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Original Research Article

Assessment of knowledge, attitudes and concerns to human papilloma virus vaccine among female nursing professionals in India

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ABSTRACT

Background: To have a successful cervical cancer control programme in developing countries, nursing staff must be aware of the facts about the disease preventive methods and the prophylactic human papilloma virus (HPV) vaccine. The aims of the present study were to assess knowledge of, attitudes toward and concerns to HPV vaccine among female Sikkimese nursing staff in India.
Methods: Between April 2012 and February 2013, a pre-designed, pretested, self administered multiple responses questionnaire survey was conducted among female Sikkimese nursing staff in India.
Results: Overall, 77.4% nursing staff responded that they had ever heard of a HPV vaccine. Trainee nurses were significantly more aware of the vaccine than regular working nurses. Actual knowledge of the vaccine was poor. Recommended age of HPV vaccination was aware by only 38.7% and only 30% nurses knew number of doses of vaccine, while over 90% nursing staff were not aware of time schedule of the vaccine. According to summarized knowledge index only 13.5% nurses had actual knowledge of HPV vaccine. Sixty five percent nurses wanted to vaccinate themselves or to their daughters. Top three aspects of HPV vaccine that nursing staff were most concerned were effectiveness, effect duration and long term effects. Eighty four percent nurses wanted more education and training sessions about cervical cancer prevention and HPV vaccine.
Conclusions: Nursing staff in India need to be updated urgently with continuing medical education about cervical cancer prevention and HPV vaccination.

Keywords: Concerns, Cervical cancer, Human papilloma virus vaccine, Knowledge, Nursing staff

INTRODUCTION

Cervical cancer is the second most common cancer among women globally.[1] However, in developing countries; it is the most common cancer among women and is responsible for 88% of total cancer related deaths among women.[2] India bears about 20% of the world's burden of cervical cancer and more than 100,000 new cases are detected every year which causes one fifths of all female deaths in India.[3]

Cervical cancer is a preventable cancer. There are many preventive methods including avoiding risk factors, performing the Pap test regularly and HPV (human papilloma virus) vaccination.[4]

Infection with human papilloma virus is one of the most common sexually transmitted infections which play a central role in causation of cervical cancer and are the most important risk factor for cervical cancer.[4] Vaccination against HPV before sexual debut is one of the most effective strategies to prevent cervical cancer linked to HPV.[5] A prophylactic vaccine has already been developed and received worldwide approval for its use, with many countries included in their national immunization schedule.[5]

Because of low doctor patient ratio in developing countries, nursing staff are the major workforce in rural public health centers and Subcenteres of developing countries.[6] These nursing staffs act as primary gate keepers for giving information and carrying out immunization programs.[6] Nursing staff administer vaccines and give education about cervical cancer and preventive methods.

Acceptability of the vaccine plays an important role in the overall success in prevention of cervical cancer in the community. Studies have shown that lack of knowledge about the disease and the vaccine was common among women and health care providers.[7-11] Majority of these studies was carried in the Western world. Attitudes towards the vaccine had been shown to vary amongst different cultures.[8,11]

To have a successful cancer control programme, nursing staff must be aware of the facts about the disease preventive methods and the prophylactic HPV vaccine. Furthermore negative attitude towards the vaccine and any concerns on the vaccine among health care providers especially among nursing can pose substantial barriers in giving appropriate information to general women.[6] Little is known about how much nursing staff from eastern India know about HPV vaccine, what their attitude is towards the vaccine and if they have any concerns about the vaccine. The aim of the present survey was to assess knowledge of, attitudes toward and concerns to HPV vaccine among Sikkimese nursing staff.

METHODS

Sikkim is a small state of Indian union located in the eastern Himalayas. There are two referral hospitals in Sikkim, Central Referral Hospital (CRH) - teaching hospital of Sikkim Manipal Institute of Medical Sciences (SMIMS), and the Sir Thutob Namgyal Memorial (STNM) Hospital at Gangtok, four district hospitals, 24 primary health centers and 147 sub centers in Sikkim.

