Original Research Article

DOI: http://dx.doi.org/10.18203/2394-6040.ijcmph20174826

Assessment of knowledge and attitude of medical and nursing students towards screening for cervical carcinoma and HPV vaccination in a tertiary care teaching hospital

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Received: 26 August 2017 Accepted: 19 September 2017

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ABSTRACT

Background: Cervical cancer is the second most common cancer among women and infection with high risk human papilloma virus (HPV) is a pre-requisite for cervical cancer. The present study was undertaken to assess the knowledge regarding cervical cancer screening and HPV vaccination among medical and nursing staff.

Methods: Four hundred participants; 200 MBBS students, 120 BSc nursing students and 80 staff nurses answered a standardized questionnaire which was analysed.

Results: Majority of the MBBS students correctly believed that cervical cancer was not the most common cancer in females and 77.5% believed that HPV is identified in more than 50% cases. Around 80% of the respondents knew that HPV is transmitted sexually and could be transmitted during pregnancy and can affect both males and females. More than 80% of the staff nurses answered correctly that HPV could be transmitted by needle sharing and 76% believed that the infection could be symptomless. More than 80% of the participants were aware that a vaccine is available against HPV but only 5.5% were vaccinated. Though the knowledge was there but several gaps were noticed regarding HPV vaccination, the major concerns being safety, efficacy and availability of the vaccine.

Conclusions: HPV is a vaccine preventable cancer and for accepting the vaccination the health professionals can play a pivotal role in raising awareness and controlling the disease.

Keywords: Cervical cancer, HPV, HPV vaccine, Awareness, Medical students, Nursing students

INTRODUCTION

Cervical cancer is the second most common cancer among women, the first being breast cancer. Every year, around 500,000 new cases of cervical cancer are diagnosed of which 270,000 women die, mostly (85%) in developing countries. It has been clearly established that infection with human papilloma virus (HPV) is a prerequisite for cervical cancer. HPV can be divided into two categories: low-risk (LR) types, which can cause benign epithelial lesions like genital warts, and high-risk

(HR) types, which are associated with the development of cervical cancer and its precursor, high-grade cervical intraepithelial neoplasia.² Cervical cancer is predominantly a health problem in low resource countries mainly due to limited access to screening and treatment facilities. As reported in 2012, about 122,844 new cervical cancer cases are diagnosed annually in India.³ In countries with well-established screening programs, significant progress has been made in decreasing the incidence and mortality associated with cervical cancer, however, in India, the mortality rates are still high as 70%

of cases are diagnosed in advanced stages. Persistent genital HR-HPV infection causes cervical cancer.² Despite definitive evidence of role of HPV in cervical cancer, well established role of HPV based screening and vaccination as effective modes of primary prevention, the uptake of these services is very poor in many developing countries, including India.^{4,5} The deficiency of knowledge of causal relationship between HPV and cervical cancer, and negative attitude towards HPV vaccination and screening among the masses can be an important reason for poor take up of these services as is stated in a study that knowledge and perceptions of the health care providers strongly influence the use of these diagnostic modalities.^{6,7}

Thus the present study was undertaken to assess the knowledge, attitude and practices regarding cervical cancer screening and HPV vaccination among medical and nursing staff of a tertiary care teaching hospital in North India.

METHODS

Study design

This is a cross sectional observational study, conducted over a period of three months from June 2016 to August 2016 in a tertiary care teaching hospital in North India, where students from medical and various paramedical streams are trained. A total of 200 MBBS students in second professional year, 120 BSc nursing students and 80 staff nurses were approached and asked to complete a one-time 17 question survey. There were no financial or material incentives provided for participation in the survey. Participation was voluntary and return of completed questionnaire signified informed consent. In order to prevent response bias, it was made clear that participation in the study was anonymous and confidential.

