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Knowledge, Attitude, and Practice on Cervical Cancer and HPV Vaccination among Medical Students in Jakarta, Indonesia: A Cross-Sectional Study

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Abstract

BACKGROUND: Cervical cancer is the second-most common cancer in Indonesian women. While the cervical cancer screening has been integrated in Indonesian primary health-care facilities, the HPV vaccination has not yet become a national program.

AIM: The objective of this research was to measure the knowledge, attitude, and behavior of medical students in Jakarta toward cervical cancer and its prevention. The result of this study could be implemented to develop a more comprehensive national educational program and public health policy.

METHODS: We conducted a cross-sectional study on medical students at 10 different universities in Jakarta, Indonesia. Student's knowledge, attitude, and behavior were collected through a self-administered online questionnaire consist of a total of 27 questions concerning cervical cancer epidemiology, pathogenesis, screening, diagnosis, and prevention.

RESULTS: A total of 2159 medical students participated in this study. More than half (55%) of the students obtained satisfactory knowledge score. The students' knowledge regarding HPV vaccination was low. However, 87.2% of them agreed to get the HPV vaccination. Only 7.0% had participated in cervical cancer screening program and only 16.8% had received HPV vaccination. Female gender, second or third year of study, and three universities had better odds to have good practice score.

CONCLUSION: The knowledge and attitude score did not reflect on student's practice on cervical cancer and its prevention. Effort to increase the awareness toward cervical cancer should be endorsed through university curriculum and public health policy.

Introduction

Cervical cancer is one of the most common cancers in women worldwide and has been considered a serious public health concern. According to Global Cancer Statistics, cervical cancer was the 4th most common cancer in women worldwide, with 604,127 new cases and 341,831 deaths in 2020 [1]. Developing and underdeveloped counties accounts for 85% of worldwide deaths cause by cervical cancer. Low- and middle-income countries also have 18 times higher death rates compared to high-income countries [2]. In Indonesia, cervical cancer was the second-most common cancer in women and accounted for around 18,279 deaths in 2018 alone [3], [4].

Primary prevention and screening are important to decrease the burden of cervical cancer [5]. Visual inspection with acetic acid (VIA) is the common method for cervical cancer screening. It is a simple and inexpensive method which can be directly followed with

treatment procedures if there is an early cervical lesion identified [6], [7]. While the cervical cancer screening has been an integrated activity in Indonesian primary healthcare facilities, the HPV vaccination has not yet become a national program. The HPV vaccination program in Indonesia has been initiated since April 2015, but it is still in the introductory phase [8].

For these programs to succeed, future physicians are required to have the right competency in cervical cancer prevention and screening. Therefore, proper training for medical students becomes vital [9]. It is also important for medical students to participate in raising public awareness and educate the people around them about cervical cancer, which require good knowledge, attitude, and practice (KAP) regarding Cervical Cancer and HPV Vaccination. However, several studies showed inadequate KAP regarding cervical cancer in medical students [10], [11].

The knowledge, attitude, and practice (KAP) survey is a common tool used in health sciences to

assess the competency of a population regarding a certain issue. The KAP survey helps identifying the gaps in knowledge and evaluating the translation of their knowledge in their attitude and daily practices. It creates educational processes and provides a useful information for program development [12], [13]. We conducted a cross-sectional study to assess the KAP on cervical cancer and HPV vaccination among medical students in Jakarta. In this study, medical students became the target population as they were considered to have higher concern for health. We expect the result of this study to be useful for the development of a more comprehensive national educational program and public health policy.

Methods

Study design and ethical approval

We conducted a cross-sectional study on medical students at 10 different universities in Jakarta, Indonesia. The participants were asked to complete a self-administered online questionnaire written in Bahasa Indonesia. This study started since July until August 2020. The study has been reviewed and approved by the Ethical Committee, Faculty of Medicine, Universitas Indonesia No.365/UN2.F1/ETIK/PPM.00.02/2020. In addition, informed consent (included at the beginning of the online form) was obtained from each study participant.

Study population

This study included pre-clinical medical students. We included both male and female students with no age limitation. We shared the questionnaire to the student's representative from each university so that we acquired as many respondents as possible. The student's representatives also ensured that the respondents met the criteria and indeed was a medical student of said university.

