Indonesian Journal of Global Health Research
Volume 6 Number 6, December 2024
e-ISSN 2715-1972; p-ISSN 2714-9749
http://jurnal.globalhealthsciencegroup.com/index.php/IJGHR

DETERMINANTS ASSOCIATED WITH THE FIRST DOSE OF HPV VACCINATION AMONG ELEMENTARY SCHOOL CHILDREN

Eva Dorista[1]*, Fahmi Ichwansyah[1,2], Hermansyah[3], Aripin Ahmad[4], Asnawi Abdullah[1]
[1]Master of Public Health, Universitas Muhammadiyah Aceh, Jl. Muhammadiyah No.91, Batoh, Lueng Bata, Banda Aceh, Aceh 23123 Aceh, Indonesia
[2]Poltekkes Kemenkes Aceh, Jl. Soekarno - Hatta, Lagang, Darul Imarah, Aceh Besar, Aceh 23231, Indonesia
[3]Department of Nutrition, Poltekkes Kemenkes Aceh, Jl. Soekarno - Hatta, Lagang, Darul Imarah, Aceh Besar, Aceh 23231, Indonesia
[4]Nursing Department, Poltekkes Kemenkes Aceh, Jl. Soekarno - Hatta, Lagang, Darul Imarah, Aceh Besar, Aceh 23231, Indonesia
*eva.dorista@gmail.com

ABSTRACT
Cervical cancer is the second leading cause of death among women in Indonesia. This health issue is actually preventable through HPV vaccination, which can be administered to 5th-grade elementary school children. Several factors influence parents' decisions not to allow their children to receive the first dose of the HPV vaccine. The aim of this study was to analyze the determinants associated with the first dose of HPV vaccination among elementary school children. This study employed a quantitative research design with a cross-sectional approach. The sample consisted of 281 mothers of 5th-grade elementary school children. Data were collected at elementary schools in Sigli City by distributing questionnaires from December 20–28, 2023. Quantitative data were analyzed using multiple logistic regression at a significance level of α=0.05 and a 95% confidence interval. The results showed that 258 children (91.81%) did not receive the HPV vaccine. Factors associated with the first dose of HPV vaccination among elementary school children were knowledge (OR=6.46; 95% CI=1.87–22.2), attitude (OR=2.74; 95% CI=1.04–7.18), concern (OR=3.31; 95% CI=1.09–10.00), and lack of utilization of information sources (OR=3.30; 95% CI=1.00–10.83). Factors not associated with the first dose of HPV vaccination included perception (OR=1.20; 95% CI=0.50–2.84), school support (OR=1.44; 95% CI=0.54–3.78), cultural beliefs (OR=1.12; 95% CI=0.47–2.63), and non-electronic media sources (OR=1.46; 95% CI=0.46–4.65). The most dominant factor associated with the first dose of HPV vaccination was poor knowledge (AOR=11.95; 95% CI=1.90–72.47).

Keywords: attitude; concerns; HPV vaccination; immunization sources; knowledge

How to cite (in APA style)
Dorista, E., Ichwansyah, F., Hermansyah, H., Ahmad, A., & Abdullah, A. (2024). Determinants Associated with the First Dose of HPV Vaccination among Elementary School Children. Indonesian Journal of Global Health Research, 6(6), 4349-4360. https://doi.org/10.37287/ijghr.v6i6.5206.

INTRODUCTION

Cervical cancer is the second leading cause of cancer-related deaths and one of the largest healthcare burdens in Indonesia. According to 2021 data from Globocan, there were 36,633 cases of cervical cancer in Indonesia, with mortality rates continuing to rise. This condition is preventable through the administration of the Human Papillomavirus (HPV) vaccine (WHO, 2023). Specifically, the 90-70-90 target aims for 90% of girls to have received a complete HPV vaccination by age 15, 70% of women to undergo high-performance screening by ages 35 and 45, and 90% of women diagnosed with cervical cancer to receive treatment (WHO, 2022).As of June 2020, 107 (55%) of the 194 WHO Member States had implemented HPV vaccination programs. The Americas and Europe have the highest implementation rates at 85% and 77%, respectively. Low- and middle-income countries generally perform better in administering the first dose compared to high-income countries. However, second-dose completion rates are lower due to higher dropout rates. Only 5 (6%) countries achieved final dose coverage exceeding 90%, 22 countries (21%) reached ≥75% coverage, and 35 countries (40%) had coverage below 50%. In 2019, global HPV vaccine final dose coverage was

estimated at 15% (Bruni et al., 2021). The global first-dose HPV coverage for girls increased from 16% in 2021 to 21% in 2022 (WHO, 2023).

