

EFFECTIVENESS OF HEALTH EDUCATION INTERVENTION ON KNOWLEDGE REGARDING PREVENTION OF CERVICAL CANCER AMONG WOMEN IN A SELECTED COMMUNITY OF KATHMANDU, NEPAL

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ABSTRACT

Cervical cancer is considered a cancer that is preventable by means of vaccination against human papilloma virus (HPV) and early detection by screening. Its incidence is decreasing in developed countries but not in developing countries, including Nepal. Disease ignorance and low awareness about available preventive health services are the main causes for cervical cancer still being a leading cause of death by cancer. We evaluated the effectiveness of a health educational intervention in improving women's knowledge about cervical cancer and its prevention in a semi-urban community of Kathmandu. Health education was provided in an interactive lecture for women of reproductive age in various wards of Shankarapur Municipality, Kathmandu. Its effectiveness was assessed by comparing the level of knowledge before and four weeks after the intervention, by interviewing participants based on a questionnaire consisting of 48 questions. The study was completed in 126 women (mean age 33.5 years). The mean pre-test and post-test correct scores were 10.2 and 42.13 respectively ($p < 0.001$). Initially, 96.8% had poor knowledge (score $< 60.0\%$ of total); post-intervention, 87.3% had good knowledge (score $\geq 80.0\%$, $p < 0.001$). Knowledge before intervention was especially poor among older age, less educated, housewives or doing small business, and married women ($p < 0.001$). Knowledge of cervical cancer and its prevention is poor among community women. A health education is very effective in improving women's knowledge and should be implemented as a policy to achieve the goal of eliminating cervical cancer as a public health issue.

KEYWORDS

Cervical cancer, health education intervention, Nepal

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INTRODUCTION

Cervical cancer is the second most common cancer worldwide in women under 45 years of age.¹ In Sub-Saharan Africa, 34.8 new cases of cervical cancer are diagnosed per 100,000 women annually, and 22.5 per 100,000 die from the disease as compared to 6.6 new cases and 2.5 deaths per 100,000 women, respectively, in North America.² Thus, in developing countries, it is the leading cause of death among women.³ It is leading cause of mortality among Nepalese women also.⁴ According to WHO 2022 cancer mortality profile, annually 2244 new cases of cervical cancer are being diagnosed in Nepal and claims 1493 lives of women.

The most important risk factor for cervical cancer is Human Papilloma Virus (HPV) infection. Nearly all cases of cervical cancer can be attributable to HPV infection. Other risk factors include early sexual debut, multiple sexual partners, smoking, genetic predisposition and compromised immunity.⁵ The cure rate for invasive cervical cancer is closely related to the stage of disease at diagnosis and the availability of treatment.⁶ With effective screening and early treatment, the morbidity and mortality rates of cervical cancer have significantly decreased in many countries.⁷

In the developed and high-income countries, the health services related to cervical cancer such as vaccination, screening and treatment are easily accessible to the people. Also, the women there have overall better knowledge about various aspects of the disease.⁸ In comparison, the knowledge and awareness levels regarding cervical cancer are poor in the low- and middle-income developing countries.⁹⁻¹¹ Knowledge about cervical cancer, awareness of the related health services and practice of screening and HPV vaccination are in general poor in Nepalese women, as reported in the few studies that have been conducted.¹²⁻¹⁵

Health education about cervical cancer provided to the women by various methods such as short lectures, group discussions, videos and leaflets were found to result in significant improvements in knowledge and awareness about cervical cancer in different studies.^{11,16-18} However, effectiveness of an educational intervention on knowledge and awareness have not been reported in the Nepalese context. In this study, a health educational intervention was implemented in women in a sub-urban community of Kathmandu and changes in their levels of knowledge was assessed after four weeks to assess the effectiveness of the educational intervention in Nepalese women.

MATERIALS AND METHODS

This quantitative, quasi-experimental study was conducted among women of reproductive age group (15-49 years) in different wards of the Shankarapur Municipality (Sankhu), Kathmandu, Nepal from February to April, 2022. The study was approved by the Institutional Review Committee of Nepal Institute of Health Sciences, Jorpati, Kathmandu. Informed written consent was obtained from the participants.

