

# Knowledge, Attitudes and Barriers towards Human Papillomavirus (HPV) Vaccination in Developing Economies Countries of South-East Asia Region: A Systematic Review

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## ABSTRACT

Cervical cancer is the fourth most common cancer among women worldwide with South-East Asian countries jointly contributes to nearly one-third of the global cervical cancer burden. The objective of this study is to review and determine the knowledge, attitude, also barriers among people in developing countries of South East Asia region towards human papillomavirus (HPV) vaccination against cervical cancer. We performed a literature search for published articles in English that reported about knowledge, attitudes and barriers towards HPV vaccination in developing countries of South-East Asia on UN World Economic Situation and Prospects 2018 classification, prior to recent years (2008-2018). Terms and keywords relevant to knowledge attitudes towards HPV vaccination were used in a search of the electronic database. A total of 120 studies were initially identified and 10 studies were finally selected that met all eligibility criteria. The percentage of knowledge on availability of HPV vaccine to protect women against cervical cancer was varied from 7.8–97.5%. Meanwhile the positive attitude percentage ranged from 36.1–92.1%. Some barriers of taking

HPV vaccination were because of afraid by the side effects, needle and/or any other safety issues, believed that the vaccine needed only when symptom appears, embarrassment and unaffordable price. Our study find even while levels of knowledge are generally low, individuals are still willing to receive vaccination against HPV. The barriers reflect the importance of immediate implementation of educational campaigns before vaccination is made available through a national HPV vaccination program. It may improve uptake of vaccination and its effectiveness to people in each country.

**Key words:** Cervical cancer, Human papillomavirus, HPV vaccine, Knowledge, South-East Asia.

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## INTRODUCTION

Cervical cancer is the fourth most common cancer among women worldwide, with an estimated 528,000 new cases and 266,000 deaths in 2012.<sup>1</sup> Approximately 90% of cervical cancer mortalities occurred in the developing countries of the world, with Asia accounting for 144,400 deaths.<sup>2</sup> Most cervical cancer cases are caused by human papillomavirus (HPV) infection. HPV is transmissible through sexual contact, including by having vaginal or oral sex with an infected person.<sup>3</sup> Several subtypes of the virus have been identified to cause the malignant transformation of the cervical epithelium, also known as the high-risk subtypes. The identification of and the development of a vaccine against these subtypes has led to the possibility of preventing some cervical cancers through vaccination.<sup>4</sup>

HPV vaccine has the great potential to prevent HPV-related infections for millions of women and men worldwide. Regular cervical screening and HPV vaccination are the usual means for the early detection or prevention of HPV-related diseases. However, the success of the vaccine is highly dependent on the vaccination rate. The Center for Disease Control and Prevention (CDC) has suggested that people can receive the vaccine starting from age of nine; both females and males can receive the vaccine until the ages of 26 and 21, respectively.<sup>5</sup>

The HPV vaccination rate of women in the USA and Australia is about 37.6% and 32%, respectively,<sup>6</sup> but it is lower in Asian countries. Little known, knowledge of HPV and the HPV vaccine was still limited for people especially woman in developing countries and rural areas. Cervical cancer is the most common cancer in the developing and underdeveloped countries which bear more than 80% of the global burden of the disease. South-East Asian countries jointly contribute to nearly one-third of the global cervical cancer burden.<sup>1</sup> Therefore, knowledge and factors influencing the attitudes of people towards HPV vaccination should be studied to know the HPV vaccination rate among people in

developing countries of South East Asia region and identify the possible barrier of their negative attitude towards HPV vaccination.

The objective of this study is to review and determine the knowledge, attitude, also barriers among people in developing countries in South East Asia region towards HPV vaccination. The results of this study may contribute to identify and address key aspects in terms of strengthening practice of HPV vaccination especially in developing countries setting to be able to increase their coverage.

## MATERIALS AND METHODS

This research is a systematic review to find out the knowledge, attitudes and barriers towards HPV vaccination in developing economies countries of South-East Asia region from several related studies. There were 3 main steps to gain the data; first we identify and select related research about our topic. Second, we assess the retrieved research that met all eligibility criteria. Then third, we made the review and data extraction for each study.

