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Original article

Study of knowledge, attitude and practices about Human Papilloma Virus Vaccination among final year medical students in Maharashtra

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Abstract

BACKGROUND: *Cervical Cancer is the second leading cancer among women and a leading cause of cancer related deaths in India. Screening for the precancerous lesion and primary prevention with HPV vaccination are important steps to control the morbidity & mortality related to cancer cervix. The uptake of the HPV vaccine is very low in the community mainly because of lack of awareness, knowledge and apprehension regarding the HPV vaccination. Medical practitioners and health workers with accurate knowledge about the protective benefits of HPV vaccination, they can educate the community, dispel myths, and promote a positive attitude toward vaccination—ultimately helping to increase its acceptance and coverage.*

AIM: *This study was conducted to assess the knowledge, attitude & practice among medical students.*

SETTINGS AND DESIGN: *The study was conducted in Rural Medical College of Maharashtra, India.*

MATERIAL AND METHODS: *This cross-sectional study was conducted among final-year MBBS students at Rural Medical College, Maharashtra, India. Data were collected from students who provided informed consent, using a structured questionnaire administered via Google Forms. Statistical analysis was performed using both descriptive and inferential methods, including Chi-square tests and Analysis of Variance (ANOVA).*

RESULTS: *The knowledge component was found to be very high, with 99.5% of students aware of the HPV virus and its association with cervical cancer. Additionally, 99.45% of participants were aware of the various modes of transmission of the virus. However, when it came to primary prevention, only 73% agreed that HPV vaccination is necessary. Among the participants, 28.7% had received the vaccine. Notably, the number of participants willing to take the HPV vaccine increased if it were made easily available at a subsidized rate. Furthermore, 89.3% expressed willingness to recommend the HPV vaccine to the community.*

Keywords: *Cervical cancer, HPV vaccine, knowledge, attitude, practice – medical students*

Introduction:

United Nations Sustainable developmental goals and the global monitoring framework by the WHO determines to reduce the incidences of cervical cancer among the low- and middle-income countries. Population based surveys are required to collect the information and guide the cancer control effects in a standardized comparable manner (1). Cervical cancer is the fourth most common cancer globally and the most common causing death in the developing countries. About 660,000 new cases and 350,000 deaths (2022) of cancer cervix are occurring annually (2,3). The highest rate of incidence and high mortality due to cancer cervix are recorded in low- and middle-income countries. This reflects the lack of access to prevention diagnostic & treatment services due to inadequate social and economic determinants.

Persistent infection with HPV is the known cause of cancer cervix, so the prophylactic vaccination against HPV is one of the effective strategies to prevent cervical cancer and very cost effective, so bosting awareness, access to information and availability of the services are the key components to achieve prevention & control over cancer cervix (2). India has population of 36,571 million women alone 15 years of age, who are at risk of developing cervical cancer. There are approximately 132,000 new cases diagnosed and 74,000 deaths annually in India. Indian women face a 2.5% cumulative life risk and 1.4% cumulative death risk from cervical cancer (3).

According to WHO Global Strategy regarding the control and elimination of cancer cervix by 2030, one of the main targets to achieve 90% of girls to be vaccinated with HPV vaccine by the age of 15 yrs (4). The Human Papilloma Virus (HPV) is a big group of highly ubiquitous, small non enveloped double stranded circular DNA virus which infects both men and women sexual intercourse with infected partner. The infection remains mostly asymptomatic and can be diagnosed by cervical screening of the high risk women (5). Adherence to the routine screening methods in India is unsatisfactory as it is difficult to achieve not only due to high population but also other constraints like lack of awareness, stigma, lack of access, socioeconomic factors and inadequate follow up (6).
Primary prevention with HPV vaccination is found to be the most important method to control and eliminate the incidences of cervical cancer globally (7).

Presently, two types of vaccines (Gardasil and Cervarix) are available in India. Clinical trials with both the vaccine have shown efficacy against CIN (Cervical Intraepithelial Neoplasia) 2 and 3 and AIS (Adenocarcinoma in situ). For more than decade, Govt of India was planning to introduce HPV vaccine for the girls in its routine immunization as the cases of cervical cancer were on a rise. During the budget session in 2024, the plan of introducing HPV vaccination among girls of age group 9 -14 years have been discussed and further steps are being formulated for its implementation (8).

