Original Article

Knowledge and attitude about cervical cancer and human papillomavirus vaccine among medical and paramedical students of a university

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Abstract

Background: Every year, globally 570,000 women are diagnosed with cervical cancer, out of which around 311,000 die. India contributes to about 132,000 new cases and 74,000 deaths yearly. One of the major risk factors for cervical cancer is infection with some types of human papillomavirus (HPV). This is both preventable (by vaccination) and detectable early (routine screening programs). **Objective:** The objective of this study is to assess the knowledge and attitude in medical and paramedical students about cervical cancer and HPV vaccination. **Material and Methods:** A cross-sectional survey was conducted, using predesigned and validated questionnaire. It was segregated into three parts: Q1—demographic details, Q2a—questions assessing knowledge, Q2b—questions assessing attitude. Our target population was female students (18–25 years) studying in medical, nursing, and physiotherapy colleges. Descriptive statistics of data was analyzed using SPSS 16.0. **Results:** We had 73% response rate. Most participants belonged to upper middle and upper socioeconomic class, were pursuing MBBS, resided in villages, had educated parents, and had good health-care-seeking behavior. School education, television, and printed advertisements appeared to be underutilized. Around 50% of the participant had received chickenpox and typhoid vaccine, but only 8% had received HPV vaccine. The mean knowledge score was 5.19 ± 2.24, with 0.00 minimum and 11.0 maximum, out of a maximum possible score of 17. Only, place of residence appeared to effect the knowledge score. **Conclusion:** The study shows the dismal knowledge levels about HPV amongst students. Participants were interested in seeking knowledge; consider HPV vaccination provided they were provided with sufficient knowledge.

Keywords: Attitude, cervical cancer, HPV, HPV vaccine, knowledge

Introduction

Cervical cancer is an abnormal growth of cells arising from the cervix and having the ability to invade and spread to other parts of the body.[1,2] It is the fourth most common cancer in females for incidence as well as mortality. Cervical cancer comes second in incidence as well as mortality behind breast cancer in lower development index countries. Yearly, around 570,000 women are diagnosed with cervical cancer, and of them around 311,000 die. A bulk of these deaths are noted by the developing countries.[3] About one-fourth of these cases and deaths are witnessed in India.[4,5]

There are many recognized risk factors for cervical cancer—infection with human papillomavirus (HPV), human immunodeficiency virus (HIV), early age of marriage, multiple

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sexual partners, multiple pregnancies, poor genital hygiene, long-term use of hormonal contraceptives, smoking, and sexual intercourse at young age.[6-9] Out of these multiple reasons, HPV infection is considered to be the biggest contributing factor.[9] More than 40 different serotypes of HPV infection have been identified, of which around 15 are deemed to be oncogenic.[10]

Two strategies—early detection by structured screening programs using Papanicolaou smear and prevention of HPV infection by the use of vaccines—have shown to maximally impact the incidence, outcome, and mortality associated with cervical cancer.[11,12] Multiple barriers have been identified which lead to a suboptimal number of persons seeking routine screening.[12] In such a scenario, routine vaccination (using either bivalent or quadrivalent) vaccine appears to have more outreach, thereby higher impact. Multiple clinical trials and systematic reviews world over place the efficacy of HPV vaccine to prevent cervical intraepithelial neoplasia (CIN) as high as 90–99%.[13] In spite of this fact, the overall coverage of the vaccine has been found to be suboptimal.[14] In India, presently this vaccine is being offered only to adolescent females. The authors designed this study, to better understand the knowledge gaps and barriers for wider percolation of this vaccine amongst the Indian population.

The objective of the study was to assess the knowledge and attitude of medical and paramedical female students, of our university, regarding cervical cancer and HPV vaccine.

Material and Methods

A cross-sectional study was conducted in medical and paramedical female students aged 18–25 years of a university located in rural part of western India. The study spanned over 6 months from September 2016 to March 2017. The study was approved by the institutional Human Ethics & Research Committee in July 2016.

