hygiene, and 0% of samples (0 sample) practiced HPV vaccination.

18. Among 60 samples, 0% of samples (0 sample) had undergone cervical cancer screening, and 100% of samples (30 samples) had not undergone cervical cancer screening in the rural group, whereas in the urban group, 0% of samples (0 sample) had undergone screening, and 100% of samples (30 samples) had not undergone screening.

19. Among 60 samples, 0% of samples (0 sample) had a history of cervical cancer in the family, and 100% of samples (30 samples) had no family history of cervical cancer in the rural group, whereas in the urban group, 0% of samples (0 sample) had a family history of cervical cancer, and 100% of samples (30 samples) had no family history.

20. Among 60 samples, 3.33% of samples (1 sample) had previous knowledge regarding cervical cancer, and 96.67% of samples (29 samples) did not have previous knowledge in the rural group. In, whereas in the urban group, 6.67% of samples (2 samples) had previous knowledge regarding cervical cancer, while 93.33% of samples (28 samples) did not have previous knowledge.

## SECTION II. PRE - TEST KNOWLEDGE LEVEL AMONG RURAL AND URBAN WOMEN

Among the rural women, 50% (15 samples) had inadequate knowledge, 50% (15 samples) had moderate knowledge, and 0% (0 samples) had adequate knowledge in the pre-test, whereas among the urban women, 36.67% (11 samples) had inadequate knowledge, 63.33% (19 samples) had moderate knowledge, and 0% (0 samples) had adequate knowledge in the pre-test level of knowledge regarding cervical cancer and its prevention.

## SECTION III. POST - TEST KNOWLEDGE LEVEL AMONG RURAL AND URBAN WOMEN

Among the rural women, 23.33% (7 samples) had inadequate knowledge, 66.67% (20 samples) had moderate knowledge, and 10% (3 samples) had adequate knowledge in the post-test, whereas among the urban women, 0% (0 samples) had inadequate knowledge, 90% (27 samples) had moderate knowledge, and 10% (3 samples) had adequate knowledge in the post-test regarding cervical cancer and its prevention.

## SECTION IV. EFFECTIVENESS OF IEC MODULE AMONG RURAL AND URBAN WOMEN

Paired t-test

Group	Test	Mean Difference ( $\bar{D}$ )	Standard Deviation (SD)	df	Calculated "t" value	Table "t" value
Rural (n=30)	Pre-test vs Post-test	2.73	3.251	29	4.60	2.05
Urban (n=30)	Pre-test vs Post-test	4.13	2.949	29	7.67	2.05

Paired "t" test was used to assess the effectiveness of the IEC module on knowledge regarding cervical cancer.

RURAL GROUP: The calculated "t" value is 4.60 (df = 29) at 0.05 level, and the result is significant, indicating the IEC module was effective.

URBAN GROUP: The calculated "t" value is 7.67 (df = 29) at 0.05 level, and the result is significant, indicating the IEC module was highly effective.

### Unpaired t-test

N= 60

Group	Post-Test Mean ( $\bar{X}$ )	Standard Deviation	df	Calculated "t" value	Table "t" value
Rural	13.30	4.48	58	3.24	2.00
Urban	16.57	3.28			

An unpaired "t" test was used to compare the post-test knowledge scores between rural and urban women.

RURAL VS URBAN : The calculated "t" value is 3.24 (df = 58) at 0.05 level, and the result is significant, showing greater effectiveness in urban women.

### SECTION V: ASSOCIATION BETWEEN POST TEST KNOWLEDGE SCORE WITH SELECTED DEMOGRAPHIC VARIABLES

N= 60

S.No.	Demographic variable	Chi - square	Degree of freedom	P- Value	Inference
1	Age	14.36	4	9.49*	Significant
2	Area of residence	8.04	2	5.99*	Significant
3	Educational Status	49.573	6	12.59*	Significant

The above table shows that a significant association was found between the post-test knowledge score and three demographic variables: Age, Area of Residence, and Educational Status. For these variables, the obtained chi-square values were higher than the corresponding table values at the respective degrees of freedom, indicating statistical significance at  $P < 0.05$ . This implies that

women's post-test knowledge scores varied significantly based on their age, place of residence, and educational level.

**CONCLUSION:** The present study assessed the effectiveness of Information, Education and Communication (IEC) module on knowledge regarding cervical cancer and its prevention among rural and urban women in selected areas of Gorakhpur (Khatripura Village and Omkar Nagar Colony). The findings revealed that most women had inadequate knowledge during the pre-test, whereas their post-test knowledge significantly improved after the implementation of the IEC module. The IEC intervention was therefore found to be highly effective in enhancing awareness on cervical cancer, its risk factors, signs and symptoms, prevention, and screening methods among both rural and urban women.

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