

Knowledge and Awareness about Cervical Cancer Screening and HPV Vaccine among Females Aged 15-49 Years in Rukum District of Nepal

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Abstract Introduction: Cervical cancer is the first most common cancer and the leading cause of mortality among women in Nepal. The annual age standardized incidence rate of cervical cancer is 19.0 and the mortality rate is 12.0 per 100,000 women. Awareness and knowledge about cervical cancer among females is essential in the prevention of cancer. The objective of this study was to assess the level of knowledge and awareness about cervical cancer and to identify the screening practices among the women in Rukum district of Nepal. **Methodology:** This cross sectional study was conducted in Jan to Feb 2016 in Rukum, Nepal. Multistage sampling technique was used and 600 Female aged between 15-49 years were recruited. A semi structured interview questionnaire was used to collect the information. The inferential statistics, chi square test was used to summarize the data. For bivariate analysis, odds ratio and its 95% CI were obtained and binary logistic regression technique was used as a multivariate analysis. **Results:** Among the 600 women, 77.5% had heard about cervical cancer. Of these only 16% (72) were aware about cervical cancer screening and 7% were aware about the Pap smear test. Among these only 13.6 % (8/72) had ever undergone for cervical cancer screening. Only 5% had heard about HPV, among of them 30% knew that it can cause cervical cancer. Only 47% had adequate knowledge about cervical cancer, HPV and its screening. Education, occupation and monthly household income of the participants were significantly associated with knowledge of cervical cancer. **Conclusion:** This study identified that, there have been a low level of knowledge about cervical cancer among women. It indicates that there is a need to implement some strategies to enhance the knowledge of cervical cancer for these women.

Keywords: cervical cancer, HPV vaccine, screening, knowledge

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1. Background

Cervical cancer is the fourth most common cancer among women worldwide, with an estimated 528000 new case and 266,000 deaths in 2012. [1] More than 80% of the cases are being reported from the developing countries. [2] Human Papilloma Virus (HPV) infection is the most common sexually transmitted infection worldwide. [3] HPV is the necessary but not sufficient cause for cervical cancer. There are more than 100 types of HPV, of which at least 13 are high risk cancer causing strains. HPV strains 16 and 18 are the cause of nearly 70% of the cervical cancer. [4] Exogenous and endogenous factor in conjunction with HPV infection influence the risk of

progression from HPV infection to cervical cancer. [5] Behavioural factors such as having early age of sex, multiple sexual partner, multiple pregnancies, use of OCP for more than 5 years, smoking habit is associated with a higher prevalence of HPV infection [5,6].

In Nepal, Cervical cancer is the first most common cancer among women. [7] According to WHO/ICO report 2014, the estimated age standardized annual incidence rate of cervical cancer is 19.0 per 100,000 women and mortality rate is 12.0 per 100,000 women per year, which makes Nepal, one of the highest cervical cancer rates country in South Asia. [7] Despite the fact, this estimate is most likely underestimation of true incidence of the disease due to lack of population based cancer registry system and inadequate cancer screening facilities in Nepal.

It is the only type of cancer which can be prevented. Cervical cancer screening provides ample opportunity for detection and treatment of pre cancer before progression to invasive cancer. [3,8] Pap smear is an internationally accepted method for cervical cancer and has been very successful in developed countries, lowering cervical cancer mortality by nearly 50-60%. [9] However, in developing countries, due to inadequate resources, lack of health system infrastructure, cervical cancer prevention remains opportunistic. Even the reported screening coverage remains low, where the majority of women had never undergone pelvic examination. [10]

The utilization of screening services and success of cervical cancer control program will require improving the knowledge and awareness about cervical cancer among women. Till date, no studies have been exclusively conducted in the rural district of Nepal, where no any formal cancer screening programmes were conducted. For these reasons, this study was conducted with the aim to assess level of knowledge and awareness about cervical cancer, screening and HPV vaccine among female in Rukum district of Nepal.

2. Methods

A cross sectional study was conducted among women aged 15-49 years from Jan to Feb 2016 in Rukum district of Nepal. Rukum is one of the remote hilly districts in Mid-Western region of Nepal; administratively it is divided into 43 Village Development Committee (VDCs). The required sample size was calculated on the basis of awareness obtained from previous studies [11] with 95 % confidence interval and 5 % absolute error. The calculated sample size was 594 after adjusted with design effect and 5 % non response rate.

