Section: Community Medicine

Original Research Article

HUMAN PAPILLOMA VIRUS VACCINATION PRACTICES, AWARENESS OF CERVICAL CANCER SCREENING AND ITS RISK FACTORS AMONG MEDICAL AND PARAMEDICAL STUDENTS OF A CITY

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Abstract

Background: Cervical cancer is one of the leading causes of morbidity and mortality in developing countries. Considering the role of medical and paramedical students in the very matter, this study aims at understanding their knowledge, attitude, and practice towards the same. The study aims to assess knowledge, attitudes, and practices about cervical cancer, its screening, and vaccination among medical and paramedical students, as well as the factors affecting their awareness. **Materials and Methods:** This study evaluates HPV vaccination practices, awareness about cervical cancer, screening, and risk factors across a cross-sectional study. A cross-sectional study involving 484 medical, dental, and nursing students at a tertiary healthcare hospital evaluated HPV vaccination practices and awareness about cervical cancer screening using a validated questionnaire. **Result:** Out of the total participants, 318(46.97 %) said they were willing to get vaccinated out of which 204 (30.13 %) were females and 114 (16.84 %) were males. Significant association was found between graduating degree and knowledge (p value- 0.0001), attitude (p value 0.0018)as well as practices (p value- 0.0011)of cervical cancer and its screening. Significant associations were found between mother education and attitude of students for cervical cancer, its screening, and its' vaccination. **Conclusion:** The knowledge regarding cervical cancer is poor among the students of the medical school.

INTRODUCTION

Cervical cancer is the fourth most prevalent cancer among females all over the world.[1] Human papillomavirus (HPV) infection causes cervical cancer, particularly HPV 16 and 18 strains account for 75% of these cases [1]. It is most common sexually transmitted infection worldwide and has a global prevalence of 11.7 %.[2] , so the burden of HPV is significant. HPV affects both men and women.[3]

Associated risk factors for cervical cancer include

1. Early age of sexual activity
2. Multiple sexual partners
3. High risk male sexual partner
4. Early age for childbirth
5. Tobacco consumption
6. Prolonged use of oral contraceptives

Above associated risk factors are abundantly prevalent in India and so is reflected in the number of cervical cancer cases reported.[4] Cervical cancer and its precancerous lesions if detected early are curable which makes early and regular screening gain importance.[5] Screening with Pap smear, Visual inspection with acetic acid (VIA) and HPV DNA detection are quite effective.[5]

Though screening modalities have been in place for more than fifty years, the burden of the disease has not yet reduced as expected in India. For this reason, reinforcement with

another preventive measure through vaccination has now been advocated.[1] Bivalent and quadrivalent HPV vaccines are licensed for use in India [6].

Medical and paramedical students are future healthcare providers and play the most important role in creating awareness about cervical cancer screening and HPV vaccination. Research has shown that patients who receive a strong recommendation from healthcare providers are 4 to 5 times more likely to be vaccinated.[7]

Considering the role of medical and paramedical students in the very matter, this study aims at understanding their knowledge, attitude and practice towards the same. Various factors responsible for awareness among medical and paramedical students is also taken into consideration.

Aims and Objectives

1. To evaluate knowledge, attitude and practice about cervical cancer, its screening and Human Papilloma Virus vaccination among medical and paramedical students.
2. To evaluate the awareness about various risk factors leadings to cervical cancer among medical and paramedical students.
3. To analyze various factors that affect the awareness about cervical cancer, its screening and Human Papilloma Virus vaccination among the student.

MATERIALS AND METHODS

The following study was a cross sectional study of Knowledge, Attitude and Practices type among medical and paramedical students.

