

ORIGINAL ARTICLE

Effect of Health Education on the Knowledge and Attitude Regarding the Human Papillomavirus Vaccine among Adolescent School Girls of a City in Western Maharashtra

Tekawade Apurva U, Tambe Muralidhar P, Parande Malangori A, Sancheti Poonam V, Borle Pradip S

Department of Community Medicine, B J Government Medical College, Pune, Maharashtra.

CORRESPONDING AUTHOR

Dr Tekawade Apurva U, Department of Community Medicine, B J Government Medical College, Pune, Maharashtra, Maharashtra 411001

Email: apurva212@gmail.com

CITATION

Tekawade AU, Tambe MP, Parande MA, Sancheti PV, Borle PS. Title. Indian J Comm Health. 2024;36(4):549-555. <https://doi.org/10.47203/IJCH.2024.v36i04.008>

ARTICLE CYCLE

Received: 10/03/2024; Accepted: 16/07/2024; Published: 31/08/2024

This work is licensed under a Creative Commons Attribution 4.0 International License.

©The Author(s). 2024 Open Access

ABSTRACT

Background: Human papillomavirus vaccine is effective in preventing cervical cancer and is especially recommended for girls above nine years of age. Understanding the level of awareness and attitude of the target population towards the HPV vaccine is imperative to create awareness where necessary.

Aim and Objectives: To assess the baseline knowledge, attitudes, and behaviours concerning HPV vaccine among adolescent school girls in urban area, and to investigate the impact of health education on these parameters. **Study design:** Quasi-experimental **Study setting:** Secondary school in Pune city

Target population: Adolescent girls **Methods and Material:** Calculated sample size was 200. A school was chosen randomly. All the willing female students from 8th-10th standards were enrolled. Awareness about HPV infection and vaccination, attitude and practices were assessed at the baseline and two weeks after the health education intervention, using a self-administered structured questionnaire. **Results:** Initially, only 2.5% had heard about the HPV vaccine and none had received it. Following health education, the proportion of students who correctly answered the questions regarding the HPV vaccine, diseases prevented and who can take the vaccine increased significantly by 94%, 71.5% and 72% respectively. Positive attitude regarding the risk of HPV infection and age for vaccination improved significantly by 78.5% and 48% respectively. Vaccine seeking behaviour improved significantly by 17.5%. **Conclusions:** Adolescent school girls had poor baseline knowledge and attitude regarding the HPV vaccine and health education significantly improved the same.

KEYWORDS

Adolescent Girls; Cervical Cancer; HPV Vaccine; Health Education

INTRODUCTION

Cervical cancer ranks fourth and second among carcinomas among females, globally(1) and in India(2), respectively. According to estimates, annually 123907 women in India are diagnosed

with cervical cancer and 77348 die from it.(2) Infection due to HPV, especially types 16 and 18, is the major cause for cervical cancer(3) hence vaccination against HPV is an effective way to prevent it. The Indian Academy of Paediatrics recommends HPV vaccination for

all girls more than nine years old. Catch-up vaccination may be offered to women till 45 years of age.(4) The W.H.O. Cervical Cancer Elimination Strategy has set a target for 2030 that 90% of girls should be fully vaccinated with the HPV vaccine by the time they are 15 years old.(5)The target group for HPV vaccination is primarily young adolescent females.(6) Hence, we sought to assess adolescent school girls' knowledge and attitude regarding the HPV vaccine and the effect of health education on the same.

Objectives:

1. To assess the knowledge and attitude regarding the HPV vaccine among adolescent school girls in an urban area
2. To evaluate the effect of health education on the knowledge & attitude regarding HPV vaccine

MATERIAL & METHODS

Study Design: It was a quasi-experimental study involving adolescent school girls.

Sample Size: The calculated sample size was 200 which was obtained using the formula $N = [(Z_{\alpha} + Z_{\beta}) \times P \times Q] / L^2$ at confidence level= 95%, $Z_{\alpha}=1.96$, Power= 80%, $Z_{\beta}=0.84$, Absolute error= 10% (L). P= effect of health education. Due to the lack of similar studies in Indian setting, the effect of health education (P) was assumed to be 50% for the purpose of this study. Q is the compliment of P= 50%. Therefore, $N = [(Z_{\alpha} + Z_{\beta}) \times P \times Q] / L^2 = [(1.96 + 0.84) \times 50 \times 50] / (10 \times 10) = 196$, considered 200 for convenience.