Study subjects

The undergraduate students of two streams; medical and nursing category were taken. The medical students were in their second professional year with a preclinical knowledge and were now undergoing clinical and patient care training. The nursing category included both students and staff nurses of the hospital. The nursing students were in the first year of the nursing training while the staff nurses had an experience of 10-15 years of nursing.

Study tools

A standardized questionnaire was developed for the purpose of study. The questionnaire comprised of two sections; i) demographic details, ii) knowledge relating to cervical cancer, HPV, and vaccination. Data obtained were analyzed using SPSS statistical software version 16. The responses of the participants to questions were

analyzed according to the stratification. A p value ≤ 0.05 was considered to be statistically significant.

RESULTS

Sociodemographic characteristics

A total of 400 participants who filled the complete questionnaire were included in the analysis; this included 200 medical students, 120 first year BSc nursing students and 80 staff nurses. The age range of the participants was 17-57 years with a mean age of 22.54 years. Majority (83.43%) of the students were less than 20 years old whereas most of staff nurses belonged to 41-50 years age group. Majority of the participants were females (73.5%). In the staff nurses group, 45% had a primary education up to higher secondary and 25% of them were graduates prior their formal nursing training. Hindus comprised 96.5% of the survey participants. Majority of the participants (88%) were unmarried and maximum belonged to middle class family. The characteristics of the study participants are given in Table 1.

Basic cervical cancer knowledge

The response in the category of basic knowledge of cervical cancer among survey participants was mixed. Majority (141/200) of the MBBS students correctly believed that cervical cancer was not the most common cancer in females (p≤0.003) and 77.5% believed that HPV is identified in more than 50% cases of cervical cancer (p≤0.00). Regarding the methodology used for screening of cervical cancer, only 7.5% of all participants knew that all techniques namely PAP smear, HPV testing and visual inspection of the cervix could be used for screening purpose. About 54.5% of all MBBS students thought that PAP was the only modality available for screening. The most common risk factor for cervical cancer was thought to be HPV infection (56.75%) followed by having multiple sexual partners (39%). Only 38.75% of the participants believed that there could be multiple risk factors for cervical cancer and only 7.5% of them recognized all the options in the questionnaire as possible risk factors. Males had significantly more knowledge regarding cervical cancer than females. (p<0.001) The results are tabulated in Table 2.

Knowledge regarding HPV

Around 80% of the respondents knew that HPV is transmitted sexually. More than 80% of the staff nurses (68/80) answered correctly that HPV could be transmitted by needle sharing (p \leq 0.00) and 81.25% knew that HPV could be transmitted during pregnancy (p \leq 0.00). Majority of the MBBS students (149/200) knew that HPV could affect both males and females (p \leq 0.01) and 76% believed that the infection could be symptomless (p \leq 0.00). The belief that HPV infection could not be treated with antibiotics was high among BSc nursing students (p \leq 0.00) and this belief was also high among MBBS

students (71%). Around 87% of the participants linked HPV to genital warts whereas only 21.25% had the knowledge that HPV can cause anal cancer. More than

90% participants also thought infection with HPV can cause lung and bowel cancer. The results are shown in Table 3.

Table 1: Demographic characteristics of study participants.

Characteristic	Total	Staff nurse	BSc nursing	MBBS
Characteristic	n (%)	n (%)	n (%)	n (%)
Age				
<20 years	281 (70.25)	14 (17.5)	91 (75.83)	176 (88)
21-30 years	74 (18.5)	21 (26.25)	29 (24.16)	24 (12)
31-40 years	5 (1.25)	5 (6.25)	0	0
41-50 years	25 (6.25)	25 (31.25)	0	0
51-60 years	15 (3.75)	15 (18.75)	0	0
Sex				
Male	106 (26.5)	0	0	106 (53)
Female	294 (73.5)	80 (100)	120 (100)	94 (47)
Education				
Matric	5 (1.25)	5 (6.25)	0	0
Higher secondary	356 (89)	36 (45)	120 (100)	200 (100)
Graduate	20 (5)	20 (25)	0	0
Postgraduate	4(1)	4 (5)	0	0
GNM	15 (3.75)	15 (18.75)	0	0
Religion				
Hindu	386 (96.5)	80 (100)	117 (97.5)	189 (94.5)
Muslim	5 (1.25)	0	1 (0.83)	4 (2)
Sikh	9 (2.25)	0	2 (1.66)	7 (3.5)
Socioeconomic status				
Low	32 (8)	2 (2.5)	22 (18.33)	8 (4)
Medium	317 (79.3)	76 (95)	98 (81.66)	143 (71.5)
High	51 (12.8)	2 (2.5)	0	49 (24.5)
Marital status				
Married	48 (12)	47 (58.75)	1 (0.83)	0
Unmarried	352 (88)	33 (41.25)	119 (99.16)	200 (100)