Multistage sampling technique was used to recruit the subjects. At the first stage, purposive sampling was used to select the 12 VDCs. Within each VDC, three wards were randomly selected and consecutive house to house visits were conducted by the investigator. From each VDC fifty women were included in the study. If more than one woman was eligible in a house, voluntarily one selection was made. Female aged between 15-49 years irrespective of their marital status, those who had been residing in the selected VDCs for at least one year were included in the study. Women with a history of cervical cancer, pregnant women with 4 month of gestation period and who were chronically ill and unable to give consent were excluded from the study.

The semi structured interview schedule was used. The content of the questionnaire was developed by using the information from the literature and a previously published questionnaire. The questionnaire was designed in English, translated and administered in Nepali, the official language of Nepal. The questionnaire was pre tested among 60 females and necessary changes were made and incorporated in the questionnaire for final data collection. The interviews lasted 15 minutes on an average. The questionnaire was divided into six sections, covering sociodemographic and health information of the participants; knowledge and awareness of cervical cancer; HPV infection; cervical cancer screening and awareness of HPV vaccine.

For awareness, the women who ever heard of the term "cervical cancer" or "HPV" or "cervical cancer screening" or HPV vaccine" were considered. In order to find the level of knowledge 16 questions regarding knowledge about warning sign, risk factor and prevention of cervical cancer, aware of screening and HPV vaccine were considered to create the knowledge score. Each correct answer was scored one and for incorrect/don't know/no answer were scored as zero. Then the final knowledge score was computed by adding all variables. Finally, the composite score was dichotomized using a median and at the 50th percentile was considered as a cut off value. Respondents, who scored above average score were classified as adequate knowledge and average or below average, were classified as inadequate knowledge. Screening practices refers to the married women, who had undergone for cervical cancer screening at least once in their lifetime. Acceptance of HPV vaccine refers to the willing to receive HPV vaccine themselves or for their daughter if the vaccines become available, if it is free or even with a charge.

2.1. Statistical Analysis

The collected information was summarised by using the descriptive statistics such as frequency, percentage, mean, S.D, median and IQR. The Inferential statistics such as chi square test was used. Odds ratio (OR) and its 95% confidence interval (CI) was performed for bivariate analysis. Those variables which were found significant at the 5% level of significance in bivariate analysis were selected for multivariate analysis. The multivariate analysis technique, binary logistic regression analysis was used to identify the strength of association. Adjusted Odds Ratio (AOR) and its 95% CI were obtained. The data management and analysis were performed by using Microsoft Excel and SPSS 16.

2.2. Ethical Considerations

Study was approved by institutional ethical committee of K S Hegde Medical College, Nitte University Mangalore. Approval and written permission was obtained from the District Health Office (DHO) of Rukum district. Written informed consent in local language was taken before administering the data collection tool.

3. Results

3.1. Demographic Characteristics of the Subjects

A total of 600 women of reproductive age groups (15-49) were included for the study. The mean age was 27 ± 8.9 years and most of them (51%) were aged between 15 to 24 years. Most of the women were Hindus (98.2%) and 1.8% were Christians. Most of the respondents were homemaker (40.3%) followed by student (27.3%). Majority of the women (45.8%) reported 5 to 15 thousands (in rupees) monthly household income.

Among the participants, 77% (459) were married and sexually active. The mean age at marriage was 17.4 ± 2.4

years and the majority of the women (73%) were having married before the 18 years of age. 36.4 % of the women had more than 3 children. Homemade pads during menstruation were used by 76% women and sanitary napkins by 4 % women. Use of both sanitary napkins and homemade pads were reported by 20% participants. Most of the women (52%) are currently not using any contraceptive methods. Reported contraceptive methods are injectable method (48%), condom (13%) implant (6%), intrauterine devices (3%), either male or female sterilization (18%) and oral pills (12%). About 24% of the women had a history of abortion. Distributions of the socio demographic characteristics are presented in Table 1.