Data Collection: A school was randomly selected from the list of schools in the city. Permission was obtained from the school authorities for conducting the study. The selected school had 95, 129 and 98 female students studying in classes 8th, 9th and 10th respectively with their combined strength being 322. Universal sampling method was practised and all these students were given the option to participate in the study. Assent form for students, consent form for parents and project information brochure were distributed to all the adolescent girls of classes 8th to 10th, a day prior to the study. Only those who had signed the assent forms and had parental consent to participate were enrolled in the

study. 218 students participated in the study initially.

The baseline knowledge, attitude and practices of the participants regarding the HPV vaccine were assessed using a structured, self-administered questionnaire. Following which, health education was imparted to the participants by the principal investigator using a PowerPoint Presentation which was prepared with the help of W.H.O.'s training module for HPV vaccination. (7,8)The PPT consisted of information regarding Human Papillomavirus, HPV infection, its transmission and ways of prevention, cervical cancer, disease burden and symptoms of cervical cancer, HPV vaccination, side effects, types of HPV vaccines, (6, 9, 10) their cost and availability.

The knowledge, attitude and practices were re-assessed two weeks after the health education intervention. This post-intervention test was answered by 200 participants which met the calculated sample size. Eighteen participants were lost to follow up.

Data Analysis: Microsoft Excel 2010 and SPSS version 29 were used for data entry and analysis. Socio-demographic characteristics and responses to questions related to knowledge, attitude and practices were depicted by frequency (percentage). McNemar's test was used to assess the significance of the effect of health education on the concerned aspects. Mann-Whitney test and ANOVA test were used to check the association between the socio-demographic factors and the change in knowledge, attitude and practices. A 'P-value' of <0.05 was considered significant.

Ethical Consideration: The study commenced after approval of the Institutional Ethics Committee and was conducted from July 2023 to September 2023, in a secondary school in Pune, Maharashtra.

RESULTS

Study comprised 200 participants.

Age of the participants ranged from 12years to 17years (Figure 1) with mean age of 14.10 years.

Figure 1 Distribution of the participants according to their age

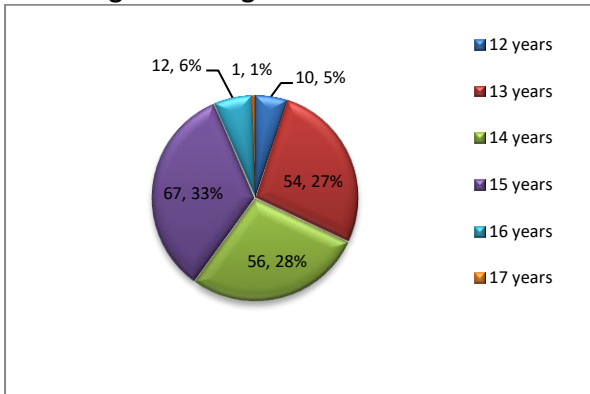


Figure 2 Distribution of the participants according to their socioeconomic class

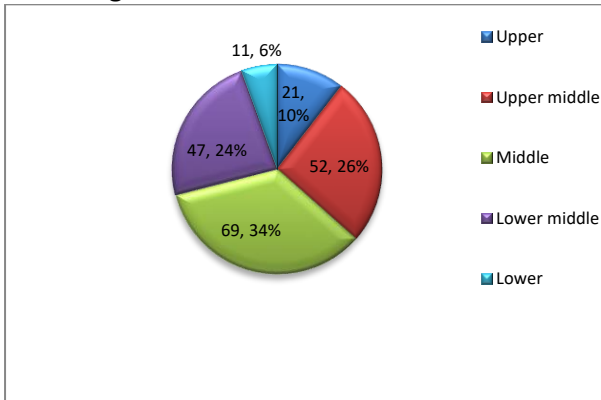


Figure 2 depicts the socioeconomic distribution. Majority of the participants (34.5%) belonged to the middle socioeconomic class according to B. G. Prasad’s scale 2023.(11)

Table 1 Distribution of the participants according to the education of their parents

Education	Father N=200 (%)	Mother N=200 (%)
Illiterate	15 (7.5)	17 (8.5)
Primary	38 (19)	74 (37)
Secondary	109 (54.5)	85 (42.5)
Higher secondary	27 (13.5)	17 (8.5)
Diploma	2 (1)	1 (0.5)
Graduate	9 (4.5)	6 (3)

The educational status of the participants’ parents has been represented in table 1. Majority of the parents (48.5%) had attained secondary level education.

