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An evaluative study on the effectiveness of an educational intervention on knowledge regarding cervical cancer and its prevention among female school students in selected school of Varanasi UP

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Abstract
Background: Cervical cancer is one of the leading causes of cancer-related deaths among women worldwide. It is primarily caused by persistent infection with high-risk human papillomavirus (HPV) types. Despite advancements in screening and vaccination, cervical cancer remains a significant public health challenge, especially in low- and middle-income countries. Early detection through Pap smears and HPV testing can significantly reduce mortality rates. In India, cervical cancer accounts for a substantial percentage of female cancer cases, and the burden continues to rise due to limited preventive measures and delayed medical intervention.
Methodology: A quantitative approach with a pre-experimental design was used in this study. The study included 30 girls students from BLW inter college. A non-probability purposive sampling technique was used for data collection. Socio-demographic data were collected using a demographic variables and knowledge was assessed using structured knowledge questionnaire.
Results: The findings revealed a significant improvement in their knowledge after the intervention. The **pre-test** results showed an average score of 11.28, indicating limited awareness regarding cervical cancer and its prevention. However, after the planned teaching program, the post-test score increased to 16.22, paired t value (7.19) was also found significant at 0.05 level of significance reflecting a notable improvement in understanding. The results emphasize the effectiveness of educational intervention in enhancing awareness and promoting preventive behaviours among school students.
Conclusion: The study concludes that the educational intervention effectively improved the knowledge of female school students regarding cervical cancer and its prevention.

Keywords: Effectiveness, educational intervention, knowledge, cervical cancer, prevention

Introduction
Cervical cancer is a major public health concern in India. The disease is highly preventable yet the burden is high. Persistent infection with human papillomavirus (HPV), particularly types 16 and 18, is the predominant cause of cervical cancer [1]. According to the National Cancer Registry Programme, HPV-associated cancers form a substantial proportion of the national cancer burden, with cervical cancer being one of the leading contributors [2]. Adolescents and young girls often have inadequate knowledge about cervical cancer, its risk factors, and preventive strategies. A study among young tribal women found that only 26% were aware of cervical cancer and just 20.5% had heard of HPV, awareness of the HPV vaccine was even lower [3]. In Varanasi, there is a growing need to assess baseline knowledge of cervical cancer among school girls and evaluate whether educational interventions can significantly improve awareness. Educational interventions have been found effective in improving knowledge and attitudes about HPV and cervical cancer. A study among female healthcare students (aged 19-25), a structured educational session resulted in significant improvement in their understanding of HPV, cervical cancer, and willingness to vaccinate [4].

Aim of the study
Enhance knowledge regarding cervical cancer and its prevention among female school students by educational intervention.

Objectives

- To assess the pre-test knowledge score towards cervical cancer and its prevention among female school students.
- To evaluate the effectiveness of structured teaching programme on cervical cancer and its prevention among female school students.
- To find out an association between pre-test knowledge score among female school students regarding cervical cancer and its prevention and their selected demographic variables.

Operational definition

- **Effectiveness:** It refers to the gain in post-test knowledge score after providing educational intervention on Cervical Cancer and its prevention as measured by structured knowledge questionnaires among female school students.
- **Educational Intervention:** It is a teaching learning material. It refers to systematically developed set of audio-visual teaching aid prepared through chart paper, pamphlets, white board on cervical cancer and its prevention among a group of female school students.
- **Knowledge:** It refers to the awareness and understanding of cervical cancer and its prevention by female school students assessed by the responses to the items of the structured knowledge questionnaires.
- **Cervical cancer:** Cervical cancer is a type of cancer that occurs in the cells of the cervix the lower part of the uterus that connects to the vagina.
- **Prevention:** It refers to measures which are taken to avoid the occurrence of cervical cancer.
- **Female school Students:** In this study it refers to the female students who are studying in the BLW Inter College.

Hypothesis

All the hypotheses will be tested at 0.05 level of significance.

- **H_1:** The mean post-test knowledge score regarding cervical cancer and its prevention is significantly higher than the mean pre-test knowledge score among female school students.
- **H_2:** There is significant association with the pre-test knowledge score regarding cervix cancer and its prevention of female school students and selected demographic variables.

Conceptual framework

The modified conceptual framework based on the concept of "Kings Goal Attainment Theory" by Imogene King (1971) was adopted. Imogene King's Goal Attainment theory offer insight into nurse's interaction with individual and group within the environment.

It highlights the importance of client's participation in decision that influences care and focuses on both the process of nurse-client interaction and the outcome of care.