Medical students are the future healthcare providers and are the most important role players for promoting the awareness and acceptance of HPV vaccination. So, it is important for the medical students to have good knowledge, positive attitude and high acceptance for control and elimination of Cancer Cervix (9).

Materials and Methods:

This cross-sectional study was conducted in MBBS final year students during the period of 1st April 2024- 30th June, at Rural Medical College in Maharashtra (India). The data was collected from the students who gave consent for participation, using Google Form. Universal sampling method was adopted. A standardized and validated questionnaire, was perused using Google Forms. Statistical Analysis was performed using descriptive and inferential statistics (Chi – Square and ANOVA). **Inclusion Criteria:** All the final year students (both males and females) gave consent for participation; **Exclusion Criteria:** Students who did not give the consent. Ethical Approval was obtained from Institutional Ethical Committee at Pravara Institute of Medical Sciences – Deemed to be University with Registration Number: PIMS/DR/RMC/2024/692

Results:

A total of 178 final MBBS students had participated in the study. Out of which 113 (63.48%) were female students and-65 (36.52%) were male students. Mean age of the study participants was 22.92 ± 2.15 years.
Among study participants, 103 (57.86%) were from Urban residence followed by 50 (28.08 %) from Rural and 25 (14.04%) from suburban area. Around 83 (46.62%) participant's annual family income was in the range of 10 to 20 Lakhs. On studying participant's parent's occupation, it was found that 81 (45.50%) were doing serving with different organizations. 42 (23.59%) were Medical Practitioner, 34 (19.10%) were running their family business and 21 (11.79%) were self-employed. Among the participants 2 (1.42%) male students were married.
There was family history of genital cancer among 3 (1.68%) female participants. Out of 178 study participants, 19 (10.67%) were sexually active. Among the sexually active participants, males outnumbered the females with 11 (36.52%) and 8 (42.11%) respectively. 28 (15.73%) female participants gave history of visit to gynaecological clinic in last three years (TABLE 1).
On comparing the mean scores of knowledges of study participants, there was statistically significant difference in knowledge of participants who haven't visited hospital in last 3 years with that of who had visited hospital ($F=3.20$, p value 0.05). There is no statistically significant difference observed in knowledge score of participants with respect to gender, residence, family income/year, business, marital status, family history of genital cancer and sexual activity status.
On comparing the mean scores of attitudes of study participants, there was statistically significant difference in attitude of married and unmarried participants ($F = 4.62$, $p < 0.05$). Higher positive attitude was shown by married participants. Similarly, participants who had visited hospital/clinic in last 3 years ($F = 4.39$, $p < 0.05$) with mean score of participants who had not visited the hospital/clinic in last 3 years being more i.e. 1.53 ± 0.16. Therefore, higher positive attitude was shown by participants who had visited hospital/clinic in last three years. The rest of the demographic variables are statistically not significant (TABLE 2).
On comparing the mean scores of acceptability towards HPV vaccine, there is statistically significant difference in gender, females having higher mean acceptability score of 6.17 ± 0.14 while males having lower mean acceptability score 5.20 ± 0.22 with $p < 0.001$. Also, significant difference in acceptability according to the residence of

participants where participants from urban area showing higher mean acceptability score of 6.04 ± 0.14 with F = 3.86, $p < 0.05$. The rest of the demographic variables are statistically not significant (TABLE 2).

Majority of the study participants 170 (95.5%) know that majority of the cases of cancer cervix are caused by HPV virus, 167 (93.8%) participants know that HPV vaccination is the way of primary prevention for cancer cervix. Around 99.43% (n=177) are aware about the mode of transmission through sexual intercourse and other modes. (GRAPH NO. 1)

Among the study participants 130 (73%), feels that it is necessary for everyone to take HPV vaccine, 84 (47.2%) feels that HPV vaccine may lead to some other infection.

More than half 113 (63.5%) of the study participants were interested in taking HPV vaccine and this number increased to 139 (78.1%) if it is made available at a nearby recognized medical centre, further this number increased to 149 (83.7%) if it is made available at a subsidized rate and again the number of participants willing to take HPV vaccine increased to 159 (89.3%) if a detailed information regarding the safety and efficacy of the vaccine is provided and this difference was extremely statistically significant. (TABLE 3)

Among the reasons for not interested in taking the vaccine, the major specific reason was of fear of side effects n = 32(18%) followed by cost of the vaccine n = 26(14.6%), followed by non-availability of the vaccine n = 18 (10.11%), had social taboo reason n = 3 (1.7%).

