*Original Article*

# The Comparison of Human Papillomavirus Knowledge by General Characteristics in Vaccinated Thai Women

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***Objective:*** To evaluate human papillomavirus [HPV] vaccine knowledge, the reason for receiving HPV vaccination and comparison of HPV vaccine knowledge by general characteristics.

***Materials and Methods:*** In this cross-sectional study, we randomly sampled 300 of 1,366 women who received HPV vaccination with bivalent and quadrivalent vaccines during October 2013 to March 2014. Data were collected by interviewing women before the second or third dose of HPV vaccine. Data were analyzed by frequency, percentage, mean and standard deviation [SD]. HPV vaccine knowledge and general characteristics were compared by one-way ANOVA.

***Results:*** The women were 21 to 68 years of age (mean, 43.97 years), predominantly had sexual experience (74.7%), had obtained Bachelor's degree or higher (69.0%), and had monthly income >20,000 baht (53.3%). The mean HPV vaccine knowledge score was 7.31, and most women had good (52.0%) or moderate knowledge (33.0%). Main reasons for receiving HPV vaccination included benefits/cost-effectiveness (99.3%), fear of cervical cancer (93.3%) and recommended by medical personnel (81.3%). Significant differences were observed for HPV vaccine knowledge according to age group ($p<0.001$), monthly income ($p = 0.015$) and educational attainment ($p = 0.015$).

***Conclusion:*** Proactive strategies about HPV vaccine knowledge could lead to health equity towards sustainable prevention of cervical cancer in Thai women.

***Keywords:*** Knowledge, HPV vaccine, HPV infection

**J Med Assoc Thai 2018; 101 [Suppl. 6]: S75-S80**
**Full text. e-Journal:** http://www.jmatonline.com

Cervical cancer was the fourth most common worldwide and the second most common women cancer in Thailand; it is estimated that 8,184 new cases and 4,513 deaths occur annually due to this disease[1,2]. One important factor of cervical cancer is human papillomavirus [HPV] infection; persistent HPV infection is a significant stage of disease progression that can lead to pre-cancerous lesions and cervical cancer. Effective and successful treatment outcomes can be achieved in early stage cervical cancer, while end stage cervical cancer generally results in poor treatment and death. Thus, cervical cancer prevention is recommended and the most effective primary prevention strategy of cervical cancer is HPV vaccination[3]. In Thailand, the Food and Drug Administration has approved two types of registered vaccines (bivalent and quadrivalent vaccines), which have a cervical cancer prevention rate of about 70%[4]. However, HPV vaccination in Thai women is still low.

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**How to cite this article:** Saeloo S, Taepisitpong C, Kantathavorn N, Rawangban S, Kwangkaew S, Krongthong W. The Comparison of Human Papillomavirus Knowledge by General Characteristics in Vaccinated Thai Women. J Med Assoc Thai 2018;101;Suppl.6: S75-S80.

In previous studies about knowledge and attitude of HPV vaccination in medical personnel and adolescent, maternal, and general women, a low-moderate level of HPV vaccine knowledge was found. Moreover, the decision to receive HPV vaccination or factors related to HPV knowledge included benefits/cost-effectiveness and recommended by medical personnel[5-21]. Therefore, the authors were interested in the HPV vaccinated group with a focus on HPV vaccine knowledge. Identification of the reason for HPV vaccination among these vaccinated groups can help medical personnel create targeted educational programs and shape public health management guidelines for cervical cancer prevention in Thailand.