This cross-sectional study assessed HPV vaccination practices and awareness about cervical cancer among medical, dental, and nursing students at a tertiary healthcare hospital. Conducted over 60 days in July-August 2022, it included 650 medical, 250 dental, and 150 nursing students. Participants were those who consented, excluding non-consenting students. The sample size was 677, with no further sampling as all consenting students were included.Data collection involved personal visits to students, where they were informed about the study and gave written consent. They then completed a pre-tested questionnaire without influence. The questionnaire, developed to evaluate HPV vaccination practices and awareness of cervical cancer risks and screening, was validated and revised based on suggestions from a panel of community medicine and gynecology professors.Confidentiality was maintained, and personal data were kept private. The study had Institutional Ethics Committee approval. Data analysis used Microsoft Excel and Epi Info Software, with statistical significance set at $p<0.05$. Results were divided into categories of good or poor knowledge, positive or negative attitude, and good or poor practice based on responses to questions about HPV vaccines, cervical cancer, and screening.Modified B G Prasad classification was used to classify socioeconomic status of students.[8] The study used Vancouver style for references and citations.

RESULTS

It is a cross sectional study of knowledge, attitude, practice type to assess the HPV Vaccination practices, awareness about cervical cancer, its screening and awareness about its risk factors among medical and para-medical students. The study was conducted within the duration of 60 days.

Data for the study was collected from 484 medical students, 155 dental students and 38 nursing students of respective college. As shown in the [Table 1], the study involved 677 participants, with a slight female majority (55.1%). The average age was around 21 years. Most participants (70.9%) lived in urban areas and were single/unmarried (98.52%). The predominant religion was Hinduism (78.73%), followed by Islam, Buddhism, and others. In terms of parental education, a significant number of parents were graduates or had higher degrees, though some were illiterate or had only primary education. Parental employment varied, with many mothers being unemployed and fathers employed in professional or semiprofessional jobs. Most students lived in nuclear families (71.05%) and belonged to the upper socio-economic class (68.24%).

As shown in the [Table 2], in a study of 677 participants, there was varied awareness about cervical cancer and HPV. About 57.75% correctly identified cervical cancer as the leading female gynecological cancer, while 35.60% incorrectly believed other cancers like breast or vaginal were more prevalent, and 6.65% had no idea. When it came to the main cause of cervical cancer, 66.91% knew it was HPV, but 15.51% mistakenly attributed it to factors like alcohol or contraceptive use, and 17.58% were uncertain. Participants showed mixed understanding of risk factors: 48.89% recognized multiple sexual partners as a risk, 65.43% for frequent HPV infections, 23.34% for smoking, 22.16% for early sexual activity, 47.12% for poor hygiene, 25.70% for long-term oral contraceptives, and 32.79% for family history. However, some incorrectly considered old age, nulliparity, and HIV as risks.Awareness of diagnostic tests varied: 46.23% knew about the Pap smear, 49.48% about the HPV test, and only 15.805% about visual inspection with acetic acid. Some misconceptions existed, like 16.395% believing blood sampling was a diagnostic method, and 29.25% had little idea about these tests. Regarding HPV-related diseases, 66.17% correctly linked HPV to cervical cancer, with fewer recognizing its role in laryngeal

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papilloma (11.67%), genital warts (26.74%), and carcinoma penis (12.70%). Misunderstandings included 16.395% associating HPV with HIV and 11.52% with syphilis.For HPV transmission, 75.775% correctly identified sexual contact as a route, 34.86% knew about transmission from mother to fetus, but there were incorrect beliefs about transmission through blood (33.09%) and contaminated food (5.465%). In terms of HPV vaccine awareness, 78.73% understood it prevents HPV infection, but 5.17% incorrectly thought it cured HPV, and 16.10% were unsure. Regarding vaccine eligibility, 53.91% correctly knew it's for both genders, but 21.27% thought it was gender-specific, and 24.815% were clueless. About the timing for the HPV vaccine, 22.16% correctly stated it should be taken before first sexual exposure, while 32.35% had misconceptions about other timings, and 45.49% had no idea. Finally, 34.71% correctly knew the HPV vaccine is administered intramuscularly, but 14.62% had other misconceptions, and 50.66% were unaware of the administration route.

