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Parental Knowledge and Motivation in HPV Vaccination Decision-Making for Cervical Cancer Prevention Among Children

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ABSTRACT

Cervical cancer remains one of the leading causes of mortality among women in Indonesia, with persistent challenges in preventive efforts. Vaccination against the Human papillomavirus (HPV) is recognized as an effective primary prevention strategy to reduce the incidence of cervical cancer. However, HPV vaccination coverage among school-aged children in Indonesia remains suboptimal, partly due to limited parental awareness and varying levels of motivation. This study aimed to examine the relationship between parental knowledge of cervical cancer prevention and parental motivation toward HPV vaccination in children. A quantitative analytical study with a cross-sectional design was conducted among parents of female students in grades five and six at SD Negeri 5 Kresnomulyo, Pringsewu. A total of 67 respondents were recruited using a total sampling technique. Data were collected through validated questionnaires assessing knowledge and motivation levels and were analyzed using the Chi-square test. The findings demonstrated a statistically significant association between parental knowledge and motivation toward HPV vaccination ($p < 0.001$). These results suggest that improving parental knowledge through structured and targeted health education programs may strengthen motivation and increase acceptance of HPV vaccination as an essential preventive measure against cervical cancer.

Keywords: Knowledge; Motivation; Cervical Cancer; HPV Vaccination; Children

INTRODUCTION

Cervical cancer remains a major public health problem and is one of the most common cancers affecting women worldwide. According to the World Health Organization, cervical cancer ranks as the fourth most common cancer among women globally, with more than 600,000 new cases and over 300,000 deaths reported annually, particularly in low- and middle-income countries (WHO, 2022; Bruni et al., 2021). In Indonesia, cervical cancer is consistently reported as one of the leading cancers among women, with incidence rates that continue to increase, indicating that current preventive efforts have not yet achieved optimal outcomes (Kemenkes RI, 2024).

Most cases of cervical cancer are caused by persistent infection with high-risk human papillomavirus (HPV), especially types 16 and 18. HPV infection is often asymptomatic and may persist for prolonged periods, leading to precancerous cellular changes and eventual cancer development if not prevented early (Arbyn et al., 2020).

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Cervical cancer prevention strategies include primary prevention through HPV vaccination, secondary prevention via early detection methods such as visual inspection with acetic acid (VIA) and Pap smear screening, and tertiary prevention through treatment. Among these approaches, HPV vaccination is recognised as the most effective strategy, as it prevents HPV infection before precancerous changes occur (Kemenkes RI, 2024).

In Indonesia, HPV vaccination has been implemented through the School-Based Immunization Program (BIAS), targeting primary school–aged girls to provide early protection. Despite this initiative, vaccination coverage remains suboptimal due to several barriers, including limited parental knowledge, concerns about vaccine safety, and the influence of misinformation related to vaccination (Sari et al., 2022; Putri et al., 2023).

Parents play a crucial role in decision-making related to their children's health, including decisions regarding vaccination. According to health behavior theory, knowledge is a predisposing factor that influences an individual's attitudes, motivation, and behavior (Notoatmodjo, 2018). Parents with a good level of knowledge about cervical cancer and HPV vaccination tend to have more positive attitudes and higher motivation to support HPV vaccination (Rahmawati et al., 2021).

Several previous studies have shown that low HPV vaccination coverage is closely associated with insufficient parental knowledge and motivation (Putri et al., 2023; Sari et al., 2022). Therefore, this study is important to analyze the relationship between parental knowledge of cervical cancer prevention and parental motivation toward HPV vaccination for their children, as a basis for planning health education interventions. High-risk HPV infection, particularly types 16 and 18, contributes to more than 70% of cervical cancer cases worldwide (WHO, 2022). This infection is often asymptomatic, resulting in many patients being diagnosed only at an advanced stage.

Efforts to prevent cervical cancer can be undertaken through primary, secondary, and tertiary prevention. Primary prevention is achieved through HPV vaccination, secondary prevention through screening methods such as visual inspection with acetic acid (VIA) and Pap smear, and tertiary prevention through the treatment of cervical cancer (Cohen et al., 2019; Kemenkes RI, 2024). Among these three approaches, HPV vaccination is considered the most effective strategy because it can prevent HPV infection before the development of cancerous cellular changes.

The Indonesian government has implemented the HPV vaccination program through the School-Based Immunization Month (Bulan Imunisasi Anak Sekolah/BIAS), targeting girls of primary school age. This program aims to provide early protection before children are exposed to HPV. However, the implementation of HPV vaccination in the field continues to face various barriers, including limited parental understanding, concerns about vaccine side effects, and the influence of inaccurate information related to vaccination (Putri et al., 2023).

