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Assessing Knowledge, Perception and Practices About HPV Infection, Cervical Cancer & HPV Vaccination among Non-Health Science Female Undergraduates

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Abstract: ***Background: Cervical cancer is a malignant outgrowth of the cervix, the lowermost part of the uterus, it is the second most leading cancer among women in India, and fourth around the globe. Every year around 604, 000 new cases are diagnosed with India accounting for approximately 132, 000 new cases, the highest among other Asian countries and 340, 000 deaths are happening annually around the globe, where India contributes to about 74, 000. Persistent infection with high - risk strains of Human Papilloma Virus is accountable for the causation of cervical cancer, 70% of the time, which is preventable via HPV Vaccination and can be detected early via routine screenings. Objective: This study assesses the knowledge, perception, and practices among non - health science female undergraduates on Human Papilloma Virus, Cervical Cancer and HPV vaccination in eastern India, alongside their vaccination status against HPV. Methodology: A cross – sectional study was designed and carried out using a structured questionnaire derived from previous literature searches. The questionnaire was segmented into four parts, a) socio - demographic details, b) questions to assess knowledge, c) questions to assess vaccination practices, d) questions to assess perception. Target population was non - health science female undergraduate students. Data of 674 complete responses were analysed using SPSS 24. Results: Participants of this study primarily belonged to Urban areas, well - educated families and had good health seeking behaviour. Among the study population 4.3% (n - 29) were vaccinated against HPV. The mean knowledge score was 11.24, with 2 being minimum and 23 being the maximum score, out of a maximum possible score of 33. Mother's educational background significantly influenced the knowledge score of the respondents. (P= 0.05) Conclusion: the study shows that the study population had insufficient knowledge about HPV & Cervical cancer, but they showed willingness to get vaccinated if there is provision of necessary knowledge.***

Keywords: Cervical Cancer, HPV, HPV Vaccination, Knowledge, Perception.

1. Introduction

Carcinoma of the cervix is a malignant outgrowth of the cervix, the lowermost, narrow part of the uterus. **(0)** With an estimated 604, 000 instances newly diagnosed and 342, 000 fatalities per year, it is one of the most widespread forms of cancer when it comes to women. (**[2])** Cervical cancer is one of the predominant public health challenges worldwide. It is the fourth most common malignancy & cause of cancer related fatality among women globally and second - most prevalent cancer in Indian women and additionally, the second most significant cause of fatalities due to cancer in Indian women. (**[3])** Cervical cancer and related deaths are more prevalent in developing countries. (**[4])** There are many known and acknowledged risk factors which are associated with causation of Cervical cancer such as unprotected sexual intercourse, starting sexual activities at an early age, having multiple sexual partners, having multiple numbers of pregnancies, poor genital hygiene practice, long term use of hormonal contraceptives, early age of marriage, immunosuppression, smoking, but various epidemiological studies have long indicated that persistent infection with high - risk variants of the human papillomavirus (HPV) is proven to be the most commonly associated risk factor behind occurrence of carcinoma of the cervix **([5], [6])** Evidence shows presence of more than 200 different types of HPV infection based on their genomic sequence and among them HPV 16 & HPV 18 are associated with more than 60% of all cervical cancer instances. (**[7])** Sexual transmission is the mostly noticed pathway of HPV transmission but self - inoculation, transmission through mother to child are coming as possible potential pathways. (**[8])**

HPV associated infection are mostly prevalent in reproductive age group and there are two known to be strategical approaches to prevent the occurrence of HPV infection and related oncological outcomes, which are Papanicolaou (PAP) Smear screening and vaccination against Human Papilloma Virus. (**[9], [10])** Though HPV vaccination has been noted to be close to 100 percent effective (**[25]),** there are numerous factors such as less awareness, cost of the vaccine, safety concerns, socio - cultural practices, acts as prominent barrier in widespread adoption of the vaccine in India. (**[11] - [17])**

In India students belonging to non - health science background have very limited access to knowledge regarding infectious organism HPV and method of prevention as suggested by various articles (**[18], [19])** therefore the study was conducted with these following objectives –

1) To assess knowledge and perception regarding cervical cancer and HPV vaccination of non - health science female undergraduate university students.
2) To assess the vaccination status against HPV of the students
3) To assess the willingness to get vaccinated among the undergraduate female non - health science university students.