### Study identification

Relevant research studies were located through an extensive search from electronic databases (PubMed, Science Direct and Cochrane Database of Systematic Reviews) and Google Scholar on August-September 2018. We performed a literature search for published articles in English that reported about knowledge, attitudes and barriers towards HPV vaccination South-East Asia countries prior to recent years (2008-2018).

A preliminary hand search of the literature was completed in order to identify appropriate keywords and medical subject heading (MeSH) terms. Key terms used for the search were as follows: “knowledge”, “knowledge and attitude”, “knowledge, attitude and barriers”, “HPV”,

“HPV vaccine”, “Asian countries”, “South-East Asia”. Search terms were combined using the operators “AND” and “OR” to ensure that all relevant articles were located. We were also finding the study by manually type the name of different developing economies countries in South-East Asia based on UN World Economic Situation and Prospects 2018 classification.<sup>7</sup> Only studies that met all those variables of interest were included, with inclusion and exclusion criteria shown in Table 1.

### Study Quality Assessment

A total of 124 studies were initially identified: 110 from the initial search strategy and an additional 14 articles were gathered from the hand search of the literature. After further review of references from the retrieved studies, 12 studies were finally selected that met all eligibility criteria. The PRISMA diagram of retrieved studies is shown in Figure 1.

### Data extraction

Data were independently extracted by two independent researchers. Data extraction form included details of study design, research sample, countries and selection of variables, instruments, approach and the result of each study. Non-agreement or any dissimilarity on the data extraction was resolved by discussion among the authors.

## RESULTS

### Details of selected studies

The retrieved studies consisted of varied number of population and conducted from different developing economies countries of South-East Asia. The studies were conducted in 9 different countries (Malaysia, Thailand, India, Cambodia, Viet Nam, Singapore, Bangladesh, Lao PDR and Indonesia). The included studies were come from many different kind of publication sites. We also found a variety of years of publication within the study; with 9 out of 12 studies (75%) were conducted in recent 5 years (2013-2018).

### Methodological characteristics

The selected studies consisted of nine cross-sectional studies, one univariate descriptive analysis, one descriptive analysis and another one was using multivariate logistic regression analyses. Variation of the respondents of study sample came from different health professionals, university students, rural and urban residents. The recruitment sites of the studies were conducted mostly in hospital or public health clinic, some studies took sites in rural and/or urban areas and only one study collected the data by sending letters to the respondents. The methodological characteristics for selected studies of this paper reported in Table 2.

### Knowledge, attitude and barrier of HPV vaccine

The data extraction about study objective, knowledge, attitude and barrier of HPV vaccine of ten selected studies used in this systematic review can be seen in Table 3. Knowledge of the participants or study’s sample was assessed mostly by self-reported questionnaire with specific kind of question. The percentage of knowledge on availability of HPV vaccine to protect women against cervical cancer was varied from 7.8 – 97.5%, with the lowest percentage came from Wong’s study (2011)<sup>8</sup> for ethnically diverse young rural women in Malaysia. Meanwhile the highest knowledge percentage was seen in Tran *et al.* study (2018)<sup>9</sup> which conducted for vaccination service users in public health clinic in Viet Nam as the study sample.

The participants of another study with lowest to highest knowledge percentage about HPV vaccine were female parents of girls aged 12-15 years conducted in secondary schools in Thailand,<sup>10</sup> followed by women in the obstetrics and gynecology outpatient clinic in Malaysia,<sup>11</sup> female workers

