KNOWLEDGE, ACCEPTABILITY AND WILLINGNESS TO PAY FOR HPV VACCINATION AMONG MOTHERS OF DAUGHTERS AGED 12-15 YEARS IN BANGKOK

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KNOWLEDGE, ACCEPTABILITY AND WILLINGNESS TO PAY FOR HPV VACCINATION AMONG MOTHERS OF DAUGHTERS AGED 12-15 YEARS IN BANGKOK

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ABSTRACT

This study aims to examine the level of knowledge, acceptance, and willingness to pay for HPV vaccination among female parents of girls aged 12-15 years old in Bangkok. A school-based cross-sectional survey was conducted in 8 schools across Bangkok.

A total of 861 self-administered structured questionnaires were received with a 71.75% response rate. Approximately 70% of the respondents indicated that they have received information regarding the HPV vaccine before. However, knowledge regarding the HPV vaccine was quite low, especially in terms of efficacy of the vaccine. On the other hand, vaccine acceptability was high, ranging from 76.86% for the bivalent and 74.41% for the quadrivalent vaccine. Willingness to pay was also high, ranging from 68.9% for the bivalent to 67.29% for the quadrivalent vaccine. About one-third of the participants indicated that they would pay 300-500 baht for three doses of the bivalent vaccine.Approximately 60% of the respondents indicated that they would pay 100-500 baht more for the quadrivalent vaccine as compared to the bivalent vaccine.

Multivariate logistic regression results showed that only social normsand the knowledge score are significant predictors of acceptance. On the other hand, income and social norms are significantly associated with willingness to pay according to multivariate analysis. To increase vaccine uptake, the related organizations should provide more education for the parents, especially information related to vaccine efficacy.

KEY WORDS: KNOWLEDGE/ ATTITUDE/ ACCEPTANCE/ CERVICAL CANCER/ HPV VACCINE/ WILLINGNESS TO PAY

105 pages

ความรู้ การยอมรับ และความเต็มใจจ่าย ของวัคซีนป้องกันมะเร็งปากมดลูกในมารดาที่มีลูกสาวอายุระหว่าง12-15 ปี ในกรุงเทพมหานคร

KNOWLEDGE ACCEPTABILITY AND WILLINGNESS TO PAY FOR HPV VACCINATION AMONG MOTHERS OF DAUGHTER AGE 12-15 YEAR IN BANGKOK

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บทคัดย่อ

การศึกษาครั้งนี้มีวัตถุประสงค์เพื่อศึกษาระดับความรู้การยอมรับและความเต็มใจที่จะจ่ายสำหรับการฉีดวัคซีนป้องกันมะเร็งปากมดลูก ในมารดาที่มีลูกสาวอายุระหว่าง 12-15 ปีในเขตกรุงเทพมหานครโดยเป็นการสำรวจแบบภาคตัดขวางใน 8 โรงเรียนทั่วเขตกรุงเทพมหานคร

การศึกษาในครั้งนี้ได้รับแบบสอบถามกลับมาเป็นจำนวน 861 ฉบับคิดเป็นอัตราตอบกลับร้อยละ 71.75ร้อยละ70 ของผู้ตอบแบบสอบถามระบุว่าเคยได้รับทราบข้อมูลเกี่ยวกับวัคซีนป้องกันมะเร็งปากมดลูกมาก่อน ขณะที่ระดับความรู้เกี่ยวกับวัคซีนดังกล่าวในกลุ่มตัวอย่างค่อนข้างต่ำโดยเฉพาะอย่างยิ่งในแง่ของประสิทธิภาพของวัคซีน อย่างไรก็ตามอัตราการยอมรับวัคซีนค่อนข้างสูงคิดเป็นร้อยละ 76.86สำหรับวัคซีนชนิดไบวาเลนซ์ และร้อยละ 74.41สำหรับวัคซีนควอไดวาเลนซ์เช่นเดียวกันกับความเต็มใจที่จะจ่ายซึ่งมีค่าสูงโดยพบว่าร้อยละ 68.9 และ 67.29 ของกลุ่มตัวอย่างระบุว่ายินดีที่จะจ่ายเพื่อวัคซีนไบวาเลนซ์ และ วัคซีนควอไดวาเลนซ์ ตามลำดับ ประมาณหนึ่งในสามของผู้ตอบแบบสอบถามมีความเต็มใจที่จะจ่ายเป็นจำนวนเงิน300-500 บาทสำหรับวัคซีนไบวาเลนซ์ จำนวน 3 เข็มและประมาณร้อยละ 60 ของผู้ตอบแบบสอบถามระบุว่าพวกเขามีความเต็มใจที่จะจ่ายเพื่อวัคซีนควอไดวาเลนซ์มากกว่าวัคซีนไบวาเลนซ์เป็นเงิน 100-500 บาท