Despite this progress, HPV vaccination coverage in Indonesia has not yet met the target. In 2022, HPV vaccination for 5th- and 6th-grade elementary school children remained suboptimal. Among provinces, only DKI Jakarta, Central Java, DI Yogyakarta, East Java, and Bali reached the 90% target. Provinces such as North Sulawesi, South Sulawesi, Southeast Sulawesi, and Gorontalo fell below the target (Kompas, 2023).In 2022, eight provinces in Indonesia failed to achieve 70% coverage for follow-up immunization among elementary school-aged children. Aceh is one of the provinces with a follow-up immunization coverage below 30% (Kemenkes RI, 2023). In 2023, HPV vaccines were introduced as part of follow-up immunizations for elementary school children across all 34 provinces, including Aceh. The government collaborated with the education sector to integrate HPV vaccination into the School Health Program (BIAS) as part of school-based health efforts (WHO, 2023). However, HPV immunization coverage in Indonesia remains significantly low, including in Pidie District.

Data from the Pidie District Health Office indicate that only 12.17% of 5th-grade students (from a total of 3,822 students) received the HPV vaccine. In Sigli City, the capital of Pidie District, HPV immunization coverage is also low. Among 281 5th-grade students, only 23 (8.19%) received parental consent for HPV vaccination.Several studies have highlighted that parental knowledge and attitudes influence HPV vaccination for children (Siarni & Dewi, 2023; Fitriani et al., 2018; Khatiwada et al., 2021). Other factors, such as income, family support, perceived seriousness and susceptibility, and perceived benefits, have also been found to enhance HPV vaccination rates (Fitriani et al., 2018). According to Azh et al. (2021), low parental knowledge about HPV and its vaccine contributes to a lack of maternal intention to vaccinate their children. Additionally, the high cost of the vaccine and economic challenges are significant barriers to HPV vaccination (Azh et al., 2021). A study in France found that 38.6% of mothers reported their daughters had received at least one dose of the HPV vaccine. Factors such as the child's age, concerns about HPV vaccine safety, knowledge, attitudes, maternal refusal of the HPV vaccine, and personal or family experiences after vaccination were associated with HPV vaccine uptake (Dib et al., 2022). Wijayanti et al. (2021) reported that attitudes, subjective norms, and perceived behavioral control were significant predictors of HPV vaccine uptake when the vaccine was provided free of charge to 5th- and 6th-grade girls in Jakarta since 2016.

Interviews conducted with 10 mothers of 5th-grade elementary school children revealed the following: Four mothers no longer allowed their children to receive the first dose of the HPV vaccine due to perceived side effects. Some mothers stated that they were unaware of the benefits of HPV immunization and only followed the school’s program. Three mothers did not permit their children to receive either the first or second dose of the vaccine, citing religious concerns and labeling the vaccine as haram (forbidden). This study aims to identify the determinants associated with the first dose of HPV vaccination among children.

METHOD

This research is a quantitative study with a cross-sectional approach, aimed at identifying the determinants associated with the first dose of HPV vaccination among elementary school children in Sigli City, Pidie District. Data collection was conducted simultaneously for both independent and dependent variables at a single point in time (Swarjana, 2016). The population in this study consisted of mothers with daughters in the 5th grade of elementary school in Sigli City, Pidie District, totaling 281 children. The sample was drawn from the same population using

a total sampling technique, resulting in 281 participants.This study utilized both primary and secondary data. Primary data were collected directly from the field through questionnaires distributed to mothers of 5th-grade elementary school students. Secondary data included information about HPV vaccination. Data collection was assisted by 10 enumerators who were immunization program coordinators. Questionnaires were distributed to respondents, using instruments adapted from prior studies, including Rahayu et al. (2020), Dethan & Suariyani (2017), Siarni & Dewi (2023), Wang et al. (2018), dan Zhang et al. (2013). Data analysis comprised univariate, bivariate, and multivariate analyses. Statistical tests were performed using logistic regression with a 95% confidence level. Variables with a p-value ≤ 0.25 in the bivariate analysis were included in the multivariate model.

RESULT

Tabel 1.
Distribution of characteristics of children and parents in Sigli City, Pidie Regency

Characteristics	f	%	Mean	SD	Min	Max
Child Age (Years)			10,26	0,48	10	12
Mother's Age (Years)	37,60	5,64	23	54		
Mother's Education						
High	81	28,83				
Middle	126	44,84				
Primary	58	20,64				
No School	16	5,69				
Mother's Occupation						
Formal	51	18,15				
Non-formal	46	16,37				
Not Working	184	65,48				
Father's Age (Years)			42,50	6,27	27	74
Father's Education						
High	83	29,54				
Middle	136	48,40				
Primary	49	17,44				
No school	13	4,63				
Father's Occupation						
Formal	88	31,32				
Non-formal	182	64,77				
Not working	11	3,91				
Income (Rupiah)			3.106.584	2.259.654	100.000	15.000.000
Number of Household Assistants (People)			4,25	1,09	2	10
Number of Children (Children)			2,30	1,08	1	8

