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Determinants of Human Papilloma Virus (HPV) Vaccination among Elementary Students in Central Jakarta

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ABSTRACT

Background: Human Papilloma Virus (HPV) is the leading risk factor of cervical cancer. World Health Organization (WHO) has recommended including HPV vaccination in national immunization programs in all countries. Specifically, Jakarta Province has been implementing HPV vaccination since 2016. In this case, several factors influence vaccination coverage. However, there is limited evidence about determinants associated with HPV vaccination. Therefore, this study aimed to investigate the factors associated with HPV vaccination among elementary students in Central Jakarta.

Methods: This was a cross-sectional study conducted from March until June 2020. The study population involved 167 female students of the 6th level of the elementary school in Central Jakarta. There were eight elementary schools in Kemayoran and Cempaka Putih Sub Districts selected purposively. Primary data was collected employing an online questionnaire, which was fulfilled by respondents (mothers and students). Data were analyzed utilizing statistic software for descriptive and bivariate analysis. For the bivariate analysis, Chi-Square Test was performed.

Results: The HPV vaccination coverage was 80.84%. It was also showed that the last education level of the respondents' father and mother was mainly senior high school (SMA) for 50.3% and 47.9%, respectively. The mothers' knowledge was mainly in the middle (56.9%), and they had a positive attitude/support (67.1%). There were only 2.4% of the respondents with a family history of cervical cancer. In terms of family economic status, the main part of respondents had low expenditure for 2-3 million IDR (59.3%) a month. Meanwhile, human resources (vaccination providers) and HPV vaccine were 100% available in the vaccination service. Of the respondent, 47.9% of those said that the vaccine price was affordable. Children who had no support to get HPV vaccination from their father, mother, and siblings were 14.4%, 6.6%, and 21.6%, respectively. Besides, children who were not supported by their teachers was 3.6% and not supported by their peers was 23.4%. Meanwhile, father and mother's supports were significantly associated with HPV vaccination.

Conclusions: Factors associated with HPV vaccination were the support from the father and mother.

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INTRODUCTION

Cervical cancer is the second commonest cancer in Indonesia. It was estimated that Indonesia's incidence was 23.4 per 100,000 women in 2020, with the death rate of 13.9 per 100,000 women [1]. In Jakarta province, the incidence was 9.25 per 100,000 women by 2012 [2]. The disease became one of the main contributors to cancer treatment cost in Indonesia, the 3rd rank. It rose from IDR 1.54 trillion in 2014 became 2.29 trillion in 2015, 2.61 trillion in 2016, and 3.18 trillion in 2017 [3].

The leading risk factor of cervical cancer is the Human Papilloma Virus (HPV). The virus influences initiating stage of the metaplasia process to be cervical cancer in the human body. The carcinogenesis of cervical cancer is started by infection of HPV as the initiator of mutation of cervical cells [4]. HPV is a virus transmitted through sexual intercourse. HPV infection generally occurs in females in reproduction age, with 80% of which may recover and 20% becomes a pre-cancer lesion. The infection can lead to cervical cancer between 3 and 17 years after infection [5].

Since 2008, World Health Organization (WHO) has recommended including HPV vaccination in national immunization programs in all countries. The vaccination target is girls at the age of 4 until 14 before experiencing sexual intercourse [6]. HPV vaccination is a way to prevent cervical cancer early, but this vaccination does not replace cervical cancer screening [7]. The introduction of HPV vaccination to women in Indonesia will be very beneficial to reduce the burden of cervical cancer, in which the screening of this disease is not adequate [8].

HPV vaccination in Indonesia was started in 2012, and Jakarta Province is one of the provinces implementing HPV vaccination since 2016. The program's target is female elementary students in the 5th level for the first dose and the 6th level for the second dose. The vaccine, a quadrivalent vaccine for type 6, 11, 16, and 18 HPV, is given at 0-12 months for children aged nine until 13 years [9]. By 2017, coverage of the vaccination in Jakarta among the 5th level of elementary school was 89.4%, and the coverage of Central Jakarta was 90.1%. It was higher than national coverage at 70.9% [10]. The coverage indicates that there are some children in Jakarta, especially in Central Jakarta, who have not received the vaccination.