ในการวิเคราะห์การถดถอยโลจิสติกแบบพหุตัวแปรพบว่าบรรทัดฐานทางสังคมและระดับของความรู้ ส่งผลอย่างมีนัยสำคัญทางสถิติต่อระดับการยอมรับต่อวัคซีนในขณะที่รายได้และบรรทัดฐานทางสังคมเป็นปัจจัยที่มีความสัมพันธ์ต่อความเต็มใจที่จะจ่ายอย่างมีนัยสำคัญทางสถิติ ในการเพิ่มการยอมรับของวัคซีนหน่วยงานที่เกี่ยวข้องควรให้ข้อมูลเพิ่มเติมกับผู้ปกครองโดยเฉพาะอย่างยิ่งข้อมูลที่เกี่ยวข้องกับการประสิทธิภาพของวัคซีน

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CHAPTER I
INTRODUCTION

1.1 Background and Rationale

Cervical cancer is the third most commonly diagnosed cancer and the fourth leading cause of cancer death in female worldwide(1). The health and economic burden of cervical cancer is substantial(2-4). Infection with Human papillomavirus (HPV) is the known cause of cervical cancer. At present, two types of vaccine, quadrivalent and bivalent, have proven efficacy against type 16 and 18, which responsible for 70% of cervical cancer cases. Quadrivalent HPV vaccine also protects against HPV types 6 and 11, which are responsible for genital wart. Because the vaccine is most efficacious before exposure to HPV, current guideline recommends HPV vaccination for all females aged 11 to 12 years and as young as 9 years(5). Catch-up vaccination is also recommended for all females aged 13 to 26 years who have not been previously vaccinated(6). Given the prevalence and burden of cervical cancer, the public health benefit of HPV vaccine is quite large. Nevertheless, price of the vaccine is relatively high. As of July 18, 2011, the retail price of the vaccine in the US is about $130 per dose ($390 for full series)(6). Cost-effectiveness results of HPV vaccine are mixed depending on duration of protection, vaccine coverage, and the types of HPV protected against(7). Limited knowledge of the HPV vaccines was identified in several studies(8). Since HPV vaccines are targeted towards young children, parents will obviously play an important part in whether or not to vaccinate their children against HPV. Previous literatures indicated that intention of parents to vaccinate their daughters against HPV is high(8). Concerning factors associated with vaccine acceptability, it was found that perceived benefit of vaccine(8, 9) a physician recommendation and concern about cancer risks (8) were positively associated with the vaccine acceptability. On the other hand, cost safety (8) issues and concerns that vaccination would promote adolescent sexual behaviors were negatively associated

with the vaccine acceptability(10).At present, very little is known about the difference between bivalent and quadrivalent in term of acceptability.

Contingent valuation studies using Willingness to Pay (WTP) method are now becoming more widespread in health care and have been recently undertaken to estimate the monetary benefit of many vaccines. WTP for HPV vaccine is the value that individuals placed on the vaccine. It can be used as a measure of private economic benefits hence permits the cost-benefit analysis aims at evaluating the investment in HPV-vaccination program. More importantly, information on the willingness to pay for HPV vaccine can also be used to aid policy decision-making regarding HPV vaccination in the future.

According to our review willingness to pay for HPV vaccine varied across countries. Differential benefit between bivalent and quadrivalent HPV vaccine was also found. In developed countries, the monetary value placed on the vaccine was higher than that of the current price indicated the net benefit for vaccination program. On the other hand, in developing countries, monetary value placed on the vaccine is lower than its actual price. However, no such study was conducted in Thailand before.

In Thailand, cervical cancer ranks as the second most frequent cancer among Thai women between 15 and 44 year of age. According to the incidence of cervical cancer among Thai women is estimated at 29.2 per 100,000 populations per year. Current estimates showed that every year about 10,000 Thai women are diagnosed with cervical cancer while about 5,000 die from the disease(11). In Thailand, both types of HPV vaccines have approved in 2007. A recent local study suggested that the vaccine was considerably less cost-effective than cervical cancer screening in the Thai context (12). At present, none of them was included in national immunization program under Thai's public health insurance scheme. Nevertheless, there has been a substantial effort to include the vaccine into health insurance scheme coverage (13).Since the end of 2012, Ministry of public health proposed to incorporate the HPV vaccine into the national programme that allow 400,000 girls aged over 12 to be vaccinated.