Table 2. Distribution of the participants according to the occupation of their parents

Occupation	Father N=200 (%)	Mother N=200 (%)
Homemaker	0	137 (68.5)
Unemployed	16 (8)	0
Unskilled	44 (22)	34 (17)
Semi-skilled	7 (3.5)	5 (2.5)
Skilled	128 (64)	23 (11.5)
Professional	5 (2.5)	1 (0.5)

Table 2 depicts the occupational status of the participants’ parents. Most of the mothers (68.5%) were homemakers and most of the fathers (64%) were skilled workers.

Table 3 Effect of health education on knowledge, attitude & practices regarding the HPV vaccine

SN.	Question	Pre-health education and post-health education responses (N=200)		χ^2 (McNemar)	P-value
		Pre-intervention	Post-intervention		
1	Have you ever heard of the HPV vaccine?	No	7	186.005	0.000
		Yes	188		
2	Which diseases does the HPV vaccine prevent?	Incorrect	57	141.007	0.000
		Correct	143		
3	Who can take the HPV vaccine?	Incorrect	56	142.007	0.000
		Correct	144		
4	What do you think about HPV infection?	Negative attitude	39	153.057	0.000
		Positive attitude	158		
		1	2		

SN.	Question	Pre-health education and post-health education responses (N=200)		χ^2 (McNemar)	P-value
		Pre-intervention	Post-intervention		
5	If there are vaccines that prevent cancer, are you willing to get yourself vaccinated?	Negative attitude 45	Negative attitude 36	0.379	0.538
		Positive attitude 30	Positive attitude 89		
6	At what age do you think HPV vaccine should ideally be given?	Negative attitude 102	Negative attitude 97	92.092	0.000
		Positive attitude 1	Positive attitude 0		
7	Have you sought consultation regarding HPV vaccines?	No 161	Yes 36	31.243	0.000
		Yes 1	Yes 2		
8	Have you taken the HPV vaccine?	No 198	Yes 2	—	0.5*
		Yes 0	Yes 0		

*Binomial distribution

Table 3 shows the baseline responses and the change following the intervention. Pre-existing knowledge was poor. Only 2.5% knew about the HPV vaccine. No participant had received the HPV vaccine before the study. Correct responses to questions regarding HPV vaccine, diseases prevented and who can take the vaccine increased by 94%, 71.5% and 72% respectively, which was statistically significant with P-value=0.000. Positive attitude regarding the risk of HPV infection and age for vaccination improved by 78.5% and 48% respectively, which was statistically significant with P-value=0.000. Willingness for receiving vaccines that prevent cancer improved by 3% however, it was not statistically significant. Proportion of participants who sought

consultation for the HPV vaccine significantly increased by 17.5%, P-value=0.000. Lack of awareness came forth as the major reason as to why the participants weren't vaccinated already. Within two weeks following the health education intervention, two participants got themselves vaccinated.

Mann-Whitney test and ANOVA test were used to check the association of age, education of parents and socio-economic class with the change in knowledge, attitude and practices following the health education intervention, as shown in Table 4. No significant association was found between the socio-demographic factors and change in knowledge, attitude and practices.

Table 4 Association of socio-demographic factors with the change in knowledge, attitude and practices

Parameters	n	Change in knowledge		Change in Attitude		Change in practice		
		Mean	SD	Mean	SD	Mean	SD	
Age (Yrs)	12 – 14	120	2.33	.781	1.15	.967	.21	.447
	15 – 17	80	2.44	.777	1.34	.795	.15	.393
	MW test: Z Value		1.13		1.23		1.11	
	P Value		0.26		0.22		0.27	
Education of father	Illiterate	15	2.20	1.014	1.27	.799	.00	.000
	Primary	38	2.53	.603	1.16	.789	.24	.490
	Secondary	109	2.42	.761	1.21	.982	.19	.419