Inclusion criteria

All the female undergraduate students studying in medical, nursing, and physiotherapy were approached to participate in the study.

Exclusion criteria

Interns and postgraduate students were excluded from this study. Any student who was absent on the day of the session was not approached again for the study.

Written informed consent was sought from all the participants. We divided the participants into batches of 50–100 depending on their study course. The investigators gave a short introduction about the aims and objectives, background of the study. The investigators entertained all the initial queries after the brief introduction session. After this, the questionnaire was introduced. No time limit was imposed on the participants. After everyone filled the questionnaire, the investigators took verbal feedback and a short question–answer session was conducted by a consultant gynecologist, to address all the queries, which were raised during the session. We conducted seven such sessions in total.

Survey instrument

Questionnaire (Questionnaire S1, Questionnaire S2) had been prepared by the investigators, keeping in mind the study objectives. Questionnaire S1 had the demographic and socioeconomic details of the participants. Participants were given the option of filling the form anonymously. Questionnaire S2 had 26 questions targeted at assessing the knowledge and attitude of the participants. Question numbers 1–15, 22, and 23 were to assess the knowledge and questions 16–21 and 24–26 assessed the attitude of the participants [Table 1]. The questionnaire was a mixture of true or false and multiple-choice questions. The participants were scored only on the knowledge questions. So, the maximum score was 17 and minimum possible score was 0. The questionnaire was in English, which is also the language of instruction for medical and paramedical course in India. Both the parts of the questionnaire were first reviewed by two independent clinicians for the content validity and the alignment with study objectives. The questionnaire was then tested for face validity in a pilot study on 10 interns and postgraduate students to ensure if the questions were understood. The result showed that the content was well understood by the respondents.

Analysis

The filled questionnaire was manually entered into Microsoft Excel. Then, it was exported to Statistical Package for Social Sciences (SPSS 16) and analyzed. Descriptive statistics and stratification were used to analyze the demographic profile and participants' responses to the attitude questions. The score of the knowledge question was added up (out of maximum score of 17). Chi-square test was used to compare their knowledge score with their demographic profile, where P value of < 0.05 was considered significant.

Results

We approached a total of 549 students, of which 401 consented and participated in this study (73%). Almost half of the participants were studying MBBS (50.4%), followed by BSc Nursing (19.5%), GNM Nursing (17.7%), and Physiotherapy (12.5%). The demographic details of the participants are highlighted in Table 2. They were in the age range of 18–25 years. Majority of our participants were staying in cities (54.1%), belonged to upper middle and upper socioeconomic class (63.9%), had educated parents (either of the parents completing higher secondary or graduation—84.5%), and had decent health-seeking behavior (Regular pediatrician visits—37.4%, received chickenpox vaccine—54.4% and typhoid vaccine—44.4%). Still only 32 (8%) had received HPV vaccine.

In the questions assessing their knowledge, the mean score was 5.19 ± 2.24. The minimum recorded score was 0 and maximum

Table 1: Questionnaire used to assess the knowledge and attitude of the participants