Methods

Research approach

A quantitative research approach was considered the best to assess the knowledge of female school students regarding cervical cancer and its prevention.

Research design

A Pre-experimental research design (one group pre-test post-test only) was selected to assess knowledge of female school students regarding cervical cancer and its prevention.

Research setting

Based on the geographical proximity, feasibility of conducting the study and availability of the samples, main study was conducted in BLW inter college, Varanasi.

Population

The target population for the study was the school student in selected schools of Varanasi, UP.

Sample

In this study sample are the female school students of BLW inter college, Varanasi, UP.

Sample Size

In this study investigator selected 30 female school students for study.

Sampling Technique

In this study the investigator used non-probability sampling technique in which purposive sampling method was used to draw the samples.

Criteria for selection of sample:-

Inclusion criteria

- Female school students of BLW intercollege.
- Student who are present at the time of data collection.
- Female school students of 11^{th} and 12^{th} standard.

Exclusion Criteria

- Student who are not willing to participate in the study.
- The male school student of selected school.

Variables

Dependent variable

Knowledge regarding cervical cancer and its prevention among female school students.

Independent variable

Educational intervention regarding cervical cancer and it is prevention.

Demographic variables

Demographic variables such as age of the students, education, educational stream, religion, and family history of cervical cancer any previous information regarding cervical cancer prevention yes sources of information about cervical cancer.

Content validity

Content validity of the tool obtained on the basis of opinion from different experts from the different fields comprising of 1 onco-psychiatrists, 1 oncologist, 5 nursing expert in Medical surgical nursing, 2 nursing expert in Obstetric and Gynecological Nursing, 1 nursing expert in Paediatric Nursing.

Reliability of the tool

The reliability of structured knowledge questionnaire was r=0.77 as calculated by using Karl Pearson Split half method

with spearman brown's prophecy technique. Hence structured knowledge questionnaire was found reliable and feasible.

Ethical consideration

Formal permission was obtained from the concerned principal of BLW Inter College. After explaining the purpose of the study and about the confidentiality, informed consent was obtained from subjects before collecting the data.

There was no ethical issue aroused during study period.

The subjects were informed that their participation was voluntary and they had freedom to withdraw from the study.

Pilot study

The pilot study was carried out in order to find the feasibility of the study. Ten sample's data were collected who met the inclusion criteria and exclusion criteria. Pilot study showed that the study was feasible.

Development and description of tool

Tools were prepared on the basis of objective of the study. Socio-demographic proforma and structured knowledge questionnaire were prepared to assess the knowledge of female school teachers, the following steps were carried out in preparing the tool.

Tool consists of three sections as follows

Section A: It consist of socio-demographic data which includes age, gender, education qualification of the students, education stream of the students, religion of the students and family history of cervical cancer of students.

Section B: Section B consists structured knowledge questionnaire regarding cervical cancer and its prevention among female school students.

This includes 25 structured questions, which are categorized under 4 headings:-

- General information about cervical cancer.
- Etiology and risk factors of cervical cancer.
- Sign and symptoms of cervical cancer.
- Prevention of cervical cancer.

Section C: This section consists of educational intervention on cervical cancer and its prevention among female school students with lesson plan.

Results

Demographic Variables

Table 1: Description of demographic variables of the participants (Female School students), N=30

S. No.	Demographic Variables	Frequency	Percentage
1	**Age**		
	A) 15-18 years	17	56.7%
	B) 18-20 years	12	42.3%
	C) Above 20 years	1	1%
2	**Education**		
	A) Class 11	12	40%
	B) Class 12	18	60%
3	**Education Stream**		
	A) Science	18	56.%
	B) Arts	8	26.3%
	C) Commerce	4	17%
4	**Religion**		
	A). Hindu	20	66.70%
	B) Muslim	8	25%
	C) Christian	2	8.33%
	D) Other	0	0%
5	**Family History of Cervical Cancer**		
	A) Yes	9	30%
	B) No	21	70%

Table 1, depicts the description of demographic variables of the participants (Female school students)

Majority of female students 56.7% were between 15-18 years, 42.3% were between 18-20 years and 1% were above 20 years of age. Majority of the students, 40% were in 11th standard and 60% belongs to 12th standard. Among them 56.7% belongs to science stream, 26.3%)were from arts stream and 17% belongs to commerce stream, 40% female students were Hindu, 33.3% were Muslim, 16.7% were Christian and 10% were from other religion. Among the samples (70%) does not have any family history of cervical cancer where as 30% have family history of cervical cancer.