As shown in the [Table 3], out of the total participants, 318(46.97 %) said they were willing to get vaccinated out of which 204 (30.13 %) were females and 114 (16.84 %) were males. 158 (23.34 %) said that they are not willing to get vaccinated. When enquired for the likely cause of their unwillingness, 62 (9.16 %) said that they were doubtful about the efficacy of the vaccine, 90 (13.29 %) said that they were afraid of the side effects, 31(4.58 %) said that the vaccine was too costly, 38 (5.61 %) said that they are at a very low risk of getting cervical cancer for whatever reasons and 113 (16.69 %) said that not much is known to them about the vaccine which prevents them from taking it. 250 (36.93 %) number of students were willing to undergo regular screening for HPV infection and 212 (31.31 %) of them were unwilling.

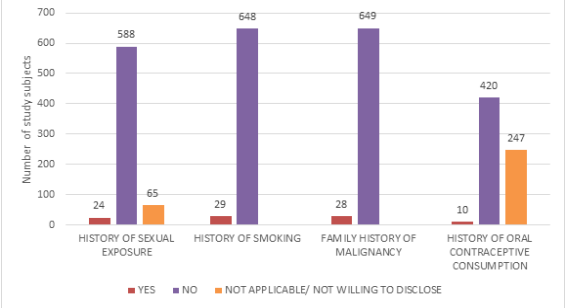

Figure 1: Descriptive Analysis of exposure of the students to Various Associated Risk Factors of Cervical Cancer.

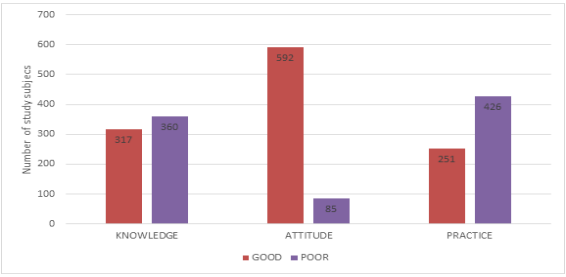

Figure 2: Overall prevalence of knowledge, attitude and practice.

As shown in the [Table 4], 35 (5.17 %) students were vaccinated against HPV and 535 (79.02 %) where not vaccinated. 14 (2.07 %) of them had for at least once undergone screening and 479 (70.75 %) had never undergone screening.

Table 1: Descriptive Analysis of Socio Demographic Variables (n=677)

Variables		Males (%)	Females (%)	Total (%)
Age		21.22 (+ 1.56)	20.90 (+ 1.36)	
Residence	Urban	189 (27.91)	291(42.98)	480(70.90)
	Rural	115(16.99)	82(12.11)	197(29.09)
Religion	Hindu	246(36.34)	287(42.39)	533(78.73)
	Muslim	27(3.99)	44(6.50)	71(10.49)
	Christian	1(0.15)	3(0.44)	4(0.59)
	Sikh	0(0.00)	3(0.44)	3(0.44)
	Buddhist	23(3.40)	34(5.02)	57(52.73)
	Jain	6(0.89)	2(0.29)	8(1.18)
Marital Status	Living with partner	4(0.59)	6(0.89)	10(1.48)
	Single	300(44.31)	367(54.21)	667(98.52)
Mother's Education	Illiterate	21(3.10)	22(3.25)	43(6.35)
	Primary school	62(9.16)	36(5.32)	98(14.47)
	Secondary school	80(11.82)	63(9.30)	143(21.12)
	Higher Sec. school	52(7.68)	95(14.03)	147(21.71)
	Graduate/Diploma	66(9.75)	106(15.66)	172(25.41)
	Post graduate/Honors	23(3.40)	51(7.53)	74(10.93)
Mother's Occupation	Unemployed	240(35.45)	283(41.80)	523(77.25)
	Unskilled worker	1(0.15)	3(0.44)	4(0.59)
	Semiskilled worker	10(1.48)	6(0.89)	16(2.36)
	Skilled worker	8(1.18)	8(1.18)	16(2.36)
	Semi-professional	32(4.73)	56(8.27)	88(13.00)
	Professional	13(1.92)	17(2.51)	30(4.43)
Father's Education	Illiterate	10(1.48)	7(1.03)	17(2.51)
	Primary school	17(2.51)	7(1.03)	24(3.54)
	Secondary school	35(5.17)	25(3.69)	60(8.86)
	Higher Secondary school	50(7.38)	51(7.53)	101(14.92)