HPV vaccination coverage is influenced by several factors. In low middle-income countries, the vaccination is influenced by sociocultural, health, and political support [11]. A study in Kediri, East Java, Indonesia, showed that education, knowledge, and family support were associated with HPV vaccination [12]. In Asia Pacific countries, women's susceptibility to HPV infection, knowledge of safety and effectiveness of the vaccine, social consequences, and peer support were associated with the willingness to get the HPV vaccine [13]. Nevertheless, there is limited evidence about determinants associated with HPV vaccination, especially in Jakarta, a metropolitan city. Jakarta's population has a unique characteristic that many ethnicities from all areas in Indonesia are there. Therefore, this study aimed to investigate factors associated with HPV vaccination among elementary schools in Central Jakarta.

METHODS

This observational study used the design of a cross-sectional study. The study was conducted in Central Jakarta from March until June 2020. Female students of the 6th level of the elementary school in Central Jakarta became the study population. The main respondents of this study were the students' mothers. The researchers took a sample of elementary schools purposively with the criteria that the school had low coverage of HPV vaccination (under 90%) from private and public schools. The respondent's eligibility criteria

were respondents who could use a mobile phone and willing to be respondents. There were eight selected elementary schools in Kemayoran and Cempaka Putih Sub Districts: 1) SD Muhammadiyah, Kebon Kosong, 2) SDN 03 Serdang, Kemayoran, 3) SDN 11 Serdang, 4) SDI Qatrunada, 5) SDN Sumur Batu 12, 6) SDN Sumur Baru 14, 7) SD Anglo Cempaka Putih Barat, and 8) SDN Cempaka Putih Barat 19. The sample of the study was the total population from the 6th level of the selected schools. Thus, a total of 167 mothers and 167 female students were included in this study using sample size tests of two population proportions [14]. Mothers answered the identity questions, including father and mother's last education, HPV vaccination, knowledge, attitude, and vaccine affordability. Meanwhile, the students answered questions of support from family, teachers, and friends.

Primary data were collected using an online questionnaire (self-administered), which was fulfilled by respondents (mothers and students). Data were analyzed utilizing statistic software (SPSS 16.0) for descriptive, bivariate, and multivariate analysis. Descriptive analysis was performed to explore the frequency of dependent variable (HPV vaccination) and independent variables, including father's last education, mother's last education, mother's knowledge, mother's attitude, family expenditure, vaccine's availability, vaccination providers' availability, vaccine's affordability, and support from father, mother, siblings, teachers, and peers. Knowledge was categorized as high (score ≥ 80) for correct answers, medium (score of 60–79), and low (< 60). Besides, family expenditure is a proxy of the household's economic status. The attitude was categorized as positive (score $\geq$ median) and negative (score $<$ median). The bivariate analysis was then performed to know the association between independent variables with a dependent variable using Chi-Square Test with .05 significance.

This study was conducted based on ethical clearance from the University of Esa Unggul Jakarta No. 0144.20.114/DPKE-KEP/FINAL-EA/UEU/IV/2020.

RESULTS

The descriptive analysis results showed that HPV vaccination coverage was 80.84% (135 of 167 respondents), and there were 32 of 167 respondents (19.16%) who have not received the HPV vaccination.

The analysis results also showed that the last education level of the respondents' father and mother was mainly senior high school (SMA) for 50.3% and 47.9%, respectively. The mother's knowledge was mainly in the middle (56.9%), and they had a positive attitude/support (67.1%). There was only 2.4% of the respondents have a family history of cervical cancer. In terms of

family economic status, the main part of respondents had low expenditure for 2-3 million IDR (59,3%) a month. Meanwhile, human resources (vaccination providers) and HPV vaccine were 100% available in the vaccination service. Of the respondent, 47.9% of those said that the vaccine price was affordable. Children who had no support to get HPV vaccination from their father, mother, and siblings were 14.4%, 6.6%, and 21.6%, respectively. Meanwhile, children who were not supported by their teachers was 3.6% and not supported by their peers was 23.4% (Table 1).