The determined minimum sample size was 113, based on 92.0% rate of adequate level of knowledge about cervical cancer reported in a similar study in Ghana¹⁹ and using the Cochran formula ($n = z^2pq/d^2$) with 5.0% allowable error at 95.0% confidence interval. Finally, 11 numbers (10.0% of calculated size of 113) were added to address non-response or loss on follow-up. Non-probability purposive sampling method was adapted to recruit the participants. Altogether, 177 women consented to participate in the study.

The tool for data collection was a structured, close-ended questionnaire that was developed by researcher based on extensive literature review and consultation with specialist gynecologists and experienced nurses. The areas included in the questionnaire were general information, reproductive health history and knowledge regarding prevention and treatment of cervical cancer. Total score of knowledge was 48, grouped into four categories - meaning and symptoms (11 questions), risk factors (11 questions), preventive measures (12 questions) and specific knowledge on Pap smear and HPV vaccination (14 questions). Pre-testing was done among 12 participants (10.0% of sample size) to ensure instrument reliability and content validation. A reliability coefficient of 0.90 was obtained by Cronbach alpha.

Women of the community were first approached with the help of community social workers and leaders. Their general information including sociodemographic information was collected. In later part of the interview, information on their reproductive health practice and knowledge about prevention of cervical cancer was obtained.

The health educational intervention was implemented by organizing short sessions of Power-point presentations supplemented by interactive discussions in small groups, which lasted for about 30 minutes. The participants were followed up after about four weeks and their knowledge about prevention and treatment of cervical cancer was re-evaluated

using the same questionnaire tool. Level of knowledge was categorized as poor (score <29, i.e. <60.0%), average (score 29-38, i.e. 60.0-79.0%) or good (score ≥38, i.e. ≥80.0%).

The results were finalized after discarding incomplete data. Pre- and post-intervention levels of knowledge were compared by paired t test or Wilcoxon signed rank test, with level of significance set at p value less than 0.05. Differences among subgroups were compared by ANOVA or independent t-tests.

RESULTS

Altogether, 177 women were initially enrolled in the study but the study was completed in only 126 women as 29 could not be contacted in follow-up for the second interview and 22 were removed due to incomplete responses.

General and sociodemographic characteristics of participants: Table 1 and 2 shows the median age of the women was 33.5 years, with almost two-third of the women 30 years or older. Most of the participants were the *Adibasi-Janajati*

Table 1: General characteristics of participants (n=126)

Characterstics	Minimum	Maximum	Median	Interquartile range
Age (completed years)	15	49	33.5	18-40
Age at marriage	13	36	20.5	18-22.78
Number of children	0	4	2	1-2

Table 2: General and sociodemographic characteristics of participants (n=126)

Category	Subclasses	n	%
Age	Up to 29 years	45	35.7
	30 years and above	81	64.3
Ethnicity	<i>Brahmin-Chhetri</i>	40	31.7
	<i>Adibasi-Janajati (Newar, Tamang)</i>	79	62.7
	<i>Others (Madhesi, Dalit)</i>	7	5.6
Religion	<i>Hindu</i>	90	71.4
	<i>Buddhist and others</i>	36	28.6
Type of family	Nuclear	64	50.8
	Joint/Extended	62	49.2
Level of education	Uneducated/barely literate	41	32.5
	Primary level	23	18.3
	Secondary school	14	11.1
	High secondary	42	33.3
	Bachelor/Masters	6	4.8
Type of occupation	Agriculture	37	29.4
	Business/trade	17	13.5
	Job/service	9	7.1
	Housewife	27	21.4
	Students/unemployed	36	28.6
Marital status	Unmarried	41	32.5
	Married	85	67.5
Smoking habit	No	117	92.9
	Yes	9	7.1
Regular alcohol Consumption	No	121	96.0
	Yes	5	4.0
Type of family planning method	No	45	35.7
	Oral contraceptives (OCP)	12	9.5
	Norplant	15	11.9
	IUCD (Copper T)	1	0.8
	Depo	5	4.0
	Condom	2	1.6
	Male permanent	3	2.4
	Female permanent	1	0.8