Number	Question		Incorrect answer *n* (%)	Correct answer *n* (%)
Questions assessing knowledge				
Q1	All cancers are preventable		84 (20.9%)	317 (79.1%)
Q2	Cervical cancer is preventable		347 (86.5%)	54 (13.5%)
Q3	Cervical cancer is caused by?		347 (86.5%)	54 (13.5%)
Q4	Is there any vaccine available for cervical cancer?		211 (52.6%)	190 (47.4%)
Q5	Is the cervical cancer vaccine available in India?		234 (58.6%)	167 (41.6%)
Q6	For which age group should the HPV vaccine be given?		345 (86.0%)	56 (14.0%)
Q7	Can it be given to boys?		327 (81.5%)	74 (18.5%)
Q8	Can it be given to a sexually active girl?		162 (40.4%)	239 (59.6%)
Q9	Do girls/women need to be screened for HPV before getting vaccinated?		221 (55.1%)	180 (44.9%)
Q10	Can it be given to a woman already having HPV infection?		309 (77.1%)	92 (22.9%)
Q11	How many doses of HPV vaccine are required for protection?		345 (86.0%)	56 (14.0%)
Q12	Is it safe to have multiple sexual partners after full course of HPV vaccine?		364 (90.8%)	37 (9.2%)
Q13	Is it safe to have sex without condoms after HPV vaccine?		372 (92.8%)	29 (7.2%)
Q14	Do girls/women who have already been vaccinated, require cervical cancer screening?		182 (45.4%)	219 (54.6%)
Q15	Cervical cancer protection provided by HPV vaccine is complete		378 (94.3%)	23 (5.7%)
Q22	Are you aware of HPV screening?		253 (63.1%)	148 (36.9%)
Q23	Are you aware of any genetic relationship of cervical cancer?		254 (63.3%)	147 (36.7%)
Questions assessing attitude			**Yes *n* (%)**	**No *n* (%)**
Q16	Would you like to receive HPV vaccine?		293 (73.1%)	24 (6%)
Q17	What do you think is the most important hurdle preventing yourself to receive HPV vaccine?	High cost	30 (7.5%)	358 (89.3%)
		Worry about complications	116 (28.9%)	272 (67.8%)
		Worry about the efficacy	43 (10.7%)	345 (86%)
		Inadequate information	200 (49.9%)	188 (46.9%)
Q18	What are your sources of knowledge and information on HPV vaccine?	Undergrad school teaching	182 (45.4%)	208 (51.9%)
		Friends	41 (10.2%)	349 (87%)
		Newspaper	23 (5.7%)	367 (91.5%)
		Books	46 (11.5%)	344 (85.5%)
		Internet	135 (33.7%)	255 (63.6%)
		Television	8 (2%)	382 (95.3%)
Q19	Has anybody (friends/family) sought your opinion till now regarding HPV vaccination?		101 (25.2%)	283 (70.6%)
Q20	Would you like to be educated by experts?		358 (89.3%)	37 (9.2%)
Q21	Have you seen any advertisement for HPV vaccine?		84 (20.9%)	313 (78.1%)
Q24	Have you come across any patient of cervical cancer during your clinical posting?		103 (25.7%)	293 (73.1%)
Q25	Have you ever seen screening for cervical cancer?		61 (15.2%)	334 (83.3%)
Q26	Have you taken the HPV vaccine?		32 (8%)	276 (68.8%)

recorded score was 11, out of a maximum possible score of 17. The descriptive question-wise performance is enlisted in detail in Table 1. There was no relation between the mean score and undergraduate course pursued (*P* value—0.101), language of education (*P* value—0.130), education of mother (*P* value—0.119), education of father (*P* value—0.694), doctor amongst first degree relatives (*P* value—0.565), having a gynecologist as a friend/relative (*P* value—0.814), having a pediatrician as a friend/relative (*P* value—0.086), and having a family history of cancer (*P* value—0.946). Only factors effecting the knowledge score were place of residence (*P* value—0.031) and socioeconomic status (*P* value—0.002).

In the questions assessing the attitude of the participants, most of the participants were interested to be educated by a subject expert (89.3%) and receive the HPV vaccine (73.1%). Most of the participants felt that television advertisements, newspaper, and books were poor sources of information regarding HPV vaccine. Undergraduate teaching (45.4%) and internet (33.7%) were the most common sources of information. The students felt that the biggest barriers to them getting vaccinated for HPV were inadequate information, doubts regarding efficacy, complications, and cost of the HPV vaccine [Table 1].