Moreover, the bivariate analysis results suggested that father and mother's supports were significantly associated with HPV vaccination ($P < .05$) with a prevalence ratio (PR) of 1.45 (95% CI 1.03 – 2,05) and 1.83 (95% CI 0.96 – 3.15), respectively. Other variables were not associated with HPV vaccination ($P > .05$): father's last education, mother's last education, mother's knowledge, mother's attitude, family expenditure, family history of cervical cancer, vaccine's affordability, and support from siblings, teacher, and peers (Table 2).

DISCUSSION

Coverage of HPV vaccination among the 6th elementary school level in Central Jakarta was 80.84% or 19.16% of those who have not got the vaccination. This coverage was lower than reported data in 2017, stating that the Jakarta Province coverage was 89.4% and Central Jakarta was 90.1%. This coverage was also lower than coverage in Kulonprogo Regency, Yogyakarta province (99.8%), Gunung Kidul Regency (99.7%), Surabaya City (95.1%), and Bandung Regency (94.8%) [10].

The coverage seemed higher than a study in Badung Regency, Bali, in 2017 on HPV vaccination for senior high school (10th level), revealing that 92.2% of those had not received the HPV vaccination [15]. Similarly, a study in Yogyakarta in the same year uncovered that female adolescents' willingness to get HPV vaccination was only 9.9%. The halal issue was the most consideration to participate in the vaccination [16]. A study among elementary and junior high schools in Sleman, Yogyakarta, in 2017, disclosed that willingness to get HPV vaccination was still low (42.5%). The factor associated with intention to the vaccination was the attitude. Meanwhile, the factor that became a consideration to uptake HPV vaccination was the vaccine's safety [17].

The respondents' parents of this study mainly had an education of senior high school (middle). It indicated that they could understand the HPV vaccination's benefits and their daughter's risk of getting cervical cancer if they did not get the vaccine. Similarly, mothers'

Table 1. Characteristics of study participants

Variable	N	%
Last education of father		
≤ Elementary School	2	1.2
Junior High School	36	21.6
Senior High School	84	50.3
University	45	26.9
Last education of mother		
≤ Elementary School	22	13.2
Junior High School	22	13.2
Senior High School	80	47.9
University	43	35.7
Knowledge of mother		
High	39	23.4
Middle	95	56.9
Low	21	12.6
Attitude of mother		
Positive	112	67.1
Negative	54	32.3
Family history of cervical cancer		
Yes	4	2.4
No	163	97.6
Family expenditure (IDR)		
< 2 million	23	13.8
2–3 million	99	59.3
4–5million	25	15.0
> 5 million	18	10.8
Availability of human resources		
Yes	167	100
No	0	0
Availability of HPV vaccine		
Yes	167	100
No	0	0
Affordability of HPV vaccine price		
Affordable	80	47.9
Not affordable	30	18.0
Support from father		
Yes	143	85.6
No	24	14.4
Support from mother		
Yes	156	93.4
No	11	6.6
Support from siblings		
Yes	131	78.4
No	36	21.6
Support from teachers		
Yes	161	96.4
No	6	3.6
Support from peers		
Yes	128	76.6
No	39	23.4