Majority of the study participants n = 159(89.3%) were willing to recommend HPV vaccine to their peers/patients.

Among the study participants n = 51(28.7%) have taken the HPV vaccine, n = 93(52.2%) of participants were not ready to take the vaccine without family's consent. All the participants n = 178 (100%) think that acceptance among people for HPV vaccine will have a positive impact on women's health by limiting the morbidity and mortality caused by cancer cervix.

More than half n = 93(52.2%) participants thought that doctors would be the most influencing person to get oneself vaccinated followed by family members n = 45(25.3%), followed by general health policy of the institute n = 24(13.5%) and lastly friend n = 16 (9.0%). (GRAPH No. 2)

TABLE 1: BASIC DEMOGRAPHIC CHARACTERISTICS BY SEX

Variables		Females	Males	Total	$\chi 2$/F/Z
		N (%)			
Residence	Rural	24 (48.00%)	26 (52.00%)	50	***9.64*** **
	Sub Urban	14 (56.00%)	11 (44.00%)	25	
	Urban	75 (72.82%)	28 (27.18%)	103	
MBBS Year	Final Year	113 (63.48%)	65 (36.52%)	178	***3.60*** **
Family Income/Year	< 9 Lakhs	1 (25.00%)	3 (75.00%)	4	7.78
	10 - 20 Lakhs	47 (56.63%)	36 (43.37%)	83	
	21 - 40 Lakhs	29 (70.73%)	12 (29.63%)	41	
	41 - 80 Lakhs	19 (70.73%)	8 (29.63%)	27	
	> 80 Lakhs	4 (57.14%)	3 (46.83%)	7	
	Not Reported	13 (81.25%)	3 (18.75%)	16	
Business	Family Business	21 (61.76%)	13 (38.24%)	34	3.01
	Private Nursing Home/Medical Practitioner	27 (64.29%)	15 (35.71%)	42	
	Self Employed	10 (47.62%)	11 (52.38%)	21	
	Service	55 (67.90%)	26 (32.10%)	81	
Marital Status	Married	0 (0.00%)	2 (100.00%)	2	3.51
	Unmarried	113 (64.20%)	63 (35.80%)	176	

Family History of Genital CA	No	110 (62.86%)	65 (37.14%)	175	1.76
	Yes	3 (100.00%)	0 (0.00%)	3	
Sexually Active	No	99 (65.56%)	52 (34.44%)	151	4.27
	Yes	8 (42.11%)	11 (36.52%)	19	
	Not Reported	6 (75.00%)	2 (25.00%)	8	
Hospital/Clinic Visit in last 3 Years	No	32 (48.48%)	34 (51.52%)	66	***10.17*** **
	Yes	77 (72.64%)	29 (27.36%)	106	
	Not Reported	4 (66.67%)	2 (33.33%)	6	
Reason for Hospital Visit	Any Other Clinic	60 (63.16%)	35 (36.84%)	95	***23.82*** ***
	Gynaecological Clinic	28 (100.00%)	0 (0.00%)	28	
	Not Reported	25 (45.45%)	30 (54.55%)	55	

*p value: *** = 0.001, ** = 0.01, * = 0.05, . = 0.1*

TABLE 2: ONE WAY ANOVA: Knowledge, attitude and acceptability score of the study participants

