

Knowledge Regarding Human Papillomavirus Vaccine Among Mothers of School-Going Girls Aged 9–15 Years: A Descriptive Study from Coimbatore, Tamil Nadu

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Abstract—Background: Cervical cancer is largely preventable through human papillomavirus (HPV) vaccination, and mothers play a major role in immunization decisions for school-going girls. Baseline data on maternal knowledge of the HPV vaccine from school settings in Tamil Nadu are limited.

Objectives: To assess the level of knowledge regarding the HPV vaccine among mothers of school-going girls aged 9–15 years and to determine its association with selected demographic variables. **Methods:** A quantitative, descriptive study was conducted among 50 mothers selected by non-probability convenience sampling at a school in Sulur, Coimbatore. Data were collected using a structured self-administered questionnaire comprising five demographic items and 21 multiple-choice knowledge items, with content validity established by four nursing experts. Data were analysed using frequency, percentage and the chi-square test at $P < 0.05$. **Results:** More than half of the mothers were aged 30–35 years (52.0%), and 78.0% had a UG degree or higher education. Thirty-six mothers (72.0%) had moderately adequate knowledge, 13 (26.0%) had inadequate knowledge, and only one (2.0%) had adequate knowledge. No significant association was found between the level of knowledge and age ($\chi^2 = 0.653$, $P = 0.721$), religion ($\chi^2 = 0.012$, $P = 0.915$), occupation ($\chi^2 = 2.313$, $P = 0.315$) and marital status ($\chi^2 = 0.122$, $P = 0.727$). **Conclusion:** Most mothers possessed a moderate level of knowledge, comprehensive understanding regarding HPV vaccination and its role in cervical cancer prevention was insufficient. The findings highlight the need for planned educational interventions and emphasize the vital role of nurses in creating awareness and promoting HPV vaccination among mothers to prevent cervical cancer in school-going girls aged 9–15 years

Index Terms—Human papillomavirus, HPV vaccine, knowledge, mothers, cervical cancer prevention, school-going girls aged 9–15 years.

I. INTRODUCTION

Cervical cancer is the fourth most common cancer in women worldwide, with an estimated 660,000 new cases and 350,000 deaths in 2022.[1] In India, 123,907 women are diagnosed and 77,348 die from the disease every year, and it is the second most frequent cancer among women aged 15–44 years.[2] Persistent infection with high-risk types of human papillomavirus (HPV), particularly HPV 16 and 18, is the primary cause, and women living with HIV have a markedly higher risk (pooled RR 6.07; 95% CI: 4.40–8.37).[3] A meta-analysis reported a pooled HPV prevalence of 85% (95% CI: 71–92%) among Indian women with cervical cancer,[4] and a case-control study in Tamil Nadu found HPV infection in 54.9% of 246 cervical cancer patients, with HPV-16 predominant.[5] HPV-related cancers account for 7.5% of all cancers in India, of which cervical cancer constitutes 87.6% among females.[6] Locally, 1,164 women tested positive for cervical cancer in 13 government hospitals of Coimbatore district in 2024–2025, compared with 726 in 2023–2024 and 484 in 2022–2023.[7]

Primary prevention is possible through HPV vaccination, which is most effective when given before exposure to the virus; the World Health Organization recommends vaccination of girls aged 9–

15 years.[1] The WHO global strategy for cervical cancer elimination sets 90–70–90 targets for 2030: 90% of girls fully vaccinated by 15 years of age, 70% of women screened with a high-performance test at 35 and 45 years, and 90% of women with cervical disease receiving treatment.[8]. As mothers are the key decision-makers for their daughters' health care, their knowledge is central to vaccine acceptance.

Evidence on maternal and public knowledge of HPV vaccination is consistently unfavourable. Among 500 women attending a tertiary hospital in Coimbatore, only 25% were aware of HPV vaccination, although 70.2% were willing to be vaccinated after learning about it.[10] In Ethiopia, only 47.6% of 601 mothers had good knowledge of the vaccine, despite 77.4% holding a positive attitude.[11] In Lebanon, only 34% of mothers knew of HPV infection and the vaccine, and vaccine uptake among girls was 2.5%.[12] A global meta-analysis of 86 studies found parental acceptance ranging from 12.0% to 97.5%, with safety concerns the major barrier.[9] Data on maternal knowledge from Indian school settings are limited. Nurses, as health educators, are well placed to address this gap. This study therefore assessed the level of knowledge regarding the HPV vaccine among mothers of school-going girls aged 9–15 years and its association with selected demographic variables.

