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Systematic Review: Barriers for Adolescent HPV Vaccination Education in Asian Countries

Tinjauan Sistematis: Hambatan dalam Edukasi Vaksinasi HPV pada Remaja di Negara Asia

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ABSTRACT

Cervical cancer remains one of the leading causes of death among women in Asia, with low coverage of Human Papillomavirus (HPV) vaccination in many countries. This low coverage is closely related to educational barriers that have not been fully addressed. This study aims to identify barriers to HPV vaccination education among adolescents in Asian countries through a systematic review approach. Articles were searched through four databases (Google Scholar, PubMed, ScienceDirect, and GARUDA) using a combination both in Indonesian language and English keywords with the Boolean search method. Selection followed the PRISMA 2020 guidelines with inclusion criteria of publications from 2015 to 2025, either in Indonesian language or English, and available in full text, while exclusion criteria included literature review articles, irrelevance to HPV vaccination in adolescents, or not originating from Asian countries. From the 62 articles found, 6 articles met the criteria and were analyzed further. The results showed that the main barriers included low knowledge among adolescents, lack of support from health workers, and misperceptions of risk. In addition, social stigma and limited access to information were also significant barriers. Educational strategies involving schools, families, and community leaders proved to be more effective when tailored to the cultural context. This study concluded that an inclusive and contextual educational approach is essential to increase HPV vaccination coverage among adolescents.

Keywords: HPV vaccination, educational barriers, adolescents

ABSTRAK

Kanker serviks masih menjadi salah satu penyebab utama kematian perempuan di Asia, dengan cakupan vaksinasi Human Papillomavirus (HPV) yang masih rendah di berbagai negara. Rendahnya cakupan ini berkaitan erat dengan hambatan edukasi yang belum tertangani secara menyeluruh. Penelitian ini bertujuan untuk mengidentifikasi hambatan dalam edukasi vaksinasi HPV pada remaja di negara-negara Asia melalui pendekatan systematic review. Artikel ditelusuri melalui empat database (Google Scholar, PubMed, ScienceDirect, dan GARUDA) menggunakan kombinasi kata kunci berbahasa Indonesia dan Inggris dengan metode Boolean search. Seleksi mengikuti panduan PRISMA 2020 dengan kriteria inklusi berupa publikasi tahun 2015–2025, berbahasa Indonesia atau Inggris, dan tersedia dalam teks penuh, sementara kriteria eksklusi mencakup artikel literature review, tidak relevan terhadap vaksinasi HPV pada remaja, atau tidak berasal dari negara Asia. Dari 62 artikel yang ditemukan, 6 artikel memenuhi kriteria dan dianalisis lebih lanjut. Hasil menunjukkan bahwa hambatan utama meliputi rendahnya pengetahuan remaja, kurangnya dukungan dari tenaga kesehatan, dan persepsi risiko yang salah. Selain itu, stigma sosial dan keterbatasan akses informasi juga menjadi penghalang signifikan. Strategi edukasi yang melibatkan sekolah, keluarga, dan tokoh masyarakat terbukti lebih efektif jika disesuaikan dengan konteks budaya. Kajian ini menyimpulkan bahwa pendekatan edukasi yang inklusif dan kontekstual sangat diperlukan untuk meningkatkan cakupan vaksinasi HPV pada remaja.

Kata Kunci: Vaksinasi HPV, hambatan edukasi, remaja

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INTRODUCTION

Cervical cancer is one of the leading causes of death among women in Asia. Globally, more than 340,000 deaths occurred in 2020, and nearly 60% of these were in Asia. In Indonesia, cervical cancer ranks second among cancers with the highest incidence, with more than 36,000 new cases each year (Human Papillomavirus (HPV) infection, particularly types 16 and 18, is the primary cause of cervical cancer.[2] Prevention efforts through HPV vaccination have proven effective, prompting the WHO to target a minimum vaccination coverage of 90% by 2030.[3]

Although HPV vaccination has been proven effective, vaccination coverage in various Asian countries is still far from the set target. Many countries have not yet reached 50% coverage, and some regions in Indonesia and Vietnam even show coverage below 20%. This situation is not only influenced by limited access to health services but also by significant educational barriers. Lack of public knowledge, misinformation, and suboptimal health communication also influence vaccination acceptance among adolescents and parents.[6] Thus, educational barriers are an important factor that needs to be addressed in efforts to increase HPV vaccination coverage.