2. Methodology and Material

Study design and Study setting -
An institutional based cross – sectional study was executed among female undergraduate university students from non - health science background in eastern India to assess the awareness regarding cervical cancer, HPV infection and HPV vaccination status.

Study participants -

Inclusion criteria –
All female undergraduate in various non - health science courses aged 18 to 30 were included in the study.

Exclusion criteria –
Students who are male and enrolled in health science courses and aged below 18 or over 30 were excluded from the study.

A total number of 925 students were approached and invited to participate in the study and among them 692 gave consent for participation, out of which 688 returned the questionnaire. After excluding the incomplete and partially completed questionnaire a total no of 674 were taken into consideration for data analysis.

Survey instrument and Data collection –
A structured questionnaire developed through previous literature search was used for this survey. The questionnaire had questions distributed in 4 sections. Section one includes all the socio – demographic information of the participants, (age of the participants, religion of the participants, participant's marital status, residential area of the participants, Father's & Mother's educational background, and their family history of cervical cancer). Section two includes questions to assess the general awareness and knowledge regarding Human Papilloma Virus, Cervical Cancer & HPV vaccination among the undergraduate students, this section includes a total number of 25 questions (Has the participant ever heard about Cervical Cancer – HPV & HPV Vaccine, knowledge regarding affecting organ, causes of cervical cancer, possible risk factors & symptoms of cervical cancer, Diagnostic tests – procedure & Screening interval, HPV types, mode of transmission of Human Papilloma Virus, what are possible diseases HPV can cause, whom can get affected by HPV, Vaccination doses – age limit – recommendations). Third section of the questionnaire includes questions regarding vaccination status among the undergraduate students, there were around four questions in that section (Are the participants vaccinated, are the recommended dosage scheduled fulfilled, vaccination source & source of the information for getting vaccinated). And the fourth section includes a Likert scale to assess the perception among the undergraduate students regarding Human Papilloma Virus, Cervical Cancer & HPV Vaccination. This section contains 14 questions.

Ethical permission from the institutional ethics committee was obtained after official permission was taken to conduct the study. The students were verbally informed regarding the purpose of the study and then consent were obtained from them followed by distributions of questionnaire. The returned completed questionnaires were manually entered into Microsoft excel and then exported to SPSS (Version 24.0) for data analysis. Descriptive statistics were used to analyse the demographical section and the student's perception section of the questionnaire. The answer to the questions assessing knowledge were carrying score (1 for each right answer and 0 for wrong answers) and were summed up to have maximum score of 33. Chi square test was performed to find out associations between socio - demographic variables and knowledge score, where *p* value of 0.05 or less was considered as significant.

3. Results

Socio - demographic profile of the participants –
A total of 925 students were approached and among them, 692 given consents, out of which 674 complete data were taken into consideration for analysis. The response rate was 72.86%. The participants ranged from age 18 to 30 with a mean age of 20.96 (SD ±1.5) years. The majority of the students are Indian and few of them belongs to Nepal, Bhutan, Bangladesh & Different African Countries. Majority of the study participants belong to Hindu community (89.02%, n=600) and 89.76% of the respondents resides in urban region. All participants were unmarried. Among all the participants 1.8% had family history of cervical cancer.

Knowledge regarding Cervical Cancer –
Among the study participants 17.5% of the people did not hear about cervical cancer, where 48.8% of them could identified cervical cancer as a non - communicable disease. Among the respondents 80.1% were able to correctly identify that Cervical cancer is the Cancer of the cervix, the lowermost part of the uterus. Awareness about possible risk factors, main causative factors behind cervical cancer and awareness about the possible symptoms was poor among the undergraduate students. Only 13.2% of the participants were able to correctly identify all the possible risk factors that can facilitates the occurrence of cervical cancer.27.6% of the participants identified cervical cancer to be genetic whereas only 15.4% could recognize all possible symptoms.67.1% of them were not aware that cervical cancer is preventable. Though this study highlighted that more than 50% of the participants did not know regarding availability of any diagnostic services of cervical cancer but 75.1% students responded that cervical cancer might be treatable if diagnosed early.

