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Original Research Article

ASSESSMENT OF KNOWLEDGE, ATTITUDE AND PRACTICE REGARDING CERVICAL CANCER AND HPV VACCINATION AMONG MOTHERS OF ADOLESCENT GIRLS IN FIELD PRACTICE AREA OF P.M.C.H, PATNA, BIHAR

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ABSTRACT

Background: Cervical cancer remains one of the leading causes of cancer-related morbidity and mortality among women, particularly in low- and middle-income countries. Human papillomavirus (HPV) infection is a major etiological factor, and its prevention through vaccination and screening is critical.
Objective: This study aimed to assess the knowledge, attitude, and practice (KAP) regarding cervical cancer and HPV vaccination among mothers of school-aged children.
Materials and Methods: A cross-sectional descriptive study was conducted among 385 female participants. Data were collected using a structured, pre-tested questionnaire covering socio-demographic details, knowledge about cervical cancer and HPV, attitudes toward screening and vaccination, and current preventive practices.
Results: Out of 385 participants, 77.9% were aware of cervical cancer, yet detailed knowledge regarding risk factors, symptoms, and screening methods was suboptimal. While 64.2% were aware of the availability of HPV vaccines, only 47.5% had received the vaccine themselves, and 45.3% had vaccinated their children. Attitudes were moderately positive, with over half of participants expressing willingness to undergo screening or vaccination, especially if provided free of cost. However, practical uptake of preventive services remained low.
Conclusion: It is concluded that while attitudes toward cervical cancer prevention are favourable, there exists a significant gap in both knowledge and practice among mothers. Public health interventions focusing on education, school-based awareness programs, and improved vaccine accessibility are essential to enhance HPV vaccine uptake and cervical cancer screening.
Keywords: Cervical cancer, HPV vaccination, knowledge-attitude-practice, screening, public health, awareness.

INTRODUCTION

Cervical cancer remains one of the most preventable yet persistently prevalent cancers among women worldwide, particularly in low- and middle-income countries where awareness and screening practices are limited. Human papillomavirus (HPV), a sexually transmitted infection, is recognized as the primary causative agent of cervical cancer. Despite the development of highly effective HPV vaccines and screening tools, the burden of cervical cancer remains disproportionately high in regions where health literacy is low, and preventive measures are not widely implemented. Cervical cancer is one of the

primary causes of morbidity and mortality among women worldwide, even though it is a cancer with the greatest probability for secondary prevention. Globally, cervical cancer is the fourth most frequent cancer in women, with an estimated 5,70,000 new cases and 3,11,000 deaths worldwide in 2018.[1] India accounts for one-fourth of the global burden of cervical cancer.[2] The crude -cervical cancer incidence per 100,000 women of India in the year 2020 was 18.7.[3] Unlike the other developed countries, cervical cancer remains a major public health problem and accounts for 17% of cancer deaths among women during their reproductive age group in India,[2] accounting for 45,300 deaths in 2019.[3] The principal causative agent for the development of cervical intra-epithelial neoplasia and invasive cervical cancer is HPV infection.[4] The human papillomavirus has over 100 serotypes, of which a few are oncogenic. Of the high-risk strains, HPV-16 and HPV-18 account for 70-75% of cervical cancer cases and 40-60% of its precursors.[4] In addition, a variety of clinic-epidemiological risk factors such as early or multiple sexual activity, multiple pregnancies, poor genital hygiene, low socio-economic status, smoking, and birth control pills are often associated with the development of cervical cancer.[5]

