

Research Article

A Cross-Sectional Study to Assess the Effectiveness of a Health Educational Programme on Knowledge Regarding Prevention of Cervical Cancer Among Young Adult Female Students of Bhopal

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A B S T R A C T

Introduction: Cervical cancer is the fourth most common cancer in women and causes significant morbidity and mortality. In India, cervical cancer contributes to approximately 6–29% of all cancers.

Objectives: To determine the awareness of young adult female students regarding cervical cancer, its risk factors, screening method and prevention and to assess the association between old and new knowledge by pre- and post-test scores.

Material & Methods: This is a descriptive cross-sectional study of young adult female college students pursuing graduation in Commerce, Science and Medical disciplines in the city of Bhopal. A sample size of 387 was calculated using Cochran's formula. A pre-validated, pre-tested, close-ended multiple-choice questionnaire on socio-demographic information and various domains of cervical cancer awareness including risk factors and symptoms (domain I), screening and diagnostic (domain II) and vaccination (domain III) was filled via digital mode. Data were collected before and after a lecture demonstration, ensuring comprehensive analysis.

Results: The effectiveness of the educational programme on all the components of all three domains were found positive and some of them were found to be statistically significant too.

Conclusion: The awareness of young adult female students regarding cervical cancer and its risk factors, screening method, and prevention were fair, poor, and poor respectively. After the lecture demonstration, the awareness became good, fair and fair respectively. Nearly half of the study participants were willing to adopt screening programmes and vaccination. Teachers can be the best resource in the dissemination of knowledge in schools and colleges and can play a very important role in increasing the awareness of the youth regarding cervical cancer.

Keywords: Cervical Cancer, Awareness, Vaccination, Educational Programme

Introduction

Cervical cancer is the fourth most common cancer in women and causes significant morbidity and mortality. Two human papillomavirus types 16 and 18 are responsible for nearly 50% of high-grade cervical cancer.¹ In 1996, WHO declared HPV as the major cause of cancer of the cervix.² Every year in India, 122,844 women are diagnosed with cervical cancer and 67447 die from the disease. In India, cervical cancer contributes to approximately 6–29% of all cancers.³ In 2018, globally, approximately 5,70,000 cases of cervical cancer were estimated, out of which, there were 3,11,000 fatalities. In 2020, approximately 6,04,000 new cases were estimated and 3,42,000 women died of cancer, globally.¹ The burden of cervical cancer is increasing largely in developing and poor countries. About 90% of deaths occur in low- and middle-income countries, whereas a declining trend (65%) in the incidence of invasive carcinoma cervix has been documented in the United States and other European countries in the last 3 decades owing to the widespread introduction of Pap smear as a sensitive screening tool.⁴ Cervical cancer can be prevented early by vaccinating young female adults. Vaccination against HPV and screening and treatment of pre-cancerous lesions is a cost-effective way to prevent cervical cancer. Sikkim is the first state to introduce HPV vaccination in the entire state.⁵ A low level of community awareness of cervical cancer and a low level of education are hurdles in the diagnosis and prevention of cervical cancer. Awareness programmes are effective for all levels of prevention. Awareness means to be conscious; cognizant and informed. It is the state or ability to perceive, feel or be conscious of events, objects, or sensory patterns. Awareness measurement has the objective of analysing what respondents know as well as what they do not know.⁶ Will an educational programme on cervical cancer, its prevention and screening measures in young adult female students help them to adopt the vaccination and screening programme?

Objectives

- To determine the awareness of young adult female students regarding cervical cancer, its risk factors, screening method and prevention
- To assess the association between old and new knowledge by pre- and post-test scores

Material and Methods

A descriptive cross-sectional study was conducted in June 2023 in Bhopal, Madhya Pradesh, a city in central India. Ethical approval was obtained from Gandhi Medical College Bhopal, Institutional Review Committee, Institution Ethics Committee vide Letter No. 8502/MC/IEC/23 Bhopal dated 08.05.2023. The sample size was calculated by using the formula $n = [(Z\alpha^2 \times P \times Q)/d^2]$, where n: sample size, $Z\alpha$:

value of standard normal variate corresponding to α level of significance (95% CI), $P = 59.4\%$, $Q = 40.6\%$ and d: margin of errors which is a measure of precision (5%). From this calculation, the sample size was found to be 387. The young adult female college students of Commerce, Science and Medical disciplines who were present on the day of assessment and were willing to participate were included in the study. Out of 387 female participants, 100 (25.8%) were from Govt. Maharani Laxmi Bai Girl College pursuing a BCom, 147 (37.9%) were from Sarojini Naidu Girls College pursuing a BSc, and 140 (36.2%) were from Gandhi Medical College pursuing an MBBS course. Informed verbal consent was taken from participants. The awareness regarding cervical cancer was assessed on three domains: domain I - risk factors of cervical cancer (9 questions); domain II - screening & diagnostic (3 questions); and domain III - vaccination (8 questions). A total of 20 questions along with socio-demographic information were asked from the participants. Each correct answer was given 1 score and for each incorrect answer, 0 score was given. The total obtained score (in percentage) was categorised as follows: > 80%: very good; 60–79%: good; 41–59%: fair; < 40%: poor.