Parameters	n	Change in knowledge		Change in Attitude		Change in practice		
		Mean	SD	Mean	SD	Mean	SD	
Education of mother	Higher secondary	27	2.07	.917	1.33	.832	.19	.483
	Graduate	11	2.36	.674	1.27	.905	.18	.405
	F value		1.68		0.17		0.85	
	P Value		0.16		0.95		0.49	
	Illiterate	17	2.18	1.074	1.18	.728	.18	.393
	Primary	74	2.43	.723	1.23	.869	.16	.406
	Secondary	85	2.38	.786	1.21	.977	.20	.431
	Higher secondary	17	2.41	.618	1.41	.939	.24	.562
	Graduate	7	2.14	.900	1.00	.816	.14	.378
	F value		0.54		0.30		0.16	
Socio-economic class	P Value		0.71		0.88		0.96	
	Class I	21	2.43	.676	1.33	.856	.14	.359
	Class II	52	2.40	.721	1.15	.872	.25	.480
	Class III	69	2.32	.757	1.30	.928	.17	.419
	Class IV	47	2.32	.958	1.23	.840	.15	.416
	Class V	11	2.73	.467	.82	1.250	.18	.405
	F value		0.75		0.84		0.45	
	P Value		0.56		0.50		0.78	

$F(4, 195) = 2.37$

DISCUSSION

According to a study by Arunachalam D et al. (12), majority of the school children had inadequate knowledge regarding the HPV vaccine, which is similar to our pre-intervention findings. Also, Joshi SV et al. (13) found out that the overall baseline awareness among females of Western India was poor. Studies by Liu and Zhang from China (14,15) reported greater baseline awareness regarding HPV vaccine and diseases prevented by it. However, attitude towards risk of HPV infection was similarly poor. Majority of the participants were willing to receive vaccines that prevent cancer, consistent with Liu CR's study.(14)

Zhang et al. (15) showed that 33.6% participants had sought consultation for HPV vaccine before their study while in our study only 1.5% had sought prior consultation for the vaccine.

Post-intervention, significant improvement in knowledge was observed which was consistent with previous research.(14,15,16)

Our study showed that though the increase in knowledge after school-based health education was significant, the improvement in

willingness to get vaccinated was not statistically significant. Similar finding was reported by Gottvall M. et al. (17)

Two participants of our study got themselves vaccinated within two weeks of the health education session. This change, though important, was not statistically significant which may be because two weeks is a short duration to observe significant change in practices. Follow up studies of longer duration may show significant improvement in practices as well.

One session of health education significantly increases the knowledge regarding HPV vaccine. However, attitude and practices do not change so readily. Imparting health education repeatedly in school and inculcating positive attitude towards vaccination among the students may eventually heighten acceptance and active vaccine seeking behaviour.

CONCLUSION

The baseline knowledge, attitude and practices of the adolescent girls regarding the HPV vaccine were poor. Health education significantly improved the knowledge. Positive

changes in attitude and practices were also observed but they were not statistically significant.

RECOMMENDATION

Health education regarding cervical cancer and HPV vaccine should be imparted in schools.

LIMITATION OF THE STUDY

The study was limited to one school in Pune, Maharashtra, which may limit its generalizability to other schools in the region.

RELEVANCE OF THE STUDY

There is a dearth of literature regarding the effect of health education on the knowledge, attitude and practices regarding the HPV vaccine among adolescent school girls in India. This study helped us to understand the baseline knowledge, attitude and practices of adolescent school girls regarding the HPV vaccine and also the effect of health education on the same. With the recent launch of the indigenous HPV vaccine, Cervavac,(9,10) it is especially important that the target population is made aware of it so that they can actively avail HPV vaccination. As we seek to eliminate cervical cancer by 2030, the National Technical Advisory Group on Immunization (NTAGI) recommends the introduction of HPV vaccine in the Universal Immunization Program for girls aged 9 years to 14 years.(18) Older females may avail the vaccine in private centres. However, vaccine seeking behaviour requires awareness and health education is a means of achieving it.

AUTHORS CONTRIBUTION

All authors have contributed equally.

FINANCIAL SUPPORT AND SPONSORSHIP

Nil

CONFLICT OF INTEREST

There are no conflicts of interest.

ACKNOWLEDGEMENT

We would like to acknowledge the school that gave us the permission to conduct this study. Also, we thank all the participants and their parents for their kind co-operation. We

appreciate the school staff and the intern doctors who helped in the smooth conduct of data collection.

DECLARATION OF GENERATIVE AI AND AI ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

The authors haven't used any generative AI/AI assisted technologies in the writing process.