Variables		KNOWLEDGE (10 QUESTIONS: SCORE RANGE: 0 - 10)			ATTITUDE (4 QUESTION: SCORE: RANGE: 0 - 4)			ACCEPTABILITY (8 QUESTIONS: SCORE: RANGE: 0 - 8)		
		Mean	**SE**	**F**	**Mean**	**SE**	**F**	**Mean**	**SE**	**F**
Sex	Female	8.50	0.16	0.14 (1,176)	1.17	0.10	1.87 (1,176)	6.17	0.14	**15.58** (1,176) ***
	Male	8.40	0.21		1.42	0.15		5.20	0.22	
Residence	Rural	8.32	0.25	1.14 (2,175)	1.46	0.18	1.08 (2,175)	5.28	0.25	**3.86** (2,175) *
	Sub Urban	8.12	0.48		1.24	0.27		5.96	0.37	
	Urban	8.61	0.13		1.17	0.11		6.04	0.14	
MBBS Year	Final Year	8.46	0.12	*NA*	1.26	0.09	*NA*	5.81	0.12	*NA*
Family Income/Year	< 9 Lakhs	8.75	0.95	1.72 (5,172)	2.00	0.71	0.77 (5,172)	5.00	0.82	0.58 (5,172)
	10 - 20 Lakhs	8.52	0.15		1.33	0.13		5.67	0.18	
	21 - 40 Lakhs	7.85	0.34		1.17	0.17		6.02	0.26	
	41 - 80 Lakhs	8.89	0.31		1.33	0.24		5.81	0.35	
	> 80 Lakhs	8.86	0.34		0.86	0.40		6.00	0.31	
	Not Reported	8.75	0.37		1.00	0.24		6.13	0.43	
Business	Family Business	8.56	0.27	0.62 (3,174)	1.62	0.21	1.53 (3,174)	5.97	0.24	0.44 (3,174)
	Private Nursing Home/Medical Practitioner	8.19	0.31		1.29	0.17		5.76	0.29	
	Self Employed	8.33	0.31		1.14	0.23		6.10	0.27	
	Service	8.59	0.17		1.12	0.13		5.70	0.19	
Marital Status	Married	9.00	0.00	0.21 (1,176)	3.00	1.00	**4.62** (1,176) *	6.50	0.50	0.35 (1,176)
	Unmarried	8.45	0.13		1.24	0.09		5.81	0.12	
Family History of Genital CA	No	8.38	0.14	0.05 (1,176)	1.25	0.09	0.37 (1,176)	5.79	0.12	2.66 (1,176)
	Yes	8.89	0.26		1.67	0.88		7.33	0.33	

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Sexually Active	No	8.38	0.14	1.07 (2,175)	1.26	0.09	2.46 (2,175)	5.81	0.13	0.41 (2,175)
	Yes	8.89	0.26		1.58	0.28		6.00	0.43	
	Not Reported	8.88	0.35		0.50	0.27		5.38	0.60	
Hospital/Clinic Visit in last 3 Years	No	8.09	0.23	**3.20** (2,175) *	1.53	0.16	**4.39** (2,175) *	5.74	0.19	0.97 (2,175)
	Yes	8.64	0.15		1.14	0.10		5.91	0.17	
	Not Reported	9.33	0.21		0.33	0.21		5.00	0.68	
Reason for Hospital Visit	Any Other Clinic	8.61	0.16	0.08 (2,175)	1.39	0.11	1.63 (2,175)	5.86	0.18	0.86 (2,175)
	Gynaecological Clinic	8.75	0.25		0.96	0.20		6.07	0.25	
	Not Reported	8.05	0.27		1.18	0.17		5.60	0.21	

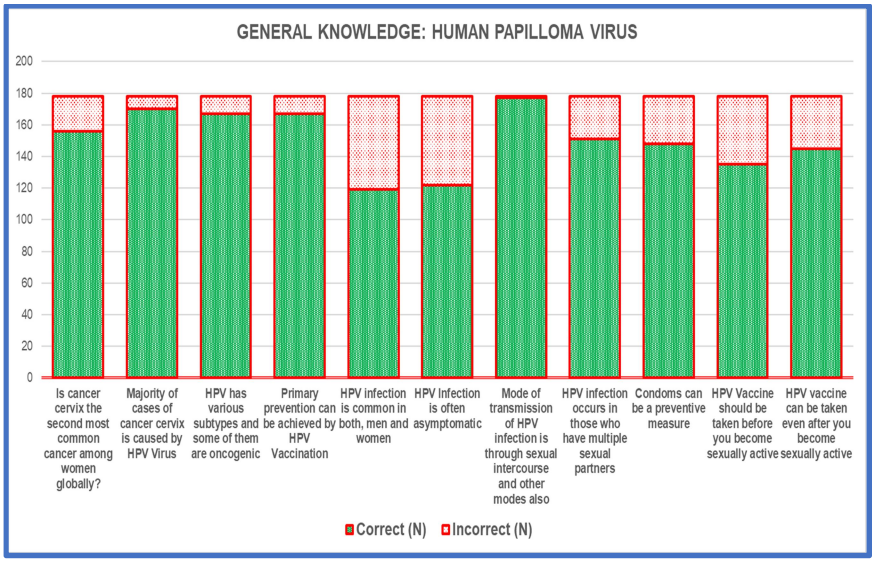
p value: ***= 0.001, **= 0.01, *=0.05, .=0.1