Based on Table 1, the average age of children is 10.26 years, with a standard deviation of 0.48 years. The average age of mothers is 37.6 years, with the majority having a secondary education (126 individuals, 44.84%) and being unemployed (184 individuals, 65.48%). The average age of fathers is 42.50 years, with most having a secondary education (136 individuals, 48.40%) and working in non-formal sectors (182 individuals, 64.77%). The average household income is Rp. 3,106,584, with a standard deviation of Rp. 2,259,654. The average household size is 4.25 members, with a standard deviation of 1.09 members. The average number of children per household is 2.30, with a standard deviation of 1.08. The minimum number of children is 1, and the maximum is 8.

Table 2.

Distribution of independent variables and dependent variables in elementary school children in Sigli City, Pidie Regency

Variables	f	%	Mean	Median	SD	Min - Max
Mother's Knowledge			13,45	14,0	2,39	6 – 18
Good	151	53,74				
Not good	130	46,26				
Mother's Attitude			53,2	36,0	5,16	16 – 45
Positive	148	52,67				
Negative	133	47,33				
Mother's Perception			10,8	11,0	2,85	3 – 17
Good	147	52,31				
Not Good	134	47,69				
School Support			2,91	3.0	1,22	0 -5
Supportive	188	66,90				
Less Supportive	93	33,10				
Cultural Beliefs Mother			6,15	6,0	1,76	2 – 10
Good	127	45,20				
Not Good	154	54,80				
Mother's Concerns			5,12	5	2,40	0 – 12
No	171	60,85				
Yes	110	39,15				
Information Source						
Electronic Media	33	11,74				
Non-Electronic Media	92	32,74				
None	156	55,52				
HPV immunization dose 1						
Yes	23	8,19				
No	258	91,81				

Table 2 shows the following findings mothers with poor knowledge 130 individuals (46.26%), mothers with negative attitudes 133 individuals (47.33%), mothers with poor health perceptions 134 individuals (47.69%), mothers with poor health perceptions 134 individuals (47.69%), mothers with low cultural beliefs about health 154 individuals (54.80%), mothers who were concerned about their children receiving the HPV vaccine 110 individuals (39.15%), mothers who did not utilize HPV immunization information sources 156 individuals (55.52%), and children who did not receive the HPV vaccine 258 individuals (91.81%).

Table 3.
Factors related to HPV immunization dose 1 in elementary school children in Sigli City, Pidie Regency

Characteristics	Imunisasi HPV				OR (95%CI)	p-value
	Ada		Tidak ada			
	f	%	f	%		
Child Age					0,50 (0,23 – 1,08)	0,080
Mother's Age					1,01 (0,94 – 1,10)	0,621
Mother's Education						
High	14	17,28	67	82,72		
Middle	6	4,76	120	95,24	4,17 (1,53 – 11,38)	0,005
Primary	1	1,72	57	98,28	11,9 (1,51 – 93,30)	0,018
No School	2	12,50	14	87,50	1,46 (0,29 – 7,16)	0,639
Mother's Occupation						
Formal	12	23,53	39	76,47		
Non-formal	3	6,52	43	93,48	4,41 (1,15 – 16,70)	0,030
Not Working	8	4,35	176	95,65	6,76 (2,59 – 17,67)	0,000
Father's Age					1,05 (0,97 – 1,13)	0,179
Father's education						
High	12	14,46	71	85,54		

Characteristics	Imunisasi HPV				OR (95%CI)	p-value
	Ada		Tidak ada			
	f	%	f	%		
Middle	7	5,15	129	94,85	3,11 (1,17 – 8,26)	0,023
Primary	2	4,08	47	95,92	3,97 (0,85 – 18,55)	0,080
No school	2	15,38	11	84,62	0,92 (0,18 – 4,72)	0,930
Father's Occupation						
Formal	15	17,05	73	82,95		
Non-formal	7	3,85	175	96,15	5,13 (2,01 – 13,12)	0,001
Not working	1	9,09	10	90,91	2,05 (0,24 – 17,28)	0,507
Family Income					0,99 (0,99 – 0,99)	0,000
Number of Household Members					0,99 (0,67 – 1,46)	0,970
Number of children					0,96 (0,65 – 1,41)	0,847
Mother's Knowledge						
Good	20	13,25	131	86,75		
Not good	3	2,31	`127	97,69	6,46 (1,87 – 22,2)	0,003
Mother's Attitude						
Positive	17	11,49	131	88,51		
Negative	6	4,51	127	95,49	2,74 (1,04 – 7,18)	0,040
Mother's Perception						
Good	13	8,84	134	91,16		
Not Good	10	7,46	124	92,54	1,20 (0,50 – 2,84)	0,674
School Support						
Supportive	17	9,04	171	90,96		
Less Supportive	6	6,45	87	93,55	1,44 (0,54 – 3,78)	0,458
Cultural Beliefs Mother						
Good	11	8,66	116	91,34		
Not Good	12	7,79	142	92,21	1,12 (0,47 – 2,63)	0,791
Mother's Concerns						
No	19	11,11	152	88,89		
Yes	4	3,64	106	96,36	3,31 (1,09 – 10,0)	0,034
Mother Information Source						
Electronic Media	5	15,15	28	84,85		
Non-Electronic Media	10	10,87	82	89,13	1,46 (0,46 – 4,65)	0,518
None	8	5,13	148	94,87	3,30 (1,00 – 10,83)	0,049

