Coverage and Knowledge Regarding Human Papillomavirus Vaccination Among Female Medical Students at Pelita Harapan University

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Abstract

Background: Cervical cancer is the fourth most common cancer among women worldwide. Human papillomavirus (HPV) is the primary cause of cervical cancer. One of the key preventive measures to reduce the incidence of cervical cancer is immunization. According to the data from the World Health Organization year 2020, the national HPV vaccination coverage in Indonesia was only 5% for the complete dose and 6% for the first dose. Lack of knowledge is one of the contributing factor of HPV vaccination coverage.

Methods: This study was conducted with cross-sectional design. This study used primary data which was collected using questionnaires. The questionnaire has been tested for validity and reliability in previous study. The subjects were female students of Faculty of Medicine University of Pelita Harapan.

Results: Our of 770 subjects with mean age of 20.3 years old, 490 subjects (63.6%) never got HPV vaccination, 102 subjects (13.3%) were not fully vaccinated and 178 subjects (23.1%) were fully vaccinated. Age at first dose of HPV vaccination was 9-14 years old in 123 subjects (43.9%) and > 15 years old in 157 subjects (56.1%). From all of the HPV vaccinated subjects, 18 subjects (6.4%) got bivalent vaccine, 52 subjects (18.6%) got quadrivalent vaccine and 64 subjects (22.9%) got nonvalent vaccine. Majority of the subjects (354 subjects, 46%) had good knowledge regarding HPV vaccination, 271 subjects (35.2%) had sufficient knowledge and 145 subjects (18.8%) had poor knowledge.

Conclusions: Despite sufficient knowledge regarding HPV vaccination among majority of female medical students at Pelita Harapan University, HPV vaccination coverage remained suboptimal.

Introduction

Cervical cancer is the fourth most common cancer among women worldwide. According to data from the World Health Organization (WHO), there were 660,000 new cases of cervical cancer in 2022, with 350,000 resulting in death.[1] In Indonesia, the data from 2021 showed cervical cancer as the second most common cancer among women. A total of 36,633 cases were reported, accounting for approximately 17.2% of all cancers in women. Cervical cancer is the leading cause of cancer-related deaths

among Indonesian women, with a mortality rate of 21,003 deaths, or 19.1% of all cancer deaths. The incidence of cervical cancer in Indonesia has doubled compared to the data reported in 2008.[2,3]

Human papillomavirus (HPV) is the primary cause of cervical cancer, identified in 99.7% of cervical cancer cases worldwide.[4] Human Papillomavirus can be classified into two major groups: non-oncogenic types and oncogenic types. One of the key preventive measures to reduce the incidence of cervical cancer is immunization. Currently, there are three types of HPV vaccines available: bivalent, quadrivalent, and nonavalent. All of these vaccines have been proven to be highly effective in preventing HPV types 16 and 18 infections, which are responsible for approximately 70% of cervical cancer cases globally.[5-7] The World Health Organization recommends the inclusion of the HPV vaccine in national immunization programs. The goal of the HPV vaccination program is to achieve 90% coverage among 15-year-old girls by the year 2030.[8]

In Indonesia, the HPV vaccination program was first introduced in 2016 in the Special Capital Region of Jakarta and was expanded nationwide in 2023. The HPV immunization program consists of two doses administered to female students in the 5th and 6th grades of elementary school. According to WHO data from 2020, the national HPV vaccination coverage in Indonesia was only 5% for the complete dose and 6% for the first dose.[9-10] Several factors contribute to the low coverage of HPV immunization in Indonesia, including limited availability of the HPV vaccine and lack of knowledge about the vaccine. Studies have shown that acceptance of the HPV vaccine is associated with levels of knowledge about the virus and vaccination, degree of sexual promiscuity and sexually transmitted infections, as well as perceptions of the vaccine's safety and efficacy.[11-13]

A systematic review conducted in the United States, Europe, Canada, Australia, and Africa found that women's knowledge regarding the link between HPV infection and cervical cancer remains low.[14] According to a study by Monteiro et al., HPV vaccination rates among university students are generally low but are comparatively higher among medical students. This is attributed to their greater understanding of cervical cancer and its association with HPV infection.[15] Therefore, the researcher is interested to study the coverage and level of knowledge regarding HPV vaccination among female medical students at Pelita Harapan University.

Material And Methods

This study was conducted with cross-sectional design. The target population was female medical students of Pelita

Harapan University. Sample size was calculated with single proportion formula (d = 0.05) with minimal sample of 140 subjects. Inclusion criteria including registered female medical students of Pelita Harapan University who consented to take part in this study. Exclusion criteria was incomplete data.

