Research Article

Knowledge, attitude and practices towards human papillomavirus infection, vaccination and cervical cancer among paramedical students at a Sri Lankan University

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Abstract

Introduction: Human papillomavirus (HPV) infection is one of the most common sexually transmitted infections, and HPV is an aetiological agent for cervical cancer (CC). In Sri Lanka, CC is the second most frequent cancer affecting women. The present study was undertaken to determine knowledge, attitude and practices (KAP) regarding HPV infection, vaccination and CC among paramedical students of the Faculty of Allied Health Sciences (FAHS), University of Peradeniya.

Methods: A purposive sample of 200 students following 5 different degree programmes at FAHS including 128 females and 72 males were surveyed. A pre-tested questionnaire was used to assess the KAP, and the analysis scale used for KAP ranged from 'satisfactory' and 'fair' to 'inadequate'.

Results: Twelve percent of the study participants reached fair to satisfactory knowledge scores on HPV infection, vaccination and CC. A significant difference in the knowledge score was noted between males and females, academic year of study, and ethnicities. A percentage of 79.5 of the study participants reached fair to satisfactory attitude scores towards HPV infection, vaccination and CC. Attitude score also significantly differed between males and females. Only 12% of the participants reached a fair to satisfactory practice score and no significant difference was noted among different categories in the practice score.

Conclusion: Overall, knowledge and practice scores regarding HPV infection, vaccination, CC and its preventive measures among the respondents were low. However, the majority of study

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participants had a positive attitude. As considerable gaps in KAP exists in many areas, and there is an urgent need for educational programmes to improve KAP related to the prevention of HPV infection and CC including vaccination among paramedical students.

Keywords: *Human papillomavirus, knowledge, attitudes, practices, paramedical students*

Introduction

Human papillomavirus (HPV) is the most common cause of anogenital infections and is mainly transmitted through sexual intercourse, including oral sex and contact with infected genital skin, mucous membranes or body fluid.[1] HPV consists of more than 120 known genotypes. Of the many genotypes infecting the anogenital area, HPV-16 and HPV-18 are the commonest oncogenic genotypes causing CC and responsible for nearly 50% of high-grade cervical dysplasia and 70% of CC cases.[2]

HPV-associated CC is the fourth most common cancer with an estimated 604,127 new cases and 341,831 deaths reported in the world in 2020.[3] CC ranked as the second most frequent cancer among women in Sri Lanka and the fourth most frequent cancer among women between 15 and 44 years of age.[4] In Southern Asia, Sri Lanka belongs to the region where about 4.4% of women in the general population are estimated to harbour HPV-16/-18 in the cervix.[3] However, invasive CC can be prevented by early preventive cytology screening and HPV vaccination.[5]

There are three licensed prophylactic vaccines available to protect against HPV-16 and HPV-18 infection and thus HPV-associated CC. Almost 70-90% of all HPV attributable cancer cases can be prevented by universal high-coverage HPV vaccination.[6] Despite the availability of vaccination and Papanicolaou (PAP) smear screening as effective modes of primary prevention of CC, the uptake of these services is poor in many developing countries, including Sri Lanka.[7]

Studies show that lack of appropriate knowledge, and poor attitude towards HPV vaccination and screening are some of the main factors for the poor acceptance of these services by the public.[8,9,10] Intention to accept these services are heavily dependent on the knowledge and perceptions of the health care providers.[11,12] As paramedical students can play a vital role in promoting screening for CC and HPV vaccination among the general population, they should have appropriate knowledge, a positive attitude and high acceptance of these services. Hence, evaluating the KAP levels of paramedical students will be useful to identify gaps which need to be corrected to promote self and social responsibility in reducing HPV infection and its complications in the country. The current study mainly focused on assessing KAP related to HPV and its prevention and control among paramedical students at the FAHS, University of Peradeniya. Findings of this study will provide useful baseline information to implement proper awareness programmes to the wider community of paramedical students who will be able to contribute towards control of HPV infection and CC prevention activities.