Knowledge regarding Human Papilloma Virus –
Nine different questions were asked to assess the knowledge of the participants regarding Human papilloma virus, and while the study revealed that 60.4% of them did not hear anything regarding Human papilloma virus and 39.6% conveyed that they have heard regarding HPV.15.3% of the students were aware regarding the STI nature of Human Papilloma Virus and 95.5% did not know how many variants of HPV exists.55.5% stated that they are not aware regarding diseases caused by HPV while 50.1% conveyed that they are not aware whether HPV is gender specific or not and more than half of the study population (53.4%) don't know if there is any diagnosing facility available for HPV.

Knowledge regarding HPV vaccine and vaccination status–

82% of the students never heard about HPV vaccination and 42.6% were not aware about gender neutral nature of HPV Vaccination. Among 674 students 29 (4.3%) students reported that they have taken vaccine and all the vaccination were taken from private clinics as per stated. Among the 29 vaccinated participants, information sources were as follows, Family/Friends for 16 participants (55.17%) & News & Media broadcast for 9 (31.03%) & social media for 4 of them (13.8%).

Knowledge score –

There was total no of 25 questions to assess the knowledge of undergraduate female students regarding cervical cancer, HPV infection and HPV vaccination. Each question carried 1 for correct answer and 0 for wrong answer or don't know status. And instances where multiple answers were acceptable scoring was 1 mark for each correct option. The mean of knowledge score was 11.24 (SD ±4.9) with 2 being minimum observed score and 23 being maximum score out of a maximum possible score of 33. The descriptive question wise performance of the respondents is depicted in table 2 - 4. The knowledge score was divided into three broad categories where score 0 - 11 (n=326, 48.4%) was considered poor knowledge and 12 - 22 (n=339, 50.3%) moderate knowledge and 23 - 33 (n=9, 1.3%) was considered good knowledge among students. Then chi square test was performed to find association between knowledge of students with the respective socio - demographic variables. There was no significant relation found between the knowledge and the age of the respondents (*P* value is 0.304), nationalities of the participants (*P* value is 0.756), religion of the participants (*P* value is 0.917), Residence (*P* value is 1.0), Educational background of the father (*P* value is 0.326), Occupation of father (*P* value is 0.125), Occupation of mother (*P* value is 0.277), having a family history of cervical cancer (*P* value is 0.171). Only factors that were found to be having effect the knowledge score was educational background of the mother (*P* value is 0.05), vaccinated participants (*P* value is 0.000)

Perception regarding cervical cancer, HPV infection and HPV vaccination –

44.5% of the respondents did not know whether HPV is a commonly occurring infection among Indian population or not, although 42.9% thought that HPV does not always results in cancer.60.7% of the participants stated that condoms can prevent the transmission of HPV from one to another 44.2% were not sure whether all HPV infected person shows any symptoms or not while possess the spreading ability.47.8% of the participants thought HPV vaccination would be safe to take and around 60% stated that HPV vaccination can prevent the risk of getting cervical cancer.37.1% of the respondents were strongly interested in HPV vaccination where 67.9% of the respondents were interested in vaccination if provided at free of cost.84.5% of the students showed interest in learning more information from experts regarding cervical cancer, HPV infection and HPV vaccination.

4. Discussion

Cervical cancer is the fourth most common cancer among women around the globe and second most in India with 342, 000 deaths annually around the globe. (**0, [2], [3])** Though there are multiple risk factors associated with cervical cancer, HPV infection has to found as the most common cause behind increasing cervical cancer incidence (**[5], [6]).** HPV is mostly preventable with the designated HPV vaccination (**[25])** but there are different barriers found in low uptake of the vaccination (**[11] - [17]).** University students are the carrier of knowledge and awareness not only among themselves but also to the entire population, or country. Mostly the university students are in their premarital phase of life and still under the recommended age limit of vaccination against Human Papilloma Virus, so ensuring a good amount of knowledge among them will benefit the society in the upcoming future (**[21], [26])** This study was conducted with the main aim of assessing the knowledge of undergraduate university female students with non - health science major regarding cervical cancer, HPV infection and HPV vaccination, and also to assess the vaccination status among the same group, in eastern India.