Table 2: Basic knowledge of cervical cancer.

Characteristic	Total=400 n (%)	Staff Nurses=80 n (%)	BSc Nurses=120 n (%)	MBBS=200 n (%)	P value		
Cervical cancer is the commonest cancer amongst women							
Yes	136 (34)	40 (50)	37 (30.83)	59 (29.5)	0.003		
No	264 (66)	40 (50)	83 (69.16)	141 (70.5)			
HPV is identified in >50% cases of c	ervical cancer						
Yes	252 (63)	30 (37.5)	67 (55.83)	155 (77.5)	0.000		
No	92 (23)	21 (26.25)	46 (38.33)	25 (12.5)			
Don't know	56 (14)	29 (36.25)	7 (5.83)	20 (10)			
Screening for cervical cancer							
PAP smear	196 (49)	58 (72.5)	29 (24.16)	109 (54.5)			
HPV testing	196 (49)	42 (52.5)	89 (74.16)	65 (32.5)			
Visual inspection of cervix	48 (12)	12 (15)	18 (15)	17 (8.5)			
PAP and HPV testing	31 (7.75)	5 (6.2)	3 (2.5)	23 (11.5)			
HPV testing and visual inspection of cervix	22 (5.5)	10 (12.5)	8 (6.6)	4 (2)			
PAP smear and visual inspection of cervix	9 (2.25)	2 (2.5)	3 (2.5)	4 (2)			
All	30 (7.5)	8 (10)	8 (6.6)	14 (7.0)			

Risk factors for cervical cancer				
HPV infection	227 (56.75)	40 (50)	80 (66.66)	102 (51)
Early start of sexual activity	94 (23.5)	10 (12.5)	15 (12.5)	69 (34.5)
Multiple sexual partners	156 (39)	24 (30)	39 (32.5)	93 (46.5)
Smoking	43 (10.7)	8 (10)	8 (6.66)	27 (13.5)
Low socioeconomic status	42 (10.5)	9 (11.25)	1 (0.83)	32 (16)
Multiple options	155 (38.75)	32 (40)	48 (40)	75 (37.5)
All	30 (7.5)	5 (6.2)	8 (6.6)	17 (8.5)

Table 3: Knowledge regarding human papilloma virus.