It was a cross-sectional study conducted between April 2012 to February 2013. The study was approved by SMIMS institutional ethics committee [IRB No-SMIMS/IEC/2012/Natl-SF-1]. Initially in major hospitals nursing staff were invited in a group in a hall and explained about the nature and purpose of the research. Those nursing staff who agreed to participate was given a consent form along with a pre-designed, pretested, self-administered multiple response questionnaire with both closed and open ended questions.

Those nursing staff who could not come in group and those who were working small hospitals; to them, an invitation letter along with consent form and questionnaire was sent in a sealed envelope to participate. Those who agreed to participate were requested to fill the questionnaire along with consent form and sent back to principal author.

The questionnaire consisted items on demographic information of the participants, questions on cervical cancer prevention and HPV vaccination for cervical cancer. The questions were designed to asses nursing staff's detail knowledge, attitude and concerns to HPV vaccine advocated for prevention of cervical cancer.

The data were analyzed by computer software Instat Graph Pad version 3.Descriptive statistics chi-square tests were done and significance of tests was decided at p-value 0.05. Data were analyzed using both univariate and multivariate analysis/binary logistic regression.

RESULTS

Invitation letters with questionnaire were sent to 396 nursing staff including trainee nursing staff in their final year, of which 354 returned the questionnaire in completed form. Seventy-one percentage participants were between 21-40 years of age, 55% were unmarried and 53% were not sexually active. Table 1 presents the detail demographic characteristics of the participant nursing staff.

Table 1: Socio-demographic characteristics of nursing staff who participated in the survey (n=354).

Characteristics	Number	Percentage
Age (years)		
<20	41	11.6
21-30	155	43.8
31-40	97	27.4
41-50	49	13.8
>50	12	3.4
Marital status		
Unmarried	194	54.8
Married/live in	160	45.2
Family		
Nuclear	231	65.3
Joint	123	34.7
Religion		
Hindu	208	58.8
Christian	57	16.1
Buddhist	88	24.9
Others	1	0.3
Community		
Nepali	209	59.0
Bhutia	53	15.0
Lepcha	30	8.5
Others	62	17.5
Residence		
Urban	215	60.7
Rural	139	39.3
Profession		
Nursing staff	252	71.2
Trainee staff	102	28.8
Ever had sex		
Yes	166	46.9
No	188	53.1

To the question 'have you ever heard about HPV vaccine' 77.4% participant (n=274) responded that they knew about it. The most common source of knowledge were from health personnel 46.4% (n=127) followed by nursing curriculum book 30.3% (n=83), electronic media 24.8% (n=68) and print media 21.2% (n=58) (Table 2).

Table 2: Awareness and source of knowledge about HPV vaccine among Sikkimese nursing staff.

Characteristics	N	%
Awareness of HPV vaccine		
Ever heard of HPV vaccine	274	77.4
Never heard of HPV vaccine	80	22.6
Source of knowledge*		
Nursing curriculum book	83	30.3
Electronic media (TV/radio/internet)	68	24.8
Print media (news paper/magazine)	58	21.2
Health personnel (doctor)	127	46.4
Friends/spouse	8	2.9
Others	45	16.4

*Multiple responses were allowed who were aware of HPV vaccine.

Table 3: Detail knowledge of the participants about HPV vaccine who ever heard about it.

Question items on HPV Vaccine*	Correct response	
	N	%
Recommended age to have a HPV vaccine (9-26 years)	106	38.7
Women should do a pap test after they have been vaccinated (every 3 year)	88	32.1
Number of doses of vaccine to be taken (three)	83	30.3
The cervical cancer you estimate can be prevented by vaccine (70%)	70	25.5
Schedule for HPV vaccine (0,2,6 month)	27	9.9
Vaccine may be given even after 45 years (F)	103	37.6
Only females who have not had sex before should receive HPV vaccination (F)	95	34.7
HPV vaccines can be given simultaneously with other vaccines like Hepatitis B vaccine (T)	72	26.3
Termination of pregnancy is not indicated who become pregnant during the course of HPV vaccination (T)	40	14.6
HPV vaccines may be given in lactating women (T)	24	8.8

*Correct answers to the items are given in brackets. T= true, F=false.