Table 1. Distribution of Socio-Demographic characteristics among the subjects

Socio-demographic Characteristics (n=600)	Frequency	Percentage
Age (in years)		
15-24	303	50.5
25-34	159	26.5
35-44	101	16.8
45-49	37	6.2
Marital status		
Married	443	73.83
Unmarried	141	23.50
Divorce	7	1.17
Widow	9	1.50
Caste		
Dalit	104	17.3
Janajati	111	18.5
Chhetri/Brahmin	364	60.7
Thakuri	21	3.5
Educational status		
Illiterate	36	6
Informal education	97	16.2
Primary	93	15.5
Secondary	164	27.3
Higher secondary	177	29.5
UG and Above	33	5.5
Occupation		
House wife	242	40.3
Agriculture	89	14.8
Daily labor	15	2.5
Business	41	6.8
Service	49	8.2
Students	164	27.3
Husband's Education		
Illiterate	23	5.2
Can read and write	30	6.8
Primary	105	23.7
Secondary	113	25.5
Higher secondary	124	28.0
UG and above	48	10.8
Illiterate	23	5.2
Husband's Occupation		
Agriculture	109	24.6
Daily labor	83	18.7
Business	53	12
Services	85	19.2
Students	55	12.4
Other	58	13.1
Monthly Household Income (Rs.)		
< 4999	85	14.2
5000 – 14999	275	45.8
15000- 24999	153	25.5
>25000	87	14.5

3.2. Awareness and Knowledge about Cervical Cancer

Of the 600 women, only 87.3% had heard the term cancer and 77.5 % (465) had heard of "cervical cancer". The major source of information on cervical cancer was radio/TV (82%) and followed by health workers (46%). Among those, 70.8% were aware of the warning sign and symptoms of cervical cancer. Only 47.7% of women were aware of risk factor of cervical cancer. The most frequently cited risk factors of cervical cancer were early age of sexual intercourse, multiple sex and poor personal hygiene. Majority of the participants (97%) believed that cervical cancer is a fatal disease. When asked about the possibility of developing cervical cancer, 70 % of women thought that they had no risk. (Table 2)

Table 2. Distribution of Knowledge and Awareness related characteristics on cervical cancer

Knowledge and awareness (n=600)	Frequency	Percentage
Heard of cervical cancer		
No	135	22.5
Yes	465	77.5
Source of information*		
Health workers	214	46.0
Radio/TV	381	81.9
New papers and magazines	57	12.3
Family Friends	129	27.7
Teachers	153	32.9
Other(Internet)	6	1.3
Aware of any warning sign and symptoms of CC		
No	136	29.2
Yes	329	70.8
Warning sign and symptoms of CC cited by respondent*		
Intermenstrual bleeding	293	89.3
Unpleasant vaginal discharge	279	85.1
Vaginal bleeding after menopause	78	23.8
Persistent lower back pain	66	20.1
Vaginal bleeding during and after sexual intercourse	113	34.5
Believes Cervical cancer is fatal		
No	12	2.6
Yes	453	97.4
Aware of risk factor of CC		
No	243	52.3
Yes	222	47.7
Risk factor for cervical cancer cited by the respondents *		
HPV infection	21	9.5
HIV/STI infection	102	45.9
early age of sexual Intercourse	202	91.0
Multiple sex partners	167	75.2
Smoking	61	27.5
Use of OCP more than 5 years	30	13.5
Multiparty (> 3 birth)	102	45.9
Hereditary	39	17.6
Abortion	95	42.8
Poor personal Hygiene	159	71.6
Cervical cancer can be prevented		
No	152	32.7
Yes	313	67.3
Believes they are at risk for developing cc		
No	326	70.1
Yes	139	29.9

Note: Multiple responses possible*.

3.3. Awareness and Knowledge about HPV

Among the women, only 5 % (30/600) had heard of HPV. Among them, 80% (24) and 30% (9) knew that HPV is a sexually transmitted infection and it can cause cervical cancer. The primary source of information about HPV was teacher (77 %) and health workers (70%).

3.4. Awareness and Willing to Accept HPV Vaccine

Among the women who had heard about cervical cancer, only 3.4% had heard of HPV vaccine. Despite low awareness, most female, 90.3% believed that vaccination were beneficial. Acceptance of the HPV vaccine among participants was very high, 90.1% (419) of the women were willing to accept the vaccine if it were available for free and 83.2% were willing to pay for the vaccine if they were not offered free. The reason among women who were not willing to accept vaccine was low awareness (56%), cost (54%) and concerned of side effect (10%) of HPV vaccine.

