RESEARCH ARTICLE

HPV, Cervical Cancer and Pap Test Related Knowledge Among a Sample of Female Dental Students in India

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Abstract

Background: The present study was designed to ascertain knowledge about HPV, cervical cancer (CC) and the Pap test among female dental students of Panineeya Institute of Dental Sciences and Hospital, Hyderabad, India. Materials and Methods: A self-administered questionnaire covering demographic details, knowledge relating to human papilloma virus (HPV) (8 items), cervical cancer (4 items) and the Pap smear (6 items) was employed. Responses were coded as "True, False and Don't Know". Mean and standard deviation (SD) for correct answers and levels of knowledge were determined. Results: Based on the year of study, significant differences in knowledge of HPV werenoted for questions on symptoms (p=0.01); transmission from asymptomatic partners (p=0.002); treatment with antibiotics (p=0.002); start of sexual activity (p=0.004); and recommended age for HPV vaccination (p=0.01). For knowledge regarding CC, significance was observed for the age group being affected (p=0.008) and symptoms of the disease in early stages (p=0.001). Indications for Pap smear tests like symptoms' of vaginal discharge (p=0.002), marital status (p=0.01) and women with children (p=0.02) had significant difference based on the year of study. Based on religion, transmission of HPV via pregnancy, HPV related diseases except CC and preventive measures except condom use and oral contraceptives showed significant differences. However, significant variation with religion was observed only for two preventive measures of CC (Pap test; p=0.004) and HPV vaccination (p=0.003). Likewise, only the frequency of Pap test showed a significant difference for religion (p=0.001). Conclusions: This study emphasizes the lack of awareness with regard to HPV, CC and screening with pap smear even among health professionals. Hence, regular health campaigns are essential to reduce the disease burden

Keywords: Knowledge - HPV - cervical cancer - Pap test - India

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Introduction

According to GLOBOCAN, cancer of the cervix is the fourth most common cancer in women with an estimated 528,000 new cases and 266,000 deaths worldwide. This accounts for 7.5% of all female cancer deaths. Almost nine of the ten (87%) cervical cancer (CC) deaths occur in less developed countries (GLOBOCAN, 2012). In India, annually 123,000 new cases are identified with 67,477 new deaths every year with a crude incidence rate of 20.2 and age standardized incidence rate of 22.0 per 100,000 per year. These statistics ranks cervical cancer as the second cause of female cancer deaths in India.

Early age of marriage, multiple sexual partners, multiple pregnancies, poor genital hygiene, long term use of hormonal contraceptives, smoking, sexual intercourse at young age are all recognized as significant risk factors for cervical cancer (Louie et al., 2009; Winer, 2012; Hong et al., 2013). But virtually, all cervical cancers are linked to genital Human Papilloma Virus (HPV) infection (Ozyer et al., 2013). HPV infection is the most commonest sexually transmitted infection in the world with 12% of females being infected at any time (Ortashi, 2012)6. Upto 80% of the invasive cervical cancer cases can be prevented by early preventive cytology-screening programs (Rositch, 2012). However, educational and attitudinal barriers have been acknowledged as major reasons for low screening prevalence in developing countries (Markovic et al , 2013). Organized cervical screening programs utilizing the cervical/ vaginal smear (Pap Test / Smear) has been shown to significantly reduce the incidence and mortality of cervical cancer (Bray et al., 2005). Hence, knowledge plays an important role in a person's decision to engage in health preventive behaviors. In recent years, there has been a proliferation of International studies on HPV knowledge, its related diseases and preventive aspect (Johnson et al, 2014; Dany et al., 2015; Watkins et al., 2015)

However, none of the studies so far have solicited the knowledge regarding HPV, CC among dental students. Dental students form a part of the health care team and can be instrumental in disseminating the knowledge concerning HPV virus, transmission, related diseases, prevention and vaccination. For this reason, the present study was designed to ascertain the knowledge about

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HPV, CC and Pap test with female dental students as target population.

Materials and Methods

A cross-sectional survey was conducted among a cohort of female dental students of Panineeya Institute of Dental Sciences and Hospital, Hyderabad, India. Ethical approval was obtained from Institutional Review Board (PMVIDS/PHD/0036/2015) Participation was voluntary and return of completed questionnaire signified informed consent.