One of the previous studies conducted by Rashid S et al, reported that the students belonging from any biological background have been showing positive sign towards being more associated with good knowledge and other previous studies have revealed poor and nether level of knowledge among the college students in India (**[18], [19], [20]).** This study was majorly focusing on knowledge level of the university students having non - health sciences as their major courses, because they are mostly not aware regarding health and related matter (**[18], [19]).**

Participants of this study were mostly aged between 18 to 21 years with the mean age of 20.96 (SD ±1.5) years, and more than 90% of them were Indian. Most of the students belonged to Hindu community and resides in the urban region and have good access to all the possible sources of information like television, social media etc. despite of that 17.5% of the students stated that they have not heard anything about cervical cancer. Though more than two third of the students have heard about cervical cancer, awareness about possible risk factors, main causative factors behind cervical cancer and awareness about the possible symptoms were found to be poor among the undergraduate students. Only 13.2% of the participants were able to correctly identify all the possible risk factors that can facilitates the occurrence of cervical cancer. The study showed that among the total number of participants more than half have never heard about Human Papilloma Virus (60.4%). This was similar to the finding of a study conducted by Cinar İO et al. in a university in Turkey, which showed that only 16.8% of the participants heard about HPV. (**[21])** similar studies previously conducted in India showed one interesting finding that though the students might be aware about cervical cancer they are less aware when it comes to knowledge regarding Human papilloma virus. The mean of knowledge score was 11.24 (SD ±4.9) with 2 being minimum observed score and 23 being maximum score out of a maximum possible score of 33, which portrays that more than 80% of the students have scored less than 50% in the questionnaire. There were multiple studies conducted on university students and found quite the similar result of poor knowledge among the population. (**[21], [18], [20])** Among 674 students 29 (4.3%) students were found to be vaccinated against HPV which had a significant effect on the knowledge

score (*P* value is 0.000) along with the educational background of mother which also found to be having significant impact on the knowledge score of the university students (*P* value is 0.05). However, 67.9% of the respondents were interested in vaccination while 84.5% of the students showed interest in learning more information from experts regarding cervical cancer, HPV infection and HPV vaccination. This study shows that the students despite of having poor knowledge were eager to learn about HPV & Cervical cancer and methods of prevention, which would be a good indicator to do a root – cause analysis of barriers preventing access to knowledge.

5. Conclusion

This study indicated that there was very poor and unsatisfactory knowledge regarding cervical cancer, HPV infection and HPV vaccination among undergraduate students having non health science major, but also portrayed their willingness to attend any educational programme and training regarding HPV & Cervical cancer to mitigate the risk among themselves. And the students who were not vaccinated also showed positive interest towards vaccination, which gives a ray of positivity in the pathway of preventing cervical cancer.

Limitations
The study only limited on assessing the awareness of female participants so it might not represent the entire population or general population. This study did not observe the underlying possible barriers behind low knowledge level of the participants.

Declaration of consent –
Informed consent was taken from each and every respondent before participation and the participatory status was voluntary.

Conflict of Interest –
There was no conflict of interest.