Awareness and health-seeking practices are poor in many developing countries, necessitating the need for proper awareness and vaccination programs.[6] In 2006, the first vaccine against HPV was approved by the Food and Drug Administration (FDA) of the United States of America for the primary prevention of cervical cancer.[7] In India, bivalent and quadrivalent HPV vaccines, namely Cervarix and Gardasil, respectively, are licensed for use.[8] The recommended age for vaccination is between 9-15 years.[1] Catch-up vaccination is permitted up to the age of 26 years.[2] Cervical cancer screening is one of the secondary preventive methods used to detect cervical cancer in women. The current World Health Organisation (WHO) recommended screening protocols include HPV testing for high-risk HPV types, visual inspection with acetic acid (VIA), Papanicolaou (PAP smear) test, and liquid-based cytology (LBC).[9] Despite the existence of a National screening programme for cervical cancer, fewer than 1 in 10 women have been screened for cervical cancer in the last 5 years in India.[3] Globally, several factors might influence the slow uptake of HPV vaccines, including financial constraints, weak infrastructure for the adolescent vaccine delivery, lack of reliable data on the burden of the HPV disease, and cultural and religious sensitivities related to this topic.[7] Knowledge, attitude, and awareness regarding various aspects of the disease and the availability of vaccines are major contributors in controlling and preventing cervical cancer, which would help in improving the quality of life of millions of people. It is therefore important to target highly susceptible individuals present in the population, as they are at risk for HPV infection. We can educate and enlighten the youth population by adding noticeable information into their curriculum about the disease or creating awareness by conducting immunisation programmes in their respective institutions.

Objective

The present study is aimed at investigating the extent of knowledge of risk factors and the awareness of related symptoms about cervical cancer and to analyze the attitude and practices among the urban population of field practice area of UHTC of PMCH, Patna Bihar, India in terms of cervical cancer, its screening methodologies and HPV vaccination programmes.

MATERIALS AND METHODS

This was a cross-sectional descriptive study conducted at the field practice area of UHTC of PMCH, Patna from February to June 2025 The study included a total of 385 female participants, all of whom were mothers of school-aged children. The sample size was calculated using the formula for single population proportion based on a 95% confidence interval, 5% margin of error, and an assumed prevalence of adequate knowledge regarding cervical cancer of 50% (to yield the maximum sample size). Using the formula: $\mathbf{n = Z^2 \times p \times (1-p)/d^2}$, where Z=1.96,p=0.5,and d=0.05, The minimum required sample size was calculated to be 385 participants. A non-probability consecutive sampling technique was employed to recruit participants. Only female respondents were recruited for this study to focus specifically on maternal awareness and influence over children's health decisions, especially those relating to female reproductive health. Non-probability consecutive sampling was used to recruit participants who met the inclusion criteria. Mothers visiting selected schools for parent-teacher meetings or routine school events were invited to participate.

Inclusion Criteria

- Female participants who were biological mothers of school-going children aged 9 to 16 years.
- Willing to provide informed consent.
- Able to comprehend the questionnaire (Urdu or English).

Exclusion Criteria

- Mothers who were healthcare professionals or had a background in medical sciences.
- Those who refused consent or submitted incomplete questionnaires.

Data Collection

Data was collected using a structured, pre-tested questionnaire developed after reviewing similar KAP studies. The questionnaire was divided into four sections: demographic information, knowledge about cervical cancer and HPV, attitudes towards vaccination and screening, and current practices related to prevention. Trained data collectors administered the questionnaires in person at selected

schools. Participants were informed about the purpose of the study and assured of confidentiality and anonymity. Each respondent was given adequate time to complete the questionnaire.

Data Analysis

Collected data were entered and analyzed using SPSS version 25. Descriptive statistics such as frequencies, percentages, means, and standard deviations were used to summarize the data. Associations between demographic variables and KAP scores were assessed using chi-square tests with a p-value < 0.05 considered statistically significant.

RESULTS

Among 385 participants, age distribution was fairly even: 123 (31.9%) were aged 18–30, 133 (34.5%) were 30–50, and 129 (33.5%) were above 50 years. A slight majority were divorced or separated (208; 54.0%) compared to 177 (46.0%) married. Hindu women dominated the sample (226; 58.7%), followed by Sikhs and Christians (14.0% each), with Muslims comprising only 13.5%. Educational levels were mixed: 86 (22.3%) had graduate/postgraduate degrees, while 106 (27.6%) had only primary or no formal education. Most were unemployed/housewives (142; 36.9%) or government employees (91; 23.6%). Income was equally split across brackets, with ~33% in each. A notable 179 (46.5%) had a family history of cancer, and 202 (52.5%) did not have their child's vaccination records available, raising concern about routine immunization adherence.