Questionnaire development and validation

The questionnaire was developed using methods described by Tsang *et al.* [14]. We established a committee consisted of gynecology oncology doctors and fresh medical doctor graduates to construct the questionnaire. The questionnaire contains the socio-demographic data and questions that explored the KAP of the participants toward cervical cancer. The socio-demographic data included gender, university, and year of study. The KAP questions were based on four dimensions: cervical cancer epidemiology, pathogenesis, screening and diagnosis, and preventions. Prior to pilot testing, the KAP questionnaire

consists of 16 questions on knowledge, 6 questions on attitude, and 5 questions on practice. Pilot testing conducted on 50 medical students from Universitas Indonesia. The validity was assessed using Pearson's correlation on Statistical Package for Social Sciences (SPSS) version 23 (IBM Corp, New York). Only questions with significant correlations ($p < 0.005$) would then be included in the final version.

Data collection

Data were collected through a self-administered online questionnaire written in Bahasa Indonesia. Informed consent was included as one of the items in the questionnaire. Correct response for the knowledge section was scored 1 and incorrect response was scored 0. Meanwhile, in the attitude and practice section, positive response was scored 1, neutral response was scored 0, and negative response was scored –1. From the final score of each component, we then classify the overall score of each participant into "good" and "poor". If the final score was >60% of the maximum score, we then categorized it as "good." Otherwise, we categorize it as "poor."

Data analysis

The recorded data were then analyzed using SPSS 23 software. We calculated mean ± standard deviation for quantitative variables, frequency, and percentage for qualitative variables. Statistical comparison between groups was calculated using Kruskal–Wallis test. The association between independent variables and outcome were examined using multivariate logistic regression with adjusted odds ratio. The odds ratios for university were calculated using Universitas Indonesia as the reference university. Significant association was concluded when $p < 0.05$.

Patient and public involvement

No patient involved.

Results

Demographic characteristics

A total of 2159 medical students participated in this study. Table 1 shows the demographic profile of the participants. Of all the participants, 74.6% were female, and 34.3% were first year medical students. The students came from ten different universities, with most participants (22.7%) were from Universitas Indonesia.

Table 1: Demographic profile of participants (*n* = 2159)

Characteristics	*n* (%)
Gender	
Male	549 (25.4)
Female	1610 (74.6)
University	
Universitas Indonesia	490 (22.7)
University A	170 (7.9)
University B	180 (8.3)
University C	225 (10.4)
University D	223 (10.3)
University E	158 (7.3)
University F	179 (8.3)
University G	182 (8.4)
University H	157 (7.3)
University I	195 (9.0)
Study year	
First	741 (34.3)
Second	703 (32.6)
Third	585 (27.1)
Fourth	130 (6.1)

Assessment of knowledge

Table 2 shows the knowledge of the students on cervical cancer. Most participants had heard about HPV vaccination (89.8%). From ten questions, five questions were answered correctly in less than 50% of the participants. The questions with the smallest number of correct answer (33.3%) were regarding the recommended doses of HPV vaccine in a person younger than 15 years old. The other three questions with <50% correct answer were also related to the HPV vaccination. The other one question was related to the pathogenesis of cervical cancer.

The mean of total knowledge score from all participants was 5.82 ± 2.11, ranging from 0 to 10. About 55% of participants obtained a satisfactory knowledge score. The knowledge scores were significantly different across gender, study years, and universities. Table 3 shows that female, second or third year of study, and students from University C had higher odds of having good knowledge score compared to male, first year, and students from Universitas Indonesia; respectively. One university had lower odds of having good knowledge score (adjusted for gender and study year) compared to Universitas Indonesia.

Assessment of attitude

The attitudes of the students related to cervical cancer are shown in Table 4. Around 87.2% of the participants agreed to get the HPV vaccination. However, 78.8% and 63.1% of the participants still had not planned to take cervical cancer early detection test or to get the HPV vaccination, respectively.

The mean of total attitude score was 2.33 ± 1.56, which ranged from -5 to 5. The proportion of students which were considered to have good attitude was a high as 90%. The attitude scores were also different across gender, study years, and universities. The adjusted odds of having good attitude score were higher in female compared to male, and in four universities compared to Universitas Indonesia (Table 3).