Characteristic	Total=400	Staff nurses= 80	BSc Nursing=120	MBBS=200	P value	
HPV is transmitted sexually	n (%)	n (%)	n (%)	n (%)		
Yes	318 (79.5)	63 (78.75)	93 (77.5)	162 (81)	0.64	
No	76 (19)	17 (21.25)	25 (20.83)	34 (17)	0.04	
Don't know	6 (1.5)	0	2 (1.66)	4(2)		
HPV is transmitted by needle		U	2 (1.00)	4 (2)		
Yes	236 (59)	68 (85)	56 (46.66)	112 (56)	0.000	
No	137 (34.25)	12 (15)	63 (52.5)	62 (31)	0.000	
Don't know	27 (6.75)	0	1 (0.83)	26 (13)		
HPV is transmitted during pr	· · · · ·	U	1 (0.83)	20 (13)		
Yes	248 (62)	65 (81.25)	79 (65.83)	104 (52)	0.000	
No		15 (18.75)		· , ,	0.000	
Don't know	117 (29.25)	, ,	37 (30.83)	65 (32.5)		
	35 (8.75)	0	4 (3.33)	31 (15.5)		
HPV can affect both males an		F2 (66 25)	00 (72 22)	140 (74.5)	0.015	
Yes	290 (72.5)	53 (66.25)	88 (73.33)	149 (74.5)	0.015	
No	87 (21.75)	16 (20)	26 (21.66)	45 (22.5)		
Don't know	23 (5.75)	11 (13.75)	6 (5)	6 (3)		
HPV infection can be sympton		50 (50 5)	54 (5 2 22)	150 (50)	0.000	
Yes	274 (68.5)	58 (72.5)	64 (53.33)	152 (76)	0.000	
No	104 (26)	14 (17.5)	50 (41.66)	40 (20)		
Don't know	22 (5.5)	8 (10)	6 (5)	8 (4)		
HPV infection is treatable wit						
Yes	124 (31)	56 (70)	18 (15)	50 (25)	0.000	
No	254 (63.5)	12 (15)	100 (83.33)	142 (71)		
Don't know	22 (5.5)	12 (15)	2 (1.66)	8 (4)		
HPV vaccine can prevent cerv						
Yes	279 (69.75)	58 (72.5)	83 (69.16)	138 (69)	0.003	
No	95 (23.75)	11 (13.75)	35 (29.16)	49 (24.5)		
Don't know	26 (6.5)	11 (13.75)	2 (1.66)	13 (6.5)		
HPV can cause genital warts						
Yes	351 (87.75)	68 (85)	109 (90.83)	174 (87)	0.421	
No	49 (12.25)	12 (15)	11 (9.16)	26 (13)		
HPV can cause anal cancer						
Yes	85 (21.25)	9 (11.25)	8 (6.66)	68 (34)	0.000	
No	315 (78.75)	71 (88.75)	112 (93.33)	132 (66)		
HPV can cause lung cancer						
Yes	380 (95)	74 (92.5)	117 (97.5)	189 (94.5)	0.255	
No	20 (5)	6 (7.5)	3 (2.5)	11 (5.5)		
HPV can cause bowel cancer						
Yes	370 (92.5)	76 (95)	111 (92.5)	183 (91.5)	0.604	
No	30 (7.5)	4 (5)	9 (7.5)	17 (8.5)		
<u> </u>						

Table 4: Knowledge regarding HPV vaccine.

Characteristic	Total=400	Staff nurses=80	BSc nursing=120	MBBS=200	P value
Characteristic	n (%)	n (%)	n (%)	n (%)	1 value
Is a vaccine available a	ngainst HPV?				
Yes	331 (82.75)	61 (76.25)	94 (78.33)	176 (88)	0.00
No	52 (13)	8 (10)	25 (20.83)	19 (9.5)	
Don't know	17 (4.25)	11 (13.75)	1 (0.83)	5 (2.5)	
Are you vaccinated aga	ainst HPV?				
Yes	22 (5.5)	0	9 (7.5)	13 (6.5)	0.00
No	277 (69.25)	80 (100)	18 (15)	179 (89.5)	
Don't know	101 (25.25)	0	93 (77.5)	8 (4)	
Will you child vaccinate	ted against HPV?				
Yes	187 (46.75)	46 (57.5)	49 (40.83)	92 (46)	0.069
No	163 (40.75)	25 (31.25)	50 (41.66)	88 (44)	
Don't know	50 (12.5)	9 (11.25)	21 (17.5)	20 (10)	
HPV Vaccine is availal	ble for which sex				
Male	7 (1.75)	3 (3.75)	1 (0.83)	3 (1.5)	0.022
Female	96 (24)	22 (27.5)	16 (13.33)	58 (29)	
Both	41 (10.25)	10 (12.5)	13 (10.83)	18 (9)	
No answer	256 (64)	45 (56.25)	90 (75)	121 (60.5)	
HPV Vaccine is availal	ble for which age grou	ıp			
9-12 years	25 (6.25)	6 (7.5)	12 (10)	7 (3.5)	0.000
12-15 years	19 (4.75)	4 (5)	1 (0.83)	14 (7)	
15-45 years	104 (26)	70 (87.5)	15 (12.5)	29 (14.5)	
No answer	252 (63)	0	92 (76.66)	150 (75)	
Reason for not getting	vaccinated				
Cost	19 (4.7)	2 (2.5)	5 (4.1)	12 (6.0)	
Safety	18 (4.5)	3 (2.5)	5 (4.1)	10 (5.0)	
Efficacy	20 (5.0)	3 (2.5)	3 (2.5)	14 (7.0)	
No knowledge	156 (39)	26 (32.5)	58 (48.3)	72 (36)	
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Knowledge regarding HPV vaccine