Pretesting was done among 5% of the total sample size and necessary modifications were made. A pre-validated, pre-tested, close-ended multiple-choice questionnaire on socio-demographic information, risk factors, screening and vaccination for cervical cancer was filled in digital mode before and after the lecture demonstration. Data collection was done in digital mode (Google Form) under the guidance of mentors before (pre-test) and after (post-test) the educational programme (lecture-demonstration). The collected responses were entered in Microsoft Excel. The results were expressed in percentages and chi-square was calculated on pre- and post-test scores.

Results

The mean age of female participants of MLB College, Sarojini Naidu College, and GMC was 19.5 ± 1.8 , 19.5 ± 1.5 and 20.3 ± 1.4 years respectively. The mean age of the participants was 19.5 ± 1.5 years.

In the study, it was found that only 254 (65.6%) students were aware of the cervix as a part of the female reproductive system but after the lecture demonstration, 356 (92.0%) students were aware of the cervix being a part of the uterus (Table 1). Awareness changed from good to very good. Initially, 235 (60.7%) students of different streams had a perception that breast is the most common cancer in women, but after the lecture demonstration, perception changed towards cervical cancer (20.4% to 46.5%) and awareness changed from poor to fair. In the study, it was found that awareness regarding cervical cancer was higher in medical students than in students from the Science and Commerce disciplines. After the demonstration, awareness

among students increased up to 95%. Awareness regarding cervical cancer, mode of transmission through sexual intercourse and age of occurrence among young adult female students was found to be good (60.7%), fair (51.2%) and fair (50.9%), respectively but after the demonstration, awareness changed to very good (92.2%), very good (86.8%) and fair (58.7%), respectively. Awareness regarding the common agent causing cervical cancer i.e., HPV among students was poor (29.7%), but after the demonstration, the level of awareness among students increased to good (67.2%). The awareness regarding acquired HPV infection being the common risk factor of cervical cancer among students was poor (32.9%) but after the demonstration, the level of awareness among students increased to good (68.5%). The awareness regarding symptoms of cervical cancer like bleeding between menses, bleeding after sexual intercourse, foul-smelling vaginal discharge, unexplained weight loss and pain/ low back ache among students was poor (38.5%), but after the demonstration, awareness among students increased to fair (52.5%).

Overall, the effectiveness of the educational programme on most of the components of domain I was found to be positive but statistically non-significant concluding that there was no difference found in awareness regarding cervical cancer among young adult female students of different colleges.

In domain II, the values corresponding to the awareness regarding common screening techniques for cervical cancer, age criteria for screening and diagnostic Pap smear method were found to be 27.9%, 16.3% and 22.5%, respectively categorised as poor awareness which after demonstration were found to be 74.4%, 31.8%, and 42.9%, respectively and improved to good and fair knowledge. After demonstration, the test scores of knowledge on screening technique and diagnostic Pap smear method were found to be statistically significant.

In domain III, the level of awareness was found to be fair for cervical cancer as a preventable disease (46.2%) and vaccination for cervical cancer (42.6%), and poor for the name of the vaccine (29.7%), eligible age group (15.2%), cost of the vaccine (26.3%), side effects and effectiveness of the vaccine (25.3%), vaccine availability in Bhopal (25.6%) and willingness to get vaccinated (32.6%), which after demonstration was found to be very good (84.5%), good (78.5%), good (69.8%), fair (53.7%), fair (51.9%), fair (51.7%), fair (49.1%) and fair (50.9%), respectively. Pre- and post-test scores of all the above entities were found to be statistically significant.

Table I. Impact of Educational Programme on Knowledge About Cervical Cancer Among Young Adult Female Students of Bhopal

Domain	Questionnaire	Before	After	% Increase	Before	After	% Rise	Before	After	% Increase	Before	After	% Increase	p Value
1		BCom n (%)			BSc n (%)			Medical n (%)			Total N (%)			
	What is cervix?	76 (76.0) Good	92 (92.0) Very Good	21.1	96 (65.3) Good	128 (87.1) Very Good	33	82 (58.6) Fair	136 (97.1) Very Good	66	254 (65.6) Good	356 (92.0) Very Good	40	0.286505
	Which is the most common cancer in women?	11 (11.0) Poor	42 (42.0) Fair	282	26 (18.0) Poor	69 (46.9) Fair	165	42 (30.0) Poor	69 (49.3) Fair	64	79 (20.4) Poor	180 (46.5) Fair	128	0.06081
	Do you know about cervical cancer?	60 (60.0) Good	88 (88.0) Very Good	46.7	83 (56.5) Fair	135 (91.8) Very Good	63	92 (65.7) Good	134 (95.7) Very Good	46	235 (60.7) Good	357 (92.2) Very Good	52	0.818731