Methods

Study design, participants, and the questionnaire

A cross-sectional survey on the KAP towards HPV infection, vaccination and CC was conducted from November 2017 to March 2018. The study included full-time paramedical students from all

years (1st, 2nd, 3rd and 4th years) of study at FAHS, University of Peradeniya. A total of 200 randomly selected male and female paramedical students (age: 20-30 years) belonging to five degree programmes, including Medical Laboratory Sciences (MLS), Nursing, Pharmacy, Physiotherapy and Radiography, were recruited for the survey. To determine the KAP on HPV infection, vaccination and CC, a pre-tested questionnaire was used. Participants who volunteered for pre-testing of the questionnaire were excluded from the main study. The questionnaire was modified based on the comments and suggestions received from the pre-testing.

Data collection

A proportionate stratified random sampling technique was used to select 200 participants who were divided into 4 groups according to the academic year. The sample size of each group was proportional to the relative size of that group within the population. The sample was then randomly selected from each group to have a better representation of each group in the population. After explaining the study to the participants, the questionnaire and consent forms were distributed to the participants and collected after 20 minutes. In the questionnaire, demographic details (age, gender, ethnicity, stream of study), knowledge about HPV infection, vaccination and CC (symptoms, ways of transmission, risk factors, and preventive measures), and attitudes and practices (control and prevention) towards HPV infection were assessed. Both closed (Yes/No) and open-ended questions were included in the questionnaire.

Ethical considerations

The study was approved by the Ethical Review Committee of the FAHS. The participants were informed about the study objectives and their right to refuse or terminate their participation in the study at any time. In addition, permission to collect information from students was approved from the Dean of the FAHS and individual participants. The confidentiality of information was assured to the study participants.

Data analyses

The data were entered and analysed using the IBM SPSS software version 20 and MS-EXCEL 2013. Each question was analysed individually and the KAP on HPV infection, vaccination and CC were assessed using a score system. Association between each of the tested parameters (gender, ethnicity, age group, year of study and the degree programme) on KAP regarding HPV infection, vaccination and CC were analysed using the Chi-square test and significance was considered at $p< 0.05$.

<u>Knowledge scale</u>

A total of 8 questions assessed knowledge of HPV infection, vaccination and CC (15 marks). For single choice questions, +1 was given for a correct answer and 0 marks was given for an incorrect answer. For questions with multiple choices, one point was given for each of the correct answers, -1 was given for an incorrect answer, and for no response, 0 marks were given. A minus mark was not carried to the next question. The total knowledge score ranged from 0 to 15 and the scale was classified as follows: 'satisfactory' > 11(75-100%), 'fair'=7-11(50-74%) and 'inadequate' < 7(0-49%).

<u>Attitudes scale</u>

A total of 6 questions assessed the attitude regarding HPV infection, vaccination and CC (6 marks). +1 was given for each correct answer, -1 for an incorrect answer, and a non-response

was marked as 0 mark. The total score ranged from 0 to 6 and the scale was classified as follows: 'satisfactory' ≥ 4(75-100%), 'fair'=3(50-74%) and 'inadequate' ≤ 2(0-49%).

Practices scale

A total of 5 questions assessed the practices towards HPV infection, vaccination and CC (5 marks). For each correct answer +1, for an incorrect answer and non-response, 0 mark was given. The total score ranged from 0 to 5 and the scale was classified as follows: 'satisfactory'≥ 3(75-100%), 'fair'= 2(50-74%) and 'inadequate' ≤ 1(0-49%).

Results

Sample characteristics and distribution of study participants in different KAP levels

This study included 200 paramedical students from the FAHS, University of Peradeniya, and the socio-demographic characteristics of the study participants were diverse. Of the 200 paramedical students, 64% were females. Most of the students (79.5%) were between 20 and 25 years and 20.5% of them were between 25 and 30 years of age. Of the 200 study participants, Sinhalese, Tamils and Muslims were 89.5%, 5% and 5.5%, respectively.