A self-administered questionnaire was distributed in the class-room. The questionnaire comprised of four sections; demographic details regarding age, year of study and religion was gathered in the first section. The next three sections consisted of questions on knowledge relating to Human Papilloma Virus (HPV) (8 items), Cervical Cancer (4 items) and Pap smear (6 items), respectively. Items were selected based on previous studies (Al-Dubai et al., 2010; Juntasopeepun et al., 2011; Blödt S et al., 2012; Hong Y et al., 2013). A pilot test was conducted to check if the questionnaire was easily understood and modifications were done accordingly.

Responses were coded as- "True, False and Don't Know". For each item, scoring was done as 1 for correct answer and 0 for incorrect answer. Overall score was computed by summing the correct answer scores and higher score indicated higher level of knowledge. Mean and standard deviation (SD) for correct answers was determined and utilizing the used mean±SD approach, levels of knowledge was categorized as Low, Average and High. Comparison of the mean correct knowledge scores and levels of knowledge was done based on Year of Study

Table 1. Total Number of Correct Responses (N (%)) and Comparison of Correct Responses Based on Year of Study and Religion

S. No.	Questions	Correct Answer	N (%)	p-value	
				Yr of Study	Religion
1	HPV is transmitted by				
	Sexual Intercourse	True	155 (66.52)	0.24	0.15
	Needle Sharing	False	33 (14.16)	0.72	0.13
	Pregnancy	False	50 (21.46)	0.37	0.00001*
	Vaginal Delivery	True	66 (28.33)	0.21	0.85
2	HPV related diseases are				
	Cervical cancer	True	152 (65.24)	0.33	0.07
	Genital Warts	True	110 (47.21)	0.97	0.00001*
	Oral Cancer	True	75 (32.19)	0.11	0.00001*
	Anal Cancer	True	72 (30.90)	0.99	0.001*
	Urinary Infection	False	28 (12.02)	0.61	0.00001*
	Bowel Cancer	False	48 (20.60)	0.27	0.008*
	Lung Cancer	False	54 (23.18)	0.29	0.03*
3	HPV can affected both males and females	True	139 (59.66)	0.12	0.05*
4	Most people with HPV do not experience any symptoms	True	92 (39.48)	0.01*	0.66
5	People can transmit HPV to their partners even if they have no symptoms	True	125 (53.65)	0.002*	0.09
6	HPV infections can be treated with antibiotics	False	82 (35.19)	0.002*	0.90
7	Preventive Measures for HPV Infections				
	Condom Use	True	120 (51.50)	0.77	0.30
	Vaccination	True	117 (50.21)	0.86	0.00001*
	Oral Contraceptives	False	43 (18.45)	0.13	0.08
	Pap Test	False	97 (41.63)	0.66	0.02*
	Late start of Sexual activity	True	26 (11.16)	0.004*	0.03*
	Less number of sexual partners	True	66 (28.33)	0.63	0.01*
8	HPV Vaccine is recommended for females aged 9 and above	True	102 (43.78)	0.01*	0.67
9	Cervical Cancer (CC) can affect only older women	False	34 (14.59)	0.008*	0.49
10	CC symptoms commonly present with vaginal discharge or bleeding even in the early stages of the disease				
		False	89 (38.20)	0.001*	0.09
11	CC is preventable	False	139 (59.66)	0.88	0.44
12	Preventive Measures for Cervical cancer				
	Pap Test	True	89 (38.20)	0.83	0.004*
	Late start of Sexual activity	True	48 (20.60)	0.09	0.18
	HPV Vaccination	True	111 (47.64)	0.16	0.003*
	Oral Contraceptives	False	50 (21.46)	0.89	0.44
	Condom Use	True	83 (35.62)	0.09	0.12
13	Pap Smear is indicated only in women with vaginal discharge / bleeding	False	43 (18.45)	0.002*	0.72
14	Unmarried women are not supposed to get pap test	False	95 (40.77)	0.014*	0.80
15	Women who are done having children do not need pap tests	False	95 (40.77)	0.02*	0.62
16	Pap test are not necessary after vaccination with HPV Vaccine	False	66 (28.33)	0.89	0.07
17	Pap test checks to see any cancer cells around the cervix	True	102 (43.78)	0.35	0.67
18	Pap test should be done once a year	True	84 (36.05)	0.08	0.001*

and Religion by Analysis of Variance. Correlations among Knowledge scores were evaluated using Karl Pearson's Coefficient. Statistical significance was set at 0.05.