Assessment of practice

Table 4 shows the responses to the questionnaire on practices related to cervical cancer and HPV vaccination. Around 37.1% of the participants had educated people about the need for cervical cancer screening. However, only 7% had participated in cervical cancer screening program. Regarding HPV vaccination, only 16.8% of the participants had received HPV vaccination.

The mean of total attitude score was -1.16 ± 2.24, ranged from −5 to 5. Only 23% of the participants obtained good practice score. There was a significant difference in attitude score between gender, study years, and universities. Female gender, second or third year of study, and three universities had better odds to have good practice score compared to male gender, first year participants, and participants from Universitas Indonesia (Table 3). One university had lower odds of having good practice score compared to Universitas Indonesia.

Discussion

This study found that the knowledge regarding cervical cancer was still low in medical students. Other studies conducted in India and Turkey also documented low knowledge level among medical students [10], [11]. This issue becomes a concern because medical students supposed to have better health knowledge and more interest in health issues than general population. Poor knowledge among them may reflect even worse knowledge in society [10]. Due to inadequate data, we were not able to perform an analysis to identify the cause of this poor knowledge. However, several studies have identified possible causes, such as inadequate national screening, poor health promotion and immunization program, socio-religious issues, and the fear of vaccination side effects [15], [16], [17]. These extensive problems should be addressed to increase the knowledge in society, and hopefully decrease the burden of cervical cancer.

One particular topic lacking in knowledge was regarding the HPV vaccination. This result is in concordance with the study by Komalasari in 2012 [18] in medical students at a university in Semarang, Indonesia. This lack of knowledge might be caused by the inadequacy of HPV vaccination material instilled in the reproductive curriculum of preclinical students. To the authors' knowledge, the curriculum in Indonesian medical school focused more on the risk factors and the early detection of cervical cancer. Since HPV vaccination is not mandatory in Indonesia, the details of the vaccination might not be fully addressed.

The poor practice score might be caused by the lack of activity regarding the cervical cancer screening

Table 2: Responses to the knowledge questionnaire on cervical cancer and human papillomavirus vaccination (*n* = 2159)

Questions	Correct answer, *n* (%)	Incorrect answer, *n* (%)
Have you heard about HPV vaccination?	1938 (89.8)	221 (10.2)
Is HPV vaccine intended for cervical cancer prevention?	1757 (81.4)	402 (18.6)
Cervical cancer is at the … place on the most common cancer diagnosed in women	1300 (60.2)	859 (39.8)
What is the most common mode of transmission?	1710 (79.2)	449 (20.8)
How does the infection of HPV-16 and HPV-18 cause cervical cancer?	1065 (49.3)	1094 (50.7)
What are the brand names of HPV vaccine in Indonesia?	1311 (60.7)	848 (39.3)
How many HPV vaccine dose needed to be fully vaccinated?	876 (40.6)	1283 (59.4)
At what range of age does the HPV vaccine if given works optimally?	917 (42.5)	1242 (57.5)
How many doses of HPV vaccine is recommended for a person younger than 15 years old?	718 (33.3)	1441 (66.7)
How many doses of HPV vaccine is recommended for an adult?	980 (45.4)	1179 (54.6)

HPV: Human papillomavirus.

Table 3: Odds ratio of demographic characteristics and knowledge, attitude, and practice score