Table1. Distribution of study participants at different levels of KAP scores.

Demographic factors		Knowledge				Attitude				Practice			
		Inadequate (≤7)	Fair (7-11)	Satisfactory (≥11)	*p* value	Inadequate (<2)	Fair (= 3)	Satisfactory (≥4)	*P* value	Inadequate (≤1)	Fair (= 2)	Satisfactory (≥3)	*P* value
		Percentage (%)				Percentage (%)				Percentage (%)			
Gender	Male	97.2	2.8	0	0.01	30.6	22.2	47.2	0.002	86.1	8.3	5.6	0.712
	Female	82.8	15.6	1.6		14.8	12.5	72.7		89.1	9.4	1.6	
Age group	20-25 years	87.4	11.3	1.3	0.734	19.5	16.4	64.2	0.782	88.7	8.8	2.5	0.279
	25-30 years	90.2	9.8	0		24.4	14.6	61.0		85.4	9.8	4.9	
Ethnicity	Sinhala	89.9	10.1	0	0	21.2	16.2	62.6	0.31	98.7	9.5	2.8	0.584
	Tamil	60	20	20		30.0	20.0	50.0		100.0	0.0	0.0	
	Muslim	81.8	18.2	0		0.0	9.1	90.9		81.8	9.1	9.1	
Study year	1st year	98.1	1.9	0	0.044	26.9	19.2	53.8	0.45	86.5	11.5	2.0	0.853
	2nd year	90.5	9.5	0		11.9	16.7	71.4		92.9	4.8	2.4	
	3rd year	82.1	14.3	3.6		21.4	17.9	60.7		89.3	7.1	3.6	
	4th year	82	18	0		20.0	10.0	70.0		84.0	12.0	4.0	
Degree	MLS	87.2	12.8	0	0.346	12.8	10.3	76.9	0.217	82.1	15.4	2.6	0.437
	Nursing	84.3	13.7	2		24.5	13.7	60.8		84.3	11.8	3.9	
	Pharmacy	86.7	13.3	0		16.7	23.3	60.0		86.7	6.7	6.7	
	Physiotherapy	84.2	15.8	0		15.8	26.3	57.9		89.5	7.9	2.6	
	Radiography	97.6	0	2.4		28.6	9.5	61.9		97.6	2.4	0.0	
Total		88	11	1		20.5	16.0	63.5		88	9	3	

Distribution of study participants at different levels of KAP scores is shown in Table 1. KAP score of the study participants was compared with their demographic data. A significant difference was noted in the knowledge and attitude scores between males and females. The

knowledge score differed significantly among different study years (p=0.044) and ethnicity. However, no significant difference was noted in attitude and practice scores among different ethnicities and study years (p>0.05). Age group and degree programmes did not show any statistically significant difference in KAP scores (p>0.05). Moreover, no significant difference was observed in the practice score among these categories.

Knowledge on HPV infection, vaccination and CC among the study participants

Knowledge of HPV infection, vaccination and CC, their signs and symptoms, risk groups, modes of transmission, risk factors and preventive methods were analysed. Of the 200 paramedical students, 46% knew about HPV through university education. Only 40.5% participants knew that HPV infects both men and women. A total of 115 (57.4%) paramedical students knew that CC is one of the consequences of HPV infection. More than 50% of participants knew that sexual intercourse is the major route of transmission and having multiple sex partners is a risk factor for developing HPV infection. Nearly 50% of participants knew that the HPV vaccination is one of the preventive methods while 30% of participants did not know how to prevent HPV infection and its consequences.

Attitude towards HPV infection, vaccination and CC among the study participants

The responses for attitude related questions on HPV infection, vaccination and CC are given in Table 2.

Table 2. Attitude of the study participants towards HPV infection, vaccination and CC.