Table 2: Description of the pretest knowledge score of the female school students regarding cervical cancer and its prevention

Pre-test knowledge scoring criteria	Category (level of knowledge)	Frequency	Percentage%
Below 6	Poor	1	3.33%
7-12	Average	19	63.3%
13-18	Good	10	33.3%
19-25	Excellent	0	0%

Table 2, depicts the description of the pretest knowledge score of the female school students regarding cervical cancer and its prevention. Majority of the students have average level of knowledge comprising 63.3%, a total of 10 students comprising 33.3% fell into good knowledge category. Only 1 (3.33%) student is having poor knowledge.

Table 3: Description of the post-test knowledge score of the female school students regarding cervical cancer and its prevention

Post-test knowledge scoring criteria	Category (Level of knowledge)	Frequency	Percentage%
Below 6	Poor	0	0%
7-12	Average	4	13.33%
13-18	Good	19	63.33%
19-25	Excellent	7	23.33%

Table 3, Majority of the students have good level of knowledge comprising 63.33%, a total of 7 students comprising 23.33% have excellent level of knowledge. Only 4 (13.33%) students is having average level of knowledge which indicated that there was a significant increase in knowledge scores after administration of educational intervention regarding cervical cancer and its prevention.

Table 4: Effectiveness of educational intervention on knowledge regarding cervical cancer and its prevention among female school students

Category (Level of Knowledge)	Knowledge Scoring criteria	Pretest				Post-test				Mean Difference	T-Value
		(F)	(%)	Mean	S.D	(F)	(%)	Mean	S.D		
Poor	0-6	01	3.33	45.12	3.2	00	00	64.8	3.76	4.94	7.19*
Average	7-12	19	63.3			04	13.3				
Good	13-18	10	33.3			19	63.3				
Excellent	19-25	00	00			07	23.3				

The data presented in the table represents the mean, mean difference, mean percentage, median, standard deviation, and 't' value of pre-test and post-test knowledge scores regarding cervical cancer and its prevention. The findings indicates that the mean post-test knowledge score (16.22) was higher than the mean pre-test knowledge score (11.28), with a mean difference of 4.94. The mean percentage of the post-test knowledge score (64.88%) was also higher than the mean percentage of the pre-test knowledge score (45.12%). Additionally, the median post-test knowledge score (16.47) was greater than the median pre-test knowledge score (11.42). The standard deviation (SD) of post-test knowledge score (3.76) was slightly higher than the SD of pre-test knowledge score (3.2). A paired t-test analysis yielded a 't' value of (7.19*), indicating a statistically significant improvement in knowledge scores. This suggests that the intervention was effective in enhancing knowledge regarding cervical cancer and its prevention.

Table 5: Description of association between pretest knowledge of female school students regarding cervix cancer and its prevention with their selected demographic variables, N=30

S. No.	Demographic variable	Poor Knowledge	Average Knowledge	Good Knowledge	Excellent Knowledge	χ^2 Value	P-Value	Significant ($p<0.05$)
1								
	Age	1	5	3	3	253	0.865	Not
		0	4	3	3			Significant
		0	2	4	2			
2								
	Gender	0	0	0	0	1.59	0.207	Not
		1	4	8	7			Significant
3								
	Education	0	4	2	3	3.60	0.731	Not
	level	1	5	3	3			Significant
		0	4	3	2			
4	Education							
	Stream	1	5	8	3	0.43	0.512	Not
		0	2	4	4			Significant
		0	1	1	1			
5								
	Religion	0	3	2	2	1.38	0.711	Not
		1	2	2	2			Significant
		0	6	3	1			
		0	3	1	2			
6	Family							
	History of	1	10	2	2	4.43*	0.035	Significant
	Cervical	0	4	6	5			
	Cancer							

Table 5, Data presented in the table showed that there was significant association between pretest knowledge scores regarding cervical cancer and its prevention with their selected demographic variable family history of cervical cancer χ^2=4.43* at 0.05 significant level).

Discussion of the study

The findings of the study were discussed with reference to the objective and with findings from other studied.

The objectives of the studies where assess the knowledge regarding prevention on cervical cancer and to assess the relationship between knowledge and selected variables.

Study findings revealed that the majority of the school student between 15-20 or 20 above 20 years age group were unaware of causes and risk factor of cervical cancer like Human Papillomavirus (HPV), Sexual activity, Weak Immune System, Obesity, Age (30-39 & 60-69), Nutritional Deficiency and Cigarette Smoking.

To assess the pre-test knowledge score towards cervical cancer and its prevention among female school students.