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	Graduate/Diploma	130(19.20)	170(25.11)	300(44.31)
	Post graduate/Honors	62(9.16)	113(16.69)	175(25.85)
Father's Occupation	Unemployed	17(2.51)	13(1.92)	30(4.43)
	Unskilled worker	12(1.77)	6(0.89)	18(2.66)
	Semiskilled worker	45(6.65)	48(7.09)	93(13.74)
	Skilled worker	27(3.99)	22(3.25)	49(7.24)
	Semi-professional	146(21.56)	185(27.33)	331(48.89)
	Professional	57(8.42)	99(14.62)	156(23.04)
Type of family	Nuclear family	209(30.87)	271(40.03)	481(71.05)
	Joint family	57(8.42)	51(7.53)	108(15.95)
	Three generation family	37(5.46)	51(7.53)	88(13.00)
Socio-economic Status	Class 1	188 (27.77)	274(40.47)	462(68.24)
	Class 2	51(7.53)	44(6.5)	95(14.03)
	Class 3	27(3.99)	18(2.66)	45(6.65)
	Class 4	24(3.55)	16(2.36)	40(5.91)
	Class 5	13(1.92)	21(3.10)	34(5.02)
Graduate Degree	Medical	261(38.55)	222(32.79)	484(71.49)
	Dental	31(4.58)	124(18.32)	155(22.89)
	Nursing	11(1.62)	27(4.00)	38(5.61)
Academic Year	1st Year	94(13.88)	120(17.72)	214(31.61)
	2nd Year	72(10.63)	114(16.84)	186(27.47)
	3rd Year	71(10.49)	52(7.68)	123(18.17)
	4th Year	23(3.40)	47(6.94)	70(10.34)
	Intern	44(6.50)	40(5.90)	84 (12.41)

Table 2: Descriptive Analysis of Knowledge of students about Cervical Cancer, its risk factors, its screening and HPV vaccination. (n=677)