Table 3 shows that the characteristic factors associated with HPV immunization in elementary school children in Sigli City, Pidie Regency, are mothers with secondary education (OR=4.17; 95%CI=1.53-11.38; p=0.005), mothers with primary education (OR=11.9; 95%CI=1.51-93.3; p=0.018), mothers with non-formal employment (OR=4.41; 95%CI=1.15-16.70; p=0.030), mothers without employment (OR=6.76; 95%CI=2.59-17.67; p=0.000), fathers with secondary education (OR=3.11; 95%CI=1.17-8.26; p=0.023), fathers with non-formal employment (OR=5.13; 95%CI=2.01-13.12; p=0.001) and parental income (OR=0.99; 95%CI=0.99-0.99; p=0.000). In addition, factors that are also related to HPV immunization in elementary school children in Sigli City, Pidie Regency are knowledge (OR=6.46; 95%CI=1.87-22.2; p=0.003), attitude (OR=2.74; 95%CI=1.04-7.18; p=0.040), concern (OR=3.31; 95%CI=1.09-10.00; p=0.034), and not utilizing information sources (OR=3.30; 95%CI=1.00-10.83; p=0.049).

Table 4.

The most dominant factors related to hpv immunization dose 1 in elementary school children in Sigli City, Pidie Regency

Variables	Model 1		Model 2		Model 3	
	OR (95%CI)	p-value	OR (95%CI)	p-value	OR (95%CI)	p-value
Mother's knowledge is not good			5,70 (1,60-20,31)	0,007	11,95 (1,97-72,47)	0,007
Negative Mother Attitude			2,41 (0,89-6,53)	0,082	2,85 (0,84-9,69)	0,092
The Worried Mother			2,25 (0,71-7,08)	0,163	5,47 (1,17-25,41)	0,030
Information Source; Non-Electronic Media			1,99 (0,57-6,87)	0,274	0,89 (0,16-4,79)	0,897
No source of information			3,31 (0,94-11,64)	0,061	1,66 (0,31-8,78)	0,546
Child Age	0,47 (0,18-1,17)	0,106			0,43 (0,14-1,31)	0,138
Father's Age	1,13 (1,02-1,26)	0,016			1,12 (0,99-1,25)	0,052
Income	0,99 (0,99-0,99)	0,001			0,99 (0,99-0,99)	0,004
Non-formal Mother's Work	2,49 (0,50-12,31)	0,261			5,66 (0,90-35,6)	0,065
Mother Does Not Work	4,64 (1,30-19,46)	0,017			10,56 (2,43-45,79)	0,002
Pseudo R2	0,2610		0,1431		0,3993	

Table 4 in model 3, the most dominant factor associated with HPV immunization dose 1 in grade V elementary school children in the Sigli City area of Pidie Regency is poor mothers (AOR = 11.95; 95% CI = 1.90-72.47; p = 0.007). Mothers with poor knowledge are 11.95 times more likely not to provide HPV immunization doses to children compared to mothers with good knowledge when other variables are constant. In model 3, it only explains 39.93% of the factors associated with HPV immunization dose 1 in grade V elementary school children in the Sigli City area of Pidie Regency.

DISCUSSION

Relationship between Parental Characteristics and HPV Immunization Dose 1 in Elementary School Children

Based on the research findings, the parental characteristics associated with the administration of the first dose of the HPV vaccine to children include the mother's education level (secondary and basic), the mother's occupation, the father's education level (secondary), the father's non-formal occupation, and the family income.This study aligns with the findings of Feiring et al. (2015), which demonstrated that higher maternal education levels were significantly associated with a lower likelihood of initiating HPV vaccination (highest education level compared to the lowest). Conversely, higher maternal income was significantly linked to a greater likelihood of initiating vaccination. Similarly, the father's education and income showed comparable relationships, albeit weaker.Likewise, a study by Kolek *et al.* (2022) revealed a negative correlation between parents' education levels and their willingness to vaccinate. The higher the parents' education level, the lower the willingness to vaccinate their children. Employment status and marital status were not found to be related to parents' willingness to vaccinate.