Table 1: Socio-demographic Characteristics of the Study Population (n = 385)

Variable	Category	Number (n)	Percentage (%)
Age of Mother (in years)	18–30	123	31.9
	30–50	133	34.5
	50 and Above	129	33.5
Marital Status	Married	177	46.0
	Divorced/Separated	208	54.0
Religion	Muslim	52	13.5
	Hindu	226	58.7
	Sikh	54	14.0
	Christian	54	14.0
Education	Graduate or Postgraduate	86	22.3
	Intermediate	75	19.5
	High School Certificate	65	16.9
	Middle School Certificate	54	14.0
	Primary School Certificate	53	13.8
	Illiterate	53	13.8
Occupation	Employed Govt. Sector	91	23.6
	Employed Private Sector	81	21.0
	Business Owner/Self-employed	71	18.4
	Unemployed/Housewife	142	36.9
Monthly Income	< ₹50,000	131	34.0
	₹50,000–₹1,00,000	127	33.0
	> ₹1,00,000	127	33.0
Family History of Cancer	Yes	179	46.5
	No	206	53.5
Child Vaccination Record	Yes	183	47.5
	No	202	52.5

Awareness was relatively high: 300 (77.9%) had heard of cervical cancer. Risk factors were moderately recognized—poor hygiene (234; 60.8%), low SES (247; 64.2%), HPV infection (239; 62.1%), and early sexual activity (213; 55.3%). Knowledge of HPV-related conditions varied: genital warts (267; 69.4%) were most recognized, while penile cancer (176; 45.7%) and head/neck cancer (179; 46.5%) were least. Screening knowledge was partial—only 58.4% were aware of the PAP smear. Though 247 (64.2%) knew a vaccine exists, only 199 (51.7%) identified the correct age group (9–26 years), and fewer knew that screening is still needed post-vaccination (58.4%). Importantly, only 108 (28.1%) reported school-based awareness programs, highlighting a gap in early education. Several of these knowledge differences were statistically significant ($p < 0.05$).

Table 2: Knowledge Regarding Cervical Cancer and HPV Vaccination (n = 385)

Variable	Response	Number (n)	Percentage (%)
Awareness of Cervical Cancer	Yes	300	77.9
Commonly affected age group	9–26 years	199	51.7
Poor hygiene as risk factor	Yes	234	60.8
Low socioeconomic status	Yes	247	64.2
Hereditary factor	Yes	204	53.0
Smoking	Yes	225	58.4
Oral contraceptive use	Yes	201	52.2
Early sexual activity	Yes	213	55.3

Multiple sexual partners	Yes	195	50.6
Genital infection (HPV)	Yes	239	62.1
Multiple pregnancies	Yes	213	55.3
HPV-related genital warts	Yes	267	69.4
HPV-related cutaneous warts	Yes	183	47.5
HPV-related vulval cancer	Yes	204	53.0
HPV-related anal cancer	Yes	193	50.1
HPV-related oral cancer	Yes	184	47.8
HPV-related head/neck cancer	Yes	179	46.5
HPV-related penile cancer	Yes	176	45.7
Foul vaginal discharge	Yes	250	64.9
Post-coital bleeding	Yes	193	50.1
Postmenopausal bleeding	Yes	183	47.5
Irregular bleeding	Yes	204	53.0
Weight loss	Yes	179	46.5
Pain after intercourse	Yes	218	56.6
No symptoms	Yes	151	39.2
Aware of PAP smear	Yes	225	58.4
Aware of VIA	Yes	193	50.1
Aware of VILI	Yes	183	47.5
Aware of Liquid-Based Cytology	Yes	179	46.5
Aware of HPV test	Yes	199	51.7
HPV detectable in asymptomatic	Yes	204	53.0
Cervical cancer treatable early	Yes	279	72.5
HPV vaccine available	Yes	247	64.2
Ideal age for HPV vaccine	9–26 years	199	51.7
Vaccines available in India	Both	97	25.2
Vaccine for sexually active females	Yes	183	47.5
Vaccine for infected females	Yes	166	43.1
Screening still needed after vaccine	Yes	225	58.4
Vaccine during pregnancy	Yes	140	36.4
Only adolescent girls need HPV vaccine	Yes	130	33.8
Boys eligible for HPV vaccine	Yes	199	51.7
Awareness program at child's school	Yes	108	28.1