REFERENCES

1. World Health Organization - Cervical Cancer. Available at: <https://www.who.int/news-room/fact-sheets/detail/cervical-cancer>. Accessed on 24 Aug 2024.
2. India-Human Papillomavirus and Related Cancers, Fact Sheet 2023. Available at: https://hpcvcentre.net/statistics/reports/IND_FS.pdf. Accessed on 24 Aug 2024.
3. Centers for Disease Control and Prevention - Basic Information about Cervical Cancer. Available at: https://www.cdc.gov/cancer/cervical/basic_info/index.htm. Accessed on 24 Aug 2024.
4. Indian Association of Paediatrics- Human Papillomavirus Vaccines. Available at: <https://iapindia.org/pdf/vaccine-information/HPV-VACCINE.pdf>. Accessed on 24 Aug 2024.
5. World Health Organization- Cervical Cancer Elimination Initiative. Available at: <https://www.who.int/initiatives/cervical-cancer-elimination-initiative>. Accessed 24 Aug 2024.
6. WHO- Immunization, Vaccines and Biologicals – Human papillomavirus vaccines (HPV). Available at: [https://www.who.int/teams/immunization-vaccines-and-biologicals/diseases/human-papillomavirus-vaccines-\(HPV\)](https://www.who.int/teams/immunization-vaccines-and-biologicals/diseases/human-papillomavirus-vaccines-(HPV)). Accessed on 24 Aug 2024.
7. Essential Training Package for HPV Vaccine Introduction- Module 1. Available at: https://cdn.who.int/media/docs/default-source/immunization/training/vaccine-specific/hpv/training_package_mod1cervarix_jun2014.pdf?sfvrsn=7d5a3a6e_12. Accessed on 24 Aug 2024.
8. Essential Training Package for HPV Vaccine Introduction- Module 6. Available at: https://cdn.who.int/media/docs/defaultsource/immunization/training/vaccine-specific/hpv/hpvtrainingpackage_mod6gardasil_jun2014.pdf?sfvrsn=52fea623_19. Accessed on 24 Aug 2024.
9. Indian Cervical Cancer Vaccine or HPV Vaccine. Available at: <https://innovareacademics.in/blog/indian-cervical-cancer-vaccine-or-human-papillomavirus-hpv-vaccine/>. Accessed on 24 Aug 2024.
10. Cervavac. Available at: https://www.seruminstitute.com/product_ind_cervavac.php. Accessed on 24 Aug 2024.
11. Akram, Zainab; Khairnar, Mahesh R.; Kusumakar, Ananta; Kumar, Jadhav Sachin; Sabharwal,

- Harloveen; Priyadarsini, S. Savitha; Kumar, P G Naveen. Updated B. G. Prasad Socioeconomic Status Classification for the Year 2023. *Journal of Indian Association of Public Health Dentistry* 2023;21(2):204-205
12. Arunachalam D, Subash Chandrabose G. Knowledge and attitude on human papilloma virus among adolescent girls in school students at Puducherry. *Int J Community Med Public Health*. 2019;6(2):573-8.
 13. Joshi SV, Chaudhari HR, Chaudhari NA. Effect of Education on Awareness, Knowledge, and Willingness to Be Vaccinated in Females of Western India. *J Cancer Educ*. 2020;35(1):61-68.
 14. Liu, CR., Liang, H., Zhang, X. et al. Effect of an educational intervention on HPV knowledge and attitudes towards HPV and its vaccines among junior middle school students in Chengdu, China. *BMC Public Health* 2019;19(1):488.
 15. Zhang X, Liu CR, Wang ZZ, Ren ZF, Feng XX, Ma W, Gao XH, Zhang R, Brown MD, Qiao YL, Geng Q, Li J. Effect of a school-based educational intervention on HPV and HPV vaccine knowledge and willingness to be vaccinated among Chinese adolescents : a multi-center intervention follow-up study. *Vaccine*. 2020;38(20):3665-3670.
 16. Kwan TT, Tam KF, Lee PW, Chan KK, Ngan HY. The effect of school-based cervical cancer education on perceptions towards human papillomavirus vaccination among Hong Kong Chinese adolescent girls. *Patient Educ Couns*. 2011;84(1):118-22.
 17. Gottvall M, Tydén T, Höglund AT, Larsson M. Knowledge of human papillomavirus among high school students can be increased by an educational intervention. *Int J STD AIDS*. 2010;21(8):558-62.
 18. Centre urges States to create awareness and take steps for prevention of cervical cancer among girl students. Available at: <https://pib.gov.in/PressReleasePage.aspx?PRID=1885597>. Accessed on 24 Aug 2024.