Results

A total of 233 respondents had completed the questionnaire and were included in the study. The age range was 17-24 years with a mean age of 19.91+1.90 years. Most of them belonged to the first year (75; 32.2%) with only a small group in the third year (28; 12%) of undergraduate study. Majority of them were Hindus (194; 83.3%), 13.7% were Muslims and only 3% belonged to followed a different religion like Christianity, Jainism etc.

Correct responses to the questions and comparison based on the year of study and religion are demonstrated in Table 1. Based on the year of study, significant difference for knowledge of HPV was noted for questions on symptoms (p=0.01); transmission from asymptomatic partners (p=0.002); treatment with antibiotics (p=0.002); start of sexual activity (p=0.004) and recommended age for HPV vaccine (p=0.01). For knowledge regarding Cervical Cancer (CC), significance was observed for the age group being affected (p=0.008) and symptoms of the disease in early stages (p=0.001). Indications for pap smear tests like symptoms' of vaginal discharge (p=0.002); marital status (p=0.01) and women who are done with children (p=0.02) were the questions which had significant difference based on the year of study.

On the other hand, when correct responses were compared based on religion, transmission of HPV via pregnancy, HPV related diseases except CC and

Table 2. Mean±SD of Correct Answer for Total Knowledge, HPV, CC and *Pap Smear* Based on Year of Study and Religion

		Total knowledge Mean + SD	HPV Mean+SD	Cervical Cancer Mean+SD	Pap Smear Mean+SD
Year of study	Year 1	10.16+7.24	6.01+4.47	2.05+1.92	2.09+1.88
	Year 2	12.91+7.52	7.47+4.32	3.27+2.15	2.18+1.84
	Year 3	14.86+8.12	10.50+5.86	3.18+2.28	1.18+1.56
	Year 4	12.80+6.74	8.22+4.13	2.61+1.79	1.98+1.89
	Interns	15.82+7.61	9.86+4.80	3.32+2.11	2.64+2.10
	Total	12.79+7.63	7.95+4.89	2.76+2.08	2.08+1.91
	P-value	0.001*	0.00001*	0.002*	0.03*
Religion	Hindu	12.95+7.58	8.04+4.84	2.88+2.06	2.04+1.90
	Muslims	12.44+8.11	7.63+5.28	2.28+2.13	2.53+2.02
	Others	9.86+6.96	7.00+4.90	1.71+1.98	1.14+1.46
	Total	12.79+7.63	7.95+4.89	2.76+2.08	2.08+1.91
	P-value	0.55	0.79	0.13	0.16

*p<0.05

Table 3. Association of the Levels of Knowledge Based on Year of Study and Religion