A number of studies show that there is a gap in adolescents' understanding of HPV and vaccination. In Indonesia, parental resistance is still encountered even though vaccination is provided free of charge through schools.[5] In Bali, some teachers and adolescents do not fully understand the educational materials provided by community health centers, so health messages are not conveyed optimally.[7] The reproductive health savings approach in Yogyakarta has increased awareness among adolescents, but has not yet had a direct impact on vaccination decisions.[8] Meanwhile, Malaysia faces the challenge of a mismatch between the types of vaccines available and the dominant HPV variants.[2] Other countries such as Vietnam also face obstacles in the form of low public trust and information access disparities between urban and rural areas.[9]

Conceptually, global research confirms that barriers to education are influenced by cultural factors, gender, social stigma, and the level of trust in health institutions. Educational programs that do not consider the socio-cultural context often fail to reach adolescents as the main target group. In addition, one-way communication strategies have not been able to effectively build understanding and acceptance of vaccines. International literature also shows that low- and middle-income countries, including many Asian countries, still lack proven and culturally sensitive education models. This knowledge gap highlights the need for systematic studies to map educational barriers more comprehensively in the Asian region.

This study aims to review barriers to HPV vaccination education among adolescents in Asian countries. It identifies patterns of barriers that emerge, compares educational strategies between countries, and formulates recommendations for education that is inclusive, contextual, and relevant to the needs of Asian adolescents.

MATERIALS AND METHODS

The research method used was a systematic

review with journal article searches through four main databases, namely Google Scholar, PubMed, ScienceDirect, and GARUDA Ministry of Education and Culture on March 20, 2025. The keyword combinations used included "Challenges," "Barriers," "HPV Vaccine Education," "HPV Vaccine Campaign," and "Adolescents" in the Google Scholar and GARUDA database searches. Meanwhile, the PubMed and Science Direct database searches used keyword combinations in English with the Boolean Search method. The keywords used included ("Challenges" OR " " "Barriers" OR "Difficulties") AND ("HPV Vaccination Education" OR "HPV Immunization Awareness") AND ("Adolescents" OR "Teenagers" OR "Youth" OR "Young People"). Then, the research findings were compiled using the 2020 PRISMA (Preferred Reporting Items for Systematic Reviews and Meta Analysis) guidelines in the form of a chart in Figure 1.

Inclusion criteria were set to include articles published between 2015 and 2025, written either in Indonesian language or English, available in full text, and with research samples from the Asian region. Articles were excluded if they were literature reviews or systematic reviews, irrelevant based on their title or abstract, or did not study adolescent populations or the context of HPV vaccination.

Data extraction was performed using an extraction form developed by the researchers. The variables collected included article title, author name, year of publication, research design, content or findings relevant to barriers to education and HPV vaccination, the presence of adolescent samples, and the location of the study in Asia. All articles that met the criteria were entered into an extraction table to facilitate organization and comparison between studies.

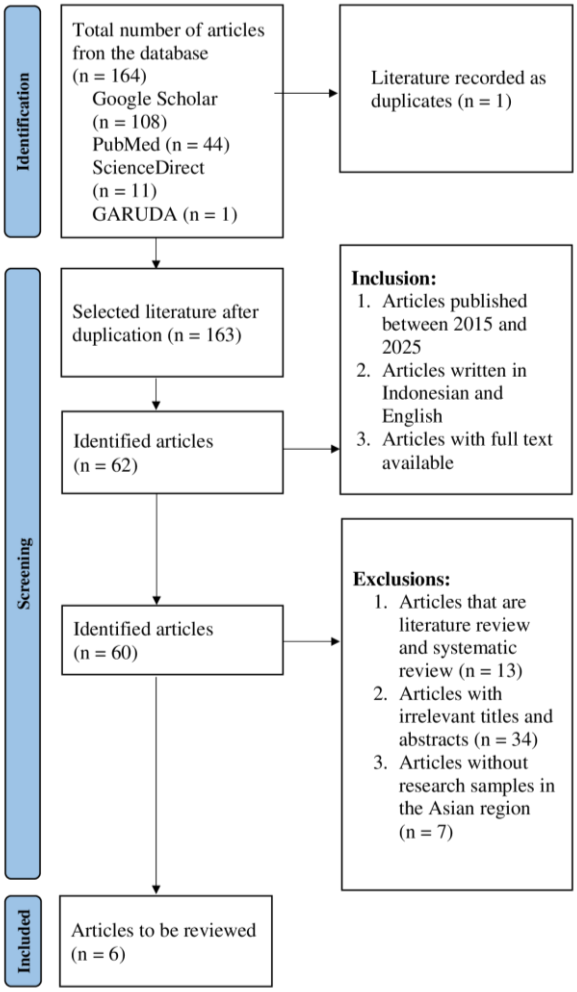

Figure 1. Flowchart of Systematic Review using PRISMA Guidelines

Data analysis was performed using a narrative synthesis approach with thematic synthesis techniques. Each article was read thoroughly to identify important data, then coded based on the emergence of concepts or patterns related to barriers. The codes were grouped into main themes such as knowledge barriers, social stigma, risk perception, vaccine costs, and access to education. The resulting themes were then synthesized

narratively to describe common patterns and variations in findings across Asian countries.