Knowledge	**Males (%)**	**Females (%)**	**Total (%)**
Leading Female gynecological cancer in India			
Correct Answer (Cervical cancer)	168 (24.81)	223 (32.94)	391 (57.75)
Incorrect Answer (Breast cancer, Vaginal cancer, Cancer of fallopian tubes)	111 (16.39)	130 (19.20)	241 (35.60)
Answer not known	25 (3.69)	20 (2.95)	45 (6.65)
Main cause of cervical cancer			
Correct Answer (Human Papilloma Virus)	208 (30.72)	245 (36.19)	453 (66.91)
Incorrect Answer (Alcohol consumption, having sexual intercourse, use of intrauterine devices)	35 (5.17)	70 (10.34)	105 (15.51)
Answer not known	60 (8.86)	59 (8.71)	119 (17.58)
Risk factors for cervical cancer			
Correctly Answered: Multiple sexual partners	141 (20.83)	190 (28.06)	331 (48.89)
Frequent infection with HPV	194 (28.65)	258 (38.11)	443 (65.43)
Smoking	82 (12.11)	76 (11.23)	158 (23.34)
Early age of first sexual intercourse	60 (8.86)	90 (13.29)	150 (22.16)
Poor hygiene	132 (19.50)	187 (27.62)	319 (47.12)
Long term use of oral contraceptives	69 (10.19)	105 (15.51)	174 (25.70)
Family history of malignancy	95 (14.03)	127 (18.76)	222 (32.79)
Incorrect answers: Old age	19 (2.81)	17 (2.51)	36 (5.32)
Nulliparity	36 (5.32)	23 (3.40)	59 (8.71)
HIV infection	45 (6.65)	89 (13.15)	134 (19.79)
Answer not known	68 (10.04)	50 (7.38)	118 (17.43)
Diagnostic methods used for detection of cervical cancer			
Correctly Answered: Pap smear	138 (20.38)	175 (25.85)	313 (46.23)
HPV test	133 (19.645)	202 (29.84)	335 (49.48)
Visual inspection with acetic acid	53 (7.83)	54 (7.98)	107 (15.805)
Incorrectly Answered: Blood sampling	40 (5.91)	71 (10.49)	111 (16.395)
Answer not known	100 (14.77)	98 (14.475)	198 (29.25)
Recurrent HPV infection may increase risk of			
Correctly Answered: CA cervix	191 (28.21)	257 (37.96)	448 (66.17)
Laryngeal papilloma	38 (5.61)	41 (6.06)	79 (11.67)
Genital warts	60 (8.86)	121 (17.87)	181 (26.74)
Carcinoma penis	35 (5.17)	51 (7.53)	86 (12.70)
Incorrectly Answered: HIV infection	40 (5.91)	71 (10.49)	111 (16.395)
Syphilis	35 (5.17)	43 (6.35)	78 (11.52)
Answer not known	85 (12.555)	80 (11.82)	165 (24.37)
How is HPV transmitted			
Correctly Answered: Sexual route	219 (32.35)	294 (43.43)	513 (75.775)
From mother to fetus	97 (14.33)	139 (20.53)	236 (34.86)
Incorrectly Answered: Via blood	100 (14.77)	124 (18.32)	224 (33.09)
Through ingestion of contaminated food	19 (2.81)	18 (2.66)	37 (5.465)
Answer not known	70 (10.34)	63 (9.305)	133 (19.645)
Is HPV infection curable			
Yes	139 (20.53)	138 (20.38)	277 (40.915)
No	56 (8.27)	97 (14.33)	153 (22.60)

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Answer not known	109 (16.10)	138 (20.38)	247 (36.48)
Benefits of taking HPV vaccine			
Correctly answered (Prevents HPV infection)	222 (32.79)	311 (45.94)	533 (78.73)
Incorrectly answered (Cures HPV infection)	22 (3.25)	13 (1.92)	35 (5.17)
Answer not known	59 (8.71)	50 (7.38)	109 (16.10)
Who can take HPV vaccine			
Correctly answered (Both males and females)	162 (23.93)	203 (29.985)	365 (53.91)
Incorrectly answered (Males only, Females only)	61 (9.01)	83 (12.26)	144 (21.27)
Answer not known	80 (11.82)	88 (13.00)	168 (24.815)
Appropriate age group for taking HPV vaccine			
Correctly Answered (Before the first sexual intercourse)	54 (7.98)	96 (14.18)	150 (22.16)
Incorrectly Answered (Children before attainment of puberty, Before getting pregnant, After menopause)	99 (14.62)	120 (17.725)	219 (32.35)
Answer not known	150 (22.16)	158 (23.34)	308 (45.49)
Route of administration of HPV vaccine			
Correctly Answered (Intramuscular)	95 (14.03)	140 (20.68)	235 (34.71)
Incorrectly Answered (Intradermal, Subcutaneous, Intravenous)	51 (7.53)	48 (7.09)	99 (14.62)
Answer not known	158 (23.34)	185 (27.33)	343 (50.66)

Table 3: Descriptive Analysis of Attitude of students towards HPV vaccination and Screening for Cervical Cancer. (n=677)