Factors	Levels of total knowledge			Levels of HPV knowledge			Levels of Cervical Cancer knowledge			Levels of Pap Smear knowledge			Total
	Low	Average	High	Low	Average	High	Low	Average	High	Low	Average	High	
Year of study													
Year 1	23	46	6	24	47	4	39	31	5	26	38	11	75
	(30.67)	(61.33)	(8)	(32)	(62.67)	(5.33)	(52)	(41.33)	(6.67)	(34.67)	(50.67)	(14.67)	(32.19)
Year 2	6	30	9	7	34	4	11	27	7	12	30	3	45
	(13.33)	(66.67)	(20)	(15.56)	(75.56)	(8.89)	(24.44)	(60)	(15.56)	(26.67)	(66.67)	(6.67)	(19.31)
Year 3	2	18	8	5	12	11	7	16	5	14	13	1	28
	(7.14)	(64.29)	(28.57)	(17.86)	(42.86)	(39.29)	(25)	(57.14)	(17.86)	(50)	(46.43)	(3.57)	(12.02)
Year 4	5	29	7	5	30	6	12	27	2	12	23	6	41
	(12.2)	(70.73)	(17.07)	(12.2)	(73.17)	(14.63)	(29.27)	(65.85)	(4.88)	(29.27)	(56.1)	(14.63)	(17.6)
Interns	8	24	12	5	27	12	12	26	6	10	22	12	44
	(18.18)	(54.55)	(27.27)	(11.36)	(61.36)	(27.27)	(27.27)	(59.09	(13.64)	(22.73)	(50)	(27.27)	(18.88)
P value	0.01*			0.0001*			0.01*			0.04*			
Religion													
Hindu	36	123	35	36	126	32	61	112	21	62	105	27	194
	(18.56)	(63.40)	(18.04)	(18.56)	(64.95)	(16.49)	(31.45)	(57.73)	(10.82)	(31.96)	(54.12)	(13.92)	(83.27)
Muslim	7	19	6	8	20	4	15	14	3	8	18	6	32
	(21.88)	(59.38)	(18.74)	(25)	(62.5	(12.5)	(46.88)	(43.74)	(9.38)	(25)	(56.25)	(18.75)	(13.73)
Others	1	5	1	2	4	1	5	1	1	4	3	0	7
	(14.29)	(71.42)	(14.29)	(28.57)	(57.14)	(14.29)	(71.42)	(14.29)	(14.29)	(57.14)	(42.86)	0	(3)
Total	44	147	42	46	150	37	81	127	25	74	126	33	233
	(18.88)	(63.09)	(18.03)	(19.74)	(64.38)	(15.88)	(34.76)	(54.51)	(10.73)	(31.76)	(54.08)	(14.16)	(100)
P value	0.97			0.87			0.09			0.47			

*p<0.05

preventive measures except condom use and oral contraceptives showed a significant difference. However, significant religion differences were observed only for two preventive measures of CC (Pap test ; p=0.004) and HPV vaccination ; p=0.003). Likewise, only the frequency of pap test showed a significant difference for religion (p=0.001). (Table 1)

Based on the year of study, the correct mean scores for total knowledge (0.01); Knowledge about HPV (p=0.00001); CC (0.002) and Pap Smear (p=0.03) illustrated significant difference. Pair wise comparison by Tukeys's multiple post hoc procedures showed that significant difference was noted for first year respondents with third year (p=0.03) and interns (p=0.0005) for the correct mean total knowledge score. Similar finding was seen for HPV mean knowledge scores and in addition difference was displayed between second year and third year also (p=0.05). For correct CC mean scores, significance was observed for first year with second year (p=0.01) and interns (p=0.008). Nevertheless, pap smear mean scores exhibited significant difference only among third years and interns (p=0.01). However, no such significant difference was noted based on religion. (Table 2)

Classification of study population based on the level of correct knowledge (in %) demonstrated that majority of the respondents had average knowledge (147; 63%). Comparison of the same based on the year of study showed significant difference for all knowledge scores where as no significance was seen based on religion. (Table 3).

Correlation by Karl's Pearson correlation coefficient revealed significant positive correlation between all the knowledge scores i.e total, HPV, CC and Pap smear knowledge.

Discussion

Level of knowledge and awareness has been suggested as an elementary step to develop positive approach towards the disease, its consequences and prevention. Hence, this study aimed at determining the knowledge about HPV, Cervical cancer and pap smear tests among female dental students in a dental institution in India. Age- group of this population forms a significant target group where preventive measures through vaccination can be directed. Also, this group involves people who are yet to have first sexual experience thereby establishing an ideal cluster for immunization programme. Moreover, to our knowledge, studies have assessed Knowledge and awareness concerning HPV, Cervical cancer and pap tests among medical students (Pandey et al., 2012; Mehta et al., 2013; Deriemaeker et al., 2014; Fu et al., 2014), nursing students (Ortashi et al., 2012; Wamai et al., 2013; Yanikkerem and Koker, 2014) and general population (Al-Dubai et al., 2010; Juntasopeepun et al., 2011; Rositch et al., 2012; Poole et al., 2013; Ozyer et al., 2013; Johnson et al., 2014; Watkins et al., 2015), no study has evaluated the same among dental students. This cohort of female dental students also can be the best medium to spread recognition about the disease amidst the wider group. Therefore, the present questionnaire study was undertaken. Lack of standardized questionnaire made us formulate a questionnaire based on past research (Joy et al., 2011; Ortashi et al., 2012; Rositch et al., 2012; Ozyer et al., 2013; Wamai et al., 2013; Johnson et al., 2014; Dany et al., 2015; Watkinset al., 2015; Montgomery et al., 2015). However, the internal consistency for all questions had a Cronbach's alpha value of 0.8.