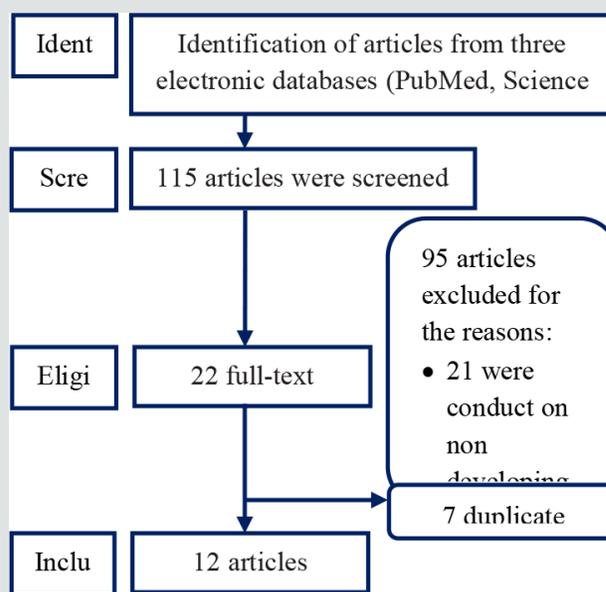
in public health site, university and office of Lao PDR,<sup>12</sup> women aged 20–69 who lived in rural areas in Cambodia,<sup>13</sup> students attending a tertiary institution in Singapore aged 15-26 years,<sup>14</sup> secondary school students in rural areas in Malaysia,<sup>15</sup> nurses and doctors from three government and private hospitals in Thailand,<sup>16</sup> female professionals employed at selected private banks in urban areas of Bangladesh,<sup>17</sup> young women, mothers of girls aged 12 – 15 years and adult women in university, urban and rural areas of Indonesia,<sup>18</sup> and medical students of tertiary teaching hospital in India,<sup>19</sup> respectively.

In another side, the attitude score or percentage in most selected studies was assessed by total number of answer “yes” responses in case of closed questions. Meanwhile the attitude score in case of open questions was defined as the total number of “yes” responses with correct answers. Some question samples to assessed attitude toward HPV vaccine were “do you want to get the HPV vaccine?” “Will you give consent for vaccination against HPV?” “Are you interested to get HPV vaccine?” or “if there were a cheap vaccine against HPV, would you get vaccinated?”. The positive attitude percentage about HPV vaccine was ranged from 36.1 – 92.1%, with 10/12 (about 80%) of the studies had high intention

**Table 1:** Inclusion and exclusion criteria for the reviewed articles

Inclusion Criteria		Exclusion Criteria	
1.	Published in the English language	1.	Review articles, letters and comments
2.	Time frame year from 2008 - 2018	2.	Non developing economies countries*
3.	Report about both knowledge and attitude towards HPV vaccination	3.	Article was not based on original research (i.e., the study was a literature review);
4.	Exclusively represent nation/s of study population in South-East Asia region		
5.	Available in full-text		

\* Based on UN World Economic Situation and Prospects 2018 classification 7.



**Figure 1:** PRISMA diagram of retrieved studies.

**Table 2:** Methodology of selected studies

Study	Country	Respondents	Recruitment sites	Sample size	Method	Approach
1. Al-Dubai <i>et al.</i> 2010 <sup>11</sup>	Malaysia	Malaysian women in the obstetrics and gynecology outpatient clinic	Hospital	300	Cross-sectional study	Self-administered questionnaire
2. Songthap <i>et al.</i> 2009 <sup>16</sup>	Thailand	Nurses and doctors from three government and private hospitals	Hospital	300	Cross-sectional survey	Self-administered questionnaire
3. Tripathy <i>et al.</i> 2015 <sup>19</sup>	India	Medical students of aged between 18-25 years	Tertiary teaching hospital	150	Cross-sectional survey	Self-administered questionnaire
4. Wong, 2011 <sup>8</sup>	Malaysia	Ethnically diverse young rural women in Malaysia	Rural areas	449	Multivariate logistic regression analyses	Interviewed using a standard questionnaire
5. Jalani <i>et al.</i> 2016 <sup>15</sup>	Malaysia	Secondary school students in rural areas of Negeri Sembilan Malaysia	Rural areas	380	Cross-sectional study	Face to face interview
6. Touch and Oh, 2018 <sup>13</sup>	Cambodia	Women aged 20–69 years who lived in Kampong Speu Province	Rural areas	440	Community-based cross-sectional survey	Face to face interview survey
7. Tran <i>et al.</i> 2018 <sup>9</sup>	Viet Nam	Vaccination service users	Public health clinic	492	Cross-sectional study	Face to face interviews using self-reported questionnaire
8. Zhuang <i>et al.</i> 2016 <sup>14</sup>	Singapore	Students attending a tertiary institution aged 15-26 years	Tertiary institute	255	Cross-sectional survey	Self-administered questionnaire
9. Bhuiyan <i>et al.</i> 2018 <sup>17</sup>	Bangladesh	Female professionals employed at selected private banks	Urban areas	160	Univariate descriptive analyses	Interviews through a self-administered questionnaire
10. Hando <i>et al.</i> 2018 <sup>12</sup>	Lao PDR	Female workers in Vientiane, the capital of Laos	Public health site, university and office	356	Cross-sectional study	Face to face interview
11. Kruiroongroj <i>et al.</i> 2014 <sup>10</sup>	Thailand	Female parents of girls aged 12-15 years in Thailand	Secondary schools	861	Cross-sectional study	Self-administered questionnaire
12. Endarti <i>et al.</i> 2018 <sup>18</sup>	Indonesia	Young women, mothers of girls aged 12 – 15 years and adult women	University, urban and rural areas	392	Descriptive analyses	Self-administered questionnaire