II. METHODS

Study design and setting

A quantitative, descriptive study was conducted at RVS Matriculation Higher Secondary School, Sulur, Coimbatore, which serves students from urban and semi-urban areas and had 243 female students aged 9–15 years. The setting was chosen for the availability of eligible mothers and feasibility of data collection.

Participants and sampling

The population comprised mothers of school-going girls aged 9–15 years enrolled in the school. Fifty mothers were selected by non-probability convenience sampling; the sample size was determined by feasibility and availability. Mothers who could read and write Tamil or English and were willing to participate were included. Mothers who were not present at the time of data collection or could not be contacted directly were excluded.

Data collection tool

A structured self-administered questionnaire was developed by the investigators in two parts. Part A comprised five demographic items (age, religion, education, occupation and marital status). Part B comprised 21 multiple-choice questions on knowledge regarding the HPV vaccine, covering its purpose, benefits, recommended age, dosage, availability and role in preventing cervical cancer. Each correct response scored 1 and each incorrect or unanswered response scored 0 (total score 0–21). Scores of 0–7, 8–14 and 15–21 were categorised as inadequate, moderately adequate and adequate knowledge, respectively.

Validity and Reliability

Content validity was established by four nursing experts with a Master's degree in Nursing and more than 10 years of experience, who reviewed the tool against the study objectives; the tool was modified according to their suggestions. A high degree of test–retest reliability was observed for the tool ($r = 0.94$).

Data collection procedure

Permission was obtained from the principal of the school. With the help of class teachers, a list of eligible students was prepared. Mothers were approached at the school premises during drop-off and pick-up times, and those residing near the school were approached through pre-arranged home visits. After explaining the purpose of the study and obtaining verbal informed consent, the questionnaire was distributed; mothers took 15–20 minutes to complete it, and the investigators were available to clarify doubts. Completed questionnaires were checked for completeness. Data collection was completed in three days.

Data analysis

Data were analysed using SPSS 16. Frequency and percentage described the demographic characteristics and knowledge levels. The chi-square test assessed the association between knowledge level and demographic variables at a significance level of $P < 0.05$.

Ethical considerations

Ethical approval was obtained from the institutional authority. Verbal informed consent was obtained from

all participants. Confidentiality and anonymity were maintained by using code numbers instead of names, and data were used only for research purposes.

III. RESULTS

Table 1. Frequency and percentage distribution of mothers according to demographic characteristics (N = 50)

Characteristic	Frequency (n)	Percentage (%)
Age (years)		
30–35	26	52.0
36–40	16	32.0
41–45	8	16.0
Religion		
Hindu	42	84.0
Muslim	2	4.0
Christian	5	10.0
Others	1	2.0
Educational status		
Illiterate	1	2.0
Foundational stage (up to 2nd Std)	1	2.0
Preparatory stage (3rd–5th Std)	5	10.0
Secondary stage (9th–12th Std)	4	8.0
UG degree and above	39	78.0
Occupation		
Engineering profession	4	8.0
Medical profession	1	2.0
Teacher	34	68.0
Other	11	22.0
Marital status		
Married	44	88.0
Divorced	1	2.0
Separated	5	10.0

Demographic characteristics of the 50 mothers, 26 (52.0%) were aged 30–35 years, 16 (32.0%) were aged 36–40 years and 8 (16.0%) were aged 41–45 years. Most were Hindus (42; 84.0%) and married (44; 88.0%). Thirty-nine mothers (78.0%) had a UG degree or higher education, and 34 (68.0%) were teachers (Table 1).

Level of knowledge regarding the HPV vaccine

Thirty-six mothers (72.0%) had moderately adequate knowledge, 13 (26.0%) had inadequate knowledge, and only one (2.0%) had adequate knowledge (Table 2).