Attitude	Frequency (n)	Percentage (%)
I am aware about the risk of HPV infection		
Yes	113	56.5
No	85	42.5
No response	2	1
I am satisfied with my knowledge of HPV and its preventive measures		
Yes	35	17.5
No	162	81.5
No response	3	1.5
I am willing to recommend HPV vaccine for others		
Yes	137	68.5
No	56	28
No response	7	3.5
I am willing to inform my friends/relatives to get a PAP smear		
Yes	134	67
No	62	31
No response	4	2
If I had a chance, I would have got HPV vaccine		
Yes	136	68
No	59	39.5
No response	5	2.5

Practice-related responses towards HPV infection, vaccination and CC

None of the 200 participants were vaccinated. For the question on advising others to get vaccinated, although 12.5% had advised others, 86.5% had not advised others. Advise to others

to get a PAP smear was given by 16%, whereas 83.5 % had never advised anyone to get a PAP smear done. Among the responders, 27 participants (13.5%) answered that they had updated knowledge and 170 participants (85%) answered that they do not have updated knowledge on HPV infection, vaccination and CC (Table 2).

Table 3. Practices of the study participants towards HPV infection, vaccination and CC.

Questions	Frequency (n)	Percentage (%)
Did you get HPV vaccine?		
Yes	0	0
No	198	99.0
No response	2	1.0
Have you ever advised anyone to take HPV vaccine?		
Yes	25	12.5
No	173	86.5
No response	2	1.0
Have you ever advised anyone to do a PAP smear?		
Yes	32	16
No	167	83.5
No response	1	0.5
Do you have updated knowledge on HPV?		
Yes	27	13.5
No	170	85
No response	3	1.5

Discussion

Individuals with high knowledge and positive attitude scores are more likely to engage in healthy behaviour. This study aimed to determine the KAP related to HPV infection, vaccination and CC among paramedical students of the FAHS, University of Peradeniya. Knowledge on HPV infection, vaccination and CC was not adequate among the respondents which suggests the need to educate paramedical students on HPV infection, vaccination and CC. Knowledge on HPV infection is noted to be low in studies done in other Asian countries as well. In Lebanon, 36.5% of college students reported that they have never heard of the HPV vaccine and their level of knowledge on HPV infection and its consequences was poor to moderate.[13] Similarly, a survey conducted at a tertiary institution in Singapore reported that knowledge of students on HPV infection was low, with a median score of 7/14.[14]

A significant difference in the knowledge score was noted between male and female participants and we found that more females had high knowledge scores for HPV infection, vaccine and CC. Another study done among college students in India also reports a similar finding regarding the HPV infection, and the reason for this finding may be that HPV infection and CC are generally associated with females.[15] In the present study, more third year and final year students had satisfactory and fair knowledge scores on HPV infection compared to the first and second year students, and this finding may be attributed to the clinical training undertaken by the students after the first two years. Similar findings have been noted in another Asian study by Shetty *et al* in 2019 among medical and paramedical students.[16]

Despite only a small number of paramedical students having satisfactory and fair knowledge on HPV infection in the present study, a considerable number of students knew HPV infection causes CC (58%) and genital warts (42%). However, less than 10% of them knew that HPV causes neck and oropharyngeal cancers as well. Of the study group, 38% thought that HPV can only infect women. This reflects the low attention of men regarding the exposure to risk factors for acquiring HPV infection. However, a considerably high number of participants (>50%) were aware about the route of transmission of the HPV was sexual intercourse. This percentage is higher than a study reported in young Brazilian women, where only 19% knew that HPV is a sexually transmitted infection.[17] Likewise, only 22.6% of Turkish first year university students perceived sexual intercourse as a mode of transmission of HPV infection.[18] The majority of the current respondents knew that having multiple sexual partners is a risk factor for acquiring HPV infection. However, they had incorrect knowledge that HPV only affects individuals during the sexually active age. Similar findings have been noted in a study done among young, educated females from Sri Lanka, India and Nepal in 2011.[19] Being aware of the risk factors and route of transmission will lead the current study participants to follow preventive measures against the HPV infection and CC more effectively.