## Materials and Methods

Questionnaires were validated by three gynecologists, content validity index (1.00) using ratings of item relevance by content experts, and the reliability of the questionnaire was determined by Cronbach's alpha (0.839). Pilot study of 20 vaccinated women shown the mean and standard deviation of knowledge score were 5.1 and 2.25, calculated sample size equal 300 at $\alpha = 0.05$ and power = 0.8[22]. Three hundred Thai women (aged 20 to 70 years) were included in this study by simple random sampling from total of 1,366 women who received HPV vaccination with bivalent and quadrivalent vaccines in the cervical cancer screening project at Chulabhorn Hospital, Bangkok, Thailand from October 2013 to March 2014. After obtaining informed consent, data were collected by interviewing these women before the second or third dose of HPV vaccine. The questionnaire was comprised: general characteristics, the reason for HPV vaccination, and HPV vaccine knowledge. General characteristics included age, sexual experience, monthly income, and education attainment. Six potential reasons for HPV vaccination were given and participants could select multiple answers. HPV vaccine knowledge was assessed by 10 questions with responses of "yes", "no" or "unknown". One point was given for each correct answer, with a total possible score of 10 points and grouped into three levels: good (8 to 10 points), moderate (6 to 7 points), and poor (0 to 5 points).

The protocol of this research was reviewed and approved by the Human Research Ethics Committee, Chulabhorn Research Institute No. 011/2556.

### *Statistical analysis*

Data were analyzed by frequency, percentage, means and standard deviation [SD]. One-way ANOVA was performed for comparison of HPV vaccine knowledge by general characteristics of sample participant at the set 5% significant level.

## Results

Three hundred women, aged 21 to 68 years (mean, 43.97 years), were enrolled in this study. Most had sexual experienced (74.7%), had a monthly income >20,000 baht (53.3%), and had received a Bachelor's degree or higher (69.0%). The women had a mean HPV vaccine knowledge score of 7.31, and 52.0% was at good and 33.0% was at moderate. Main reasons for HPV vaccination were benefits/cost-effectiveness (99.3%), fear of cervical cancer (93.3%), and recommended by medical personnel (81.3%). The comparison of knowledge on HPV by general characteristics of the vaccinated women were performed and shown that the higher the age was the lower the knowledge ($p<0.001$), the higher educational attainment was the higher knowledge ($p = 0.015$) and the higher monthly income associated with the higher knowledge ($p = 0.015$).

## Discussion

The study was conducted in a specific HPV vaccinated population that mainly had good HPV vaccine knowledge. This finding was reasonable because the women participated in a cervical cancer screening program and may have received HPV knowledge or information about vaccination from medical personnel. Our findings are consistent with the results of previous studies that demonstrated parents have increased HPV knowledge after undergoing an educational program, which was also related to the number of vaccinated individuals[18,21]. Another study, which evaluated HPV vaccine knowledge using a pre-post study design, found that HPV vaccine knowledge and the number of vaccinated individuals increased post-test[13].

In this study, the main reasons for HPV vaccination were benefits/cost-effectiveness, fear of cervical cancer, and recommended by medical personnel, which are consistent with previous studies[15-20]. Confirmed predictors of HPV vaccination are perceived severity of disease, benefits, and perceived barriers to HPV vaccination. Moreover, in a study of mothers with at least one girl aged 9 to 17 years, the main factor that affected vaccination was receiving vaccination advice from a physician.

When comparing HPV vaccine knowledge by characteristics, knowledge scores decreased with age.

**Table 1.** General characteristics of the 300 HPV vaccinated enrolled in the present study

| General characteristics | Number | Percent |
|---|---|---|
| Number of participants | 300 | 100.0 |
| Age (mean, 43.97 years; min-max, 21 to 68 years; SD, 9.58 years) | | |
| <30 years | 23 | 7.7 |
| 30 to 39 years | 73 | 24.3 |
| 40 to 49 years | 113 | 37.7 |
| 50 to 59 years | 77 | 25.7 |
| ≥60 years | 14 | 4.7 |
| Sexual experience | | |
| No | 76 | 25.3 |
| Yes | 224 | 74.7 |
| Monthly income (mean, 29,972.83 baht; median, 25,000 baht; range, 0 to 130,000 baht; SD, 21,485.89 baht) | | |
| ≤10,000 baht | 55 | 18.3 |
| 10,001 to 20,000 baht | 85 | 28.3 |
| >20,000 baht | 160 | 53.3 |
| Educational attainment | | |
| Primary or lower | 30 | 10.0 |
| Lower than Bachelor's degree | 63 | 21.0 |
| Bachelor's degree or higher | 207 | 69.0 |