Discussion

HPV infection is one of the most important preventable causes of cervical cancer. Multiple addressable risk factors for cervical carcinoma have been identified. Screening interventions for early detection to minimize morbidity and mortality are easy available. With the advent of HPV vaccine, we can effectively prevent HPV infection and subsequent CIN. In spite of all these

Table 2: Demographic details of the study participants

Demographic detail	Categories	*n* (%)
Course pursuing	MBBS	202 (50.4%)
	BSC Nursing	78 (19.5%)
	GNM Nursing	71 (17.7%)
	Physiotherapy	50 (12.5%)
Year of college education	First	45 (11.2%)
	Second	122 (30.4%)
	Third	108 (26.9%)
	Fourth	38 (9.5%)
	Fifth	18 (4.5%)
Residence	City	217 (54.1%)
	Village	108 (26.9%)
	Town	65 (16.2%)
Language of schooling	English	193 (48.1%)
	Gujarati	186 (46.4%)
	Hindi	2 (0.5%)
Marital status	Unmarried	385 (96%)
	Married	9 (2.2%)
Socioeconomic status	Upper class	44 (11%)
	Upper middle class	212 (52.9%)
	Lower middle class	80 (20%)
	Upper lower class	4 (1%)
	Lower class	3 (0.7%)
Maternal education	Higher secondary/graduate and above	304 (75.8%)
	Till 10th standard	51 (12.7%)
	Primary and illiterate	7 (1.7%)
Paternal education	Higher secondary/graduate and above	339 (84.5%)
	Till 10th standard	28 (7%)
	Primary and illiterate	2 (0.4%)
First degree relative is a doctor	No	257 (64.1%)
	Yes	128 (31.9%)
Relative or close friend is a gynecologist	No	350 (87.3%)
	Yes	47 (11.7%)
Relative or close friend is a pediatrician	No	367 (91.5%)
	Yes	29 (7.2%)
Underwent regular visits to pediatrician as a child	No	238 (59.4%)
	Yes	150 (37.4%)
Received chickenpox vaccine	No	75 (18.7%)
	Yes	218 (54.4%)
Received typhoid vaccine	No	90 (22.4%)
	Yes	178 (44.4%)
Have a family history of cancer	No	336 (83.8%)
	Yes	58 (14.5%)

factors, cervical cancer continues causing significant mortality and the morbidity.[5]

In this study, the mean knowledge score was 5.19 ± 2.24 with 0 being the minimum score and 11 being the maximum score, out of a total score of 17. This implies that most of the students have scored less than 30% in the questionnaire. Multiple studies conducted amongst medical and other students of similar age group also documented poor knowledge.[15,16] This is an issue of concern as medical and paramedical female students are assumed to be the cream of the society, and such poor scores among them reflect a dismal knowledge level throughout the society. We have not performed a root cause analysis for the poor knowledge. But other studies have identified multiple causes like lack of national screening and awareness programs, social and religious issues, fear of unknown side effects, and lack of sufficient percolation of the new guidelines for HPV vaccination in national immunization program.[15-17] Most of the participants were MBBS students, belonged to upper middle socioeconomic class, had educated parents, and had good health-care-seeking behavior. Almost 50% had received typhoid vaccine and more than 50% had received chickenpox vaccine. But only 8% had taken HPV vaccine. This can reflect poor knowledge amongst the doctors who educated these students about the other vaccines. An in-depth analysis is needed to understand the barriers probably even present amongst the health-care providers to address this deficit.

Similar surveys done in other countries have had interesting information to reveal. In a study using social media platforms of medical students, about 28.8% students identified HPV as being a causative agent for cervical cancer, which was more than double of our sample (13.5%).[18] However, the sample involved developed and developing countries with America; European students comprising about 88% of the sample had more knowledge than African and Asian students who were about 12% of the sample and thus the sample is not representative. The study asked questions to both males and females while we asked only female students. A study conducted in a Brazilian university showed better knowledge in female students above causation of cervical cancer (88%) but only 26% were vaccinated against 8% in our study. However, a repeat survey in the same students showed higher vaccination of 52%, indicating that the survey helped improve vaccination.[19]

The authors of this study strongly feel that it's utmost important to equip our health-care providers like family physicians with knowledge. They are in most circumstances the first care providers. This is also supported by the fact that in our study, only 37.3% showed to pediatricians routinely, while the rest (62.7%) showed to family physicians. Most patients fully trust their family physicians and their words have deeper impact on patient practices. To targeted programs, educating these influencers regarding HPV vaccination and routine screening for cervical cancer can alter the societal perceptions, thereby overcoming certain barriers. Primary care physicians routinely manage patients for various mild illnesses. When they encounter patients, especially female patients, they need to determine the various vaccines received by patients while evaluating them for the cause of illness. Asking for history of receipt of cervical cancer vaccine and having a discussion around, it is important to ensure demand for the vaccine and subsequent protection of the female patients. They need to emphasize the need of the older family members to protect their daughters against future illnesses. Since cervical cancer is a common occurrence, discussing cases (without revealing privacy) of cervical cancer may be helpful.