TABLE 3: Attitude of participants towards HPV vaccine

	Yes N (%)	No N (%)	Chi – Square
If you have not taken the HPV vaccine then are you interested in taking the vaccine in near future	113 (63.5 %)	65 (36.5%)	12.94 ***
Will you take the HPV vaccine if it is available at a nearby recognized medical	139 (78.1%)	39 (21.9%)	56.10 ***
Will you take the vaccine if it is available at a subsidised rate/national programme	149 (83.7%)	29 (16.3%)	80.90 ***
Will you take the vaccine if a detailed information regarding the safety and efficacy of the vaccine is provided	153 (86.0%)	25 (14.0%)	92.05 ***

p value: ***= 0.001, **= 0.01, *=0.05, .=0.1

Graph No. 1: General Knowledge of the study participants regarding Cervical cancer



GRAPH NO. 1: Sankey Diagram – Sex, Residence, Vaccination Status, Reason for No Vaccination and Best Influencers for HPV Vaccination.

Discussion

Cervical cancer is a serious public health problem globally. WHO has aimed to eliminate the disease by 2120 with a goal to reduce the new cases to four or less PER 100,000. To achieve this mission they have set in targets for 2030 (90-70-90), 90% of the girls between 9-15 years should be covered with HPV vaccination, 70% of the eligible women should be screened and 90% of the women with precancerous lesion should be treated (4). It has been established globally, that HPV vaccination is an important measure to control & eliminate cervical cancer. When combined with screening for precancerous cervical lesion then this intervention becomes more effective in reducing the morbidity and mortality of cancer cervix. As previous studies conducted in India has shown prevalence of high-risk HPV 16/18 in about 95% of cases of Cancer Cervix while other contemporary studies have suggested that HPV vaccination can effectively reduce the burden of cancer cervix (9). In spite of proven beneficial effect, the uptake of the vaccine in general population is very low in the developing countries including India (5,10–14). The low uptake is clearly associated with lack of awareness about the HPV virus which is a positive agent of cervical carcinoma and HPV vaccine which can be used for primary prevention (9,13,14). To overcome these hurdles effective counselling should be provided by health care workers, practicing doctors and who possess good knowledge and positive attitude for the HPV vaccine.

In the present study conducted among the final year medical students, the knowledge level was found to the very good as n = 177(99.5%) were aware about the HPV virus and its association with cancer cervix. They were aware about the mode of transmission of the virus by sexual and other routes also. Among all participants, n = 130(73%) showed agreement that HPV vaccination was necessary for prevention of cancer cervix.

In the past, similar studies have been conducted in India, which showed that medical students and doctors had good knowledge about the HPV virus, while it was poor amongst the various population groups like university students, general population and even in health care workers (9,12-14). The poor knowledge reflected in the poor uptake of the vaccine which was evident in prior studies conducted in India, which showed that only 6.8% of the population was vaccinated.

Contemporary studies conducted in different countries have shown mixed results, while some studies indicated inadequate knowledge (15), while other studies showed good knowledge about the HPV virus and vaccine (16,17). A meta-analysis done in China reflected limited awareness & acceptance of HPV virus & HPV vaccination (18). Study conducted among medical students in Jeddah showed low level of knowledge which causes low motivation and uptake of the vaccine (19).

Sound knowledge is associated with a positive attitude and acceptance of the HPV vaccination. In the present study, a positive attitude was noticed among the participants, n = 135(75.8%) agree that the vaccine should be taken before becoming sexually active & n = 145(81.5%) agree that the same can be taken even after being sexually active. However, n = 105(59.0%) still want to have more study reports to be well aware about the vaccine.

Previous studies done in India has shown that despite the limited knowledge, majority of the participants agreed to get vaccinated specially when they were made aware about the protective benefit of the vaccine. The study done in Kolkata showed that 75% of the female participants decided to get vaccinated after the survey during which they acquired knowledge about HPV virus and its association with cancer cervix (12). Another study done among the medical students in India recorded about 88% of the participants showed positive attitude & agreed to get vaccinated (13). There are various other factors which limit the acceptance of HPV vaccination in the community.