	What is the age of occurrence of cervical cancer?	59 (59.0) Good	72 (72.0) Good	22	71 (48.3) Fair	87 (59.2) Fair	23	67 (47.9) Fair	68 (48.6) Fair	1.5	197 (50.9) Fair	227 (58.7) Fair	15	0.67
	What is the common cause of cervical cancer?	34 (34.0) Poor	58 (58.0) Fair	70.6	45 (45.0) Fair	94 (63.9) Good	109	36 (25.7) Poor	108 (77.1) Good	200	115 (29.7) Poor	260 (67.2) Good	126	0.12
	What is the mode of transmission of HPV?	46 (46.0) Fair	82 (82.0) Very Good	78.3	79 (53.7) Fair	124 (84.4) Very Good	57	73 (52.1) Fair	130 (92.9) Very Good	78	198 (51.2) Fair	336 (86.8) Very Good	70	0.79
	What are the risk factors of cervical cancer?	24 (24.0) Poor	62 (62.0) Good	158	42 (32.9) Poor	89 (60.5) Good	84	46 (32.8) Poor	114 (81.4) Very Good	148	112 (32.9) Poor	265 (68.5) Good	108	0.759572
	What are the symptoms of cervical cancer?	32 (32.0) Poor	56 (56.0) Fair	75	64 (43.5) Fair	65 (44.2) Fair	70	52 (37.1) Poor	83 (59.3) Good	60	149 (38.5) Poor	203 (52.5) Fair	33	0.95369
2	Do you know about the commonly used screening technique for cervical cancer?	36 (36.0) Poor	71 (71.0) Good	97.2	50 (34.0) Poor	108 (73.5) Good	116	22 (15.7) Poor	109 (77.9) good	396	108 (27.9) Poor	288 (74.4) Good	167	0.004149
	What is the age criterion for screening for cervical cancer?	15 (15.0) Poor	37 (37.0) Poor	147	24 (16.3) Poor	45 (30.6) Poor	88	24 (17.1) Poor	41 (29.3) Poor	71	63 (16.3) Poor	123 (31.8) Poor	95	0.644036
	What is the diagnostic method for cervical cancer?	13 (13.0) Poor	49 (49.0) Fair	277	35 (23.8) Poor	60 (40.8) Fair	71	39 (27.9) Poor	57 (40.7) Fair	46	87 (22.5) Poor	166 (42.9) Fair	91	0.032387

3	Do you know that cervical cancer can be prevented?	35 (35.0) Poor	77 (77.0) Good	120	88 (59.9) Good	124 (84.4) Very Good	41	56 (40.0) Fair	126 (90.0) Very Good	125	179 (46.2) Fair	327 (84.5) Very Good	83	0.049539
	Do you know about the cervical cancer vaccine?	54 (54.0) Fair	69 (69.0) Good	27.8	74 (50.3) Fair	114 (77.6) Good	54	37 (26.4) Poor	121 (86.4) Very Good	227	165 (42.6) Fair	304 (78.5) Good	85	0.000518
	Do you know the name of the vaccine?	37 (37.0) Poor	63 (63.0) Good	70.2	55 (37.4) Poor	97 (66.0) Good	76	23 (16.4) Poor	110 (78.5) Good	378	115 (29.7) Poor	270 (69.8) Good	135	0.000462
	Which age group is eligible for cervical cancer vaccine?	17 (17.0) Poor	43 (43.0) Fair	124	27 (18.4) Poor	66 (44.9) Fair	144	15 (10.7) Poor	97 (68.6) Good	541	59 (15.2) Poor	206 (53.7) Fair	253	0.008871
	Do you know about the cost of the HPV vaccine?	31 (31.0) Poor	43 (43.0) Fair	38.7	52 (35.4) Poor	62 (42.2) Fair	19	19 (13.6) Poor	96 (68.6) Good	404	102 (26.3) Poor	201 (51.9) Fair	97	< 0.00001
	Do you know about the side effects and effectiveness of the vaccine?	30 (30.0) Poor	43 (43.0) Fair	43.3	51 (34.7) Poor	61 (41.5) Fair	20	17 (12.1) Poor	96 (68.6) Good	467	98 (25.3) Poor	200 (51.7) Fair	104	< 0.00001
	Do you know about vaccine availability in Bhopal?	30 (30.0) Poor	43 (43.0) Fair	43.3	51 (34.7) Poor	61 (42.5) Fair	23	18 (12.9) Poor	96 (68.6) Good	427	99 (25.6) Poor	190 (49.1) Fair	91.7	< 0.00001
	Will you be willing to be vaccinated against cervical cancer?	40 (40.0) Fair	43 (43.0) Fair	7.5	56 (38.1) Poor	60 (42.8) Fair	12	30 (21.4) Poor	94 (67.1) Good	214	126 (32.6) Poor	197 (50.9) Fair	56.1	0.000024