Parental education in the middle category can significantly aid in the ability to receive new information related to HPV vaccination. Consequently, parents are expected to provide informational support to their children (Wantini & Indrayani, 2020). According to Ganczak *et al.* (2018), parents with better educational backgrounds may have greater access to health-related information. However, television, the internet, and pamphlets, rather than medical staff, are often the primary sources of information for parents regarding HPV. These sources may include incomplete or inaccurate information.The researchers assume that there is a relationship between parental education and the administration of the HPV vaccine to elementary school children. Parental educational backgrounds greatly influence their attitudes and behaviors toward health prevention efforts for their children, including HPV vaccination. Higher education levels correlate with more positive perceptions of immunization. Additionally, parents with higher education levels are generally more open to new

information and more progressive regarding HPV vaccination. In contrast, parents with lower education levels tend to distrust the healthcare system and are more likely to believe in myths about immunization.

Factors Associated with HPV Immunization Dose 1 in Elementary School Children

The research findings indicate that factors associated with HPV vaccination in elementary school children in Sigli City, Pidie Regency include knowledge, attitudes, concerns, and underutilization of information sources. Mothers with poor knowledge are 6.46 times more likely not to provide the first dose of the HPV vaccine compared to mothers with good knowledge.This study aligns with research indicating a relationship between knowledge and positive decisions regarding HPV vaccination in children (Rancic et al., 2022). Similarly, a systematic review showed that knowledge about cervical cancer and the HPV vaccine remains low (Perlman et al., 2014). A review conducted in 2021 also found that public knowledge about cervical cancer and the use of cervical cancer screening is still low (Uchendu et al., 2021). This highlights that, year after year, public knowledge about cervical cancer remains a taboo subject for many parents.An individual's knowledge will influence their behavior once they understand the meaning and benefits of that behavior. Health behavior is determined by knowledge (Irwan, 2020). In this study, the concept of parental knowledge primarily includes understanding "who, where, and when" someone should be vaccinated and assessing the sufficiency or satisfaction with information about vaccination (López *et al.*, 2020).

Additionally, the study found that mothers with negative attitudes are 2.74 times more likely not to provide the first dose of the HPV vaccine compared to mothers with positive attitudes. This is consistent with research by Saragih et al. (2023) which showed a relationship between parents' attitudes and HPV vaccination. Lack of awareness negatively impacts mothers' behavior in preventing cancer for themselves and other family members (Saragih et al., 2023). Likewise, research by Marliana (2023) found that a positive attitude is 4.10 times more likely to lead to the use of HPV immunization services compared to a negative attitude.However, this study contrasts with research by Zaky (2020), which found no relationship between parents' attitudes and HPV vaccine acceptance. Similarly, another study found no correlation between general attitudes toward the HPV vaccine and parents' acceptance of it for their daughters (Frianto *et al.*, 2020).The study also found a relationship between mothers' concerns and the provision of the first dose of the HPV vaccine. Mothers who were concerned about vaccination were 3.31 times more likely not to give the HPV vaccine compared to mothers who were not concerned. This aligns with research by Mihretie et al. (2022) which showed that fear of HPV infection is significantly related to knowledge and willingness to use the HPV vaccine. Parents who fear contracting HPV are more likely to be willing to accept the HPV vaccine compared to parents who do not fear HPV infection (Mihretie et al., 2022). According to Kohler et al. (2023), mothers' concerns about administering the HPV vaccine are influenced by perceptions that their children are not sexually active, worries about potential side effects of the vaccine, and the desire for adolescents to be old enough to provide consent.

The study also found a relationship between mothers who do not utilize information sources and the administration of the first dose of the HPV vaccine. Mothers who do not use information sources are 3.30 times more likely not to give the HPV vaccine compared to mothers who utilize electronic media. This is consistent with research by Hurit (2022) which found a relationship between information sources and HPV vaccination. Similarly, research by Hanifah (2022) found a link between information sources and the provision of the HPV vaccine to children. Rodriguez *et al.* (2019) found that information strategies can influence vaccination intentions by increasing knowledge and awareness about HPV, though their

impact on actual HPV vaccination behavior is minimal. The most effective strategies to change vaccination behavior encompass many aspects. This is consistent with previous reviews (Walling *et al.*, 2016), which emphasized the effectiveness of interventions targeting both healthcare providers and patients. HPV vaccination behavior, actions, and attitudes are shaped by exposure to information and interactions with other community members (Turiho *et al.*, 2017).