Bivariate analysis was performed between the acceptance of HPV vaccine and socio demographic variables. Those variables which were significant at the 5% level of significance in bivariate analysis were incorporated in multivariate analysis and the result is summarized in Table 4.

Age group and monthly household incomes of the respondents were significantly associated with willingness

to receive HPV vaccine. Respondents who had below 5 thousands monthly income were less likely to accept HPV vaccine than those who had more than 15 thousand (AOR, 0.312 CI; 0.133-0.733) and above 25 thousand monthly income in rupees (AOR, 0.148 CI; 0.038-0.571). The respondents who were in the age group below 20 years were less likely to accept HPV vaccine than those who were in the age group of 21-29 years (AOR; 0.218; CI = 0.102-0.465) and above 30 years (AOR; 0.303; CI = 0.148-0.623).

Table 3. Awareness and Acceptability of HPV vaccine

Characteristics (n= 465)	Frequency	Percentage
Heard of HPV vaccine	16	3.4
Willing to accept if free		
No	46	9.9
Yes	419	90.1
Willing to pay for vaccine		
No	78	16.8
Yes	387	83.2
Reason for not willing to vaccination* (n= 78)		
Low awareness	44	56.4
Cost of vaccine	42	53.8
Need to ask their family	21	26.9
Side effect	8	10.2

Table 4. Association between Determinants and Acceptance of HPV vaccine

Determinants	Frequency (n=465)	Willing (%)	OR	Chi square p-value	AOR, 95 % CI for AOR
Age					
<20	152	68.4	1		1
21-29	161	92.5	0.174(0.088-.345)	0.001	0.308* (0.135-0.704)
>30	152	88.2	0.572(0.160-0.530)		0.363* (0.17-0.775)
Marital status					
Married	123	73.2	1		1
Unmarried	342	86.8	0.413(0.249-0.686)	0.001	1.613 (0.154-16.878)
Occupation					
Homemaker/farmer/labor	243	84.8			1
service/Small business	78	97.4	0.147(.034-.623)	<0.001	0.338 (0.075-1.527)
Students	144	72.9	2.068(1.245-3.435)		1.214 (0.487-3.029)
Husband's Occupation					
Farmer/Daily labour	122	77.9	1		1
Business/service	116	94.8	0.224(0.093-0.537)	0.002	1.943 (0.803-4.704)
Students	48	85.4	0.601(0.242-1.490)		0.989 (0.374-2.613)
Other	46	91.3	0.335(0.110-1.018)		1.484 (0.41-5.369)
Monthly Household Income (Rs.)					
< 4999	57	68.4	1		1
5000 – 14999	206	78.2	0.606(0.316-1.159)		0.721 (0.363-1.43)
15000- 24999	125	90.4	0.230(0.102-0.520)	<0.001	0.379* (0.155-0.931)
>25000	77	96.1	0.088(0.024-0.317)		0.185* (0.047-0.733)

Note: p value < 0.05 is significant; OR: Odds Ratio; AOR: Adjusted Odds Ratio; CI: Confidence Interval

(* indicates significant at the 5 % level of significance);

1: Reference category;

n= only included respondents who were aware of cervical cancer (n = 465) in the willing to accept HPV vaccine.

Table 5. Distribution of Knowledge and Awareness related characteristics on cervical cancer screening

Characteristics (n=465)	Frequency	Percentage
Heard about screening	72	15.5
Heard about Pap smear test	32	6.9
Aware screening test were aimed to detect cc		
Yes	57	79.2
No/Don't know	15	20.9
Necessary to undergo the screening test for cc		
Yes	68	94.4
Frequency for doing screening		
Once in life time	2	2.8
Every year	29	40.3
3 years	9	12.5
5 years	15	20.8
Don't know	17	23.6
Undergone for cervical cancer screening		
No	51	86.4
Yes	8	13.6
Willing to participate in screening camp		
Yes	72	100

3.5. Awareness and Knowledge toward Cervical Cancer Screening

The majority of the respondents had never heard about cervical screening. Only 15.5 % (72/465) of the study participants had heard about screening. Only 6.9 % had heard about the Pap smear test. Health workers (79%) were the main source of information for cervical cancer screening. Only 13.6% (8/72) women had ever undergone for cervical cancer screening during their lifetime. (Table 5).