Most of the participants had acquired whatever information they had through undergraduate classes and internet. This suggests that this is a largely ignored topic by schools, print newspapers, and in media—television and advisements.

The knowledge score was compared across the various demographic variables. Course pursued didn't have a significant impact on the average score. Most of the participants were first, second, and third-year students. For MBBS students, their gynecology training wouldn't have begun yet, while BSc, GNM Nursing, and Physiotherapy would have been introduced to gynecology. This can probably explain their similar scores but is not an excuse for them. Parent's education and, doctor amongst the relatives or friends didn't affect the knowledge score. The probable reason must be lack of communication among the family members about this topic. A large number (89.3%) of students wanted information from experts and this along with the fact that many have known about HPV vaccine from classes indicates that experts have a role to play in information dissemination. A recent study indicates that source of knowledge matters since those who received it from friends or family had inaccurate knowledge versus those who received it from health-care providers. Poor knowledge can lead to poor attitude, behavior, and reproductive choices and hence public health interventions for cervical cancer need to take these factors into account.[20]

Only place of residence and socioeconomic status affected the scores. Participants belonging to city and towns scored more than those in villages. There can be multiple reasons for this like open culture permitting free exchange of knowledge, easier access to internet, education programs focusing on cities, etc., Statistically, socioeconomic status also affected the scores. When the authors analyzed the score in detail, average score and participants of upper class were 44 and 6.15 ± 2.45, upper middle was 212 and 4.97 ± 2.18, lower middle was 80 and 5.1 ± 2.24, upper lower was 4 and 6.75 ± 1.5, and lower class was 3 and 8 ± 3.46. Due to the less number of participants in the lower and lower middle class, care should be taken in interpreting the statistics.

However, most of the student showed interest in getting HPV vaccine and getting educated by the subject experts. This gives us a ray of hope that with appropriate vaccination, screening, and educational programs, we can attain our goal. The current study has given impetus in our institute to a suggestion that includes a module on vaccines for undergraduates in their first year and we hope to present our results soon.

Limitations

This study was limited to determine awareness of the females only of a single center. It might not represent the general population. We did not study the underlying barriers for poor knowledge level.

Conclusion

This study highlights dismal knowledge about cervical cancer and HPV vaccination but identifies positive attitude and eagerness to learn indicating that targeted education, vaccination, and screening strategies at an early age can help in decreasing the mortality and morbidity related to cervical cancer. We do note the encouraging signs that the study shows with respect to interest in learning the importance of cervical cancer vaccine.

Declaration of patient consent

Consent of the participants was obtained during the study

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Conflicts of interest

There are no conflicts of interest.