and/or willingness to get HPV vaccination. The lowest percentage came from Tripathy *et al.* (2015)<sup>19</sup> conducted in India and the highest percentage was in Hando *et al.* (2018)<sup>12</sup> in female workers in Vientiane, the capital of Laos.

Out of twelve selected studies, there were several barriers for participants taking the HPV vaccine. Most of them were not intended to taking HPV vaccine because of afraid by the side effects, needle and/or any other safety issues. Other reasons were because of believed that the vaccine needed only when symptom or risk appears, feelings of shame or embarrassment at receiving a sexual transmitted infection (STI) vaccine and unaffordable price of the vaccine. Summary of knowledge, attitude and barrier towards HPV vaccination can be seen in Table 4.

## DISCUSSION

Based on UN World Economic Situation and Prospects 2018 classification, there are around 18 countries of East Asia and 9 South Asia countries which included in this category.<sup>7</sup> There were already many research discuss about the knowledge and attitude about HPV in those countries, but research which focus on knowledge and attitude about HPV vaccination were still limited based on our search. There were 8 countries from 12 different studies that met our criteria which discussing about

knowledge, attitudes and barriers toward HPV vaccination.

This paper reviews the knowledge, attitudes and barriers toward HPV vaccination in developing countries of South-East Asian region. In terms of knowledge, percentage of knowledge on availability of HPV vaccine to protect women against cervical cancer was varied from 7.8 – 97.5%. This wide range indicated that there was a big gap of knowledge within people in each country. Lowest percentage came from ethnically diverse young women in rural area; means that we need put more intention to share the information about HPV vaccine in rural area as the access of health information for them were limited.<sup>20, 8</sup> In another study conducted in Maldives, very few women know of a vaccine to prevent cervical cancer, not because of low access of health information, but since the HPV vaccines are not available in that country.<sup>21</sup> Therefore, HPV vaccine knowledge requires further study, since published study populations show a range of cultural, socioeconomic and other differences.<sup>22</sup>

The positive attitude percentage about HPV vaccine was ranged from 36.1–92.1%. Eight out of ten studies had result that more than 50% sample have intention and/or willingness to get HPV vaccination. Our studies find that while levels of knowledge are generally low, individuals are still willing to receive vaccination against HPV, like the result of some other studies.<sup>8,23</sup> This suggests that apart from the perceived risk of