Considering knowledge of preventive measures, 50% of the respondents knew that HPV vaccination can prevent CC while only a few respondents knew of PAP smear screening as a preventive measure. Based on a study done by Makwe *et al* in 2012, knowledge of HPV infection, CC risk factors and preventive measures were poor among university students and health care workers.[20] In our study, the overall knowledge score of the participants was inadequate on these aspects. However, the current study participants had high attitude scores for prevention of HPV infection, vaccination and CC compared to other studies.

In general, the attitude score was satisfactory for more than 50% of the participants, and 69% of study participants mentioned they would recommend HPV vaccination and PAP smear screening tests to their family members and friends. Paramedical students therefore knew the importance of taking preventive measures against HPV-associated CC. In addition, a considerable number of paramedical students were willing to get HPV vaccination if they had the opportunity. The attitude towards HPV infection, vaccination and CC was better in females than in males, which indicates that female undergraduates are willing to practice and encourage others towards taking preventive measures against HPV infection.

Of the study participants, 88% had inadequate scores for practice-related questions. It may be because participants had no chance to interact with their communities as they spent their time in the university due to academic work and examinations. In our study, none of the students had received the HPV vaccine prior to the survey. In a study from China, a low rate (9.5%) of acceptance of HPV vaccine has been reported among college students.[21] Similar findings were noted in a study carried out in Lebanon where only 16.5% of female college students had received the vaccine.[11] In Singapore, the vaccination rate among 15 to 22 years old students was only 9.8%.[12] Lack of awareness, societal, and cultural barriers and personal beliefs could be contributing to poor acceptance of HPV vaccine.[22] HPV vaccination was introduced to the national immunisation programme in Sri Lanka in July 2017 and is recommended for females between 10 to 28 years of age for the primary prevention of CC caused by HPV infection.[23]

Among the study participants, only 12.5% had advised someone to get HPV vaccination, and 16% advised someone to do a PAP smear screening. Updated knowledge on HPV was acquired by 13.5% of study participants from the internet, social media, lectures, clinical programmes and newspapers. This reflects that knowledge of HPV and the vaccine can influence students to contribute positively towards HPV vaccination. Therefore, increasing the knowledge on HPV infection, vaccine and the CC could effectively improve HPV vaccination among paramedical students. This association has also been reported in a survey done in a sample of female students attending an American college in 2016.[24]

The accuracy of the study findings depends on the nature of the study population and selection of an appropriate sample size. The present study findings may create a positive impact to improve awareness on prevention of HPV infections and CC among paramedical students in Sri Lanka. In addition, these results provide useful inputs to guide health authorities in planning, designing, and initiating educational programmes on HPV prevention.

Conclusion

This study noted inadequate knowledge and practice scores for the prevention of HPV infection, vaccination and CC with considerably better attitude scores. These results indicate that there is an urgent need for strengthening educational programmes to eliminate the gap between higher attitude scores and low knowledge and practice scores. Awareness programmes can be initiated in different faculties of the university to improve the KAP on prevention of HPV infection and CC. This will contribute to reduce HPV infection and CC in the country to some extent as paramedical students would be able to spread KAP on the prevention of HPV infection and CC to their local communities in different parts of Sri Lanka.

Declarations

Acknowledgement: None
Conflicts of Interest: The authors report there are no competing interests to declare.
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Ethics statement: Ethical approval for the study was obtained from the Ethical Review Committee of the FAHS, University of Peradeniya. A written informed consent was obtained from the study participants prior to data collection.
Authors' contributions: FN conceptualized the study, critically read and revised the manuscript. SP carried out data collection and data analysis. FN & SA drafted the manuscript.

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