Information sources are crucial in influencing knowledge about HPV vaccination (Li *et al.*, 2020). According to Szilagyi *et al.* (2020), sistem informasi imunisasi secara elektronik maupun manual efektif meningkatkan vaksinasi HPV. Namun, sumber informasi juga dapat mempengaruhi keyakinan orang tua dalam pemberian imunisasi HPV. both electronic and manual immunization information systems are effective in improving HPV vaccination rates. However, information sources can also influence parents' beliefs about HPV vaccination. McKenzie *et al.* (2023), stated that parents' beliefs about the negative impacts of HPV vaccination on children discourage them from seeking vaccination information.The main reason children do not receive the HPV vaccine is due to the child's own refusal, often because of fear of needles, even though parents are concerned about the potential consequences. Additionally, the father's role in prohibiting vaccination also has an impact. Parental fears about the consequences of not vaccinating their children, as well as resistance from children and spouses, are significant barriers to low HPV vaccination coverage. Schools also remain passive, as HPV vaccination is seen as a parental right. Mothers who are concerned about their children's health are more likely to take preventive measures, such as administering the HPV vaccine. The researchers hope that parents will increase their understanding of HPV vaccination and its health impacts, so they will consider vaccinating their children to prevent cervical cancer.

The Most Dominant Factors Associated with HPV Dose 1 Immunization in Elementary School Children

The results of this study indicate that the most dominant factor associated with the first dose of the HPV vaccine in children is knowledge. Mothers with poor knowledge are 11.95 times more likely not to provide the first dose of the HPV vaccine to their children compared to mothers with good knowledge, when other variables are held constant.This study is consistent with the research by Winarti & Silitonga (2020), which shows that knowledge plays a significant role in shaping attitudes toward cervical cancer prevention. Similarly, Dereje *et al.* (2021) found that good knowledge about HPV is 2.32 times more likely to lead to acceptance of the HPV vaccine. According to Siarni & Dewi (2023), parents' knowledge about the HPV vaccine influences their attitudes. This is in line with this study, which shows that good knowledge about cervical cancer and the HPV vaccine can motivate individuals to prevent cervical cancer by vaccinating their children. More than 50% of mothers answered questions about cervical cancer and the HPV vaccine correctly. This is the basis for concluding that knowledge is the most dominant factor related to HPV vaccination. Furthermore, good knowledge also affects mothers' attitudes and concerns, making them more confident in vaccinating their children.

An individual's behavior is shaped by their knowledge once they understand the meaning and benefits of that behavior. Health behaviors are determined by knowledge (Irwan, 2020). In this study, the concept of parental knowledge includes understanding "who, where, and when" someone should be vaccinated and evaluating the sufficiency or satisfaction with information about vaccination (López *et al.*, 2020).Knowledge should ideally reach the application level because the stages of knowledge—from awareness and understanding to application—reflect a person's actual condition. This leads to behaviors that align with their knowledge,

particularly regarding HPV vaccination and cancer in general (Perlman *et al.*, 2014).The researchers assume that there is a relationship between knowledge and the first dose of the HPV vaccine in children because as mothers' knowledge improves, they better understand the importance of the HPV vaccine for preventing cervical cancer, leading them to vaccinate their children. However, some mothers with good knowledge still do not vaccinate their children, likely due to concerns about potential side effects or the belief that their children are unlikely to develop sexual cancer since no family members have had such diseases.

CONCLUSION

The results of this study indicate that family support, whether emotional, instrumental, informational, or esteem, plays an important role in the treatment compliance of tuberculosis patients. Most respondents have insufficient family support, namely emotional support (68.2%), instrumental (68.2%), informational (70.5%), and esteem (59.1%). Meanwhile, treatment compliance is still low, with 33 respondents (75%) non-compliant. These data indicate a correlation between low family support and low levels of treatment compliance. Therefore, increasing the role of the family in providing comprehensive support to tuberculosis patients needs to be a focus in efforts to improve treatment compliance.

REFERENCES

Azh N., Hosseinzadeh K., Javadi A. & Gholami-Toranposhti S. (2021). Factors predicting mothers' intention toward human papilloma virus vaccination of adolescents: A cross-sectional study among iranian families, Iranian Journal of Nursing and Midwifery Research, 26(6):495.

Bruni L., Saura-Lázaro A., Montoliu A., Brotons M., Alemany L., Diallo M.S., et al. (2021). HPV vaccination introduction worldwide and WHO and UNICEF estimates of national HPV immunization coverage 2010–2019, Preventive medicine, 144:106399.

Dereje N., Ashenafi A., Abera A., Melaku E., Yirgashewa K., Yitna M., et al. (2021). Knowledge and acceptance of HPV vaccination and its associated factors among parents of daughters in Addis Ababa, Ethiopia: a community-based cross-sectional study, Infectious Agents and Cancer, 16(1):1-7.

