

A Study to Assess the Effectiveness of a Structured Teaching Program on Knowledge Regarding Cervical Cancer Among Adolescent Girls in Selected Senior Secondary School at Agra

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Abstract

Cervical cancer continues to be a significant health concern for women globally, even though it can largely be prevented through timely screening, vaccination, and increased awareness. Adolescence represents an important stage for health education, as knowledge gained during this period can shape future health behaviors. This study was conducted to evaluate how effective a structured teaching program is in improving knowledge about cervical cancer among adolescent schoolgirls. The study had several objectives: to assess participants' knowledge before the intervention, deliver a structured educational program, evaluate knowledge after the intervention, compare pretest and posttest results, and explore any relationship between knowledge levels and selected demographic factors. A quantitative approach was used, employing a pre-experimental one-group pretest–posttest design. The research was carried out at SMK Memorial Public School in Sunari, Agra, involving 30 adolescent girls selected through purposive sampling. Data collection was done using structured questionnaires administered both before and after the teaching session. The results showed that prior to the intervention, 23.3% of the participants had low knowledge, while 76.6% demonstrated a moderate level of understanding. Following the teaching program, 56.6% of the students had moderate knowledge, and 43.3% reached a good level of understanding. The comparison between pretest and posttest scores revealed a noticeable improvement in awareness and comprehension of cervical cancer. In conclusion, the structured teaching program proved to be effective in enhancing knowledge among adolescent girls. The findings highlight the importance of incorporating regular health education programs in schools to foster early awareness and encourage preventive health practices.

Keywords: Cervical cancer, adolescent girls, health education, awareness, structured teaching program

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INTRODUCTION

Cervical cancer remains one of the most significant threats to women's health globally. Unlike many other forms of cancer, cervical cancer is entirely preventable; however, it continues to claim the lives of hundreds of thousands of women annually. It is a disease defined by inequity, while developed nations have seen a sharp decline in cases due to robust screening programs. Developing regions continue to face a staggering burden. This disparity highlights a silent pandemic in which a lack of resources and education leads to a devastating loss of life [1].

The primary catalyst for this malignancy is the

human papillomavirus (HPV), specifically high-risk strains 6 and 18. Because HPV is a sexually transmitted disease, the veil of social stigma often surrounds the diagnosis. This makes the “human” side of the disease complex; women may feel shame or hesitation in seeking care for the disease. When we talk about cervical cancer, we are not just talking about cells; we are talking about mothers, daughters, and sisters who often die in their early 40s, the prime of their lives, leaving behind families and destabilizing the social fabric of their communities [2].

In India, the estimated number of new cases per year (2013–2025) is 1,23,900 to 1,27,500, and the number of deaths due to this disease in 2023 is 35,691. India accounts for 19% of global cervical cancer cases [3].

India launched a National HPV Vaccination Program in 2023, starting with girls aged 9–14 years, aiming for mass protection and eventual elimination of cervical cancer by 2040 [4].

Cervical cancer is largely preventable through HPV vaccination, regular screening, and early detection. However, several barriers limit women’s participation in screening programs in developing countries. Common psychological obstacles include embarrassment and shyness. Limited knowledge and awareness of screening procedures, diagnosis, and treatment also hinder participation. Structural challenges, such as a lack of time, further contribute to low screening uptake. In addition, sociocultural and religious factors, including insufficient family support, can negatively influence women’s involvement in preventive practices [5].

Need for the Study

It focuses on why adolescent girls are key to care, the knowledge-attitude gap, and the need to overcome barriers to cervical cancer.

The Power of Early Intervention

Adolescence is a developmental period, a window of opportunity, in which health behaviors and attitudes are formed for a lifetime. By targeting senior secondary school girls, this study addresses the demographic that stands to benefit the most from HPV vaccine education at this stage, providing valuable information regarding cervical cancer. An educated girl becomes a health advocate within her family, encouraging her mother, sister, and other females to undergo Pap smear tests and get vaccinated [6].

Breaking the Barriers of Silence

The need for study arises from the significant barriers that currently exist.

- *Psychological barriers:* One of the major barriers is shyness and embarrassment regarding reproductive health, which often prevents girls from asking questions about it.
- *Structural barriers:* Even if girls want to learn about this topic, there is a lack of time due to its limited inclusion in the academic curriculum for health education.
- *Sociocultural barriers:* There are many myths about the vaccine, such as it affecting fertility or being unnecessary for young girls [7].

Identifying the Gaps

There is a significant knowledge-attitude-practice gap. Many girls may have heard the term “cancer,” but only a few understand the preventive nature of the HPV vaccine or the importance of regular screening through Pap smears.

This study is important for identifying what is missing in their understanding so that interventions can be designed according to their needs, fears, and misconceptions. By educating them, we empower future women to take care of their health [8].

Contribution to Health Care

This study is vital for assessing awareness and preventive practices regarding cervical cancer among adolescent girls. It includes both urban and rural areas, especially those with low literacy, where the burden of cervical cancer is higher.