Rakheja Shashi *et al*., conducted a study aimed to evaluate the knowledge, attitude, and awareness regarding HPV vaccination among college-going girls aged 18-26 years in Delhi-NCR, focusing on identifying barriers to vaccine uptake and factors influencing vaccination status. A cross-sectional survey was conducted involving 506 college students from various institutions in Delhi-NCR. Data were collected using an online structured questionnaire addressing demographics, knowledge of cervical cancer and HPV, awareness of the HPV vaccine, and attitudes toward vaccination. Among the respondents, 80.2% correctly identified cervical cancer as a malignancy of the cervix, but 20% mistakenly associated it with other cancers like neck or bone cancer. Only 58.3% accurately recognized HPV as a virus linked to cancer, while a significant proportion confused HPV with HIV/AIDS (37.2%) or considered it a bacterial infection (16.6%). The findings reveal substantial knowledge gaps and socio-cultural barriers to HPV vaccination among college-going girls in Delhi-NCR. While awareness of cervical cancer was moderate, misconceptions regarding HPV and its vaccine persist. To increase vaccination coverage, it is crucial to implement educational campaigns targeting young women, address misinformation on social media, and advocate for the inclusion of the HPV vaccine in the National Immunization Programme. Reducing financial barriers through policy interventions could further enhance vaccine uptake [5].

To evaluate the effectiveness of educational intervention on cervical cancer and its prevention among female school students

Nirmala *et al*., conducted a study evaluating the Effectiveness of a Structured Teaching Program on Cervical Cancer Prevention for Urban Women to assess the effectiveness of structured teaching program on the prevention of cervical cancer among urban women in chikkabanavara, Bengaluru, Karnataka. The study employed a pre-test and post-test design to evaluate the knowledge of urban women regarding cervical cancer prevention before and after the teaching intervention. A total of 40 participants where participants were selected through random sampling. A structured questionnaire was used to measure their knowledge on topics such as risk factors, early detection methods, and prevention strategies, including screening and vaccination. The findings indicated a significant improvement in knowledge among participants post-intervention, demonstrating the value of structured education in raising awareness and promoting preventive behaviors. This study underscores the importance of educational programs in empowering women to take proactive steps in preventing cervical cancer [6].

To find out an association between pre-test knowledge score among female school students regarding cervical cancer and its prevention and their selected demographic variables

Yadav K Sanjeev *et al*., conducted a Study on Knowledge, Screening, and Associated Risk Factors for Cervical Cancer among Women in Eastern Uttar Pradesh, India. This study sought to evaluate women's knowledge and attitudes towards cervical cancer and screening in Eastern Uttar Pradesh. A descriptive cross-sectional study assessed the socio-demographic profile, Knowledge, Attitude, and Practice of community health workers regarding cervical cancer and screening. Results indicated that despite possessing adequate knowledge and perception of cervical cancer and screening, less than 10% of participants had undergone screening. Notably, a significant association was observed between knowledge level and screening practice. The study concluded that bridging the gap between perception and practice necessitates the implementation of educational programs and active participation in screening campaigns. In summary, enhancing awareness and cultivating positive attitudes towards cervical cancer screening among women in Eastern Uttar Pradesh are pivotal for early detection and improved prognosis [7].

Summary

The purpose of study is to evaluate the level of knowledge regarding cervical cancer and its prevention among school students in selected school of Varanasi.

This study is designed by the researcher to evaluated the level of knowledge purposive sampling technique was used the selected sample a 30 sample.

The collected data were calculated by using both descriptive and inferential statistics based on the objective of the study.

The hypothesis is tested and accepted. Data is statistically analyzed and represented as table and graphic in the previous.

Conclusion of the study

Based on the finding above, the study concludes that most of the participants (70%) don't knew about the cervical cancer despite the fact that the rate of utilization of cervical cancer screening services was low yet they knew about cervical cancer and cervical cancer screening services. An experimental study was undertaken to assess the knowledge of the female school students between the age group 15-20 or above 20 years about risk factor and its prevention of cervical cancer. The conveyed that the students have lower level of knowledge about risk factor and its prevention of cervical cancer. The study was conducted in a relatively sample of 30 school students between the age group of (15-20 or above 20). The study clearly portrays that after administration of educational intervention majority of the school students had good and excellent level of knowledge however poor knowledge was seen in 0% of the school students between the age group of 15-20 or above 20 years.

Recommendation

- A similar study can be replicated on large sample to generalize the findings.
- A similar study can be conducted by influencing, addition demographic variables that may influence the level of knowledge of female school student.

Conflict of Interest

Not available

Financial Support

Not available

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