Characteristic	Knowledge status				Attitude status				Practice status			
	Good	Poor	COR (95% CI)	AOR (95% CI)	Good	Poor	COR (95% CI)	AOR (95% CI)	Good	Poor	COR (95% CI)	AOR (95% CI)
Gender												
Male	250	299	1	1	427	122	1	1	90	459	1	1
Female	928	682	1.63 (1.34–1.98)	1.76 (1.43–2.18)	1519	91	4.77 (3.56–6.39)	4.74 (3.51–6.40)	407	1203	1.73 (1.34–2.22)	2.05 (1.56–2.68)
Study year												
First	300	441	1	1	661	80	1	1	90	651	1	1
Second	338	365	1.36 (1.11–1.68)	3.81 (2.27–5.88)	626	77	0.98 (0.71–1.37)	1.08 (0.49–2.36)	147	556	1.91 (1.44–2.54)	4.13 (2.66–6.41)
Third	443	142	4.59 (3.61–5.83)	2.86 (1.86–4.40)	537	48	1.35 (0.93–1.97)	1.23 (0.56–2.68)	210	375	4.05 (3.07–5.35)	2.40 (1.58–3.65)
Fourth	97	33	4.32 (2.84–6.59)	0.74 (0.47–1.17)	122	8	1.85 (0.87–3.92)	0.69 (0.31–1.55)	50	80	4.52 (2.98–6.86)	1.15 (0.76–1.74)
University												
Universitas Indonesia	264	226	1	1	426	64	1	1	159	331	1	1
University A	98	72	1.17 (0.82–1.66)	1.08 (0.75–1.55)	155	15	1.55 (0.86–2.80)	2.33 (1.11–4.88)	34	136	0.52 (0.34–0.79)	0.53 (0.35–0.79)
University B	76	104	0.63 (0.44–0.88)	0.62 (0.40–0.97)	154	26	0.89 (0.54–1.46)	1.66 (0.69–3.99)	32	148	0.45 (0.29–0.69)	0.81 (0.48–1.37)
University C	152	73	1.78 (1.28–2.48)	1.69 (1.09–2.62)	209	16	1.96 (1.11–3.48)	3.19 (1.42–7.16)	78	147	1.10 (0.79–1.54)	1.21 (0.72–2.05)
University D	134	89	1.29 (0.93–1.78)	0.77 (0.50–1.17)	202	21	1.45 (0.86–2.43)	1.57 (0.67–3.72)	47	176	0.56 (0.38–0.81)	0.64 (0.40–1.05)
University E	76	82	0.79 (0.55–1.14)	0.68 (0.45–1.03)	148	10	2.22 (1.11–4.44)	1.76 (0.77–4.02)	12	146	0.17 (0.09–0.32)	0.93 (0.58–1.50)
University F	100	79	1.08 (0.77–1.53)	1.03 (0.65–1.62)	158	21	1.13 (0.67–1.91)	1.24 (0.48–3.24)	20	159	0.26 (0.16–0.43)	2.77 (1.38–5.55)
University G	93	89	0.89 (0.64–1.26)	0.82 (0.54–1.27)	170	12	2.13 (1.12–4.04)	2.39 (1.05–5.47)	52	130	0.83 (0.57–1.21)	2.07 (1.15–3.71)
University H	75	82	0.78 (0.55–1.12)	1.08 (0.70–1.66)	138	19	1.09 (0.63–1.89)	1.20 (0.48–2.97)	17	140	0.25 (0.15–0.43)	0.65 (0.40–1.05)
University I	110	85	1.11 (0.79–1.55)	1.29 (0.82–2.02)	186	9	3.10 (1.51–6.37)	2.48 (1.07–5.77)	46	149	0.64 (0.44–0.94)	2.21 (1.19–4.10)

COR: Crude odds ratios, AOR: Adjusted odds ratio, CI: Confidence interval.

Table 4: Responses to the attitudinal statements on and practice related to cervical cancer and human papillomavirus vaccination (*n* = 2159)

Attitude				Practice			
Question	Disagree, *n* (%)	Don't know, *n* (%)	Agree, *n* (%)	Question	No, *n* (%)	Maybe, *n* (%)	Yes, *n* (%)
I agree to get the HPV vaccination	42 (1.9)	234 (10.8)	1883 (87.2)	I have educated others about the need for cervical cancer screening	1037 (48.0)	322 (14.9)	800 (37.1)
I'd rather get HPV vaccination rather than a new gadget	325 (15.1)	-	1834 (84.9)	I have advised the people closest to me to carry out early detection of cervical cancer on a regular basis	806 (37.3)	635 (29.4)	718 (33.3)
I agree with HPV vaccination in men	142 (6.6)	853 (39.5)	1164 (53.9)	I have watched cervical cancer screening or detection	1852 (85.8)	49 (2.3)	258 (11.9)
I am planning to take a cervical cancer early detection test	79 (3.7)	1621 (75.1)	459 (21.3)	I have participated in cervical cancer screening program	1074 (49.7)	934 (43.3)	151 (7.0)
I am planning to get HPV vaccination even though I am a man	50 (2.3)	1312 (60.8)	797 (36.9)	I have received HPV vaccination	36 (1.7)	1760 (81.5)	363 (16.8)