The outcome will contribute to existing literature and assist healthcare professionals in designing effective educational programs to reduce the burden of cervical cancer [9].

OBJECTIVES OF THE STUDY

1. To evaluate the baseline knowledge of cervical cancer among adolescent girls in selected senior secondary schools.
2. To implement a structured educational program on cervical cancer for adolescent girls in selected senior secondary schools.
3. To measure the level of knowledge among adolescent girls after the implementation of the structured teaching program.
4. To compare the knowledge scores before and after the intervention to assess the effectiveness of the structured teaching program.
5. To examine the relationship between pre-intervention knowledge scores and selected demographic characteristics.

OPERATIONAL DEFINITION

Effectiveness

Effectiveness refers to the degree to which the structured teaching program enhances knowledge of cervical cancer, as determined by the scores obtained in a knowledge assessment.

Structured teaching program: A structured teaching program is a systematically designed and organized educational session focused on cervical cancer, conducted among adolescent girls in a selected senior secondary school in Agra.

Knowledge: Knowledge refers to the level of awareness and comprehension of cervical cancer, as measured by a structured questionnaire.

Adolescent girls: Adolescent girls are females in the developmental phase between childhood and adulthood, generally falling within the age group of 15–19 years.

Cervical cancer: Cervical cancer is a medical condition characterized by the development of malignant cells in the tissues of the cervix, which is the lower portion of the uterus that opens into the vagina.

Variables

- *Independent variables:* Structured teaching plan on cervical cancer.
- *Dependent variables:* Knowledge level regarding cervical cancer.
- *Demographic variables:* Demographic variables included age, gender, family income, parents/guardians' occupation, and previous knowledge of cervical cancer.

Hypothesis

- *H0 (null):* There is no significant difference in the knowledge score of adolescent girls regarding cervical cancer before and after the teaching plan.
- *H1 (research hypothesis):* There will be a significant increase in the knowledge score of adolescent girls regarding cervical cancer after the implementation of the structured teaching plan.
- *H02):* There will be no association between pretest knowledge scores and selected demographic variables.

- *H2*: There will be a significant association between pretest knowledge scores and selected demographic variables.

Limitation

- *Honesty factors*: Since the data were based on self-reported questionnaires, social desirability bias may have occurred, and students may have answered what was expected rather than what they truly knew or felt.
- *Time constraints*: Limited time allowed only the measurement of immediate knowledge gain, not long-term behavioral change (e.g., receiving the HPV vaccine).
- *Environmental variables*: Factors such as health condition, mood, and classroom environment may have an effect.
- *Response sample size*: The study is limited to a small sample from one school; therefore, the findings cannot be generalized.

Delimitations

- *Time limit*: Data collection was limited to one week.
- *Geographic focus*: Restricted to selected senior secondary schools in Agra.
- *Content focus*: Focused only on knowledge of cervical cancer, excluding behavior and clinical practices.
- *Single teaching session*: Only one structured session was conducted with no follow-up.

REVIEW OF LITERATURE

Gnanadhinahari and Sheema (2023) carried out a study to evaluate the effectiveness of a structured teaching program on women's knowledge of cervical cancer at a primary health center in Akola district. The study aimed to assess existing knowledge about cervical cancer among women, measure the impact of the teaching program, and examine the association between pretest and posttest knowledge levels [10].

A one-group pretest and posttest research design was used. In this study, the structured teaching program served as the independent variable, while knowledge of cervical cancer was considered the dependent variable. Data was collected using a structured questionnaire focusing on cervical cancer.

The results indicated that most participants (88.3%) were from rural areas, while 11.7% were from urban settings. The findings demonstrated a notable improvement in knowledge, with mean scores increasing from 3.9 in the pretest to 24.67 in the posttest. Additionally, women's attitudes showed a significant positive change, with a higher mean score of 41.33 compared with the knowledge mean of 15.87. Overall, the difference between pretest and posttest scores for both knowledge and attitude were statistically significant, highlighting the effectiveness of the intervention in enhancing awareness and promoting a positive outlook toward cervical cancer education among women [11].

In 2020, Nakamura and Sasaki conducted a study to assess the effectiveness of a structured teaching plan on cervical cancer prevention targeting junior and senior high school students at Hyogo University, Kakogawa, Japan. The objective of the study was to understand the state of education for the prevention of cervical cancer and trends in the research approach selected for the study, evaluating the research approach and non-experimental, quantitative data research design. A structured questionnaire was used to collect demographic variables. The study found that HPV vaccine acceptance was favorable, but relevant knowledge was low. After the program, participants had greater knowledge and a more cheerful outlook [12]. Several studies have evaluated the effectiveness of structured teaching programs in improving knowledge about cervical cancer among different groups.