To assess the in-depth knowledge of the participants' ten questions were asked about various basic facts HPV vaccine. Recommended age of HPV vaccination was aware by only 38.7% (n=106) nursing staff.

Only 30% (n=83) nurses knew number of doses of vaccine to be taken is three while over 90% (n=247) nursing staff were not aware of time schedule of the vaccine. That woman should do regular Pap smear after HPV vaccination was aware by less than one third (n=88) of the participants; while vaccine can be given in lactating period was aware by only 8.8% (n=24) participants (Table 3).

Table 4: Unadjusted associations between participants' socio-clinical characteristics and knowledge of HPV vaccine among Sikkimese nursing staff.

Characteristics	Aware of HPV vaccine		Not aware of HPV vaccine		P value
	N	%	N	%	
Total	274	77.4	80	22.6	
Age in years					
<20	31	75.6	10	24.4	0.6751
21-30	125	80.6	30	19.4	
31-40	71	73.2	26	26.8	
41-50	37	75.5	12	24.5	
>50	10	83.3	2	16.7	
Marital status					
Unmarried	156	80.4	38	19.6	0.1602
Married/live in	118	73.8	42	26.3	
Family					
Nuclear	177	76.6	54	23.4	0.6899
Joint	97	78.9	26	21.1	
Religion					
Hindu	156	75.0	52	25.0	0.3204
Christian	48	84.2	9	15.8	
Buddhist	69	78.4	19	21.6	
Others	1	100.0	0	0.0	
Community					
Nepali	157	75.1	52	24.9	0.6366
Bhutia	42	79.2	11	20.8	
Lepcha	25	83.3	5	16.7	
Others	50	80.6	12	19.4	
Residence					
Urban	168	78.1	47	21.9	0.6977
Rural	106	76.3	33	23.7	
Profession					
Nursing staff	184	73.0	68	27.0	0.0019
Trainee staff	90	88.2	12	11.8	
Ever had sex					
yes	124	74.7	42	25.3	0.3084
no	150	79.8	38	20.2	

Table 5: Results of multivariate modelling/binary logistic regression analysis to determine factors independently associated with awareness of HPV vaccine among nursing staff.

Characteristics/variables	Odds ratio	95% CI
Age in years		
<20	0.74	0.33-1.68
21-30	1.0 (ref)	
31-40	0.66	0.36-1.20
41-50	0.74	0.34-1.59
>50	1.20	0.25-5.77
Marital status		
Unmarried	1.46	0.88-2.50
Married/live in	1.0 (ref)	
Family		
Nuclear	1.0 (ref)	
Joint	1.14	0.67-1.93
Religion		
Hindu	1.0 (ref)	
Christian	1.78	0.82-3.87
Buddhist	1.21	0.67-2.20
Community		
Nepali	1.0 (ref)	
Bhutia	1.27	0.61-2.64
Lepcha	1.66	0.60-4.55
Others	1.38	0.68-2.79
Residence		
Urban	1.11	0.67-1.85
Rural	1.0 (ref)	
Profession		
Nursing staff	1.0 (ref)	
Trainee staff	2.77	1.43-5.48
Ever had sex		
yes	1.0 (ref)	
no	1.34	0.81-2.20

To assess the actual summarized level of knowledge on HPV vaccine of the participants, response on each question was first scored and tallied for each participant. For each correct response a score of 1 and for each incorrect response a score of 0 was provided so that the total score of each respondent ranged from 0% (if none of the questions were answered correctly) to 100% (If all questions were answered correctly).