RESULTS

Based on the results of literature searches through the specified databases, 62 articles were found based on the keywords used. After further selection by analyzing and considering relevance to the topic, 6 articles were found to meet the inclusion and exclusion criteria. This selection process was carried out by reviewing the titles, abstracts, and content of the articles, particularly those discussing barriers to HPV vaccination among adolescents in Asia.

Tabel 1. Review Article Result

Author	Place	Heading	Method	Result
Hussain et al. (2016)	Saudi Arabia	*Attitudes and perceptions towards HPV vaccination among young women in Saudi Arabia*	Questioner	Low awareness of HPV (31.7%) and lack of knowledge about the vaccine's effectiveness in preventing cervical cancer (29.9%) are major obstacles for the Saudi public.
Chanprasertpinyo & Rerkswattavorn (2020)	Thailand	*Human papillomavirus (HPV) vaccine status and knowledge of students at a university in rural Thailand*	*Cross-Sectional*	Based on the study, barriers to HPV vaccination education include the perception that HPV vaccination is unnecessary due to low-risk behavior (45.1%), the perception that the risk of infection is low (45.1%), and objections to the cost of the vaccine (52.2%).
Shaikh et al. (2019)	Pakistan	*Knowledge, Attitude, and Barriers Towards Human Papillomavirus (HPV) Vaccination Among Youths of Karachi, Pakistan*	*Cross-Sectional*	Although respondents' knowledge levels were quite high, vaccine education was still hampered by high vaccine prices (46.8%), time consumption (41.8%), and social stigma (17%).
Chau et al. (2022)	Hong Kong	*Evaluating the Psychometric Properties of the Chinese Version of the Modified Carolina Human Papillomavirus Immunization Attitudes and Beliefs Scale among Chinese Adolescent Girls*	*Cross-Sectional*	These findings reveal that low exposure to HPV vaccine education in schools (82.9%) and never having discussed the vaccine with health workers (96.7%) are barriers to HPV vaccine education.
Rahmawati et al. (2024)	Indonesia	*Reproductive Health Education for Adolescent Girls at Elementary School of 51 Sungai Raya*	Lectures and discussions	This study shows that students' low initial knowledge about reproductive health, including HPV, is caused by unequal access to education.

Author	Place	Heading	Method	Result
Sutjipto et al. (2019)	Indonesia	*Introduction of HPV Vaccination by the Indonesian Coalition for Cervical Cancer Prevention Using the Innovation Diffusion Theory Approach*	Case study	HPV vaccine education campaign efforts have not been optimal because public understanding of HPV and its benefits of vaccination is still low, and the high cost of vaccines also limits the reach of the educational message.

DISCUSSION

Several countries in Asia, such as Indonesia, Maldives, Myanmar, Mongolia, and Brunei Darussalam, are categorized as countries with high rates of cervical cancer based on age, namely >20 cases per 100,000 population and >10 deaths per 100,000 population.[10] Persistent HPV infection can cause changes in cervical cells -cervical cells into precancerous cells, which will then transform into cervical cancer within 15–20 years.[11] HPV vaccination is one effective prevention strategy because it has been proven to reduce the incidence of cervical cancer by up to 90% with an effectiveness of 89.9% against HPV subtypes 16 and 18.[12,13]

However, there are still various obstacles to its implementation, one of which is the lack of education about HPV vaccination. This study found that obstacles to providing education about HPV vaccination are related to low understanding of HPV, high vaccination costs, and social stigma. These findings are in line with other studies showing that the readiness and awareness of adolescent girls regarding HPV vaccination are still at a low level.[14] The lack of knowledge and understanding is a serious concern because the formation of healthy behaviors, including disease prevention, must begin with adequate knowledge.[15] If knowledge about HPV and HPV vaccination continues to be a barrier to providing education, there is concern that the incidence of HPV infection will continue to increase. This is reinforced by data showing that >103 million women aged >15 years are at risk for HPV infection.[16]