Financial support and sponsorship –
Nil

Table 1: Socio – demographic details of study participants

Age groups	
18 - 21 Years	523 (77.6%)
22 - 25 Years	145 (21.5%)
26 - 30 Years	6 (0.9%)
Nationality	
Indian	611 (90.7%)
Bangladeshi	8 (1.2%)
Bhutanese	4 (0.6%)
Cameroonian	2 (0.3%)
Ethiopian	4 (0.6%)
Kenyan	6 (0.9%)
Malawian	1 (0.1%)
Mali	1 (0.1%)
Nepalese	16 (2.4%)
Rwandan	2 (0.3%)
Sri Lankan	11 (1.6%)
Tanzanian	5 (0.7%)
Ugandan	3 (0.4%)
Religion	
Hinduism	600 (89.02%)
Islam	12 (1.8%)
Christianity	25 (3.7%)
Buddhism	21 (3.1%)
Jainism	4 (0.6%)
Sikhism	12 (1.8%)
Residence	
Rural	69 (10.2%)
Urban	605 (89.8%)
Marital status	
Un - Married	674 (100%)
Married	00 (0.00%)
Father's educational background	
Primary school	12 (1.8%)
Secondary school	50 (7.4%)
Graduate	361 (53.6%)
Post - graduate	242 (35.9%)
Ph. D. or Higher	9 (1.3%)
Mother's educational background	
Primary school	22 (3.3%)
Secondary school	98 (14.5%)
Graduate	402 (59.6%)
Post - graduate	146 (21.7%)
Ph. D. or Higher	6 (0.9%)
Family history of Cervical Cancer	
Yes	12 (1.8%)
No	662 (98.2%)
Smoking status	
Yes	135 (20.0%)
No	501 (74.3%)
Prefer not to say	38 (5.6%)

Table 2: Knowledge regarding cervical cancer

Question	Options	Frequency (n)	Percentage (%)
Have you ever heard about Cervical Cancer	Yes	556	82.5%
	No	118	17.5%
Cervical Cancer is Best Described as	Cancer of the uterus (cervix)	540	80.1%
	Cancer of the Ovaries	00	00.00%
	Cancer of the vaginal tract	10	1.5%
	Don't know	124	18.4%
Cervical Cancer is which kind of disease	Communicable	127	18.8%
	Non - communicable	326	48.8%
	Don't know	221	32.8%
Which of the following Causes can lead to Cervical Cancer	Genetic/Hereditary	186	27.6%
	Chronic inflammation of the uterus	121	17.9%
	Human Papilloma Virus	120	17.8%
	Smoking & drinking alcohol	120	17.8%

	Don't know	127	18.9%
Which of the followings are the possible risk factors that can lead to cervical cancer**	Smoking & alcohol consumption	84	12.5%
	Poor genital hygiene practice	89	13.2%
	Unprotected sexual intercourse	88	13.1%
	Starting sexual activities at any early age	32	4.7%
	Having multiple intercourse partners	50	7.5%
	Long time use of oral contraceptives	30	4.4%
	Existing Co infection (HIV)	53	8.0%
	Immunosuppression (reduced ability of immune system to fight infection	50	7.4%
	All of the above	89	13.2%
	None of the above	2	0.3%
	Don't know	107	15.8%
Which of the following are possible symptoms of cervical cancer?**	Unusual vaginal bleeding	58	8.6%
	Persistent pain in the pelvic region	57	8.5%
	Vaginal pain or bleeding during or after sexual intercourse	60	8.9%
	Persistent unpleasant vaginal discharge	58	8.6%
	Vaginal bleeding after menopause	56	8.3%
	All of the above	140	20.8%
	None of the above	3	0.4%
Is there any test to diagnose Cervical cancer	Yes	229	34.0%
	No	10	1.5%
	Maybe	198	29.4%
	Don't Know	237	35.2%
Which of the following test is being used to best detect cervical cancer?	Blood test	73	10.8%
	Urine test	64	9.5%
	Imagery Scanning (USG, CT, MRI, PET)	122	18.1%
	PAP Smear test	78	11.6%
	Don't know	337	50.0%
At What age women can start screening for cervical cancer?	After 18 years	145	21.5%
	After 21 years	83	12.3%
	After 35 years	59	8.8%
	After 50 years	8	1.2%
	Don't know	379	56.2%
How often a woman should get screened/tested for cervical cancer?	Every year	188	27.9%
	Every 3 years	73	10.8%
	Every 5 years	37	5.5%
	Don't know	376	55.8%
Do you think cervical cancer is treatable if diagnosed early?	Yes	506	75.1%
	No	60	8.9%
	Maybe	50	7.4%
	Don't know	58	8.6%
Do you think cervical cancer is preventable?	Yes	65	9.6%
	No	85	12.6%
	Maybe	68	10.1%
	Don't know	456	67.7%
** indicates multiple answers			