Table 3: Comparison of pretest and post-test levels of knowledge about various aspects of cervical cancer and its prevention among participants (n=126)

Aspects of knowledge (subtotal score)	Pre-test		Post-test		Paired t test	
	Min-max	Mean±SD	Min-max	Mean±SD	T value	P value
Meaning and symptoms (11)	0-10	1.55±2.5	4-11	9.0±1.5	29.528	< 0.001
Risk factors (11)	0-10	2.62±2.9	6-11	10.23±1.2	26.741	< 0.001
Preventive measures (12)	0-12	4.78±3.6	7-12	11.7±0.8	21.426	< 0.001
Knowledge specific to Pap smear and HPV (14)	0-11	1.24±2.0	0-14	11.21±2.8	33.702	< 0.001
Total score (48)	1-40	10.2±8.7	28-48	42.13±4.4	37.21	< 0.001
Level of knowledge						
Poor (<29 or <60%)	122 (96.8%)		1 (0.8%)		Wilcoxon Signed Rank Test Z = 10.512, P < 0.001	
Average (29-38 or 60-79%)	3 (2.4%)		15 (11.9%)			
Good (≥38 or ≥80%)	1 (0.8%)		110 (87.3%)			

Table 4: Comparisons of levels of knowledge about cervical cancer in different subgroups of participants

Category	Subgroups	n	Mean scores	p value (ANOVA F or independent t)
Ethnicity	<i>Brahmin-Chhetri</i>	40	12.4	P = 0.127 (F = 2.101)
	<i>Adibasi-Janjati</i>	79	9.0	
	Others	7	10.9	
Age	Up to 29 years	45	14.5	P < 0.001 (t = 4.486)
	30 and above	81	7.8	
Religion	<i>Hindu</i>	90	9.98	P = 0.677 (t = 0.418)
	<i>Buddhist</i> and others	36	10.69	
Family type	Nuclear	64	10.0	P = 0.811 (t = 0.239)
	Joint and extended	62	10.37	
Educational level	Uneducated/barely literate	41	7.32	P < 0.001 (F = 12.676)
	Primary level	23	7.35	
	Secondary school	14	5.14	
	High secondary	42	14.17	
	Bachelor/master	6	24.5	
Occupation	Agriculture	37	8.97	P < 0.001 (F = 13.609)
	Business trade	17	5.94	
	Job service	9	20.56	
	Housewife	27	4.78	
	Students/unemployed	36	14.89	
Marital status	Unmarried	41	14.07	P < 0.001 (t = 3.669)
	Married	85	8.31	
Family history of cancer	Yes	10	6.5	P = 0.162 (t = 1.406)
	No	116	10.5	
Do you know about cancer	Yes	18	18.78	P < 0.001 (t = 4.953)
	No	108	8.75	
Done Pap smear before	Yes	12	11.17	P = 0.681 (t = 0.412)
	No	114	10.08	
Smoking habit	No	117	10.42	P = 0.272 (t = 1.104)
	Yes	9	7.11	
Regular alcohol consumption	No	121	10.33	P = 0.321 (t = 0.996)
	Yes	5	6.4	

people (*Newar, Tamang*), followed by *Brahmin-Chhetri* ethnicity and more than two thirds were *Hindus*. About one third were illiterate or barely literate while another one third had higher secondary education. The most common occupation was agriculture and small shops while about one-fifth were housewives. About two-thirds of the participants were married. The median age of marriage and first pregnancy were 20.5 years and 22 years respectively.

Pre-test knowledge about cervical cancer and prevention: Table 3 and 4 shows the knowledge about cervical cancer and its prevention. Ten participants (7.9%) gave a history of cancer in the family while 18 participants (14.3%) responded 'yes' to whether they know about cervical cancer.