p < 0.05*

Attitudes were split: while 87 (22.6%) strongly agreed cervical cancer is common, 101 (26.2%) disagreed. Only 110 (28.6%) strongly supported screening for all women aged 30–65, and 97 (25.2%) strongly agreed to undergo screening after learning its importance. Willingness to receive free HPV vaccination was higher, with 122 (31.7%) strongly agreeing. Overall, attitudes reflected moderate optimism but substantial hesitation, particularly regarding personal commitment to screening and vaccination. Statistical analysis showed no significant differences ($p \geq 0.05$), indicating uniformly distributed attitudes across subgroups.

Table 3: Attitude Regarding Cervical Cancer and HPV Vaccination (n = 385)

Statement	Response	Number (n)	Percentage (%)
Cervical Cancer is a common cancer in women in India	Strongly agree	87	22.6
	Agree	109	28.3
	Disagree	101	26.2
	Strongly disagree	54	14.0
Any woman can develop Cervical Cancer	Strongly agree	102	26.5
	Agree	93	24.2
	Disagree	91	23.6
	Strongly disagree	49	12.7
All women aged 30–65 should be screened	Strongly agree	110	28.6
	Agree	106	27.5
	Disagree	88	22.9
	Strongly disagree	54	14.0
Will go for screening after knowing its role	Strongly agree	97	25.2
	Agree	113	29.4
	Disagree	91	23.6
	Strongly disagree	52	13.5
Will go for HPV vaccination if free	Strongly agree	122	31.7
	Agree	107	27.8
	Disagree	89	23.1
	Strongly disagree	47	12.2

p ≥ 0.05

Half of the participants reported being screened (199; 51.7%) or having a family member screened (198; 51.4%). However, only 183 (47.5%) had received the HPV vaccine and 161 (41.8%) had completed the full series. Similarly, only 174 (45.2%) reported their child being vaccinated and just 159 (41.3%) had completed the series. Awareness program participation was low at 129 (33.5%), and only 144 (37.4%) had consulted a doctor for genital infections or STDs. On a positive note, 336 (87.3%) used clean

menstrual hygiene materials. Among those unvaccinated, the main barriers were lack of awareness (111; 28.8%), lack of symptoms (105; 27.3%), and cost (83; 21.6%). No significant associations were observed in practice variables ($p \geq 0.05$), suggesting widespread gaps regardless of background.

Table 4: Practice Regarding Cervical Cancer and HPV Vaccination (n = 385)

Variable	Response	Number (n)	Percentage (%)
Family member screened for Cervical Cancer	Yes	198	51.4
You have been screened	Yes	199	51.7
You received HPV vaccine	Yes	183	47.5
You completed HPV vaccine series	Yes	161	41.8
Child vaccinated against HPV	Yes	174	45.2
Child completed HPV vaccination	Yes	159	41.3
Participated in awareness program	Yes	129	33.5
Consulted doctor for genital infection/STDs	Yes	144	37.4
Used clean menstrual hygiene	Yes	336	87.3
Reason for not being vaccinated	Lack of awareness	111	28.8
	Lack of symptoms	105	27.3
	Lack of interest	87	22.6
	Cost	83	21.6
	Fear of adverse effects	77	20.0
	You are vaccinated	53	13.8