Fazeela MF, Fathima Safa CTP, Steena Biju, Fidha Jebin, and Dr. Sheepa SAI (2024) carried out a study among adolescent girls in a selected school at Perinthalmanna to assess the impact of a structured teaching program on knowledge of cervical cancer. The objectives included evaluating pretest and

posttest knowledge levels, determining the effectiveness of the program, and identifying any association between knowledge scores and demographic variables. A quantitative pre-experimental, one-group pretest and posttest design was used. Data were collected using a structured questionnaire and analyzed using descriptive and inferential statistics. The findings revealed that before the intervention, 70% of the participants had poor knowledge, and 30% had average knowledge. After the teaching program, there was a significant improvement, as indicated by a paired t-test value ($t = 5.993$), which was higher than the tabulated value ($t_{59} = 2.001$). The mean posttest score (16) was considerably higher than the pretest mean score (5.56). No significant association was found between pretest knowledge and demographic variables such as age, religion, family type, or prior knowledge. The study concluded that the structured teaching program was effective in enhancing knowledge among adolescent girls [13].

In another study, Puneet Gangawat, Jahanvi Patel, Badiya Neha Devjibhai, and Chauhan Himalay Nitin Bhai (2025) assessed the effectiveness of a planned teaching program on primary prevention of cervical cancer among adolescent girls in a selected school in Bhuj-Kutch, Gujarat. This study aimed to evaluate pretest knowledge and implement a teaching program. Data was collected using a self-structured questionnaire and analyzed using descriptive and inferential statistics. The results showed that prior to the intervention, 63.33% of the participants had inadequate knowledge, 35% had moderate knowledge, and only 1.66% had adequate knowledge. After the intervention, 48.33% of the participants demonstrated adequate knowledge, 38.33% had moderate knowledge, and only 13.33% had inadequate knowledge. These findings indicate a clear improvement in knowledge levels, confirming that the teaching program was both feasible and effective [14, 15].

Chetana K, Poornima G, Abhishek BV, and Ranganath T (2026) conducted a study among adolescent girls in selected PU colleges at Bagalkot to assess knowledge regarding cervical cancer, its prevention, and treatment. The study followed a quantitative evaluative approach with a pretest and posttest control group design involving 30 participants. Before the intervention, 53.3% of the students had poor knowledge, and 46.7% had moderate knowledge, with none showing adequate knowledge. After the structured teaching program, 96.7% of the students achieved moderate knowledge, and 3.3% reached an adequate level, with no participants remaining in the poor category. The results showed a statistically significant improvement, demonstrating the effectiveness of the teaching program in enhancing awareness [16].

Vanlalthakli B, Lalhithari C, Vamlarauzelmi E, Lalzuwmali M, Beulah Lalruoktim Z, and Lalmingthanga R (2026) conducted a study in selected high schools of Aizawl, Mizoram, to assess knowledge regarding cervical cancer vaccination among adolescent students. A quantitative pre-experimental one-group pretest and posttest design was used, with a sample of 100 students aged 13–18 years selected through a purposive sampling technique. The findings indicated that most participants (95%) were aged 13–15 years, and 52% were female. Initially, 48% of the students had adequate knowledge, while 26% had moderate and inadequate knowledge. A significant association was found between knowledge and family type ($p < 0.009$). After the intervention, there was a statistically significant improvement in knowledge scores ($p < 0.001$), confirming the effectiveness of the structured teaching program [17].

Another study examined the effect of a structured teaching program on knowledge of cervical cancer among auxiliary nurse midwifery (ANM) students in a selected nursing school in Madhya Pradesh. This study aimed to assess pretest knowledge, evaluate the effectiveness of the teaching program, and compare pretest and posttest scores. A quasi-experimental design with a pretest and posttest approach without a control group was used. Data was collected using a structured questionnaire along with demographic variables. The results showed that the majority of participants (76.67%) were in the age group of 18–20 years, while only 3.34% were aged 22–24. The effectiveness of the program was demonstrated by an increase in mean knowledge scores from 7.37 (pretest) to 24.93 (posttest), along with a reduction in the standard deviation from 7.18 to 1.79. The findings were statistically significant ($p = 0.005$, $df = 29$), indicating that the teaching program effectively improved knowledge regarding cervical cancer and its prevention [18].

METHODOLOGY

Research Methodology

Research methodology is a structured and organized process used to conduct research, collect relevant data, and analyze it to address a research problem or answer specific questions. It focuses on the methods and strategies used to investigate a particular issue. It includes the principles, procedures, and techniques used to identify, gather, analyze, and interpret data. This ensured that the findings were reliable, valid, and applicable to a wider context. In this study, the methodology outlines the approach used to evaluate the effectiveness of a structured teaching program on the knowledge of cervical cancer among adolescent girls in a selected secondary school in Agra.

Research Approach: Quantitative

A research approach refers to the overall plan or framework that guides the research process, from developing research questions to collecting and analyzing data. This ensures a systematic investigation of the research problem and helps produce meaningful and dependable results. In this study, a quantitative research approach was adopted to measure and assess the level of knowledge of cervical cancer among adolescent girls in a selected secondary school in Agra.

Research Design

Research design is an essential component of the research process that acts as a blueprint for conducting the study. It defines the structure, plan, and strategies used for data collection and analysis systematically. Based on the study objectives, a pre-experimental one-group pretest and posttest design was selected. This design was used to evaluate the effectiveness of the structured teaching program in improving knowledge of cervical cancer among adolescent girls in a selected secondary school in Agra.