Surprisingly, only 18% of the study population had high level of total correct knowledge, but majority of them around 63% had average level of correct total knowledge. This finding may be reason of concern as even in such erudite population the information regarding HPV, CC and Pap smear was low. Similar finding was noted in a study by Mehta et al. (2013) among Indian medical students wherein they reported that the level of awareness about HPV and HPV vaccine was very low. On the other hand, findings of the study by Pandey et al. (2012) among another cohort of medical students revealed that most of the students were well-aware about preventable nature of cervical cancer and its viral etiology. Also, comparison with other population clusters, brought to light the varying levels of knowledge like poor knowledge was reported among 18-25 year old vocational school students of Berlin (Blödt et al., 2012) and among adults and adolescent of Mali (Poole DN et al., 2013) and average awareness among educated youth in India (66%), Srilanka (57.7%) and Nepal (58.8%) (Joy et al., 2011).

The mean total knowledge score(15.82+7.61), CC score (3.32+2.11) and pap smear score (2.64+2.10) was highest among interns which could be because they have completed their course and also clinical training. On the contrary, highest mean score for HPV knowledge was accounted for third years (10.50+5.86). Inclusion of subjects like General Medicine, General Surgery and Oral Pathology in third year of the Indian Dental curriculum could have attributed to the above finding. The mean scores for total knowledge and Knowledge about HPV, CC and pap smear was comparable among Hindus, Muslims and others (Christian, Jains etc..) and was not statistically significant. Nevertheless, regression analysis revealed significant association of religion with the knowledge about HPV, CC and pap smear, thus highlighting the role of religious faiths and beliefs in awareness of a disease.

Knowledge on the topic of risk factors was highly variable. Around 66% of the study population identified sexual intercourse as a risk factor for HPV and approximately 65% acknowledged that it can cause CC. This finding was high when compared to young Brazilian women (Rama et al., 2010) wherein only 19% and 7%, correspondingly, knew that HPV was a sexually transmitted infection which causes CC. Likewise, only 22.6% of Turkish first year University students perceived sexual intercourse as a mode of transmission (Durusoy R et al., 2010). Condom use, Vaccination and pap smear test were deemed as preventive measures for HPV by 51.5%, 50.2% and 41.6% of the population, respectively. This result was higher as compared to Turkish young women where only 19.5% and 27.6% discerned condom use and vaccination as preventive measure for HPV infection ((Durusoy et al., 2010).

Though our study's particular strengths comprises

of a high response rate among a cluster which has not been surveyed for the same before, it also portrays undeniable shortcomings. A convenience sampling method encompassing female dental students from one dental institution in an urban environment were employed and thus the results may not be generalizable to other population groups in various settings. Risk of selection bias because of chosen study population cannot be ruled out. The self-administered and close-ended design of the questionnaire also poses a limitation especially because no prior data has been sought in this group. Causal relationships cannot be established/ ascertained due to cross-sectional nature of the study.

Implications for policy makers; The present study was limited only to assess the knowledge rather than vaccine acceptance as knowledge assessment is the first step towards vaccine acceptance. Prior to initiating an HPV vaccination program assessing the levels of knowledge and awareness in a community has been suggested as means to develop appropriate educational materials for vaccine recipients and decision makers. Moreover, in a country like India apart from the educational levels, social and religious beliefs are also imperative components as reflected in this study also.

This study emphasizes and highlights the lack of awareness with regard to HPV, CC and screening with pap smear even among health professionals. Hence, regular health campaigns are essential to reduce the disease burden and enhance positive attitude towards the vaccine.

In conclusion, even with these limitations, our study still provides valuable insight about HPV, CC and Pap smear knowledge among this group of female dental students. A clear understanding of the disease and its outcome will facilitate people to engage more in preventive methods of the disease. Educational and attitudinal barriers also play an major role in determining access to precautionary screening services.

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