The overall knowledge about cervical cancer and its prevention was poor among the participants, the median score being 9 out of total 48 (interquartile range 2-17.25, average score 10.2). While more than two-thirds had knowledge score less than 15, only two participants scored higher than 29. Significant differences in average level of knowledge about cervical cancer and its prevention was observed in the subgroups of age, educational level, occupation, marital status and claimed knowledge about cancer. Women of younger age, unmarried, higher educational level and job holders had significantly higher scores than the olderless educated women and those engaged in other occupation.

Post-test knowledge about cervical cancer and its prevention: Table 3 shows the level of knowledge after the educational intervention was assessed with the same questionnaire tool and methods after about four weeks. The average level of knowledge of overall participants was 42.13 (median 43), which was a very highly significant improvement over pretest level of knowledge. While only two participants had knowledge score of more than 29 in pretest, only one participant had score below 30 in post-test assessment (knowledge improved from 19 score in pretest to 28 in this participant). This demonstrated that there was marked improvement in all aspects of knowledge about cervical cancer and its prevention in all the subgroups such as ethnic, occupational, educational level, age and others. Therefore, separate group-wise comparisons were not done.

Practice of cervical cancer preventive measures: Of the 126 participants, 12 (9.5%) had undergone a Pap smear examination before. For the 114 participants who had no

Pap smear before, more than half cited lack of knowledge about Pap smear and its importance as the reason for not doing a Pap smear. About one-fifth gave unspecified or no reasons for not doing Pap smear. None of the participants had had vaccination against HPV.

DISCUSSION

Cervical cancer is caused by the HPV and vaccinations are available against the virus. Moreover, different screening tests such as the Pap smear technique help to identify the disease at the earliest and pre-cancerous stage. Cervical cancer is regarded as an entirely preventable disease. Working on vaccination and early detection, many developed countries have been able to reduce the incidence of cervical cancer.

Unfortunately, cervical cancer remains the commonest cancer in Nepalese women.^{20,21} Poor knowledge about the disease, lack of awareness about preventive measures and poor practice of screening behavior are the culprits of high incidence of the disease in Nepal, similar to many other developing and low income countries.

The level of knowledge about cervical cancer and the practice of preventive measures among Nepalese women in general is largely unassessed because of only small number of studies reported. Moreover, most of the studies have been done in women attending a tertiary care hospital (Obstetrics and Gynecology Out-patient Department, OGOPD), thus difficult to generalize. The knowledge and awareness about cervical cancer and its prevention has been mostly found to be poor.^{12,14,15} One study conducted in women attending OGOPD of the Tribhuvan University Teaching Hospital (TUTH) has reported adequate knowledge in nearly half of the respondents.²² However, even in women group with good knowledge, the practice of screening for cervical cancer is very poor.²³ Studies on effectiveness of educational intervention have not been reported yet.

In this study, the knowledge about cervical cancer and its prevention was assessed in 126 women of a suburban community in the periphery of Kathmandu and the effectiveness of a health education intervention was assessed in an interview and structured questionnaire-based study. The initial (pre-test) assessment showed a low level of knowledge among participants. The level of knowledge improved greatly when assessed about four weeks after

the health education was delivered to the women in small group teachings.

Compared to other studies, this study consisted of a smaller sample size. However, only women of reproductive age were included in this study while the other studies have included much older women also (60-70 years' age group).¹²⁻¹⁵

Another important aspect of studies relating to level of knowledge and awareness is the evaluation tool. Almost all studies evaluated the knowledge and awareness by close interviews and questionnaires. A cervical cancer awareness measure (CCAM) questionnaire has been developed for a survey purpose and used by some studies.^{24,25} However, most studies have designed their own questionnaire tailored for their communities or adopted from previously published studies. This is probably because of the length and complexity of CCAM and also because of the cervical cancer being very sensitive to community beliefs such as sexual behavior and reproductive health practices. As a result, the areas of knowledge evaluated and the total score are also different in different studies, although the core content is mostly similar. In this study, also a new questionnaire was developed to be suitable to the community, after thorough consultation with experts of the subject by clinical as well as public health views. Only the correct responses have been awarded scores.