Research Setting

A research setting refers to the environment or context in which a study is conducted. It is not just a location but also a complex environment that shapes the research process and its outcomes. It can include the physical location, cultural context, and social environment in which the research takes place. The study was conducted at the S. M. K. Memorial Public School in Agra. The setting was chosen based on feasibility in terms of the availability of senior secondary school students.

Population of the Study

Population refers to the complete collection of individuals, objects, or events that share certain defined characteristics and are relevant to the study. The research population was determined by the study's objectives and the specific variables or attributes being examined. In this study, adolescent female students were the target population.

Target Population

The target population was adolescent females from the senior secondary school of Agra.

Accessible Population

The accessible population was thirty adolescent females aged 15–18 years.

Sample Size

The sample size is the number of individuals or items selected from a larger population to participate in a study. The sample size of the present study was 30 adolescent girls.

Sampling Technique

Sampling is a crucial step in the research process. It is a method used to select a subset from a larger group to study and draw inferences about the entire population. The investigator used purposive sampling to select samples for the present study.

Sampling Criteria

The sampling criteria were defined according to the specific features of the target population. These criteria outline the guidelines established by the researcher to decide which individuals will be included in or excluded from the study. The selection criteria were categorized into two groups.

Inclusion Criteria (Desired Characteristics)

1. Female adolescents aged between 15 and 18 years.
2. Students who are present during the data collection period.
3. Students who consent to participate in the study.

Exclusion Criteria (Undesired Characteristics)

1. Students are younger than 15 years or older than 18 years.
2. Students who are absent at the time of data collection.
3. Students who decline to participate.

Development and Selection of the Research Tool

The research instrument was developed and selected in alignment with the study objectives, an extensive review of relevant literature, and consultation with subject experts. This section is essential in the methodology chapter as it highlights the process of identifying, designing, and selecting suitable tools for data collection. The careful development and selection of these instruments are vital to ensure the accuracy, consistency, and credibility of research findings. The finalized tool was further reviewed, refined, and validated by experts and the research guide.

The instrument was divided into two sections:

Section A: Demographic Variables

It consisted of items for obtaining information about the selected sociodemographic data, such as age, residence, religion, family, hearing about cervical cancer, health care services in the area, and sources of information.

Section B: Structured Knowledge Questionnaire

The structured knowledge questionnaire consists of 30 multiple-choice type questions.

Validity of the Tool

Validity refers to the degree to which an instrument measures what it claims to measure. In the present study, the questionnaire was developed after an extensive review of the literature and consultation with subject experts in the field of nursing and research methodology.

The validity of the tool was assessed by obtaining opinions from experts. Appropriate changes were made according to expert suggestions and corrections, and the tool was finalized with the help of a research guide.

Description of Tool

The developed tool was organized into two sections:

Section A: A set of demographic variables including age, residence, religion, family awareness of cervical cancer, health care services in the area, and source of information.

Section B: structured knowledge questionnaire to assess the knowledge of adolescent girls aged 15–18 years.

Scoring Interpretation

The knowledge level was tested based on a structured questionnaire on their knowledge level.

Rating scale: Good knowledge: 0–10; average knowledge: 11–20; poor knowledge: 21–30.

Data Collection Procedure

Data was collected based on the Inclusion and Exclusion criteria. The purposive sampling technique was used to select 30 samples, and data were collected using a structured knowledge questionnaire regarding cervical cancer among adolescent girls. The researcher requested the students' full cooperation and assured them of the confidentiality of their responses.

Stepwise plan for collecting data:

- To obtain permission from the authorities.
- Ethical clearance.
- Informed consent from the principal.
- Pretest, intervention, and posttest (if applicable).
- Data recording and safe storage.

RESULT

The result of the study includes three sections. Section I includes the pretest and posttest knowledge scores. Section II includes the effectiveness of the structured teaching program. Section III includes the association of pretest and selected demographic variables.

Section I: Assessment of Pretest Knowledge Regarding Cervical Cancer Among Adolescent Girls

In the present study, 30 samples were included. A pretest was conducted to assess the baseline knowledge of cervical cancer among adolescent girls in selected secondary schools in Agra.

In the present study, after the implementation of the structured teaching program, a pre- test was conducted to assess the effectiveness of the program. The findings revealed that a majority of the students, 23 (76.6%), had an average level of knowledge, with scores ranging between 11 and 20. A smaller proportion of 7 participants (23.3%) demonstrated poor knowledge, scoring between 0 and 10. Notably, none of the participants (0%) achieved a good level of knowledge (21–30) in the pretest assessment (Table 1 and Figure 1).

Table 2 and Figure 2 present the posttest knowledge scores of adolescent female students following the implementation of the structured teaching program on cervical cancer. The data indicated a notable improvement in the participants' knowledge level.

After the intervention, none of the students (0%) fell into the poor knowledge category (score 0–10), which shows a complete elimination of low-level understanding of the subject. A total of 17 participants (56.6%) demonstrated an average level of knowledge with scores between 11 and 20. Importantly, 13 participants (43.3%) achieved a good level of knowledge, scoring between 21 and 30.