Attitude	**Males (%)**	**Females (%)**	**Total (%)**
Willing to take HPV vaccine			
Yes	114(16.84)	204(30.13)	318(46.97)
No	74(10.93)	84(12.41)	158(23.34)
Already immunized	19(2.81)	16(2.36)	35(5.17)
Not applicable	96(14.18)	70(10.34)	166(24.52)
Reasons for unwillingness			
Doubtful about the efficacy of vaccine	33(4.87)	29(4.28)	62(9.16)
Fear of side effects	37(5.46)	53(7.83)	90(13.29)
Cost	18(2.66)	13(1.92)	31(4.58)
Minimal risk of cervical cancer	21(3.10)	17(2.51)	38(5.61)
Not much known about the vaccine	47(6.94)	66(9.75)	113(16.69)
Willing to undergo regular screening for HPV infection			
Yes	82(12.11)	168(24.82)	250(36.93)
No	85(12.55)	127(18.76)	212(31.31)
Not applicable	136(20.09)	79(11.67)	215(31.76)
Total			

Table 4: Descriptive Analysis of Practice of HPV Vaccination and Cervical Cancer Screening among the students. (n=677)

Practices	**Males (%)**	**Females (%)**	**Total (%)**
Vaccinated against HPV			
Yes	22(3.25)	13(1.92)	35(5.17)
No	212(31.31)	323(47.71)	535(79.02)
Not applicable	69(10.19)	38(5.61)	107(15.80)
Undergone screening for cervical cancer			
Yes	10(1.48)	4(0.59)	14(2.07)
No	153(22.60)	326(48.15)	479(70.75)
Not applicable	140(20.68)	44(4.50)	184(27.18)

As shown in the Figure 1, out of the total participants, 24(3.54 %) had a history of sexual exposure whereas 588(86.85 %) were never exposed. Out of these 8(1.18 %) were females and 16(2.36 %) were males. 48(7.09 %) used condoms during sexual exposure whereas 39(5.76 %) never used condoms. 10(1.48 %) female students were currently taking oral contraceptives. 29(4.28 %) students had the history of smoking out of which 22 (3.25 %) were males and 7(1.03 %) were females. Out of the total participants, 15(2.21 %) males said that they had a family history of malignancy and 13(1.92 %) females said that they had a family history of malignancy.

As shown in the Figure 2, 317(46.82 %) of the total participants shown good knowledge compared to other 360(53.18 %) who had poor knowledge. 592(87.44 %) students had a positive attitude towards HPV vaccination and cervical cancer screening compared to the other 85 (12.55 %) who had negative attitude. 251 (37.08 %) students reported good practice compared to other 426(62.92 %) who reported poor practice.

In the study detailed in Table 5, significant associations were observed across various demographics regarding knowledge, attitudes, and practices towards cervical cancer screening and HPV vaccination. Among genders, males demonstrated 133 with good knowledge, 270 with a positive attitude, and 173 with good practices, while females showed 184 with good knowledge, 322 with a positive attitude, but only 78 with good practices, leading to a significant gender-practice association (p=0.0000). Among different fields of study,

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medical students excelled with 245 having good knowledge, 437 a positive attitude, and 198 good practices. This was followed by dental students (50 with good knowledge, 124 with positive attitudes, 47 with good practices) and nursing students (22 with good knowledge, 31 with positive attitudes, 6 with good practices), with significant associations between study fields and knowledge (p=0.0001), attitude (p=0.0018), and practices (p=0.0011). The mother's education level also impacted student responses, showing a gradual increase in knowledge, attitudes, and practices as the education level rose, with a notable correlation with attitudes (p=0.0375). Family type influenced attitudes, with those from nuclear families showing the highest levels of knowledge (232), positive attitudes (425), and good practices (172), and a significant association between family type and attitudes (p=0.0499). Finally, academic year played a role, with first-year students leading in good knowledge (89), positive attitudes (181), and good practices (76), and a significant difference in knowledge levels across academic years (p=0.0000).