HPV: Human papillomavirus.

and HPV vaccination in the faculty, as also noted by Komalasari in 2012 [18]. Several universities had relatively more variant kinds of activity related to cervical cancer prevention compared to other universities, which might be the reason they had better practice score. Although the practice on HPV vaccination was poor, 87.2% of the participants agreed to receive the HPV vaccination. This was a room of opportunity to increase the coverage of HPV vaccination in medical students. Therefore, the promotion of HPV vaccination around campus should be improved and the vaccination program itself should be facilitated.

The result of this study shows that first year students were associated with lower score on KAP compared to second- and third-year students. This result corroborated with Yörük 2016 [19] on students of health-related faculty, which stated that the difference was related to the curriculum. Cervical cancer and its prevention are given more extensively after the first year. In this study, we included students from ten different universities. In Indonesia, all medicine faculty from all universities have the same curriculum. However, the execution of the curriculum can be different. Therefore, the result on knowledge score was also different between each university. However, in our study, we did not analyze deeper regarding the how each university implemented cervical cancer prevention on their module. Moreover, it is common sense that students in higher level of study year will tend to also have higher level of knowledge in general. Since the incidence of cervical cancer in Indonesia is still high, preventive measures becomes very important. It might be beneficial if the module regarding sexual and reproductive health is given on the first year of university. This could minimize the knowledge gap because the topic is given earlier, hence increasing participation towards cervical cancer prevention.

Yörük *et al.* [19] showed that medical students tend to achieve higher mean knowledge score compared to other health department (nursing, paramedics, and midwife). A study conducted in University of Hong Kong also reported similar result, in which medical students had better knowledge and attitude toward HPV vaccination compared to non-medical students [20]. However, the proportion of students vaccinated between medical and non-medical student had no statistically significant difference (*p*= p =0.671) [20]. Being directly exposed to the field, medical students are expected to have higher knowledge compared to non-medical students as cervical cancer and other gynecologic conditions are part of their study curriculum.

In accordance with our study, Yam *et al.* [20] showed that more than half of the medical student participants (67.7%) was not yet been vaccinated and even higher (71%) among non-medical student. In our study, only 23% participants achieve good overall practice score. Yam *et al.* [20] further analyzed that the reason behind the high rate of unvaccinated students was the price of the vaccine [20]. Currently in Indonesia, HPV vaccine was not funded by the government. People will need to go to clinics or hospitals and pay out of pocket for HPV vaccine. For students, this can become a burden because most university students in Indonesia do not work thus has no active income. Our study also showed that very low number of students (7.0%) had participated in cervical cancer screening program. The reason for this might be due to the fact that screening is done through vaginal examination by speculum insertion. This practice can be uncomfortable and also taboo on female prior to marriage in the Indonesian culture. Therefore, cervical cancer screening is usually conducted on married women, in which most university students are not.

There were several limitations to this study. First, the characteristics of the population assessed in this study were limited to gender, study year, and university. Further studies should also assess other socio-demographic characteristics, such as age, family income, and tribe to allow more comprehensive evaluation of the factors affecting the KAP on cervical cancer. The second limitation was regarding the representativeness of the findings. In this study, female students accounted for 74.6% of the participants and fourth years medical students only accounted for 6.1% of the participants. Further study with a more structured sampling method is needed to produce a more representative finding. Third, this study did not investigate further on the reason behind the low rate of HPV vaccination and screening. Future study should also address the question on why the participants refuse to undergo screening and vaccination or decided not to. The question can be incorporated in the practice section of the questionnaire or if possible, the author can select representative sample and then conduct a one-on-one interview.

Conclusion

Being the second-most common cancer diagnosed in Indonesian women, preventive measure such as increasing the awareness on the disease, screening, and HPV vaccination, is important to be included in the national health program. This study revealed that among medical students, the knowledge and attitude score did not reflect on students' practice on cervical cancer and its prevention. Effort to increase the awareness towards cervical cancer should be endorsed through university curriculum and government policy. Further study should focus on investigating the etiology behind the discrepancy between KAP score. Further study also should formulate questionnaire with HPV vaccination as the main topic.

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