Dethan C.M. & Suariyani N.L.P. (2017). Knowledge and attitudes about HPV vaccination behavior in private high school students, Media Kesehatan Masyarakat Indonesia Universitas Hasanuddin, 2017;13(2):167-175.

Dib F., Mayaud P., Renaudie C., Launay O. & Chauvin P. (2022). Determinants of human papillomavirus (HPV) vaccine uptake among girls in France: A population-based telephone survey, Human Vaccines & Immunotherapeutics, 18(5):2083894.

Feiring B., Laake I., Molden T., Cappelen I., Håberg S.E., Magnus P., et al. (2015). Do parental education and income matter? A nationwide register-based study on HPV vaccine uptake in the school-based immunisation programme in Norway, BMJ open, 5(5):e006422.

Fitriani Y., Mudigdo A. & Andriani R.B. (2018). Health belief model on the determinants of human papilloma virus vaccination in women of reproductive age in Surakarta, Central Java, Journal of Health Promotion and Behavior, 3(1):16-26.

Frianto D., Ashari A.D. & Amal S. (2020). The Influence of Attitude Factors on Acceptance of HPV Vaccine in Parents of Elementary School Students in Teluk Jambe Timur and Tegalwaru Districts, Pharma Xplore: Jurnal Sains dan Ilmu Farmasi, 5(2):41-48.

Ganczak M., Owsianka B. & Korzeń M. (2018). Factors that predict parental willingness to have their children vaccinated against HPV in a country with low HPV vaccination coverage, International journal of environmental research and public health, 15(4):645.

Hanifah D. (2022). The Relationship Between Parents' Knowledge Level And Informaion Sources With Hpv Vaccine Provision To Grade V Students At Sdn Meruya Utara 02 And Sdn Srengseng 03 In 2022: Universitas Pembangunan Nasional Veteran Jakarta.

Hurit H.E. (2022). Factors Associated with HPV Vaccination in Women of Childbearing Age in Pela Mampang Village in 2019, Archives Pharmacia, 4(1).

Irwan. Health Ethics and Behavior, Yogyakarta: Absolute Media; 2020.

Kemenkes RI. (2023). Directorate General of Disease Prevention and Control Performance Report 2022, Jakarta: Kementerian Kesehatan Republik Indonesia.

Khatiwada M., Kartasasmita C., Mediani H.S., Delprat C., Van Hal G. & Dochez C. (2019). Knowledge, attitude and acceptability of the human papilloma virus vaccine and vaccination among university students in Indonesia, Frontiers in public health, 9:607.

Kohler R.E., Wagner R.B., Careaga K., Btoush R., Greene K. & Kantor L. (2023). Mothers' perceptions and attitudes about HPV vaccination initiation among 9-and 10-year-olds, Human Vaccines & Immunotherapeutics, 19(3):2270842.

Kolek C.O., Opanga S.A., Okalebo F., Birichi A., Kurdi A., Godman B. & Meyer J.C. (2022). Impact of Parental Knowledge and Beliefs on HPV Vaccine Hesitancy in Kenya—Findings and Implications, Vaccines, 10(8):1185.

Kompas. (2023). HPV Vaccination to Begin Nationally in 2023. Available from: https://www.kompas.id/baca/humaniora/2023/05/25/vaksinasi-hpv-mulai-diberikan-secara-nasional.

Li J., Kang J., Mao Y., Zheng P., Abdullah A.S., Wu G. & Wang F. (2020). Investigating HPV-and HPV vaccine-related knowledge, perceptions, and information sources among health care providers in three big cities in China, Vaccines, 8(3):499.

López N., Garcés-Sánchez M., Panizo M.B., de la Cueva I.S., Artés M.T., Ramos B. & Cotarelo M. (2020). HPV knowledge and vaccine acceptance among European adolescents and their parents: a systematic literature review, Public Health Rev, 41:10.

Marliana W. (2023). Meta-Analysis: The Influence of Knowledge, Adolescent Attitudes and Parental Support on the Use of HPV Immunization Services: UNS (Sebelas Maret University).

McKenzie A.H., Shegog R., Savas L.S., Healy C.M., Shay L.A., Preston S., et al. (2023). Parents' stigmatizing beliefs about the HPV vaccine and their association with information seeking behavior and vaccination communication behaviors, Human Vaccines & Immunotherapeutics, 2214054.

Mihretie G.N., Liyeh T.M., Ayele A.D., Belay H.G., Yimer T.S. & Miskr A.D. (2022). Knowledge and willingness of parents towards child girl HPV vaccination in Debre Tabor Town, Ethiopia: a community-based cross-sectional study, Reproductive Health, 19(1):1-12.

Perlman S., Wamai R.G., Bain P.A., Welty T., Welty E. & Ogembo J.G. (2014). Knowledge and awareness of HPV vaccine and acceptability to vaccinate in sub-Saharan Africa: a systematic review, PloS one, 9(3):e90912.