Social stigma associating the HPV vaccine with moral issues or sexual behavior can also reduce public interest in vaccination.[17] Asian communities still believe that adolescents will engage in sexual activity earlier if they receive the HPV vaccine because they feel protected from HPV infection.[18] In addition, the belief that children are too young to receive vaccines related to STIs is also found among parents. [19] However, it should be noted that there is no correlation between HPV vaccination and the desire to engage in sexual activity at an earlier age.[20] In addition, the WHO recommends HPV vaccination for children who are not yet sexually active or girls aged 9–14 years.[11]

The high cost of HPV vaccination is one of the barriers to providing education.21–23 In China, the HPV vaccine is priced at USD 80–180 per dose.[24] In Pakistan, the HPV Cervarix vaccine is sold for USD 22, making it unaffordable for most of the Pakistani population.[25] Meanwhile, in Indonesia, the Cervarix HPV vaccine costs IDR 1,800,000 and the Gardasil HPV vaccine costs IDR 2,500,000.[26]

In several Asian countries, HPV vaccination has been included in the National Immunization Program (NIP), such as Indonesia, Hong Kong, Malaysia, Japan, the Philippines, Taiwan, South Korea, Singapore, and Thailand. The program is implemented for school-aged children or school-based programs, but in some countries, such as Singapore, there are outside of school-based programs.[27] With this policy, it is hoped that cost barriers can be reduced and the incidence of HPV infection can be lowered.

The continuing cost barriers and limited public understanding of HPV vaccination underscore the need to strengthen health policies that focus on expanding public funding and integrating HPV vaccines into national immunization programs on an ongoing basis. Various recent studies show that expanding vaccination coverage, including the use of higher-valent vaccines, is a cost-effective strategy in reducing the burden of cervical cancer in low- and middle-income countries.[28] In Indonesia, a pharmacoeconomic analysis using the Markov model also found that expanding the HPV vaccination program to include adult women (catch-up) has the potential to be cost-saving.[29] Evidence-based policies supported by adequate funding are essential prerequisites for ensuring the sustainability and equitable access to HPV vaccination, while reducing the cost barriers that have limited education and immunization services. Thus, accelerating the reduction of the burden of cervical cancer can be achieved more effectively as part of efforts to eliminate the disease in the long term.

In the context of policy implementation, the role of health workers is crucial in improving education and advocacy for HPV vaccination. Recommendations made by health workers have been shown to have a direct impact on vaccine acceptance in the community. Research in China, for example, shows that only about 30.2% of health workers in large cities routinely recommend the HPV vaccine; factors such as knowledge about HPV and comfort in discussing sexual issues greatly influence the frequency of recommendations.

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A national study of 15,967 female health workers also revealed that although they were aware of the benefits of the vaccine, their personal vaccination rates remain low, and factors such as self-efficacy, perceived benefits, and cues to action play an important role in increasing vaccine uptake.[31] Other findings on male nursing interns show that 72.3% are willing to encourage HPV vaccination in others, influenced by clinical experience with HPV-related diseases, positive attitudes toward vaccines, and perceptions of behavioral control.[32]

Overall, strengthening HPV vaccination policies needs to go hand in hand with increasing the capacity of health workers as the frontline of public education. When adequate public funding is combined with health workers who have strong knowledge and are able to communicate effectively, cost barriers and stigma can be significantly reduced. Such an integrated approach not only expands access to vaccination but also increases public trust, enabling efforts to reduce the burden of cervical cancer to proceed more quickly and sustainably.

This systematic review has limitations that need to be considered when interpreting the results. The number of articles that met the inclusion criteria was relatively small, so the findings cannot represent the overall context of countries in Asia. In addition, some articles used a cross-sectional design that only described conditions at a single point in time, so they could not explain changes in adolescents' knowledge or attitudes over time.

CONCLUSION AND SUGGESTIONS

The results of this systematic review show that HPV vaccination education among adolescents in several Asian countries faces various complex barriers, such as low levels of knowledge, social stigma, low risk perception, and limited access to information and health services. Although many adolescents show interest in HPV vaccination, various barriers such as economic factors, lack of support from health workers, and inappropriate educational approaches remain major obstacles to achieving optimal vaccination coverage. To overcome this, an inclusive and contextual HPV vaccination education program is needed through collaboration between schools, families, health workers, and community leaders. The government also needs to strengthen vaccine subsidies, expand access to information through relevant media, and provide persuasive and culturally sensitive communication training for health workers. In addition, further research can be conducted to develop educational intervention models that are adaptive to the socio-cultural dynamics in each region.

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CONFLICT OF INTEREST

There is no potential financial, personal, or other relevant conflict of interest in the preparation and interpretation of this systematic review.

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