The level of knowledge of each participant was categorized according to her total score she obtained. Respondents who scored zero were considered as "*Nil or no knowledge",* who scored 10% - 40% as "*Inadequate or poor knowledge*", and who scored 50% or more were considered to have "*Adequate or good knowledge*". Based on this summary index, only 13.5% (n=37) of the nursing staff who heard of HPV vaccine had adequate knowledge, while 73% (n=200) had inadequate or poor knowledge and 13.5% (n=37) had no knowledge of it.

Table 4 presents the unadjusted associations between participant nursing staffs' demographic profile and awareness of HPV vaccine while table 5 represents the results of multivariate analysis of selected independent variables and their associations with awareness of the vaccine among the participants.

Academic training was the only significant predictor of awareness of HPV vaccine. Awareness of vaccine was significantly more (p=0.0019) in trainee nursing staff who were 2.77 times more likely to be aware of HPV vaccine. Unmarried nurses were about 1.5 times likely to be aware of the vaccine than married nurses while nurses of Christian and Buddhist religion were more likely to be aware of HPV vaccine than Hindus.

Nursing staff were asked how important they consider the following issues about HPV vaccine-short term side effects, long term side effect, effectiveness, effect duration and cost of the vaccine when they consider vaccinated for themselves, for their daughters or recommending to others. Nurses were asked to give response on these factors of vaccine as 'not important', 'somewhat important', 'important' and 'very important'. The top two aspects of the vaccine that most nursing staff felt very important were effectiveness and effect duration (55%) while long term side effect was considered very important by 49% respondents. When nursing staff were asked if they would consider receiving a HPV vaccine for themselves or their daughter that can prevent cancer cervix, 65.3% (n=179) responded positively, while 32.8% (n=90) responded negative or were unsure. The common reasons offered by them for not willing to vaccinate were uncertain benefits, insufficient knowledge, probable side effects and cost of the vaccine. Only 1.8% (n=5) women received vaccination themselves.

Table 6: Nursing staff concern about various aspects of HPV vaccine.

Vaccine aspects n (%)	Not important	Somewhat important	Important	Very important	Missing information
Cost	16 (5.8)	37 (13.5)	100 (36.5)	79 (28.8)	42 (15.3)
Effectiveness	0 (0.0)	13 (4.7)	69 (25.2)	152 (55.5)	40 (14.6)
Effect duration	2 (0).7	22 (20.8)	56 (20.4)	151 (55.1)	43 (15.7)
Short term side effect	37 (13.5)	42 (15.3)	95 (34.7)	67 (24.5)	33 (12.0)
Long term side effect	21 (7.7)	26 (9.5)	55 (20.1)	134 (48.9)	38 (13.9)

Three fourths (76.6%, n=210) of the nursing staff were not satisfied with their knowledge on HPV vaccine and 84.7% nurses felt that more education and training session should be conducted for them on cervical cancer prevention strategies and HPV vaccine.

DISCUSSION

Healthcare professionals are the key persons to provide both knowledge and facilities towards the goal of cervical cancer prevention. Nurses are considered as primary port of entry to provide health information to general people in India and other developing countries. Most general women first come in contact with nursing staff and seek suggestion about various health issues including cervical cancer preventive methods and vaccination.[6] Therefore, this survey was done to evaluate their knowledge on this important issue of HPV vaccination. The finding of this survey shows that knowledge of HPV vaccine is poor among Sikkimese nurses in India. Similar low levels of knowledge were also reported among nursing staff from other developing countries including Nigeria, Tanzania and Thailand.[12-14]

One of the important finding of this study was lower knowledge of HPV vaccine among younger nurses. Since the vaccine has been primarily targeted for age group of 9-26 years, it was worrying to find lower level of vaccine knowledge among adolescents and young nurses. On the other hand higher level of knowledge among unmarried and sexually not active staff was encouraging as vaccine has been found to be effective before one contracts HPV infection which occurs by sexual intercourse.

Religion was another important predictor which determined awareness about HPV vaccine with Christian and Buddhist nurses had more awareness of HPV vaccine than Hindus may be explained by the fact that Orthodox Christians and Buddhist may have been benefited by teachings on different programmes at their regular visits to religious institutions. Trainee nursing staff in their final year had significantly more awareness than regular nursing staff; this is quite expected as vaccine has only been recently advocated for prophylactic use.