**Table 2.** The overall level of knowledge on HPV vaccination

| Level of knowledge on HPV vaccination | Number | Percent |
|---|---|---|
| Good | 156 | 52.0 |
| Moderate | 99 | 33.0 |
| Poor | 45 | 15.0 |

**Table 3.** Reason for HPV vaccination among 300 women

| Reason for HPV vaccination (multiple answers can be selected) | Number | Percent |
|---|---|---|
| 1) Benefits/cost-effectiveness | 298 | 99.3 |
| 2) Fear of cervical cancer | 280 | 93.3 |
| 3) Recommended by medical personnel | 244 | 81.3 |
| 4) Self-risk for cervical cancer | 179 | 59.7 |
| 5) Family or friends' history of cervical cancer | 80 | 26.7 |
| 6) Prevention for future marriage plan | 79 | 26.3 |

This finding is in line with a previous study that demonstrated HPV vaccination was deemed acceptable by mothers with daughters within the targeted age group for cervical cancer vaccination (9-26 years), and younger women were more interested in gaining HPV vaccine knowledge than older women[17,23]. Moreover, both higher education level and monthly income were related to increased HPV vaccine knowledge. This finding is in agreement with studies that showed mothers with high education levels who routinely underwent cervical cancer screening had increased knowledge about HPV infection and cervical cancer and greater interest in HPV vaccines[16], and the ability to pay for vaccine, which was well below the actual

**Table 4.** Comparison of knowledge on HPV vaccination by women characteristics

| General characteristics | Sample size | HPV vaccine knowledge score | | *p*-value* |
|---|---|---|---|---|
| | | Mean | SD | |
| Total | 300 | 7.31 | 1.60 | |
| Age | | | | <0.001 |
| <30 years | 23 | 7.87 | 1.32 | |
| 30 to 39 years | 73 | 7.71 | 1.46 | |
| 40 to 49 years | 113 | 7.55 | 1.41 | |
| 50 to 59 years | 77 | 6.73 | 1.77 | |
| ≥60 years | 14 | 5.64 | 1.45 | |
| Sexual experience | | | | 0.922 |
| No | 76 | 7.33 | 1.78 | |
| Yes | 224 | 7.31 | 1.54 | |
| Mean monthly income | | | | 0.015 |
| ≤10,000 baht | 55 | 6.80 | 1.56 | |
| 10,001 to 20,000baht | 85 | 7.26 | 1.68 | |
| >20,000 baht | 160 | 7.52 | 1.55 | |
| Educational attainment | | | | |
| Primary or lower | 30 | 6.53 | 1.63 | 0.015 |
| Lower than bachelor's degree | 63 | 7.29 | 1.62 | |
| Bachelor's degree or higher | 207 | 7.43 | 1.57 | |

* *p*-value by one-way ANOVA

cost[11]. Interestingly, the women in the present study had a relatively high monthly income (>20,000 baht per month), which may have also affected their decision to receive HPV vaccination. The director and board of the Department of Disease Control in Thailand have included HPV vaccine in the national program for girls aged 11 years or grade 5, leading to the vaccination of about 400,000 girls, which may lower vaccine prices in the future[24].

## Conclusion

HPV vaccinated population had good knowledge but the most women still have poor knowledge about HPV vaccination. Hence, proactive educational strategies about HPV vaccination could lead to health equity towards sustainable prevention of cervical cancer in Thai women. In addition, medical personnel should have an important role in planning educational programs for HPV vaccination and cervical cancer prevention.

## What is already known on this topic?

Previous studies have shown that HPV vaccine knowledge differs in various populations. The reasons for cervical cancer vaccination are studied in terms of predictive factors to inform vaccination decisions.

## What this study adds?

This study was conducted in a specific vaccinated group, which has not been studied before. Our findings confirmed the results of previous studies.


## Acknowledgements

The authors were fully supported by the Women Health Center at Chulabhorn Hospital. We would like to extend our special thanks to Chulabhorn Royal Academy for kind assistance and support towards the success and accomplishment of this research study.


## Potential conflicts of interest

None.

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