Table 1. Distribution of participants according to their pretest knowledge scores on cervical cancer (N = 30).

S.N.	Level of existing knowledge	Frequency	Percentage
1.	Poor (0–10)	7	23.3%
2.	Average (11–20)	23	76.6%
3.	Good (21–30)	0	0

Table 2. Assessments of posttest knowledge score of adolescent female students regarding cervical cancer.

S.N	Level of existing knowledge	Frequency	Percentage
1.	Poor (0–10)	0	0
2.	Average (11–20)	17	56.6%
3.	Good (21–30)	13	43.3%

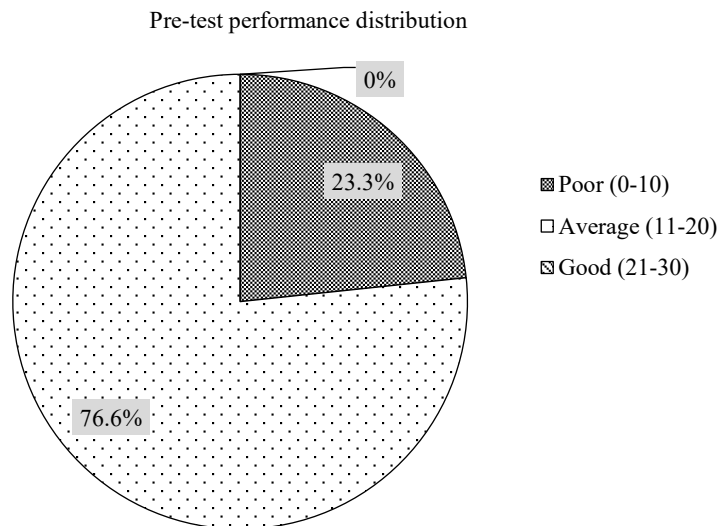


Figure 1. Pretest knowledge score.

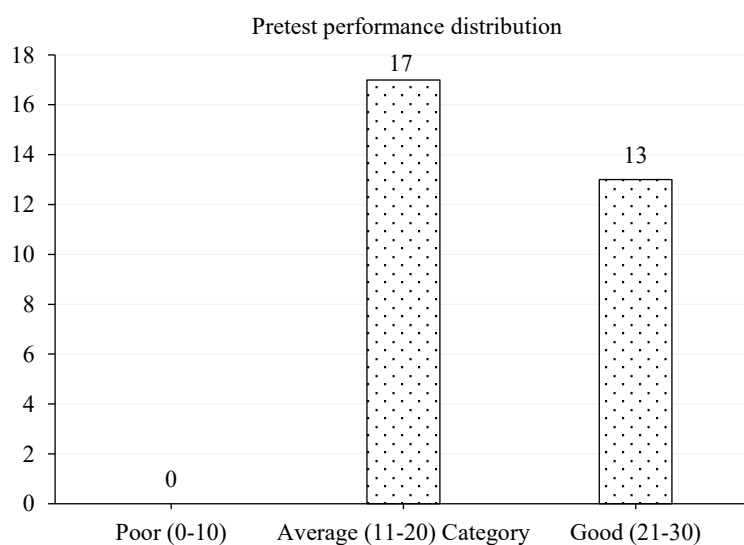


Figure 2. Posttest knowledge score.

These findings clearly reflect the positive impact of the structured teaching program on enhancing adolescent girls' knowledge of cervical cancer. The shift of participants from the poor and average categories in the pretest to higher knowledge levels in the posttest highlights the effectiveness of the educational intervention. Similar findings have been reported in previous studies, where structured teaching programs significantly improved awareness and knowledge of cervical cancer among adolescents.

Section II: Testing of Hypothesis and Evaluation of the Effectiveness of the Structured Teaching Program

This section includes testing of the hypothesis and assessment of the effectiveness of the structured teaching program by comparing the pretest and posttest mean knowledge scores. H_0 : There are no significant differences in the knowledge score of adolescent girls regarding cervical cancer before and after the teaching plan.

H_1 : There will be a significant increase in the knowledge score of adolescent girls regarding cervical cancer after the implementation of the structured teaching plan.

Table 3 and Figure 3 indicate that the posttest knowledge scores had a higher mean (19.4) with a standard deviation of 3.8, compared to the pretest mean score of 12.1 and standard deviation of 3.04. The calculated t-value (10.98) exceeded the tabulated value at the 0.05 level of significance. This demonstrates that the structured teaching program was effective in improving knowledge of cervical cancer among adolescent girls. Therefore, the research hypothesis (H1) was accepted, and the null hypothesis (H0) was rejected.

Section III: Distribution of Demographic Variables and Their Association with Pretest Knowledge Scores

This section includes the distribution of demographic variables and their association with the pretest knowledge score.