Table 3: Knowledge regarding HPV infection

Question	Options	Frequency (N)	Percentage (%)
Have you ever heard about Human Papilloma virus (HPV)?	Yes	267	39.60%
	No	407	60.40%
Do you know how many types of Human papilloma viruses (HPV) are there?	>10	13	1.90%
	10-50	0	0.00%
	50 - 100	7	1.00%
	100 - 200	10	1.50%
	Don't know	644	95.50%
Which of the following (s) could be a mode of transmission for Human Papilloma virus?**	Through blood	84	12.40%
	Through digestive system	9	1.40%
	Through respiratory tract	0	0.00%
	Transmitted through sexual intercourse	103	15.30%
	Skin - to - mucosa contact	40	6.00%
	Mother to child transmission during childbirth	53	7.90%
	Don't know	384	57.00%
	Yes	117	17.40%

Do you know that Human Papilloma Virus (HPV) is the leading cause of cervical cancer?	No	557	82.60%
Which of the followings are the two major cancer - causing types of Human Papilloma Virus?	HPV 13 & 32	7	1.00%
	HPV 56 & 59	8	1.20%
	HPV 16 & 18	29	4.30%
	HPV 6 & 11	75	11.10%
	Don't know	555	82.30%
Which disease can be caused by Human Papilloma Virus other than cervical cancer?	Cancer of other body parts (oral, head, neck, penile, vulvar, anal)	92	13.60%
	Genital & Facial warts	133	19.70%
	Respiratory Papillomatosis	30	4.50%
	All of the above	42	6.20%
	None of the above	3	0.50%
	Don't know	374	55.50%
Human Papilloma Virus can infect	Female	96	14.20%
	Male	8	1.20%
	Both	232	34.30%
	Don't know	338	50.10%
Which of the following group of people are more at risk, for getting HPV infection?	Female	204	30.30%
	Male	83	12.30%
	Both	76	11.30%
	Don't know	311	46.10%
Is there any test to diagnose Human Papilloma Virus?	Yes	140	20.80%
	No	10	1.50%
	Maybe	164	24.30%
	Don't know	360	53.40%
** indicates multiple answers			

Table 4: Knowledge regarding HPV Vaccine

Question	Option	Frequency (N)	Percentage
Have you ever heard about (HPV) vaccine?	Yes	121	18.00%
	No	553	82.00%
Who are recommended to take vaccination against HPV?	Females only	97	14.40%
	Males only	145	21.50%
	Both	145	21.50%
	Don't know	287	42.60%
What is the recommended age for getting HPV vaccination?	At birth	14	2.10%
	9 - 12 Years	50	7.30%
	Less than 26 Years	60	8.90%
	Within 45 Years	160	23.70%
	No age limit	29	4.30%
	Don't know	361	53.70%
How many doses of HPV vaccination is recommended?	1 dose	33	4.90%
	2 doses	52	7.70%
	2 - 3 doses	112	16.60%
	More than 3 doses	9	1.30%
	Don't know	468	69.40%

Table 5: Questions assessing perception regarding Cervical cancer, HPV and HPV Vaccination

Question	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I believe Human Papilloma infection is not very commonly occurred in Indian population	190 (12.5%)	84 (11.6%)	300 (44.5%)	78 (11.6)	22 (3.3%)
I think Human Papilloma Virus does not always result in cancer	172 (25.5%)	117 (17.4%)	313 (46.4%)	60 (8.9%)	12 (1.8%)
I believe Condoms can prevent the transmission of HPV infection	250 (37.1%)	159 (23.6%)	236 (35.0%)	20 (3.0%)	9 (1.3%)
A person can be infected by Human Papilloma virus and spread to others, yet may or may not show any symptoms	185 (27.4%)	146 (21.7%)	298 (44.2%)	33 (4.9%)	12 (1.8%)
I believe HPV vaccination is safe to take	188 (27.9%)	134 (19.9%)	312 (46.3%)	27 (4.0%)	13 (1.9%)
HPV vaccination can prevent the risk of getting cervical cancer	259 (38.4%)	141 (20.9%)	249 (36.9%)	18 (2.7%)	7 (1.0%)
HPV vaccination should be given to only sexually active people	175 (26.0%)	63 (9.3%)	276 (40.9%)	98 (14.5%)	62 (9.2%)
I believe that 1 Dose of HPV vaccine protection for lifetime	187 (27.7)	66 (9.8%)	310 (46.0%)	66 (9.8%)	45 (6.7%)
I think HPV vaccination should be provided at free of cost to all	356 (52.8%)	102 (15.1%)	176 (26.1%)	25 (3.7%)	15 (2.2%)
I believe People should take the vaccination before getting sexually active	231 (34.3%)	108 (16.0%)	294 (43.6%)	30 (4.5%)	11 (1.6%)
If someone is vaccinated, there is no screening required furthermore for cervical cancer	188 (27.9%)	61 (9.1%)	264 (39.2%)	110 (16.3%)	51 (7.6)