3.6. Factor Related to the Level of Knowledge

Bivariate analysis was performed between the selected determinants and level of knowledge. More than half of the participants (52%) had inadequate knowledge regarding cervical cancer. The mean knowledge score was 9.82 ± 6.7 . Those variables which were significant at the 5% level of significance in bivariate analysis were incorporated in multivariate analysis. Education level, occupation and monthly household incomes of the respondents were found to be significantly associated with knowledge of cervical cancer, HPV and screening.

Table 6. Association between determinants and knowledge of cervical cancer, screening and HPV

Determinants	Valid (n=465)	Adequate (n= (%))	OR,95 % CI	Chi square p-value	AOR, (95 % CI for AOR)
Age					
<20	152	60 (39.5)	1		1
21-29	161	95 (59)	0.453(0.288-0.712)	0.001	0.704 (0.352-1.407)
>30	152	64 (42.1)	0.897(0.567-1.417)		0.583 (0.246-1.382)
Religion					
Christian	8	1 (12.5)	1	0.048	1
Hindu	457	218 (47.7)	0.157(0.019-1.283)		0.372 (0.023-6.055)
Caste					
Dalit	64	16 (25)	1		
Janajati	88	41 (46)	0.382(0.189-0.773)	0.001	0.492(0.214- 1.133)
Chhetri/Brahmin	294	149 (50.7)	0.324(0.176-0.594)		0.536 (0.256-1.119)
Thakuri	19	13 (68.4)	0.154(0.050-0.472)		0.394 (0.105-1.481)
Educational status					
Illiterate & Informal	81	17 (21)	1		
Primary & Sec	190	66 (34.7)	0.375(0.221-0.637)	0.001	0.38*(0.161-0.898)
HS & above	194	136 (70.1)	0.480(0.257-0.895)		0.115*(0.044-0.303)
Occupation					
Homemaker/farmer/labor	243	92 (37.9)	1		1
service/business	78	65 (83.3)	0.122(0.064-0.233)	<0.001	0.264*(0.122-0.571)
Students	144	62 (43.1)	0.806(0.530-1.226)		1.252 (0.544-2.881)
Husband's Education					
No education	27	4 (14.8)	1		1
Primary & Sec	154	61 (39.6)	0.265 (0.087-0.804)	<0.001	0.766 (0.215-2.729)
HS & above	151	102 (67.5)	0.084 (0.027-0.255)		0.958(0.231-3.969)
Husband's Occupation					
Farmer/ labour	122	36 (29.5)	1		1
Business/service	116	83 (71.6)	0.171(0.098-0.299)	<0.001	0.925 (0.43-1.992)
Students	48	29 (60.4)	0.274(0.137-0.551)		0.475 (0.204-1.104)
Other	46	19 (41.3)	0.595(0.294-1.203)		1.499 (0.595-3.777)
Monthly Household Income (Rs.)					
< 4999	57	10 (17.5)	1		1
5000 – 14999	206	80 (38.8)	0.335(0.169-0.701)	<0.001	0.466 (0.209-1.037)
15000- 24999	125	71 (56.8)	0.162(0.075-0.349)		0.37*(0.155-0.882)
>25000	77	58 (75.3)	0.070(0.030-0.164)		0.22*(0.08-0.61)
Aware of STI					
No	21	4 (19.0)	1	0.0084	1
Yes	444	215 (48.4)	0.251(0.083-0.757)		0.489 (0.145-1.652)

Note: p value < 0.05 is significant; OR: Odds Ratio; AOR: Adjusted Odds Ratio;

CI: Confidence Interval

(* indicates significant at the 5 % level of significance);

1: Reference category; n= only included respondents who were aware of cervical cancer (n = 465) in the knowledge of cervical cancer.

This study showed that participant who were illiterate or having informal education were less likely to have knowledge compared with secondary level education (AOR, 0.348; CI: 0.151-0.802) and above higher secondary level (AOR; 0.115 CI: 0.044-0.303). Those participants who were homemaker or farmer or daily labour were 0.20 times less likely to have adequate knowledge of cervical cancer than those who were employed or small business (AOR, 0.209; CI; 0.137-0.652). Respondents who had monthly income below five thousands were less likely to have adequate knowledge than those who earned more than five thousand a month.