Table 4 shows the knowledge of the respondents regarding HPV vaccine. Though more than 80% of the participants were aware that a vaccine is available against HPV, only 5.5% of all participants were vaccinated against HPV and only 46.75% were willing to get their children vaccinated. Around 77% of the BSc nursing students did not know their vaccination status. Major reasons for not getting vaccinated were no knowledge regarding the availability and safety of the vaccine. Only 1.75% of the participants were aware that the HPV vaccine is to be given to boys as well and 10.25% believed that both sexes should be vaccinated. Regarding the age group to be vaccinated, majority of the participants did not answer and those who did, believed that age group to be vaccinated was the reproductive age group (15-45 years). There was no difference in knowledge regarding HPV vaccine between male and female participants and statistically not significant (χ^2 =0.328, p ≤ 0.57).

DISCUSSION

Correct knowledge and awareness about a disease and its prevention is a basic step to develop positive approach towards the disease. Early screening is known to prevent up to 80% of the invasive cervical cancer cases. However, educational barriers and behavioral patterns have been acknowledged as major reasons for low screening prevalence in developing countries. Knowledge plays an important role in deciding preventive behaviors. Hence, this study aimed at determining the knowledge about HPV and cervical cancer among medical and nursing students and staff nurses in a medical college in India.

Shimla is an urbanized city in Himachal Pradesh with a population of 171,640 with an average literacy rate of 93.58% as per census 2011. We tried to establish an ideal cluster to conduct this awareness study by including students with a medical background. Medical teaching impacts the understanding of cervical cancer, its etiology, preventive measures, availability of the vaccine and its protective efficacy. As 80% of the respondents were students, this group involves people who are yet to have first sexual experience thereby establishing an ideal cluster for immunization programme and also ideal candidates to conduct an awareness study. The staff nurses group was added as they come in contact equally with patients and attendants and form an important group in popularizing a strategy.

More than 60% of the participants correctly thought that cervical cancer was not the commonest cancer in women and that HPV had a causal association with cervical cancer. A study by Pandey et al from India showed that majority of the participants were well aware (89.6%) of several risk factors of cervical cancer development and its causal relation with HPV.11 Another study among the female educated youths in India, Nepal and Sri Lanka concluded that the awareness of cervical cancer was 66% in India, 58.8% in Nepal and 57.7% in Sri Lanka respectively. 12 It is worrisome to note that only 7.5% of all participants knew that all techniques namely PAP smear, HPV testing and visual inspection of the cervix could be used for screening purpose. It is also alarming that 54.5% of all medical students thought that PAP was the only modality available for screening. In the present study, the male students had more knowledge regarding cervical cancer than the female students and similar knowledge regarding HPV vaccine. In contrast, an Australian study showed that 62.8% of women and only 38.3% of men had heard of HPV.¹³