Primary data was collected with questionnaire distributed via google form including age, HPV vaccination status, age at fist dose of HPV vaccination, type of HPV vaccination and knowledge regarding HPV vaccination. The questionnaire to assess the knowledge regarding HPV vaccination has been tested for validity and reliability in previous study. The questionnaire consisted of 11 questions with three options of answer: true, false or I do not know. Every correct answer will be scored 2, wrong answer will be scored 1 and unanswered will be scored 0. The score will be summed up and classified into good knowledge (score 17-22), sufficient knowledge (score 12-16) and poor knowledge (score 0-11). The data was then tabulated and univariate analysis was done using Microsoft Excel. This study was approved by the Institutional Review Board of Pelita Harapan University, Tangerang, Banten, Indonesia.

Result

From March to April 2025, there were 770 subjects who met all inclusion and exclusion criteria. The mean age was 20,3-year-old with the oldest was 28-year-old and the youngest was 17-year-old. The characteristics of subjects were shown in **Table 1**.

Table 1. Subject Characteristics

Subject Characteristics	N (%)
Age, mean (year)	20,3
HPV vaccination status*	
None	490 (63,6)
Not fully vaccinated	102 (13,3)
Fully vaccinated	178 (23,1)
Age at first dose of HPV vaccination**	123 (43,9)
9-14 years old	157 (56,1)
>15 years old	
Type of HPV vaccination**	18 (6,4)
Bivalent	52 (18,6)
Quadrivalent	64 (22,9)
Nona-valent	

*From total 770 subjects
**From total 280 vaccinated subjects

The knowledge regarding HPV vaccination were shown in **Table 2**.

Table 2. Knowledge regarding HPV vaccination

Knowledge regarding HPV vaccination	N (%)
Good	354 (46,0)
Sufficient	271 (35,2)
Poor	145 (18,8)

Discussion

In our study, the majority of study subjects had sufficient-good knowledge regarding HPV vaccination (81.2%) and only small proportion had poor knowledge (18.8%). This result indicates a high level of awareness regarding the HPV vaccine among the study population. Knowledge regarding HPV vaccination is linked with

educational background. A study from Khatiwada M et al showed that university students have a good knowledge of HPV vaccination. The study also found out that there was significant association between knowledge and faculty.[16] A study done by Adnyana et al with economics university students as subjects found that majority had sufficient-good level of knowledge (78%) and only 22% had poor level of knowledge regarding HPV vaccination.[17] Another study by Putri et al also found that 74% of medical students have a good knowledge regarding HPV vaccination.[18]

Despite sufficient-good knowledge regarding HPV vaccination, majority of our study subjects do not receive HPV vaccine (63.6%). This finding is concerning, particularly within a population expected to show proactive health-seeking behavior and serve as future advocates for preventive care. The disparity between knowledge and vaccine acceptance suggests that factors other than awareness play a critical role in influencing students' decisions. A study by He et al showed factors influencing HPV vaccination in university student including trust in vaccine efficacy, perception of HPV infection risk, price considerations and constraints like distance or time. Educational background of the parents also shown to contribute to HPV vaccine hesitancy.[19] The importance of parent support toward HPV vaccination is also found to be significant factor influencing va in a study by Wahidin and Febrianti also point out the.[20]

The Indonesian government incorporated the HPV vaccine into the national immunization program across Indonesia in 2023. The HPV vaccines are administered to girls in 5th and 6th grade of elementary school. The youngest subject in our study was 17 years old, and therefore had not participated in the national HPV immunization program. As a result, HPV vaccination had to be paid out-of-pocket, which may be one of the reasons for the low HPV vaccination rate in the population.

In a study conducted in Southern Italy, medical students cited issues such as inconvenient vaccination schedules, lack of time due to academic commitments, and inadequate access to vaccination services as significant deterrents. These logistical challenges are compounded by the absence of institutional initiatives to facilitate vaccination, such as on-campus clinics or coordinated vaccination campaigns.[21] Medical students may perceive themselves as at low risk for HPV infection, especially if they are not sexually active. This perception diminishes the perceived need for vaccination. Studies have shown that individuals who do not recognize themselves as being at risk for HPV are less likely to seek vaccination, despite understanding its importance.[16,22,23]

Cultural and social influences also may play a role. Cultural attitudes towards sexuality and preventive health can influence vaccination decisions. In some contexts, discussions about HPV vaccination may be stigmatized, leading to reluctance in seeking vaccination. Additionally, misinformation and myths about the vaccine, such as misconceptions about its association with infertility or sexual promiscuity, can deter individuals from getting vaccinated.[21,24] Future studies are expected to further investigate factors influencing HPV vaccination coverage in the particular population. By tackling these barriers, vaccination rates among medical students particularly in Pelita Harapan University can be improved, ultimately contributing to broader public health goals.

Conclusion

This study showed that despite sufficient knowledge regarding HPV vaccination among majority of female medical students at Pelita Harapan University, HPV vaccination coverage remained suboptimal

Limitation

This study has several limitations. Data were self-reported, which may affect accuracy and reliability. The findings may not be generalizable due to the specific sample characteristics. Additionally, causal relationships were not assessed, making this a preliminary study.

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