**Table 3:** Summary of knowledge, attitude and barriers towards HPV vaccination

Study	Objective/s	Knowledge	Attitudes	Barriers
1. Al-Dubai <i>et al.</i> 2010 <sup>11</sup>	To determine the level of knowledge of HPV and HPV vaccines, attitudes toward HPV vaccination and barriers of being vaccinated	HPV vaccination can protect women against cervical cancer (25.3%), vaccine is not only for women with more than one sexual partner (23.3%)	Positive attitude toward the vaccine (53%), negative attitude (17%), 30% had no decision	Unawareness of the vaccine, concerned about side effects and afraid of needles.
2. Songthap <i>et al.</i> 2009 <sup>16</sup>	To evaluate acceptability, knowledge and attitude regarding HPV, cervical cancer and HPV vaccine among healthcare providers	Mean scores of 5.45 and 6.87 out of 11 (49.5% and 62.5%) for nurses and doctors' knowledge regarding HPV infection, cervical cancer and HPV vaccine at moderate levels	Positive attitude regarding HPV vaccine with mean scores 3.87 out of 5 (77.4%)	NM
3. Tripathy <i>et al.</i> 2015 <sup>19</sup>	To assess the awareness of HPV infections and vaccination among the young students of a tertiary care teaching hospital	Awareness of availability of the vaccine against HPV infection (72.1%)	Positive attitude toward the vaccine (36.1%)	HPV vaccination would give a false sense of security and sexual exposure occurs at late age
4. Wong, 201 <sup>18</sup>	To assess knowledge and attitudes towards HPV, HPV vaccination and cervical cancer among young women in rural settings in a Southeast Asia	Only 7.8% had heard of the newly released HPV vaccine	Two-thirds professed an intention to receive the HPV vaccine (66.7%)	Doubts about safety and efficacy of the new vaccine, perceived embarrassment at receiving an STI vaccine, perception of not being at risk of HPV infection
5. Jalani <i>et al.</i> 2016 <sup>15</sup>	To assess the knowledge, attitude and practice towards HPV infection, cervical cancer and HPV vaccination practice among secondary school students in rural areas	66.3% have heard of cervical cancer and 50.8% have heard of HPV vaccine	Intention to get vaccinated against HPV was quite high (86.6%)	Significant predictor for someone who rejects vaccination due to side effects
6. Touch and Oh, 2018 <sup>13</sup>	To examine the cervical cancer knowledge, attitudes and practices as well as cervical cancer prevention methods among Cambodian women	35% of women were aware that cervical cancer is preventable by vaccination	62% of women were willing to get the HPV vaccine, but only 1% of women had been vaccinated against HPV	Missconception about Pap test should not be performed regularly and believed that it is needed only when a symptom appears or once in a lifetime at any age
7. Tran <i>et al.</i> 2018 <sup>9</sup>	To investigate barriers related to knowledge-attitude-practice about the HPV vaccine and willingness to pay (WTP) for the vaccine among those using services in an urban vaccination clinic in Hanoi, Vietnam	Knowledge about the benefits of HPV vaccine to prevent cervical cancer in female and male were 97.2% and 86% respectively	Desired to be vaccinated (71.1%), only 31.8% of users were vaccinated	Rate of vaccination uptake remains low owing to high prices (especially in males), sexual health topics are often avoided in discussions at school or in the family
8. Zhuang <i>et al.</i> 2016 <sup>14</sup>	To describe the knowledge, attitudes and practices of young women regarding HPV vaccination	The mean score of participants' knowledge of cervical cancer and HPV vaccination was 7.09 out of 14 (50.6)	58.3% of sample had the intention to receive HPV vaccination	Lack of information as the major barrier
9. Bhuiyan <i>et al.</i> 2018 <sup>17</sup>	To assess the knowledge, attitude and acceptance of cervical cancer, HPV and HPV vaccination among urban professional women	56% of participants reported to have ever heard about HPV vaccination	43% of study participants showed interest in receiving HPV vaccination in the future	Not know enough about vaccination, some mentioned that their doctor did not recommend it to them
10. Hando <i>et al.</i> 2018 <sup>12</sup>	To provide the data to establish the national cervical cancer prevention program by studying the knowledge and attitude regarding cervical cancer and its prevention in Vientiane	Participants who had heard of cervical cancer, HPV and HPV vaccine comprised 89.9%, 34.0% and 27.8% for medical workers, office workers, factory workers and cleaners respectively	92.1% participant wished to get vaccinated if the cost of HPV vaccination was affordable	Absence of symptoms, feelings of shame or embarrassment, no time, beliefs of never having cervical cancer
11. Kruiroongroj <i>et al.</i> 2014 <sup>10</sup>	To examine the level of knowledge, attitude, acceptance and WTP for HPV vaccination among female parents of girls aged 12-15 years in Thailand	Only 21% of women did know that some types of HPV vaccine can also provide protection against genital warts	Participants willing to copay for the vaccine if it was not totally free: 68.9% for the bivalent to 67.3% for the quadrivalent	The main reason for non acceptance of the vaccines was concern about the side effects
12. Endarti <i>et al.</i> 2018 <sup>18</sup>	To determine knowledge, perception and acceptance related to cervical cancer, HPV vaccination and screening for cervical cancer among Indonesian women	Among female young women, 64% had good knowledge on HPV vaccination	92% participants tended to accept HPV vaccination	The high cost of HPV vaccine and willingness to take HPV vaccination/ screening only if having the risks