Discussion

Cervical cancer is the only preventable cancer with a well-known aetiology. Public awareness of this disease, its risk factors, early screening, and prevention programmes play an important role in reducing morbidity and mortality. Among all participants, 60.7% had heard of cervical cancer. The source of information among these students was from school which contributed to 40.3%. These findings are consistent with a study conducted among female African students from the Sub Saharan Africa region who had poor knowledge of the disease which influenced their attitude towards screening and vaccination.⁷ The study hence recommended that more efforts were needed to increase the awareness and uptake of screening programmes within schools. This infers that awareness activities regarding cervical cancer in schools can bring changes in health behaviour in university settings.

In the study, 387 young adult female students were included with a mean age of 19.5 ± 1.5 years, out of which, only 235 (60.7%) had heard of cervical cancer. This proportion was higher as compared to the proportion found in a study conducted by Dahiya et al. in which 75 (50%) women with a mean age of 35.87 ± 12.11 years had heard of cervical cancer.⁸ The reason for this higher proportion in the present study may be because young adult female students in the present study belonged to the Science and Medical streams.

However, this proportion was lower in comparison to a study conducted by Phuong et al.,⁹ in which the majority of women (83.8%) who were less than 30 years old had heard about cervical cancer. This may be due to the greater coverage from broadcasting programmes as well as the internet. The spread of information has become relatively easier to achieve than ever. This infers that there is a requirement for promotional activities at school and college levels for young adults.

Though the students were aware of cervical cancer, their awareness regarding symptoms (38.5%) and risk factors (32.9%) was found to be low which is in lieu with the study by Dahiya et al.,⁸ in which 17.3% knew regarding symptoms and 11.3% knew regarding risk factors of cervical cancer. In this study, it was found that only 35 women (23.3%) had ever heard of cervical cancer screening, but in the present study, the number was 108 (27.9%), and the majority of the study participants had heard of Pap smear test. The findings of both these Indian studies showed that awareness regarding cervical cancer screening and Pap smear tests was low as compared to international studies done in Kuwait,¹⁰ Singapore,¹¹ among Vietnamese-American women,¹² and in Kenya¹³. This difference is due to public health efforts in foreign countries that have succeeded in raising awareness.

It was found in studies by Rehman et al.¹⁴ and Dahiya et al.,⁸ that 18.0% and 12.0% respectively, of their respondents,

were aware of cervical cancer vaccination. In the present study, 165 (42.6%) had heard about the vaccine against cervical cancer. Awareness in young adult female college students was found to be fair. In a study by Sharma et al.,¹⁵ 136 (57.1%) medical students were aware of the recommended age range (9–26 years) for receiving the HPV vaccination, but in this study, only 10.7% of the students from the Medical discipline knew the correct age for HPV vaccination. Thus, the awareness among young adult female college students was poor.

In a study by Turki and Alqurashi, 65.5% of the participants expressed a willingness to receive the HPV vaccine if offered by the healthcare sector at no cost.¹⁶ In this study, a positive attitude towards vaccination was found to increase from 32.6% to 49.1% after the lecture demonstration.

Recommendations

Educational programmes regarding risk factors, screening tools, and vaccination for cervical cancer should be conducted in schools and colleges as they seem to constitute the preferred environment for adolescents.

Teachers are identified as potential key figures for disseminating knowledge within educational institutions in assistance with medical college faculties or medical professionals. Thus, they can take the responsibility of increasing the awareness of the youth regarding cervical cancer.

Further efforts to establish effective educational programmes followed by Pap smear screening (if required) and vaccination across different regions of the country can greatly contribute to the prevention of cervical cancer.

Limitations of the Study

It includes only young female college students.

Conclusion

The awareness of young adult female students regarding cervical cancer and its risk factors, screening method and prevention was found to be fair, poor, and poor respectively. After the lecture demonstration, the awareness became good, fair, and fair respectively. The effectiveness of the educational programme on most of the components of domain I was found positive but statistically non-significant. In domain II after the demonstration, the chi-square test values of knowledge on screening technique and diagnostic Pap smear method were found to be statistically significant, and in domain III, the chi-square test values of knowledge on vaccine for cervical cancer were found to be statistically significant.

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