DISCUSSION

Cervical cancer is the second most life threatening cancer among women worldwide. HPV vaccination alone or combined with screening have been documented as effective interventions in reducing the burden and mortality due to cervical cancer across various settings.[9] Many studies conducted in India have documented the prevalence of high-risk HPV infection i.e. HPV 16/18 to be ranging from about 30 % in inflammatory lesions to more than 95 % in case of cervical cancer.[10] Many authors have also suggested that achieving high levels of HPV vaccination would have a significant health and economic impact by reducing the burden of cervical cancer.[11]

In the current study, out of the total participants, 46.82 % of the students have good knowledge regarding cervical cancer, HPV vaccination and screening for the same. Compared to other similar studies conducted in Bangladesh with average knowledge being 43.29 %, our study showed good knowledge levels.[12] However, considering the studies conducted in Malaysia and south west Nigeria, our studies show quiet low knowledge levels, as 62.9 % and 67.1 % of students knew well about HPV vaccine, cervical cancer and its screening respectively.[13,14] Significant association (p=0.0001) was noticed between the graduating degree (medical, dental, nursing) and the status of knowledge. Better knowledge was reported among medical students (245) compared to dental and nursing students. The possible reasons maybe due to better clinical exposure to medical students compared to dental and nursing students. Significant association was noticed between academic year and knowledge of the students with senior professional students showing better compared to first and second year students (p=0.000). The likely reason being that senior professional student might have had a good understanding of knowledge regarding HPV in general compared to junior professional students. The findings are consistent with the results of other studies conducted in Jordan and Saudi Arabia.[14,15]

In order to undertake the preventive actions, it is important to have a clear cut understanding of the causative agent and associated risk factors of cervical cancers. In the present study, 66.91 % of the participants correctly knew that, HPV is the main cause of cervical cancer. This is consistent with other studies where most participants were aware that cervical cancer is caused due to HPV infection.[16,17] 65.44 % of the students reported to have a good understanding of the associated risk factors of cervical cancer such as multiple sexual partners, frequent HPV infection, smoking, long term oral contraceptive use, poor hygiene etc. These results are better compared to other similar studies conducted among general educated youth from India, Sri Lanka and Nepal, which was only 48.9 % in India, 48.5 % in Sri Lanka and 52.5 % in Nepal.[18] Out of the total participants in our study only 37.76 % knew correctly about the present day screening methods for detection of cervical cancer. When enquired further about the causative agent i.e. HPV, only 30.43 % participants of the study knew correctly the possible carcinomas that may result due to recurrent HPV infections (these are carcinoma cervix, laryngeal papilloma, genital warts, carcinoma penis). Also, only 32.5 % reported correctly the routes of transmission of the virus in our study. Compared to another study conducted in Swaziland, most participants were aware that HPV is transmitted sexually.[19]

Knowledge about HPV vaccine has a direct impact on its uptake and also on the choice of recommendation to the patients. Thus, to evaluate the same, questions regarding benefits, appropriate age, route of administration, and possible recipients were asked. It was seen that, maximum students (78.73 %) knew that HPV vaccine prevents infection. Similar results were seen in a study conducted in Jordan were 70 % participants were aware that cervical cancer protection is provided by HPV vaccine.[20] 53.91 % students knew that both males and females can take the vaccine. In a study conducted in Vietnam, it was observed that very few people answered correctly the question about the target group for HPV vaccination. In this same study it was stated that it may be due to the fact that HPV vaccination programs have largely focused on women and young adolescent girls due to their close link to cervical cancer.[21] This may lead to the misconception about the target population for HPV vaccination to be both males and females. Only 22.16 % knew that the vaccine should be taken before the first sexual intercourse. This may be due to the fact that, sexual health topics are often

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avoided at schools or in the family.[22] Some people even believe that sexuality and relationships are not appropriate for adolescent and young adults because education must be prioritized.[23] It may lead to lack of essential knowledge about vaccine administration before first sexual intercourse. Route of administration to be intramuscular was also known by only 34.71 % students.