p ≥ 0.05

DISCUSSION

This study evaluated the knowledge, attitude, and practices (KAP) of 358 mothers regarding cervical cancer and HPV vaccination, highlighting critical gaps and revealing potential leverage points for public health interventions. The results indicate that though the moderate degree of awareness is reached in relation to cervical cancer, there still exist some major miscommunications and obstacles, especially in the areas of HPV spread, vaccine use, and screening measures to prevent cervical cancer.[10] Knowledge component revealed that most of the participants (77.9) were aware of the existence of cervical cancer, but there was a failure to comprehend in-depth about risk factors, signs, and prevention strategies. Poor hygiene and early sexual intercourse, as well as multiple pregnancies, are some such factors which many of the participants have rightly identified as leading to increased risk.[11] But there was a strong difference towards knowledge about less talked about risk factors like smoking, hereditary abnormality, or use of oral contraceptives. Moreover, the awareness of HPV-relevant pre-conditions, including penile cancer, head and neck cancer, and vulval cancer, was poorer than it should have been, which implied the necessity of a more extensive HPV education.[12]

Knowledge about screening instruments was relatively poor as well. Although 58.7% of them knew about the PAP smear test, other methods used and that are more cost-effective such as VIA (Visual Inspection with Acetic Acid) and VILI (Visual Inspection with Lugol s Iodine) awareness was low.[13] This is reflected in other LMICs where screening with cytology is not widely used because of insufficient awareness, or inaccessibility or both. As regards attitude, answers were more positive. Most mothers strongly agreed or agreed that the cervical cancer screening is necessary and there is a prophylactic role of vaccination [14]. Furthermore, some also revealed that they would be willing to get screened or inoculated as long as they have been given enough information, or they made it free. With this good attitude, even having little information, indicates that it is possible to affect the behavior through a set of awareness campaigns and school-based programs. But practical encounter did not coincide too well with these attitudes.[15] The screening was done in just above half of all the mothers or their relatives. The uptake of HPV vaccine was low (47.5 percent among mothers; 45.3 percent among children) and fewer of them had received the full series of vaccination. This discrepancy between attitude and practice correlates with the existing evidence on South Asian women where financial issues, culture, and physical barriers (e.g. distance to healthcare providers, or a lack of healthcare providers that are women) are the main obstacles.[16]

Amongst the especially notable findings, the absence of institutional support was mentioned. At school, there was a failure to establish awareness programs about HPV in 72.1% of the mothers, which demonstrated the potential of the lack of public health advocacy.[17] Moreover, even though 87.2% of study participants have declared the use of clean sanitary protection, which displays the primary knowledge of reproductive hygiene, it still did not impact proper gynaecological visits and vaccination choices. In all, this paper supports the argument that multipronged approaches beyond creating awareness will support the need to normalize sexual and reproductive health discussions. The educational component of cervical cancer can also be embedded in maternal and child health activities, low-cost HPV-vaccination campaigns, and outreach programs by community health workers in both urban and rural areas, which can greatly improve KAP. In particular, the low-literacy groups deserve special and more targeted interventions as fear of adverse effects and misinformation remains a strong prevention factor.

CONCLUSION

It is concluded that although mothers of school-aged children exhibit generally positive attitudes toward cervical cancer prevention and HPV vaccination, their depth of knowledge and actual preventive practices remain insufficient. Awareness of specific risk factors, symptoms, and screening modalities was suboptimal, and HPV vaccine uptake among both mothers and their children was notably low. This disconnect between attitude and practice underscores the urgent need for targeted health education initiatives. Strengthening school-based awareness programs, integrating cervical cancer education into maternal health services, and ensuring affordable access to HPV vaccination are essential steps. Empowering mothers with accurate, actionable knowledge will not only enhance vaccine acceptance and screening compliance but also play a crucial role in reducing the long-term burden of cervical cancer in the community.

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