Rahayu A.D., Widyawati W. & Lismidiati W. (2020). Overview of Knowledge of Cervical Cancer Prevention with Human Papillomavirus Vaccine in Junior High School Students in Yogyakarta, Jurnal Keperawatan Klinis dan Komunitas (Clinical and Community Nursing Journal), 2(1):20-29.

Rancic N.K., Miljkovic P.M., Deljanin Z.M., Marinkov-Zivkovic E.M., Stamenkovic B.N., Bojanovic M.R., et al. (2022). Knowledge about HPV Infection and the HPV Vaccine among Parents in Southeastern Serbia, Medicina, 58(12):1697.

Rodriguez A.M., Do T.Q.N., Goodman M., Schmeler K.M., Kaul S. & Kuo Y.-F. (2019). Human papillomavirus vaccine interventions in the US: a systematic review and meta-analysis, American Journal of Preventive Medicine, 56(4):591-602.

Saragih N.L., Purwarini J. & Prabawati F.D. (2023). Relationship between Knowledge and Parental Attitudes in Providing Human Papilloma Virus (HPV) Vaccination to Adolescent Girls of Junior High School X Jakarta, jurnal keperawatan cikini, 2023;4(1):24-31.

Siarni N.N. & Dewi P.D.P.K., Parents' Knowledge And Attitudes About HPV Vaccine Introduction In Grade V And Vi Students At State Elementary School 1 Sangsit In 2023, Prosiding Simposium Kesehatan Nasional, 2(1):253-262.

Swarjana I.K. (2016). Health Research Methodology, Yogyakarta: Penerbit Andi.

Szilagyi P., Albertin C., Gurfinkel D., Beaty B., Zhou X., Vangala S., et al. (2020). Effect of state immunization information system centralized reminder and recall on HPV vaccination rates, Pediatrics, 145(5).

Turiho A.K., Okello E.S., Muhwezi W.W. & Katahoire A.R. (2017). Perceptions of human papillomavirus vaccination of adolescent schoolgirls in western Uganda and their implications for acceptability of HPV vaccination: a qualitative study, BMC research notes, 10(1):1-16.

Uchendu I., Hewitt-Taylor J., Turner-Wilson A. & Nwakasi C., (2021). Knowledge, attitudes, and perceptions about cervical cancer, and the uptake of cervical cancer screening in Nigeria: An integrative review, Scientific African, 14:e01013.

Walling E.B., Benzoni N., Dornfeld J., Bhandari R., Sisk B.A., Garbutt J. & Colditz G. (2016). Interventions to improve HPV vaccine uptake: a systematic review, Pediatrics, 138(1)

Wang Z., Wang J., Fang Y., Gross D.L., Wong M.C., Wong E.L. & Lau J.T. (2018). Parental acceptability of HPV vaccination for boys and girls aged 9–13 years in China–A population-based study, Vaccine, 36(19):2657-2665.

Wantini N.A. & Indrayani N. (2020). HPV Vaccination Willingness in Adolescent Girls Reviewed from Parental Factors, Jurnal Ners Dan Kebidanan (Journal of Ners and Midwifery), 7(2):213-222.

WHO. (2022). Accelerating the elimination of cervical cancer as a public health problem: Towards achieving 90–70–90 targets by 2030, World Health Organization. Regional Office for South-East Asia.

WHO. (2023). Immunization coverage 2023. Available from: https://www.who.int/news-room/fact-sheets/detail/immunization-coverage.

WHO. (2023). Pencanangan Nasional Perluasan Imunisasi Human Papillomavirus (HPV) 2023. Available from: https://www.who.int/indonesia/id/news/detail/09-08-2023-national-launch-of-human-papillomavirus-(hpv)-immunization-expansion.

Wijayanti K.E., Schütze H. & MacPhail C. (2021). Parents' attitudes, beliefs and uptake of the school-based human papillomavirus (HPV) vaccination program in Jakarta, Indonesia–A quantitative study, Preventive Medicine Reports, 24:101651.

Winarti R. & Silitonga J. (2020). Knowledege And Attitude Toward Servix Cancer Prevention Among Manggala Husada Nursing Students, Jurnal Ilmiah Keperawatan Altruistik, 3(1):42-54.

Zaky M. (2020). Relationship between Level of Knowledge and Attitude of Parents about Cervical Cancer with Acceptance of Human Papilloma Virus Vaccination in Elementary School Students: Universitas Gadjah Mada.

Zhang S.-K., Pan X.-F., Wang S.-M., Yang C.-X., Gao X.-H., Wang Z.-Z., et al. (2013). Perceptions and acceptability of HPV vaccination among parents of young adolescents: A multicenter national survey in China, Vaccine, 31(32):3244-3249.