Table 2. Association between independent variables with HPV vaccination

Variable	HPV Vaccination				Total N	PR (95% Confidence Interval)	P
	Yes		No				
	N	%	N	%			
Last education of father						-	0.445
≤ Elementary School	2	100	0	0.0	2		
Junior High School	26	72.2	10	27.8	36		
Senior High School	69	82.1	15	17.9	84		
University	38	84.4	7	15.6	45		
Last education of mother						-	0.166
≤ Elementary School	14	63.6	8	36.4	22		
Junior High School	19	86.4	3	13.6	22		
Senior High School	67	83.8	13	16.2	80		
University	35	81.4	8	18.6	43		
Knowledge of mother						-	0.724
High	33	84.6	6	15.4	39		
Middle	77	81.1	18	18.9	95		
Low	16	76.2	5	23.9	21		
Attitude of mother						1.07 (0.90 – 1.26)	0.547
Positive	93	83.0	19	17.0	112		
Negative	42	77.8	12	22.2	54		
Family history of cervical cancer						1.24 (1.15 – 1.34)	1.000
Yes	4	100	0	0	4		
No	131	80.4	32	19.6	163		
Family expenditure (IDR)						-	0.466
< 2 million	16	69.6	7	30.4	23		
2–3 million	83	83.8	16	16.2	99		
4–5million	20	80.0	5	20.0	25		
> 5 million	14	77.8	4	22.2	18		
Affordability of HPV vaccine prize						0.99 (0.82 – 1.19)	1.000
Affordable	66	82.5	14	17.5	80		
Not affordable	25	83.3	5	16.7	30		
Support from father						1.45 (1.03 – 2.05)	0.009
Yes	121	86.4	22	15.4	143		
No	14	58.3	10	41.7	24		
Support from mother						1.83 (0.96 – 3.15)	0.007
Yes	130	83.3	26	16.7	156		
No	5	45.5	6	54.5	11		
Support from siblings						1.15 (0.93 – 1.43)	0.214
Yes	109	83.2	22	16.8	131		
No	26	72.2	10	27.8	36		
Support from teachers						1.64 (0.73 – 3.66)	0.085
Yes	132	82.0	29	18.0	161		
No	3	50.0	3	50.0	6		
Support from peers						1,22 (0.98 – 1.52)	0.061
Yes	108	84.4	20	15.6	128		
No	27	69.2	12	30.8	39		

knowledge was mainly in the middle and had a positive attitude or supported the vaccination. It became positive aspects to encourage them to support their children to get a vaccination. These findings corroborate with a study among university students in Semarang, which showed that respondents had less knowledge about cervical cancer and HPV vaccination, but most respondents were willing to receive the HPV vaccination [18].

Only 2.4% of the respondents had a family history of cervical cancer, which becomes a challenge to educate the parents to understand the risk of cervical cancer for their children. The respondents were mainly in the low part in terms of expenditure for 2-3 million IDR a month. It did not become a problem because the vaccine was now free of charge, covered by the local government. There was also no problem with the availability of human resources and vaccines in PHC. This condition becomes a strength to scale up the vaccination coverage. However, many children had no support to get HPV vaccination from their father, mother, and siblings. It is a challenge for the provincial health office, district health office, and PHC to strengthen socialization and education for students' families.

Previously, a qualitative study in Uganda showed that these were major motivations for girls' and parents' acceptance of HPV vaccination. Parents' increased awareness that HPV is sexually transmitted encouraged their support for their adolescent daughters' vaccination against HPV. However, there were reports of some initial fears and misconceptions about HPV vaccination, especially during its introduction. It initially discouraged some parents and girls, but over the years, with no major side effects reported, girls reported that they were willing to recommend the vaccination to others, and parents also reported their willingness to get their daughters vaccinated without fear [19].

Factors that had an association with HPV vaccination were support from the father and mother. This result is in line with Green's theory that family support is one of the reinforcing factors of behavior, including health-seeking behavior [20]. It is also not different from a study using a systematic review in Asia Pacific countries that peer support was correlated with willingness to get HPV vaccine [13]. Moreover, a study in Kediri, East Java, showed that education, knowledge, and family support were associated with HPV vaccination [12]. Meanwhile, a study in Badung Regency, Bali, revealed that knowledge and attitude were associated with HPV vaccination among senior high school students [15].

Furthermore, a study among Dutch girls in 2013 uncovered that social-psychological determinants largely contributed to the explained variance of HPV vaccination intention of mothers. Attitudes, beliefs, subjective norms, and habit strength were significantly correlated with participants' HPV vaccination intentions [21]. Another study in Netherland suggested that mothers'

intention was the strongest predictor of their daughters' HPV vaccination uptake [22]. There is a need to strengthen efforts to increase awareness among parents who have a daughter to allow them to get a vaccination.

This study was based on a self-administered questionnaire (online), in which the respondents (mother and daughter) might influence other families in answering the questions. When fulfilling the forms, especially question about support, the daughter might discuss with their father or mother. These conditions might produce bias of information in this study.

CONCLUSIONS

Based on bivariate analysis, the factors associated with HPV vaccination among the 6th elementary school level in Central Jakarta were the father and mother's support.

DECLARATIONS

Competing of Interest

The authors declare that no conflict of interest in this study.

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