Out of 30 samples, 19 (63.30%) samples were distributed in the age group of 15 years, 09 (30%) samples were distributed in the age group of 16 years, and 2 (0.60%) samples were distributed in the age group of 17 years. In terms of residence, most participants were from urban areas (60%), while 40% were from rural areas. In terms of religion, the majority were Hindu (90%), with a small number of Muslims (2%) and Sikhs (3.3), while no participant belonged to Christianity. In terms of monthly family income, 37% earned below 10,000, 30% between 25,001 and 50,000, 20% between 10,001 and 25,000, and 13.30% above 50,000. Most participants (76.6%) were aware of cervical cancer, whereas 23.4% had not heard of it. Teachers were identified as the primary source of information (70%), followed by family members (13.30%) and social media (13.30%), with only a small proportion receiving information from friends (0.30%). A large majority (83.30%) reported the availability of healthcare services in their locality, whereas 16.60% indicated a lack of access. In addition, 86.60% of the respondents stated that they had received school-based education on reproductive or sexual health, whereas 13.30% had not received such education (Table 4).

Table 3. Assessment of the effectiveness of a structured teaching program by comparing the pretest scores and posttest scores.

	Mean and SD	Mean difference	t-value	p
Pretest score	12.1+3.04	7.3	10.98	<0.001
Posttest score	19.4+3.8			

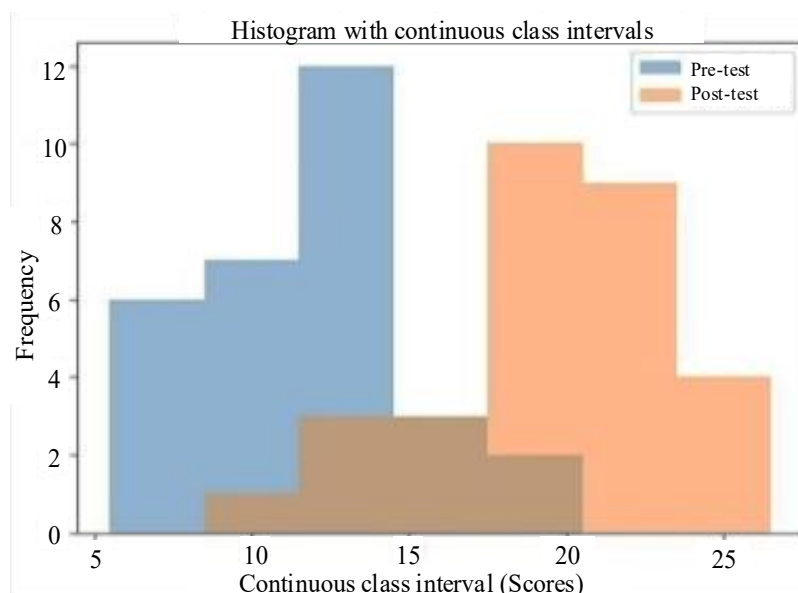


Figure 3. Comparison of pretest scores and posttest scores.

Table 5 illustrates the association between pretest knowledge scores of adolescent girls and selected demographic variables using the chi-square test. The findings indicate that there is no statistically significant association between the level of pretest knowledge and any of the demographic variables considered in this study.

The calculated chi-square values for variables such as age ($\chi^2 = 0.555$, $df = 2$), religion ($\chi^2 = 1.50$, $df = 3$), family monthly income ($\chi^2 = 0.826$, $df = 3$), source of information about cervical cancer ($\chi^2 = 6.604$, $df = 3$), residence ($\chi^2 = 1.701$, $df = 1$), prior awareness about cervical cancer ($\chi^2 = 0.052$, $df = 1$), availability of healthcare services ($\chi^2 = 0.002$, $df = 1$), and receipt of healthcare education ($\chi^2 = 0.072$, $df = 1$) were all found to be lower than their respective critical values at the 0.05 level of significance.

Table 4. Frequency and percentage distribution of adolescent girl students according to their demographic variables.

S.N.	Demographic variables	Frequency	Percentage
1	Age		
	a. 15 years	19	63.30%
	b. 16 years	09	30%
	c. 17 years	02	0.60%
2	Residence		
	a. Urban	18	60%
	b. Rural	12	40%
3	Religion		
	a. Hindu	27	90%
	b. Muslim	02	2%
	c. Christian	00	
	d. Sikh	01	3.30%
4	Family monthly income		
	a. Below 10,000	11	37%
	b. 10,001–25000	06	20%
	c. 25001–50000	09	30%
	d. Above 50000	04	13.30%
5	Heard about cervical cancer.		
	a. Yes	23	76.60%
	b. No	27	23.40%
6	Where did you hear about cervical cancer?		
	a. Teacher	21	70%
	b. Family	04	13.30%
	c. Friends	01	0.30%
	d. Social media	04	13.30%
7	Any health care service in your area		
	a. Yes	25	83.30%
	b. No	05	16.60%
8	Any health care education about reproductive or sexual health in your school		
	a. Yes	26	86.60%
	b. No	04	13.30%

Table 5. Association of pretest knowledge scores with selected demographic variables using one-way chi-square.