Actual knowledge of the vaccine was poor (13.5%) among the participant nursing staff surveyed. Only a third of the participant knew recommended age and number of doses of vaccine while only one in ten nurses knew recommended schedule of the vaccine. In their study by Shekhar et al also reported only 26.7% nurses had adequate knowledge of HPV vaccine [15]

Following the licensing of HPV vaccines in many countries including India, there has been a surge of promotional activities to increase awareness of the vaccine. It is predicted that women, who recognize the potential benefit of the vaccines, would consider being vaccinated.[16]

Fewer studies has been conducted that focus on addressing the issues that health professionals specially nursing staff are specifically concerned about the vaccine. Our studies showed that nurses' main concerns about the vaccine were effectiveness, effect duration and long term side effects. Similar concerns had been expressed by general population in different regions and cultures about the vaccine.[17-19] This finding implies if we want to remove the concerns and doubts in general population will need to update and educate health care professionals specially nurses, as they are first approached by general women.

Effectiveness has been well established in randomized trials against high-risk type 16 and 18 HPV which causes almost 70% of cervical cancers.[18–22] However research is still going on about effect duration of the vaccine and data on immunity up to 6.5 years has been reported.[20–21] Results from most of the clinical trials had shown that vaccine was generally found to be safe with minimal long term effects. However it need to be emphasized to health professionals and general women that the vaccine are relatively new and long term safety of the vaccine outside the research period are unknown and research is still on this aspect. Short-term side-effects were common, such as pain at injection site in up to 80% of women, swelling and erythema in up to 25% of women.[22] This updated information should be clearly explained to nurses so that their concerns are removed and they can give correct information regarding the vaccine to general women.

Cost is another potential factor nursing staff was concerned about with about 65% scoring it as important or very important. The vaccine is not included in Government immunization schedule and is very expensive as most of the families in India and other developing countries belong to low income group. [6]

Sixty five percent nursing staff was willing to vaccinate or recommend vaccine to others. This similar to results obtained from a study in Thailand, where 67.4% were willing to recommend vaccination to others.[14] Nurses those who are willing to vaccinate are more likely to recommend vaccine to others.[23]

More than three-fourths of the nursing staff were not happy with their knowledge about cervical cancer prevention strategy and HPV vaccine and felt about arranging regular education and training session for them. This means cervical cancer has not been given priority in arranging continuing education programmes for nurses in this region.

This in contrast to developed countries where continuing medical education and training sessions are being conducted regularly conducted for nurses. In a study in United States 86% nurses were satisfied with their level of knowledge and reported about attending at least a cervical cancer education programme in last 5 years.[24]

The study has some potential limitations. Some questions were recall or recognition type which may underestimate or overestimate knowledge respectively. The study was limited to Sikkimese nursing staff only. Never the less it is the only study which concentrated on detail knowledge about HPV vaccines among nurses in India. Since nursing staff undergo training under same curriculum, so finding of this study may be applicable for nurses of other parts of India or other developing countries. However, the author felt that further study should be conducted in other healthcare professions including nurses in other developing countries to assess their level of knowledge and plan for appropriate training strategy for health professionals.

Declaration: This study is a part of a larger cross-sectional questionnaire-based survey on cancer cervix, screening, HPV infection and vaccination. Results described in this paper are on HPV vaccine and HAVE NOT been published elsewhere. However, survey finding on cervical cancer and screening, have been published.[25] As the study population was the same for both reports, the demographics table was the same in both papers.

CONCLUSION

Knowledge of HPV vaccine was poor among Sikkimese nursing staff in India. There is an urgent need for continuing medical education and training programmes among nurses about cervical cancer preventive strategies and HPV vaccination. The concerning issues like effectiveness, effect duration and long-term side effect of HPV vaccination should specifically be addressed while giving training to nurses, so that they can give correct information to general population.

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