In the present study, the number of vaccinated participants was only n = 51(28.7%) which was low. Though it is higher than the previous studies done among medical & paramedial students wherein only 6.8% of the participants were vaccinated (9). The reasons for the low uptake of the vaccine in present study are multiple which are, fear of side effects n = 32(18%); non availability of the vaccine n = 18(10.1%). The cost of the vaccine is also a major factor. Social taboos are also mentioned by n=3 (1.7%) of participants more than half n-93 (52.2) participants were of the opinion that doctors are the most influencing person to motivate the community for acceptance of HPV vaccination, n=48 (25.3) were of the opinion that family member consent is required before taking the HPV vaccination, supportive and positive general health policy of the institute can also influence the vaccine uptake that is as mentioned by n=24 (13.5%), friends can also motivate the eligible candidate to accept the vaccination as expressed by n-16 (9%). Study conducted in Greece showed that, 47% of the participants got their young daughter vaccinated and almost all of them were aware about the availability of the vaccine (16)%. In the same study that 96.2% of the participant reported that the physician as there source of information. Similar study done in Hong Kong has shown that 47.2% of participants were vaccinated (15). The study done in Turkey among the first year University students

revealed that only 0.4% of the participant were vaccinated (22). In the same study done in Turkey high cost was found to be an important reason to be an important reason for low uptake of the vaccine. Study conducted in Bangladesh reviled that education is a powerful determinant for awareness and increase acceptancy of HPV vaccination (23). All the participants **n = 178(100%)** in the present study **agreed that** the uptake of HPV vaccination will have an immense positive effect on women's health by reducing the morbidity & mortality caused by cancer cervix.

Conclusion

The present study has demonstrated that the knowledge of the participants regarding HPV virus, HPV vaccination and cancer cervix was good. They possess a positive attitude and are willing to recommend it to eligible candidates. The coverage of the vaccine is still suboptimal for various reasons like high price of the vaccine, limited availability and accessibility, apprehensions regarding side effects and lack of information. To overcome the impediments targeted teaching, group discussion, workshops and interactive sessions should be organized where all the doubts regarding HPV virus, HPV vaccination and cancer cervix can be discussed and clarified for better understanding and encouraging acceptance of HPV vaccine.

Limitation

The present study has been conducted in a Rural Medical College with limited number of students, so the results regarding the knowledge, score, attitude & practice could not be generalized for a large section.

It is a cross sectional study which provides information at that point of time of conduction of study but lacks the ability to track the evidences over the time.

The study involves a serious health issue, so personal perception, regarding social desirability and apprehensions could have influenced some responses.

Studies are required to be conducted with large number of subjects so that the study results can be generalized and used for better outcome regarding the acceptance of uptake of the HPV vaccination in the community.

Community perceptions could be different than the medical students.

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References :

1. Viens L, Perin D, Senkomago V, Neri A, Saraiya M. Questions about Cervical and Breast Cancer Screening Knowledge, Practice, and Outcomes: A Review of Demographic and Health Surveys. J Women's Heal. 2017;26(5):403–12.
2. World Health Organization. Human Papillomavirus and Cancer [Internet]. World Health Organization. 2024. Available from: https://www.who.int/news-room/fact-sheets/detail/human-papilloma-virus-and-cancer
3. Kaarthigeyan K. Cervical cancer in India and HPV vaccination. Indian J Med Paediatr Oncol. 2012;33(1):7–12.
4. World Health Organization. Reaching 2030 cervical cancer elimination targets - New WHO recommendations for screening and treatment of cervical pre-cancer [Internet]. World Health Organization. 2021. Available from: https://www.who.int/news-room/events/detail/2021/07/06/default-calendar/reaching-2030-cervical-cancer-elimination-targets
5. Sinshaw MT, Berhe S, Ayele SG. Knowledge and Attitude Towards Human Papillomavirus Vaccine and Associated Factors Among Mothers Who Have Eligible Daughters in Debre Markos Town, Northwest Ethiopia. Infect Drug Resist. 2022;15:781–93.
6. Dsouza JP, den Broucke S Van, Pattanshetty S, Dhoore W. Exploring the barriers to cervical cancer screening through the lens of implementers and beneficiaries of the national screening program: A multi-contextual study. Asian Pacific J Cancer Prev. 2020;21(8):2209–15.
7. Government of India. Final Report of the Committee appointed by the to enquire into " Alleged irregularities in the conduct of studies using Human Papilloma Virus (HPV) vaccine " by PATH in India. 2011.
8. The Hindu B. Govt to focus on vaccination against cervical cancer , announces Finance Minister Nirmala Sitharaman. 2024;
9. Swarnapriya K, Kavitha D, Mohan Reddy GM. Knowledge, attitude and practices regarding HPV vaccination among medical and para medical in students, India a cross sectional study. Asian Pacific J Cancer Prev. 2016;16(18):8473–7.
10. National Cancer Institute. Human Papillomavirus (HPV) Vaccines What are human papillomaviruses ? 2021. p. 1–9.
11. Di Giuseppe G, Abbate R, Liguori G, Albano L, Angelillo IF. Human papillomavirus and vaccination: Knowledge, attitudes, and behavioural intention in adolescents and young women in Italy. Br J Cancer. 2008;99(2):225–9.
12. Saha A, Nag Chaudhury A, Bhowmik P, Chatterjee R. Awareness of cervical cancer among female students of premier