4. Discussion

The results of our study reported low level of knowledge and awareness of cervical cancer, its screening and HPV among women in Rukum, Nepal. In our study, 77.5 % of the participants had heard about cervical cancer. This result was similar to the study conducted in Zambia 74.7%. [12] Several studies conducted in various South Asian countries have reported that between 50-85% of women were aware of cervical cancer [13,14,15].

The findings of this study reflect a poor level of knowledge among women. Educational level, occupation and higher income of the participants were determinants of adequate knowledge of cervical cancer, its screening and HPV. Similarly, higher education and income were independent predictors of better knowledge in the Indian study [16].

Only, 47.7% (222) of the participants were aware about the risk factors of cervical cancer. The most frequently cited risk factors of cervical cancer were early age of sexual intercourse, multiple sex partner, poor personal hygiene and STI. These results are comparable with the study conducted in Madhya Pradesh, India. [16] The less frequently cited risk factors were hereditary, smoking and use of OCP more than 5 years. Hereditary factor and smoking as a risk factor for CC was also poorly recognized in a study conducted among students. [17,18] Seventy percent of the women believed they had no risk of developing cervical cancer which is higher false perception than study conducted in Gabonese women (40%). [19] The perception of one's susceptibility to cervical cancer can affect screening behaviour. In this scenario, it is important to correct the false perceptions among the women.

Only 5% of the respondents had heard of HPV. Among them, only 30% reported that it can cause cervical cancer. This is lower than the study done in Turkish where 41.6 % had heard of HPV and 33% mentioned HPV as an important factor in the causation of CC. [20] Similarly, 29% had heard of HPV and 53% recognized HPV as an STI and 42% aware that there is a link between HPV and CC in a study done in the UAE. [14] But a study conducted among rural women in India none of them had heard about HPV infection and its health effect despite of high literacy. [15]

Only 3% of the women had heard of HPV vaccine. Acceptance of the HPV vaccine was high, 83.2% of the women were willing to accept the HPV vaccine. This finding is consistent with study from Tanzania, which

reported that 93% of the participants were willing to get vaccine. [21] Increasing age and high monthly income were significantly associated with acceptance of vaccine.

This study has reported poor knowledge of cervical cancer screening. Only 15.5% of the respondents had heard about cervical cancer screening and 6.9% had heard of Pap smear test. Only 13.6 % (8/59) women had undergone for screening of cervical cancer. The overall practice of screening for cervical cancer among the sexually active respondents was only 1.7%. The practice of Pap smear test was slightly higher in a study conducted in Kathmandu and Chitwan district of Nepal that was 10.5% [22] and 15.7% [23] respectively. This difference is explained by the fact that these studies was conducted in a tertiary hospital of Nepal where women had better access to information and screening services of cervical cancer. Similarly lower uptake of Pap smear test was reported from study conducted among women, 7% in rural India [24], 9.8% in South Africa [25], 0.8 % in Ghana [26], and 6% in Tanzania [21]. Utilization of Pap smear test on other hand was better in women in the USA and South Korea i.e. 88% and 64%, respectively. [27,28] Lack of advocacy for screening and lack of cervical cancer control programme at the national level is the reason behind the low coverage among the Nepalese women.

The study has some limitations, as this study was conducted among women from selected VDCs residing in Rukum district of Nepal and hence the generalizability of the findings across Nepal may not be scientific. Study was concentrated more on quantitative aspects by using the close ended questions. A qualitative assessment with different study designs may give a wider understanding about the knowledge of cervical cancer of the participants.

5. Conclusion

Our study highlights the lack of knowledge about cervical cancer among women. These findings suggest there is a need to initiate National Cervical Cancer control programs. The study shows that the knowledge improved significantly with improvement in the level of education. By imparting proper education, women can be empowered with knowledge of cervical cancer, its early warning symptoms and the availability of adequate therapies. Education campaign involving the local media may be a good approach to inform the Nepalese women.

Competing Interests

The authors declare that they have no competing interests.

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