If not vaccinated, I will take vaccination	250 (37.1%)	141(20.9%)	246 (36.5%)	28 (4.2%)	9 (1.3%)
I will recommend someone for taking Vaccination against HPV	208 (30.9%)	160 (23.7%)	244 (36.2%)	51 (7.6%)	11 (1.6%)
Learning more regarding Cervical Cancer, HPV infection, HPV vaccination from the experts is useful	570 (84.5%)	52 (7.71%)	40 (5.9%)	12 (1.7%)	00 (00.00%)

References

[1] National Cancer Institute. Cervical Cancer—Patient Version [Internet]. National Cancer Institute. Cancer. gov; 2023. Available from: https: //www.cancer. gov/types/cervical

[2] World Health Organization. Cervical Cancer [Internet]. World Health Organization. World Health Organization; 2024. Available from: https: //www.who. int/news - room/fact - sheets/detail/cervical - cancer

[3] Sung H, Ferlay J, Siegel RL, Laversanne M, Soerjomataram I, Jemal A, et al. Global Cancer Statistics 2020: GLOBOCAN Estimates of Incidence and Mortality Worldwide for 36 Cancers in 185 Countries. CA: a Cancer Journal for Clinicians [Internet].2021 Feb 4; 71 (3): 209–49. Available from: https: //acsjournals. onlinelibrary. wiley. com/doi/10.3322/caac.21660

[4] 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: a Cancer Journal for Clinicians [Internet].2018 Sep 12; 68 (6): 394–424. Available from: https: //acsjournals. onlinelibrary. wiley. com/doi/full/10.3322/caac.21492

[5] Mekonnen AG, Mittiku YM. Early - onset of sexual activity as a potential risk of cervical cancer in Africa: A review of literature. Linde DS, editor. PLOS Global Public Health.2023 Mar 22; 3 (3): e0000941.

[6] Winer RL, Hughes JP, Feng Q, Xi LF, Lee SK, O'Reilly SF, et al. Prevalence and Risk Factors for Oncogenic Human Papillomavirus Infections in High - Risk Mid - Adult Women. Sexually Transmitted Diseases.2012 Nov; 39 (11): 848–56.

[7] CDC/NCIRD. Immunology and Vaccine - Preventable Diseases – Pink Book – Human Papillomavirus [Internet].2021 Aug. Available from: https: //www.cdc. gov/vaccines/pubs/pinkbook/downloads/hpv. pdf

[8] Petca A, Borislavschi A, Zvanca M, Petca RC, Sandru F, Dumitrascu M. Non - sexual HPV transmission and role of vaccination for a better future (Review). Experimental and Therapeutic Medicine [Internet].2020 Oct 13 [cited 2021 Jan 15]; 20 (6): 1–1. Available from: https: //www.ncbi. nlm. nih. gov/pmc/articles/PMC7579832/pdf/etm - 20 - 06 - 09316. pdf

[9] Pinkbook | HPV | Epidemiology of Vaccine Preventable Diseases | CDC [Internet]. www.cdc. gov.2020. Available from: https: //www.cdc. gov/vaccines/pubs/pinkbook/hpv. html#: ~: text=Approximately%2014%20million%20new%20HPV

[10] Basoya S, Anjankar A. Cervical cancer: Early detection and prevention in reproductive age group. Cureus.2022 Nov 9; 14 (11).