Parents play a central role in determining vaccination decisions for their children, and these decisions are strongly influenced by parental knowledge and motivation (Brumbaugh et al., 2025). According to health behaviour theory, knowledge functions as a predisposing factor that shapes attitudes and motivation toward healthy behaviours (Notoatmodjo, 2018). In this study, the relationship between parental knowledge and motivation is grounded in the Health Belief Model (HBM), which posits that knowledge influences individuals' perceptions of susceptibility, severity, benefits, and barriers, thereby shaping motivation and subsequent health-related decision-making. In the context of HPV vaccination, adequate parental knowledge may enhance motivation to support vaccination by increasing perceived benefits and reducing perceived barriers, ultimately influencing parental consent and engagement in school-based vaccination programmes (Marliana et al., 2023).

Although the association between parental knowledge and motivation has been well documented in health behaviour literature, empirical evidence examining this relationship in the context of HPV vaccination for cervical cancer prevention remains limited, particularly in relation to parental decision-making. This study, therefore, provides confirmatory evidence that strengthens existing theoretical frameworks while offering context-specific insights that extend beyond local replication. By focusing

on rural and semi-urban settings in Indonesia, the findings contribute empirical evidence to support school-based HPV vaccination programmes and highlight the importance of parental engagement in the successful implementation of these initiatives.

METHODS

This study employed a quantitative research design using an analytic survey with a cross-sectional approach. The study was conducted at SD Negeri 5 Kresnomulyo, Pringsewu Regency, in 2024. The study population consisted of all parents of female students in grades V and VI, totaling 67 respondents. A total sampling technique was applied; therefore, the entire population was included as the research sample (Sugiyono, 2020).

The research instrument was a structured questionnaire consisting of two sections: a knowledge questionnaire and a parental motivation questionnaire. The knowledge questionnaire assessed understanding of cervical cancer, including its definition, risk factors, signs and symptoms, prevention efforts, and the benefits of HPV vaccination. Responses to the knowledge questionnaire were scored using a dichotomous system, in which "Yes/Know" was assigned a score of 1 and "No/Do not know" was assigned a score of 0. The total knowledge score was converted into a percentage and classified into three categories: good knowledge (76–100%), moderate knowledge (56–75%), and poor knowledge (≤55%) regarding cervical cancer prevention.

The parental motivation questionnaire covered aspects of internal motivation (awareness and perceived benefits) and external motivation (support from health professionals, schools, and the social environment). Parental motivation was categorised into two levels based on the total questionnaire score. A total score of 21–40 indicated strong motivation, whereas a score of 10–20 indicated weak motivation.

The research instruments underwent validity and reliability testing prior to data collection. The knowledge questionnaire demonstrated acceptable validity based on Pearson product–moment correlation, with all items showing r_calculated values greater than the r_table (0.339; n = 33), and good reliability (Cronbach's alpha = 0.810). The motivation questionnaire showed good reliability based on the Kuder–Richardson formula (KR-20), with a coefficient of $\alpha = 0.832$, exceeding the acceptable threshold of 0.70.

Data were collected after obtaining informed consent from all respondents. Data analysis was performed using univariate analysis to describe frequency distributions and bivariate analysis using the Chi-square test to examine the relationship between parental knowledge and motivation, with a significance level of 0.05 (Dahlan, 2020). All assumptions for the Chi-square test were met, as no cells had an expected count less than 5 and the minimum expected count was 8.36. This study received ethical approval with protocol number 690/22/08/2025.

RESULT AND DISCUSSION

The results showed that the majority of respondents had a low level of knowledge regarding cervical cancer prevention. This finding indicates that the information received by parents about cervical cancer and HPV vaccination remains limited. In addition, most respondents demonstrated low motivation toward providing HPV vaccination for their children.

Table 1 shows that most respondents were aged 32–39 years, had a secondary education (SMA/SMK), and were homemakers. This indicates that respondents were generally of productive age and played a key role in family health decision-making, including cervical cancer prevention and HPV vaccination for their children.

Table 2 analysis of knowledge levels revealed considerable variation among respondents, with some demonstrating good, moderate, and poor knowledge. These findings suggest that parental knowledge regarding cervical cancer prevention and HPV vaccination remains uneven. Table 3 illustrates that the

majority of respondents had weak motivation toward HPV vaccination, while a smaller proportion showed strong motivation. This highlights the need for targeted health education and promotion strategies to enhance parental motivation to support HPV vaccination.

Bivariate analysis was conducted to examine the relationship between knowledge of cervical cancer prevention and parental motivation toward HPV vaccination for their children. The chi-square test yielded the following results:

Table 1. Respondent Characteristics

Respondent Characteristics	n	%
Age		
32-39 years	32	47.8
40-46 years	27	40.3
47-52 years	8	11.9
Education Level		
Primary school	2	3.0
Junior high school	11	16.4
Senior high school/vocational school	49	73.1
Diploma	4	6.0
Bachelor's degree	1	1.5
Occupation		
Laborer	18	26.9
Housewife	38	56.7
Migrant worker	3	4.5
Trader	5	7.5
Nurse	1	1.5
Midwife	2	3.0
Total	**67**	**100.0**

Table 2. Knowledge of Cervical Cancer Prevention

Knowledge Level	n	(%)
Good	22	32.8
Moderate	20	29.9
Poor	25	37.3
Total	**67**	**100**