In the present study, good practice of HPV vaccination and undergoing cervical cancer screening was found to be only 37.08 % it is mainly due to poor knowledge about the same. Only 5.17 % of the total participants have taken the vaccine, out of these only 1.92 % of the participants are females. This is in contrast with another study conducted in Bangladesh to evaluate KAP regarding HPV in medical and paramedical professionals where, around 83 participants (nearly 10 %) have taken vaccine or started the course and most of the vaccinated participants were females.[9] Factors such as fear of injection, fear of vaccine side effects, lack of knowledge about the vaccine, not being sexually active, low perceived risk of cervical cancer, non-availability of vaccine and prohibitive cost etc. are some of the barriers to receive HPV vaccine that have been reported in the literature.[24-26] In the present study only 14 participants i.e. 2.07 % of the total have previously undergone screening. The numbers are strikingly low compared to other studies conducted among female medical personnel in Delhi were it was found that around 19.7 % of the participants underwent Pap smear. Possible reasons being inaccessibility, social stigma and side effects.[27] Significant association ($p < 0.000$) was noticed between gender and practice of vaccine uptake and undergoing screening. The possible reason may be that HPV causing infection in males as well is not fairly known thus females are more likely to be linked to the topics around HPV and infections caused due to HPV. Significant association was also noticed between the graduating degree and practices. This may be because of more knowledge of medical students compared to dental and nursing students regarding the vaccine as mentioned above influencing their practices.

Though in the present study, knowledge and practice is considerably poor, attitude of the medical and paramedical students was remarkably positive i.e. 87.44 % of the total participants had positive attitude. Around 46.97 % participants were willing to receive HPV vaccine. 36.93 % of the total participants were willing to undergo screening for cervical cancer. In a similar survey-based study in Karnataka and central India, 21 % and 3 % of the respondents, respectively, were willing to get a pap smear done.[28,29] Significant association ($p=0.0018$) was seen between graduating degree and attitude towards vaccine and screening. Strikingly, significant association was also noticed between mother's education ($p=0.0375$) and type of family ($p=0.0499$). Parents, their educational qualification and attitude towards the vaccine plays an important role in the attitude of students towards the vaccine. In a Kolkata based study it was reported that, there is increase in the acceptance level of vaccine after parents were provided with detailed information about cervical cancer and HPV vaccine.[30] Similar results were found in a study where they surveyed the parents of girls aged 9-17 years. It was noticed that the factor that was strongly associated with HPV vaccine status was parental HPV knowledge.[31]

As this is cross-sectional study all the limitations associated with it are applicable. Certain items may be influenced by recall bias of study subjects and causal relationship could not be established. Social desirability bias remains possible, despite we attempted to minimize its impact through self-administration of the questionnaire. Lack of representativeness of different groups can be considered as one of the limitations as the number of participants from dental and nursing were lower than medical students.

CONCLUSION

In conclusion, the knowledge regarding cervical cancer, its risk factors, screening and HPV vaccination is poor among medical and paramedical students. Medical students, however, compared to dental and nursing students display better knowledge. Poor knowledge is reflected in the poor uptake of vaccines and poor practices of screening among these subjects. The main reason for poor uptake of vaccine being less knowledge, fear of side effects and doubts about the efficacy of vaccine. Despite of poor knowledge and poor practice, considerable amount of willingness to get vaccinated and screened is seen which is surely an important factor influencing the practices and status of willingness to recommend the same to the patients, thus affecting the community in general. Advocacies should be emphasized on the risk of HPV as sexually transmitted disease and the availably of discounted and safe HPV vaccines in tertiary educational institute as attitude towards HPV vaccination was positive among many studies.

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