Despite the fact that all the participants were from medical background, only 80% of the respondents had correct knowledge regarding HPV. Our data shows better results than a study from Taiwan conducted in 953 undergraduate women aged 17-36 years, which showed that only 49% were having HPV awareness. 14 In another study from India conducted on female dental students only 18% of the study population had high level of total correct knowledge, but majority of them (63%) had average level of correct total knowledge.¹⁵ Mehta et al had similar observations among Indian medical students wherein they reported that the level of awareness about HPV and HPV vaccine was low. 16 Findings by Pandey et al, in another cohort of medical students revealed that most of the students were well-aware about preventable nature of cervical cancer and its viral etiology. 11 In our study, around 80% of the participants had average knowledge regarding HPV but surprisingly above 90% of the participants felt that HPV can cause bowel and lung cancer. This finding may be of concern as even in such an erudite population the information regarding HPV was low.

In spite of the proven efficacy of HPV vaccine, the uptake of HPV vaccination is very low in many developing countries, including India. Lower perceived risk of cervical cancer, non-availability of vaccine, high cost are the common reasons but lack of complete knowledge about causative role of HPV in carcinoma cervix is one of the most important determining factors for poor uptake of vaccination. ^{17,18} In our study surprising only 38.25% of the participants had complete knowledge regarding HPV vaccine. Hussain et al represents that overall HPV vaccine awareness is very low both in female and male as well as dwellers of rural and urban origin. ¹⁹ But in contrast, few studies reported that high vaccine acceptance among parents and adolescents in the

general population. 20-24 A study by Massey et al indicated low awareness of HPV; among those who had heard of HPV, just 28% were willing to receive the HPV vaccine.²⁵ Overall vaccination rates were very low in our sample cohort. Only 5.5% of the participants had been vaccinated against HPV. This proportion is far lower than in European and North American studies.²⁶ In many European countries, almost 80% of the target population has been vaccinated; however, in developing countries, vaccination rates are disappointing.²⁶ The most common reasons for not getting vaccinated were no knowledge regarding the availability and safety of the vaccine. Studies have demonstrated that the proportion of subjects with intention to vaccinate themselves or their kids range from about 70% to 100% once they are educated about the vaccine.^{27,28} It is also alarming that a very small proportion of the participants had correct information regarding the age group and the sex to be vaccinated. The results of our study demonstrate a need for increased awareness of HPV and the HPV vaccine to increase vaccine uptake rates.

Continuing medical education programs for health professionals; doctors and nursing staff should be conducted at the hospital level to spread knowledge about cervical cancer prevention. Priority should be given to new concepts like HPV vaccine for primary prevention of cervical cancer so that it is well propagated into the society. Finally, further research is needed to explain the reluctance of eligible healthcare workers to go for screening despite knowledge about the problem and ready access to screening facilities. Healthcare workers need to be targeted first because of their pivotal role in any screening program. Health care providers comprise a trusted source of health information and are one of the preferred personnel for receiving HPV, cervical cancer, and vaccine knowledge and education. Therefore training of health providers in developing countries is a way to raise awareness of the HPV vaccine among the general population and also provides a feasible mechanism for vaccine delivery.

In conclusion, awareness of cervical cancer and prevention by screening showed several gaps in the knowledge and misconceptions. In order to reduce the burden of cervical cancer and implementation of vaccination program, awareness is required which can be achieved by print and electronic media, conducting free camps in rural sectors for cancer screening and prevention. The provider and the recipient will amalgamate this concept in practice only with its increased understanding. Thus, there is a need with immediate effect to educate and aware the young population about ill- myths associated with cervical cancer vaccination program in India.

Funding: No funding sources Conflict of interest: None declared Ethical approval: Not required

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Cite this article as: Ganju SA, Gautam N, Barwal V, Walia S, Ganju S. Assessment of knowledge and attitude of medical and nursing students towards screening for cervical carcinoma and HPV vaccination in a tertiary care teaching hospital. Int J Community Med Public Health 2017;4:4186-93.