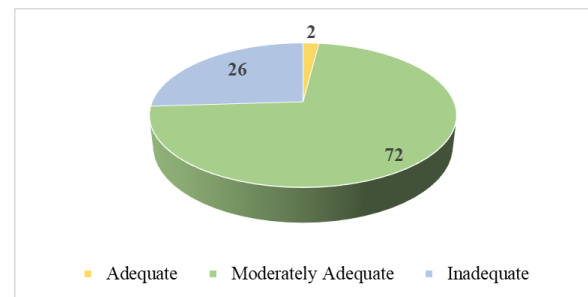


Figure 1. Percentage distribution of mothers according to level of knowledge regarding the HPV vaccine (N = 50)

Association between knowledge level and demographic variables

There was no statistically significant association between the level of knowledge and age ($\chi^2 = 0.653$, $df = 2$, $P = 0.721$), religion ($\chi^2 = 0.012$, $df = 1$, $P = 0.915$), occupation ($\chi^2 = 2.313$, $df = 2$, $P = 0.315$) and marital status ($\chi^2 = 0.122$, $df = 1$, $P = 0.727$) (Table 2).

Table 2. Association between level of knowledge regarding the HPV vaccine and selected demographic variables (n = 49) *

Demographic variable	Moderately adequate (n)	Inadequate (n)	χ^2	df	P value
Age (years)					
30–35	20	6	0.653	2	0.721 (NS)
36–40	11	4			
41–45	5	3			
Religion					
Hindu	30	11	0.012	1	0.915 (NS)
Muslim/Christian/Others	6	2			
Occupation					
Engineering/Medical profession	3	1	2.313	2	0.315 (NS)

Teacher	23	11			
Other	10	1			
Marital status					
Married	32	12	0.122	1	0.727 (NS)
Divorced/Separated	4	1			

*One mother with adequate knowledge was excluded from the association analysis. NS – not significant at $P < 0.05$; df – degrees of freedom.

IV. DISCUSSION

This study assessed the knowledge of 50 mothers of school-going girls regarding the HPV vaccine. Although the sample was relatively well educated (78.0% with a UG degree or higher) and predominantly teachers (68.0%), only one mother (2.0%) had adequate knowledge, 72.0% had moderately adequate knowledge and 26.0% had inadequate knowledge. This indicates that general education does not by itself ensure specific knowledge of HPV vaccination.

The findings are supported with the several review studies. In Ethiopia, fewer than half of the mothers (47.6%) had good knowledge,[11] and in Lebanon only 34% of mothers were aware of HPV infection and the availability of the vaccine, with vaccine uptake of 2.5% among girls.[12] A Kazakhstan study likewise reported low overall knowledge among mothers.[13] In India, only 25% of women attending a tertiary hospital in Coimbatore were aware of HPV vaccination, although most were willing to be vaccinated once informed.[10] Direct comparison is limited by differences in instruments; a global meta-analysis itself noted that knowledge levels varied widely according to the questions asked.[9]

No significant association was found between knowledge level and age, religion, occupation or marital status. Education, which was significantly associated with knowledge in the Ethiopian and Lebanese studies, [11,12] was not examined in the association analysis here.

Knowledge is only one determinant of vaccination. Qualitative evidence indicates that cost, reliable information from schools or government, and family, particularly paternal, agreement influence mothers' decisions.[14] Attitudes, acceptance and barriers were not measured in the present study.

V. IMPLICATIONS FOR NURSING

Nursing practice: School and community health nurses can organise parent education sessions and awareness campaigns that explain that the vaccine is preventive rather than curative, and address myths and safety concerns.

Nursing education: HPV and cervical cancer prevention content, adolescent immunization schedules and school health activities should be reinforced in the curriculum.

Nursing administration: Continuing nursing education and in-service programmes can update nurses on HPV vaccination, and structured programmes for mothers can be planned in schools.

Nursing research: The baseline data support interventional studies evaluating structured teaching programmes, information booklets or self-instructional modules.

VI. LIMITATIONS

The study was limited to 50 mothers (small sample size) from a single school, selected by convenience sampling, which restricts generalisability and introduce selection bias. Data were self-reported through a self-administered questionnaire.

VII. CONCLUSION

Most mothers of school-going girls had moderately adequate knowledge of the HPV vaccine, and only one in 50 had adequate knowledge. No significant association with age, religion, occupation and marital status was detected. Nurse-led structured health education for mothers, and larger multi-area and interventional studies that also assess attitudes and acceptance, are recommended.

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