References

1. Moss SF, Blaser MJ. Mechanisms of disease: Inflammation and the origins of cancer. Nat Clin Pract Oncol 2005;2:90-7; quiz 1 P following113.
2. NCI Dictionary of Cancer Terms-National Cancer Institute [Internet]. 2011 [cited 2020 Oct 08]. Available from: https://www.cancer.gov/publications/dictionaryes/cancer-terms/.
3. Bray F, Ferlay J, Soerjomataram I, Siegel RL, Torre LA, Jemal A. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA Cancer J Clin 2018;68:394-424.
4. Laikangbam P, Sengupta S, Bhattacharya P, Duttagupta C, Dhabali Singh T, Verma Y, *et al.* A comparative profile of the prevalence and age distribution of human papillomavirus type 16/18 infections among three states of India with focus on northeast India. Int J Gynecol Cancer 2007;17:107-17.
5. Torre LA, Bray F, Siegel RL, Ferlay J, Lortet-Tieulent J, Jemal A. Global cancer statistics, 2012. CA Cancer J Clin 2015;65:87-108.
6. Louie KS, de Sanjose S, Diaz M, Castellsagué X, Herrero R, Meijer CJ, *et al.* Early age at first sexual intercourse and early pregnancy are risk factors for cervical cancer in developing countries. Br J Cancer 2009;100:1191-7.
7. Winer RL, Hughes JP, Feng Q, Xi LF, Lee S-K, O'Reilly SF, *et al.* Prevalence and risk factors for oncogenic human papillomavirus infections in high-risk mid-adult women. Sex Transm Dis 2012;39:848-56.
8. Hong Y, Zhang C, Li X, Lin D, Liu Y. HPV and cervical cancer related knowledge, awareness and testing behaviors in a community sample of female sex workers in China. BMC Public Health 2013;13:696.
9. Gadducci A, Barsotti C, Cosio S, Domenici L, Riccardo Genazzani A. Smoking habit, immune suppression, oral contraceptive use, and hormone replacement therapy use and cervical carcinogenesis: A review of the literature. Gynecol Endocrinol 2011;27:597-604.
10. HPV and Cancer-National Cancer Institute [Internet]. 2019 [cited 2020 Oct 08]. Available from: https://www.cancer.gov/about-cancer/causes-prevention/risk/infectious-agents/hpv-and-cancer.
11. Bray F, Loos AH, McCarron P, Weiderpass E, Arbyn M, Møller H, *et al.* Trends in cervical squamous cell carcinoma incidence in 13 European countries: Changing risk and the effects of screening. Cancer Epidemiol Biomarks Prev 2005;14:677-86.
12. Barriers to cervical cancer screening: A qualitative study with women in Serbia-PubMed [Internet]. [cited 2020 Oct 08]. Available from: https://pubmed.ncbi.nlm.nih.gov/15953668/.
13. De Vincenzo R, Conte C, Ricci C, Scambia G, Capelli G. Long-term efficacy and safety of human papillomavirus vaccination. Int J Womens Health 2014;6:999-1010.
14. Newman PA, Logie CH, Lacombe-Duncan A, Baiden P, Tepjan S, Rubincam C, *et al.* Parents' uptake of human papillomavirus vaccines for their children: A systematic review and meta-analysis of observational studies. BMJ Open 2018;8:e019206.
15. Saha A, Chaudhury AN, Bhowmik P, Chatterjee R. Awareness of cervical cancer among female students of premier colleges in Kolkata, India. Asian Pac J Cancer Prev 2010;11:1085-90.
16. Manikandan S, Behera S, Naidu NM, Angamuthu V, Mohammed OFB, Debata A. Knowledge and awareness toward cervical cancer screening and prevention among the professional college female students. J Pharm Bioallied Sci 2019;11(Suppl 2):S314-20.
17. Navalpakam A, Dany M, Hajj Hussein I. Behavioral perceptions of Oakland University female college students towards human papillomavirus vaccination. PLoS One 2016;11:e0155955.
18. Gismondi M, Augustine AM, Tahir Khokhar MAR, Khokhar HT, Twentyman KE, Florea ID, *et al.* Are medical students from across the world aware of cervical cancer, HPV infection and vaccination? A cross-sectional comparative study. J Cancer Educ 2020. doi: 10.1007/s13187-019-01686-0.
19. Biselli-Monteiro M, Ferracini AC, Sarian LO, Derchain SFM. Influence of gender and undergraduate course on the knowledge about HPV and HPV vaccine, and vaccination rate among students of a public university. Rev Bras Ginecol Obstet 2020;42:96-105.
20. Benavidez G, Asare M, Lanning B, Ylitalo K, Fakhoury C, Thompson N, *et al.* Young adults' human papillomavirus-related knowledge: Source of medical information matters. Public Health 2020;182:125-30.