The pre-intervention level of knowledge was poor in almost all participants (97.0%). This is a higher percentage of poor score than most other studies but almost all studies^{12,14,15} agree that knowledge level is generally poor among Nepalese women whereas Shilpakar *et al*²³ have reported good level of knowledge among women attending OGOPD in the TUTH hospital, Kathmandu. Studies conducted in women of many other developing countries also have reported similarly poor levels of knowledge.^{9,10,16}

The practice of screening for cervical cancer was found to be poor in our participants, only 12 women (9.5%) had done a Pap smear study before. This rate is similar to that of another study done in women attending a tertiary hospital OGOPD in Kathmandu (10.5% screening rate).¹² Shilpakar *et al*²³ have reported 25.0% screening rate, comparatively more in younger than older age groups, in another study conducted in OGOPD-TUTH, Kathmandu.²³ In a community based study on women of 30-60 years in Kavre, Nepal the screening behavior was found in 18.3% of the respondents.¹³ In a developed community, the rate of screening practice is much closer to the

global target for elimination of cervical cancer as a public health issue such as nearly 70.0% of respondents undergoing screening every three years by women in Malta.²⁵

The lack of knowledge about cervical cancer and availability of health services are cited as the most common reasons for the poor practice of screening in all the reported studies. This highlights the need of educating the women regarding the importance of the disease and information about health services and facilities that could be accessible to them. In different studies, the effectiveness of health education intervention in improving the knowledge and awareness of participants about cervical cancer and its prevention have been assessed and found to be very useful. In Nepal, researches have focused on studying the knowledge about cervical cancer and awareness and behavior of screening practice but the impact of a health educational intervention has not been reported. Thus, this study is the first of its kind in Nepal. We found great improvements in the level of knowledge in all aspect of knowledge such as symptoms, risk factors, preventive measures and screening (p values <0.001 for all, Table 3). The number of participants with poor knowledge decreased from 96.8% to 0.8% and good knowledge increased from 0.8% to 87.3%. Studies conducted in rural communities in countries like Nigeria,¹⁶ Jamaica¹⁷ and Ghana¹⁸ have reported similar great improvements in knowledge as a result of health educational intervention. The period between initial and post-interventional assessment has been variable and most studies have waited longer time, six weeks to six months, than our study.

Abiodun *et al*¹⁶ reported an improvement in practice of screening for cervical cancer in participants of the educational intervention study from 4.3% to 8.3% (p =0.038).¹⁶ In the study by Interis *et al*,¹⁷ 40.7% of the women remaining in the study till six months follow up had screened for cervical cancer. In a study with short gap, participants' screening practice was not reported although more number of participants had expressed willingness to undergo screening.¹⁸ In this study also women expressed willingness to do screening tests but the practice was not documented.

Due to time constraints, we only allowed four weeks between pre- and post-test evaluation of participants in this study. As a result, long-term retention of knowledge could not be ascertained. Similarly, behavioral changes in terms of practice of screening and vaccination may not be expected in a short time of only a few weeks. Also, because most of the questions

are close-ended type, there was less exploration of the respondents' ideas and opinions. However, we tried to overcome this limitation by including more number of questions in comparison to many other studies.

Development of a standardized evaluation tool such as a questionnaire that is suitable to different communities is desirable so that the outcome of different studies can be compared. Educational intervention studies of similar kind should be conducted in other communities and places of Nepal in larger scales, both to know the existing levels of knowledge and awareness regarding cervical cancer and its prevention. The improvement in the practice of HPV vaccination and screening tests needs to be assessed as well.

In conclusion, the participating women had poor knowledge and awareness about cervical cancer and its prevention. The educational intervention was in the form of a short presentation and interactive discussion was

found to be very effective in improving the knowledge as evidenced by the remarkable increase in knowledge levels in re-evaluation after four weeks. Health education in small groups could be an important approach to the goal of elimination of cervical cancer as a public health issue, in our community.

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