[11] CDC. HPV Vaccine [Internet]. Centers for Disease Control and Prevention.2020. Available from: https: //www.cdc. gov/vaccines/vpd/hpv/hcp/vaccines. html

[12] Human Papillomavirus and Related Diseases Report INDIA [Internet]. [cited 2020 Aug 26]. Available from: https: //hpvcentre. net/statistics/reports/IND. pdf

[13] Sankaranarayanan R, Basu P, Kaur P, Bhaskar R, Singh GB, Denzongpa P, et al. Current status of human papillomavirus vaccination in India's cervical cancer prevention efforts. The Lancet Oncology.2019 Nov; 20 (11): e637–44.

[14] Chatterjee, S., Chattopadhyay, A., Samanta, L. (2016). 'HPV and Cervical Cancer Epidemiology - Current Status of HPV Vaccination in India', Asian Pacific Journal of Cancer Prevention, 17 (8), pp.3663 - 3673.

[15] Srinivasan S. HPV vaccine trials and sleeping watchdogs. Indian Journal of Medical Ethics.2011 Apr 1;

[16] Basu P, Mittal S. Acceptability of human papillomavirus vaccine among the urban, affluent and educated parents of young girls residing in Kolkata, Eastern India. Journal of Obstetrics and Gynaecology Research.2011 Feb 11; 37 (5): 393–401.

[17] Paul P, Tanner AE, Gravitt PE, Vijayaraghavan K, Shah KV, Zimet GD, et al. Acceptability of HPV Vaccine Implementation Among Parents in India. Health Care for Women International.2013 Apr 23; 35 (10): 1148–61.

[18] Rashid S, Labani S, Das BC. Knowledge, Awareness and Attitude on HPV, HPV Vaccine and Cervical Cancer among the College Students in India. Natarajaseenivasan K, editor. PLOS ONE.2016 Nov 18; 11 (11): e0166713.

[19] Awareness of Cervical Cancer Among Female Students of Premier Colleges in Kolkata, India. Asian Pacific Journal of Cancer Prevention, 2010; 11 (4): 1085 - 1090.

[20] Nimbalkar S, Patel I, Dongara A, Mungala B, Chapla A, Phatak A. Knowledge and attitude about cervical cancer and human papillomavirus vaccine among medical and paramedical students of a university. Journal of Family Medicine and Primary Care.2021; 10 (1): 462.

[21] Cinar İ, Ozkan S, Aslan G, Alatas E. Knowledge and Behavior of University Students toward Human Papillomavirus and Vaccination. Asia - Pacific Journal of Oncology Nursing [Internet].2019; 6 (3): 300. Available from: https: //www.ncbi. nlm. nih. gov/pmc/articles/PMC6518985/

[22] Lingam AS, Koppolu P, Alhussein SA, Abdelrahim R, Abusalim GS, ElHaddad S, et al. Dental Students' Perception, Awareness and Knowledge About HPV Infection, Vaccine, and Its Association with Oral Cancer: A Multinational Study. Infection and Drug Resistance.2022 Jul; Volume 15: 3711–24.

[23] Indracanti M, Berhane N, Minyamer T. Factors Associated with Pre - and Post - Educational Intervention Knowledge Levels of HPV and Cervical

Cancer Among the Male and Female University Students, Northwest Ethiopia. Cancer Management and Research.2021 Sep; Volume 13: 7149–63.

[24] Liu Y, Di N, Tao X. Knowledge, practice and attitude towards HPV vaccination among college students in Beijing, China. Human Vaccines & Immunotherapeutics.2019 Aug 8; 16 (1): 1–8.

[25] HPV Vaccine | CDC [Internet]. www.cdc. gov.2023. Available from: https: //www.cdc. gov/vaccines/vpd/hpv/hcp/vaccines. html#: ~: text=Immunogenicity%20and%20Vaccine%20Efficacy&text= More%20than%2098%25%20of%20recipients

[26] Borlu A, Gunay O, Balci E, Sagiroglu M. Knowledge and Attitudes of Medical and Non - Medical Turkish University Students about Cervical Cancer and HPV Vaccination. Asian Pacific Journal of Cancer Prevention.2016 Feb 5; 17 (1): 299–303.