**Table 4:** Knowledge, attitude and barrier towards HPV vaccination.

Characteristics	Study number*											
	1	2	3	4	5	6	7	8	9	10	11	12
<b>Knowledge about HPV vaccine</b>												
Awareness of availability of HPV vaccine to protect women against cervical cancer (%)	25.3	55.7	72.1	7.8	50.8	35	97.2	50.6	56	27.8	21	64
<b>Attitude about HPV vaccine</b>												
Positive attitude (%)	53	77.4	36.1	66.7	86.6	62	71.1	58.1	43	92.1	68.9	92
<b>Barrier of taking HPV vaccine</b>												
Afraid the side effects, needle and/or safety issue	√	-	√	√	√	-	-	-	-	-	-	√
Unaware about the availability of HPV vaccine as lack of information	√	-	-	-	-	-	-	√	√	-	-	-
Believed that it is needed only when symptom or risk appears	-	-	√	√	-	√	-	-	-	√	-	√
Embarrassment	-	-	-	√	-	-	√	-	-	√	-	-
High prices	-	-	-	-	-	-	√	-	-	-	√	-

\*1)Al-Dubai *et al.* 2010; 2)Songthap *et al.* 2009; 3)Tripathy *et al.* 2015; 4)Wong, 2011; 5)Jalani *et al.* 2016; 6)Touch and Oh, 2018; 7)Tran *et al.* 2018; 8)Zhuang *et al.* 2016; 9)Bhuiyan *et al.* 2018; 10)Hando *et al.* 2018; 11)Kruiroongroj *et al.* 2014; 12)Endarti *et al.* 2018

contracting cervical cancer, there were other factors affecting the decision of woman to be vaccinated against HPV that require further exploration. Hence, regular health campaigns are essential to reduce the disease burden and enhance positive attitude towards the vaccine.<sup>24</sup>

In the other side, barriers of most those who were not intended to taking HPV vaccine in this study were because of afraid by the side effects, needle and/or any other safety issues. Other reasons were because of believed that the vaccine needed only when symptom or risk appears, feelings of shame or embarrassment at receiving a sexual transmitted infection (STI) vaccine and unaffordable price of the vaccine. It should be well understood that the mere availability of an effective vaccine is not synonymous with an effective vaccination program.<sup>25</sup> This reflects the importance of immediate implementation of educational campaigns before vaccination is made available through a national HPV vaccination program to improve uptake of vaccination and its effectiveness to each country.<sup>26, 27</sup>

Several limitations need to be considered in interpreting the findings of this review. The result study may different and vary across regions because of cultural, socioeconomic and other differences of each country. Based on our findings, study that focus on HPV vaccine related issue in developing countries in South-East Asia were still limited, may also be the factor of this review cannot generally represented the issue in that region. There for we are suggest the HPV vaccine-related study conduct with an accurate and particular method in the near future.

## CONCLUSION

Our study finds that even while level of knowledge was generally low, individuals were still willing to receive vaccination against HPV. Some barriers of most those who were not intended to taking HPV vaccine in this study were because of afraid the side effects, needle and/or safety issue, believed that it is needed only when symptom or risk appears, embarrassment and price consideration. The knowledge and barriers reflect the importance of immediate implementation of educational campaigns before vaccination is made available through a national HPV vaccination program.

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## CONFLICT OF INTEREST

The authors declare no conflict of interest.

## ABBREVIATIONS

**HPV:** Human Papillomavirus; **CDC:** Center for Disease Control and Prevention; **PRISMA:** Preferred Reporting Items for Systematic Reviews and Meta-Analyses.

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