colleges in Kolkata, India. Asian Pacific J Cancer Prev. 2010;11(4):1085–90.

13. Mehta S, Rajaram S, Goel G, Goel N. Awareness about human Papilloma virus and its vaccine among medical students. Indian J Community Med. 2013;38(2):92–4.
14. Chawla PC, Chawla A, Chaudhary S. Knowledge, attitude & practice on human papillomavirus vaccination: A cross-sectional study among healthcare providers. Indian J Med Res [Internet]. 2016 Nov;144(5):741–9. Available from: https://journals.lww.com/02223309-201644050-00016
15. Leung JTC, Law C kin. Revisiting knowledge, attitudes and practice (KAP) on human papillomavirus (HPV) vaccination among female university students in Hong Kong. Hum Vaccines Immunother [Internet]. 2018;14(4):924–30. Available from: https://doi.org/10.1080/21645515.2017.1415685
16. Naoum P, Athanasakis K, Zavras D, Kyriopoulos J, Pavi E. Knowledge, Perceptions and Attitudes Toward HPV Vaccination: A Survey on Parents of Girls Aged 11–18 Years Old in Greece. Front Glob Women's Heal. 2022;3(June):1–8.
17. Lubeya MK, Zekire Nyirenda JC, Chanda Kabwe J, Mukosha M. Knowledge, Attitudes and Practices Towards Human Papillomavirus Vaccination Among Medical Doctors at a Tertiary Hospital: A Cross Sectional Study. Cancer Control. 2022;29:1–10.
18. Cui M, Wang Y, Liu Z, Liu C, Niu T, Zhou D, et al. The awareness and acceptance of HPV vaccines among parents of primary and junior high school students in China: a meta-analysis. Infect Med [Internet]. 2023;2(4):271–80. Available from: https://doi.org/10.1016/j.imj.2023.11.003
19. Kamel RM, Alomari A, Ismail A, Alballa R, Almowallad A, Alsankari L, et al. An investigation into the human papilloma virus (HPV) vaccination among undergraduate medical students (A prospective cross-sectional KAP survey). Obstet Gynecol Int J [Internet]. 2024 Sep 20;15(5):194–205. Available from: https://medcraveonline.com/OGIJ/OGIJ-15-00759.pdf
20. Rositch AF, Liu T, Chao C, Moran M, Beavis AL. Levels of Parental Human Papillomavirus Vaccine Hesitancy and Their Reasons for Not Intending to Vaccinate: Insights From the 2019 National Immunization Survey-Teen. J Adolesc Heal. 2022;71(1):39–46.
21. Dela Cruz MRI, Tsark JAU, Chen JJ, Albright CL, Braun KL. Human Papillomavirus (HPV) Vaccination Motivators, Barriers, and Brochure Preferences Among Parents in Multicultural Hawai'i: a Qualitative Study. J Cancer Educ [Internet]. 2017 Sep 7;32(3):613–21. Available from: http://link.springer.com/10.1007/s13187-016-1009-2
22. Durusoy R, Yamazhan M, Taşbakan MI, Ergin I, Aysin M, Pullukçu H, et al. HPV vaccine awareness and willingness of first-year students entering university in Western Turkey. Asian Pacific J Cancer Prev. 2010;11(6):1695–701.
23. Fahina Nasrin Eva etal awareness of HPV vaccine and its socio demographic determinants among the parents of eligible daughters in Bangladesh: A nationwide study. Nasrin, F., Rahman, M. M., Sultana, S., Ahmed, M., & Islam, M. S. (2023). *Awareness of HPV vaccine and its socio-demographic determinants among the parents of eligible daughters in Bangladesh: A nationwide study*. PLOS ONE, 18(7), e0288277. https://doi.org/10.1371/journal.pone.0288277 Heliyon 10 (2024)e 30897 (1-10)