S.N.	Demographic variables	Frequency	X ²	df	Critical value	Significant/ not significant
1	Age		0.555	2	5.99	Not significant
	a. 15 years	19				
	b. 16 years	09				
	c. 17 years	02				
2	Religion		1.50	3	7.81	Not significant
	a. Hindu	27				
	b. Muslim	02				
	c. Christian	00				
	d. Sikh	01				
3	Family monthly income		0.826	3	7.81	Not significant
	a. Below 10,000	11				
	b. 10,001–25000	06				
	c. 25001–50000	09				
	d. Above 50000	04				
4	Where did you hear about cervical cancer?		6.604	3	.81	Not Significant
	a. Teacher	21				
	b. Family	04				
	c. Friends	01				
	d. Social media	04				
5	Residence		1.701	1	3.84	Not Significant
	a. Urban	18				
	b. Rural	12				
6	Hear about cervical cancer		0.052	1	3.84	Not Significant
	a. Yes	23				
	b. No	27				
7	Access to health care services in your area		0.002	1	3.84	Not Significant
	a. Yes	25				
	b. No	05				
8	Received any health care education		0.072	1	3.84	Not Significant
	a. Yes	26				
	b. No	04				

As the calculated chi-square values were less than the critical values for all variables, the results were not statistically significant. Therefore, it can be concluded that there is no meaningful association between pretest knowledge levels and the selected demographic variables. This suggests that participants' baseline knowledge of cervical cancer was independent of their demographic characteristics.

DISCUSSION

This study evaluated the effectiveness of a structured teaching program (STP) on knowledge of cervical cancer among adolescent girls in a selected senior secondary school in Agra. The discussion section critically interprets the findings in relation to the stated objectives, research hypotheses, and

existing body of knowledge, while exploring their implications in the context of preventive health education.

Interpretation of Baseline Knowledge (Pretest Findings)

The pretest findings revealed that a substantial proportion of adolescent girls possessed only a moderate level of knowledge regarding cervical cancer, with 76.6% demonstrating average knowledge and 23.3% exhibiting poor knowledge, while none of the participants attained a proficient level of knowledge. This distribution reflects a conspicuous deficiency in baseline awareness among adolescents, particularly in domains related to etiology, risk factors, screening modalities, and preventive strategies.

These findings may be attributed to sociocultural reticence surrounding reproductive health education, limited exposure to structured health awareness programs, and inadequate inclusion of cervical cancer-related content within school curricula. The absence of participants in the “good knowledge” category further underscores the pervasive gap in comprehensive understanding, thereby justifying the need for targeted educational interventions.

Effectiveness of the Structured Teaching Program

The principal focus of this study was to evaluate the effectiveness of the STP in enhancing knowledge levels. The posttest findings demonstrated a marked improvement, with 43.3% of participants achieving good knowledge and 56.6% retaining average knowledge, while none remained in the poor knowledge category. This transition signifies a substantial positive shift in the distribution of knowledge. From a statistical standpoint, the mean pretest score (12.1 ± 3.04) increased to a mean posttest score of 19.4 ± 3.8 , yielding a mean difference of 7.3. The computed ‘t’ value of 10.98 at $p < 0.001$ indicates a highly significant difference, thereby providing robust evidence against the null hypothesis (H_0) and substantiating the research hypothesis (H_1). This statistically significant enhancement can be ascribed to the structured, systematic, and pedagogically sound design of the teaching program.

The effectiveness of the STP may be further explained by its comprehensive content coverage, logical sequencing of information, and emphasis on critical aspects such as Human Papillomavirus (HPV) infection, vaccination, and early detection. The structured format facilitated improved cognitive assimilation and retention of information among participants, content coverage, logical sequencing of information, and emphasis on critical aspects such as Human Papillomavirus (HPV) infection, vaccination, and early detection. The structured format facilitated improved cognitive assimilation and retention of information by the participants.

Comparative Analysis with Existing Literature

The findings of the present study are congruent with those of prior research studies that have documented significant improvements in knowledge following educational interventions. Similar studies conducted in both community and institutional settings have consistently reported that STPs are efficacious in enhancing awareness of cervical cancer.

The consistency of these findings reinforces the theoretical premise that health education is a cornerstone of disease prevention. It also validates the applicability of structured educational models in addressing knowledge deficits among vulnerable populations, such as adolescents.

Association with Demographic Variables

An additional objective of the study was to determine the association between pretest knowledge scores and selected demographic variables. The chi-square test analysis revealed no statistically significant associations between these variables. This finding suggests that the baseline knowledge deficit was uniformly distributed across the different demographic strata.

The absence of a significant association implies that factors such as age, educational background, or

other demographic characteristics did not exert a measurable influence on knowledge levels. This further emphasizes that the lack of awareness regarding cervical cancer is a generalized issue, necessitating universal rather than selective educational interventions.

Implications for Nursing Practice and Public Health

The findings of this study have significant implications for nursing practice, education, and public health policy. Nurses, as integral components of the healthcare delivery system, play a pivotal role in promoting health and preventing disease. The effectiveness demonstrated in the STP highlights the potential of nurse-led educational interventions in enhancing awareness and fostering preventive health behaviors. Incorporating such programs into school health services can serve as a strategic approach to reach adolescents at an early stage, thereby influencing their long-term health practices. Furthermore, integrating cervical cancer education into formal curricula can contribute to sustained awareness and early adoption of preventive measures, such as vaccination and screening.