Table 3. Parental Motivation Toward HPV Vaccination

Parental Motivation	n	%
Strong motivation	28	41.8
Weak motivation	39	58.2
Total	**67**	**100**

The results indicate a significant association between parental knowledge of cervical cancer prevention and motivation toward HPV vaccination, with most parents who had good knowledge demonstrating strong motivation, while those with poor knowledge predominantly exhibited weak motivation ($p < 0.001$), as presented in Table 4. Descriptively, the majority of respondents had poor knowledge and weak motivation, suggesting that many parents still lack a comprehensive understanding of the benefits of HPV vaccination. Limited knowledge may be influenced by restricted access to

reliable information sources, insufficient health education activities, and persistent concerns regarding vaccine safety and potential side effects, which may further hinder parental willingness to vaccinate their children. Limited knowledge may be influenced by restricted information sources, insufficient health education activities, and persistent concerns regarding vaccine safety (Smolarczyk et al., 2022).

Table 4. Relationship Between Knowledge of Cervical Cancer Prevention and Parental Motivation Toward HPV Vaccination for Children

Knowledge Level Good Moderate	Parental Motivation				Total		*p-value*	OR
	Strong motivation		Weak motivation					
	n	%	N	%	n	%		
Poor	19	86.4	3	13.6	22	32.8	<0.001	33.706
Knowledge Level	7	35.0	13	65.0	20	29.9		
Good	2	8.0	23	92.0	23	37.3		
Total	28	41.8	39	58.2	67	100		

Knowledge is a predisposing factor that shapes health-related attitudes and motivation, highlighting its role in fostering preventive health behaviors (Notoatmodjo, 2018). Parents with better understanding of cervical cancer and HPV vaccination are more likely to be motivated to vaccinate their children, highlighting the role of knowledge in fostering preventive health actions (Kolek et al., 2022). However, it should be noted that this study measured motivation, not actual vaccination behavior; thus, the results indicate associations rather than causal effects on vaccination uptake.

Respondent characteristics also contributed to these findings. Most were aged 32–39 years and had secondary education levels, which may limit their capacity to fully comprehend medical information. Additionally, as most respondents were homemakers, access to health information may depend largely on schools, social media, or healthcare providers. Inadequate or unclear delivery of information may further reduce motivation to participate in vaccination programs (Adeyanju et al., 2021).

These findings align with previous studies (Febiana, 2024; Safitri, 2023; Putri et al., 2024), which similarly identified parental knowledge, educational level, family support, and health worker–led socialization as key determinants of HPV vaccination motivation.

The relatively low parental motivation observed underscores the need for intensified and structured health education interventions. Misconceptions, such as the belief that HPV vaccination is only for adult women, highlight the importance of clear, age-appropriate messaging (Sitaresmi et al., 2020). Nurses, in particular, play a strategic role in delivering community-based education through schools, home visits, and collaboration with primary healthcare centres, aiming to strengthen parental engagement and support long-term cervical cancer prevention efforts.

The findings demonstrate a significant association between parental knowledge and motivation to support HPV vaccination for their children. However, because this study employed a cross-sectional design, causal relationships cannot be established. The relatively small sample size and the use of self-administered questionnaires may also limit the generalizability of the results and introduce potential information bias. These considerations indicate that the results should be interpreted cautiously within the specific context of the study setting.

CONCLUSION

This study demonstrates that the majority of respondents had limited knowledge of cervical cancer prevention and that parental motivation toward HPV vaccination for their children was generally low. Statistical analysis revealed a significant association between parental knowledge and motivation ($p < 0.001$), indicating that respondents with higher levels of knowledge were more likely to exhibit stronger motivation to support HPV vaccination.

These findings provide confirmatory, context-specific evidence on the relationship between parental knowledge and motivation in rural and semi-urban settings in Indonesia. While actual vaccination

behavior was not measured, the results suggest that enhancing parental knowledge and addressing motivational factors may be important considerations for designing educational and engagement strategies. Such insights can inform nurses, public health practitioners, and policymakers in planning supportive interventions to encourage informed decision-making regarding HPV vaccination.

Healthcare facilities are encouraged to strengthen structured educational programs for parents on cervical cancer prevention and the importance of HPV vaccination through regular counseling sessions and the use of clear, accessible informational media. Healthcare providers, particularly nurses and midwives, should adopt a more proactive role in delivering counseling to parents during every maternal and child health service encounter to enhance motivation for HPV vaccination. The involvement of educational institutions and schools as partners in health promotion should also be reinforced through parent meetings, with support from primary healthcare centers and local policymakers to integrate HPV vaccination education into existing promotive and preventive programs.

Future initiatives should take into account sociocultural and religious considerations, as well as the impact of misinformation, which were not empirically examined in this study. Addressing these factors may help reduce potential barriers and promote more effective parental engagement in HPV vaccination programs.

Declaration Of Generative Ai

During the preparation of this manuscript, the author(s) used OpenAI's ChatGPT to assist with language enhancement and improve overall clarity. The tool was utilized solely for linguistic refinement, while all scientific content, data analysis, and interpretations remain the full responsibility of the author(s).

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