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Critical Reflection on Study Design

Although this study yielded significant findings, certain methodological considerations warrant discussion. The use of a pre-experimental one-group pretest and posttest design, although appropriate for preliminary evaluation, lacks a control group, thereby limiting the ability to attribute changes exclusively to the intervention. Additionally, the small sample size ($n=30$) and confined geographical setting may affect the external validity and generalizability of the findings. Despite these limitations, this study provides valuable insights into the effectiveness of structured educational interventions and serves as a foundation for future research employing more rigorous experimental designs.

Synthesis of Findings

Overall, the discussion elucidates that the STP was highly effective in enhancing knowledge of cervical cancer among adolescent girls. The statistically significant improvement in posttest scores, coupled with the shift in knowledge categories and the absence of poor knowledge post-intervention, underscores the efficacy of the intervention.

These findings collectively highlight the indispensable role of structured health education in addressing knowledge gaps, promoting awareness, and contributing to the prevention and early detection of cervical cancer.

CONCLUSION

This study assessed the effectiveness of an STP on the knowledge of cervical cancer among adolescent girls studying in selected senior secondary schools in Agra. A quantitative research approach was used, employing a pre-experimental one-group pretest and posttest design with a sample of 30 participants. The results provide strong evidence that structured educational interventions are effective in improving awareness of cervical cancer among adolescents. The pretest findings showed that most participants (76.6%) had only average knowledge, while 23.3% had poor knowledge, and none demonstrated good knowledge of cervical cancer. This highlights a clear lack of awareness, especially

regarding risk factors, prevention strategies, screening methods, and early detection.

After the implementation of the STP, a marked improvement in knowledge levels was observed. In the posttest, no participant remained in the poor knowledge category. Instead, 56.6% had average knowledge, and 43.3% had good knowledge. This improvement in the distribution from lower to higher knowledge categories indicates the effectiveness of the educational intervention.

Statistical analysis further supported these findings. The mean pretest score was 12.1 ± 3.04 , which increased to 19.4 ± 3.8 in the posttest, showing a mean difference of 7.3. The calculated *t*-value of 10.98 at $p < 0.001$ demonstrates a highly significant difference between the pretest and posttest scores. Accordingly, the null hypothesis (H_0), which stated that there is no significant difference in knowledge before and after the intervention, was rejected, and the research hypothesis (H_1) was accepted.

Additionally, the chi-square test used to examine the association between pretest knowledge scores and selected demographic variables revealed no statistically significant relationship between knowledge levels and demographic factors.

This suggests that the baseline knowledge deficit was uniformly distributed across different demographic groups, highlighting the universal need for educational interventions, irrespective of background characteristics.

However, the significant improvement observed by post-intervention indicates that a structured and well-planned teaching program can effectively bridge this knowledge gap. From a broader perspective, this study underscores the critical role of health education in disease prevention and health promotion. Cervical cancer is preventable through vaccination, early screening, and awareness. It requires targeted educational strategies, particularly among adolescents. The implementation of an STP in school settings can serve as an effective approach to equip young individuals with essential knowledge, thereby fostering positive health behaviors and reducing future disease burden.

Furthermore, the statistical analysis reinforces the effectiveness of STP. The mean pretest knowledge score was 12.1 ± 3.04 , whereas the mean posttest score increased to 19.4 ± 3.8 , resulting in a mean difference of 7.3. The calculated '*t*' value of 10.98 at a significance level of $p < 0.001$ indicates a highly statistically significant difference between the pretest and posttest scores. Therefore, the null hypothesis (H_0), which states that there is no significant difference in knowledge scores before and after the intervention, is rejected, and the research hypothesis (H_1) is accepted. This confirms the structure. The teaching program was highly effective in improving knowledge of cervical cancer.

The results of this study emphasize that adolescent girls, despite being at a crucial stage for preventive health education, often lack adequate knowledge regarding cervical cancer. However, the significant improvement observed by post-intervention indicates that a structured and well-planned teaching program can effectively bridge this knowledge gap.

From a broader perspective, this study underscores the critical role of health education in disease prevention and health promotion. Cervical cancer, which is preventable through vaccination, early screening, and awareness, requires targeted educational strategies, particularly among adolescents. The implementation of an STP in school settings can serve as an effective approach to equip young individuals with essential knowledge, thereby fostering positive health behaviors and reducing future disease burden.

In conclusion, this study successfully demonstrated that an STP is an effective, feasible, and impactful educational intervention for improving knowledge of cervical cancer among adolescent girls. The statistically significant enhancement in posttest scores, along with the shift in knowledge categories,

validates the intervention's success. Therefore, it is strongly recommended that similar educational programs be incorporated into school health services and community health initiatives to promote awareness and contribute towards the prevention and early detection of cervical cancer.

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