In order to formulate the future HPV vaccination policy, it is essential to understand parents' knowledge, acceptance, willingness to pay, and factors associated with the acceptance and willingness to pay for HPV vaccination. At present, very little

is known about these issues in Thailand. The difference between bivalent and quadrivalent vaccine in term of acceptability and willingness to pay were also unknown.

1.2 Objectives

1. To examine mothers' acceptance for HPV vaccination (both bivalent and quadrivalent vaccine);

2. To examine the factors associated with mothers' acceptance for HPV vaccination(both bivalent and quadrivalent vaccine);

3. To examine the factors associated with mothers' willingness to pay for HPV vaccination (both bivalent and quadrivalent vaccine);

4. To examine the mother's willingness to pay for HPV vaccination (both bivalent and quadrivalent vaccine);

5. To examine knowledge and attitude regarding HPV vaccine among mothers of daughter aged 12-15 years in Bangkok**.**

1.3 Expected benefits and application

The findings of this study will offer useful information for future HPV vaccination policy formulation and decision making in Thailand. By understanding the factors affecting parental acceptance to HPV vaccine is crucial to increase uptake if the vaccine program is introduced. In addition, the findings from this study can be used to develop effective education material regarding HPV vaccination for parents in Thailand.

CHAPTER II
LITERATURE REVIEW

This chapter is divided into 5 parts as follows;

1. Cervical cancer and prevention
2. Human Papillomavirus (HPV) infection and HPV vaccine
3. Psychological models used to explain health behavior
    3.1 Health belief Model (HBM)
    3.2 Model for process of building consumer acceptance and willingness to pay
    3.3 Theory of Planned Behavior (TPB)
4. HPV acceptance and factors associated with acceptance
5. Willingness to pay for HPV vaccine

2.1 Cervical cancer and prevention

2.1.1 General information

Cervical cancer is a disease in which malignant (cancer) cells form in the cervix.Cervical cancer usually develops slowly over time. Before cancer appears in the cervix, the cells of the cervix go through a series of changes in which cells that are not normal begin to appear in the cervical tissue. When cells change from being normal cells to abnormal cells, it is called dysplasia. Depending on the number of abnormal cells, dysplasia may go away without treatment. The more abnormal cells there are, the less likely they are to go away. Dysplasia that is not treated may turn into cancer, over time. The cancer cells grow and spread through the cervix. It can take many years for dysplasia to turn into cancer.

Avoiding risk factors and increasing protective factors may help prevent cancer. Risk factors of cervical cancer are HPV infection, smoking, high number of full-term pregnancies, and long-term use of oral contraceptives.

HPV Infection

There are more than 80 types of human papillomavirus. About 30 types can infect the cervix and about half of them have been linked to cervical cancer. HPV infection is common but only a very small number of women infected with HPV develop cervical cancer. HPV infections that cause cervical cancer are spread mainly through sexual contact. Women who become sexually active at a young age and who have many sexual partners are at a greater risk of HPV infection and developing cervical cancer.

Smoking

Smoking cigarettes and breathing in secondhand smoke increase the risk of cervical cancer. Among women infected with HPV, dysplasia and invasive cancer occur 2 to 3 times more often in current and former smokers. Secondhand smoke causes a smaller increase in risk.

High number of full-term pregnancies

Women who have had 7 or more full-term pregnancies may have an increased risk of cervical cancer.

Long-term use of oral contraceptives

Women who have used oral contraceptives for 5 years or more have a greater risk of cervical cancer than women who have never used oral contraceptives. The risk is higher after 10 years of use.

On the other hand, protective factors may decrease the risk of cervical cancer include preventing HPV infection, and screening.

Preventing HPV infection

HPV may be prevented by avoiding sexual activity, using barrier protection or spermicidal gels, and getting an HPV Vaccine: Two HPV vaccines have been approved by the U.S. Food and Drug Administration(FDA). The HPV vaccines have been shown to prevent infection with the two types of HPV that cause most cervical cancers. The vaccines protect against infection with these types of

HPV for 6 to 8 years. It is not known if the protection lasts longer. The vaccines do not protect women who are already infected with HPV.

Screening

Cervical cancer usually does not have symptoms until it is quite advanced. For this reason, it is important for women to get regular screening for cervical cancer. Screening tests can find early signs of disease so that problems can be treated early, before they ever turn into cancer(14).

Cervical cancer is preventable through both primary and secondary preventive measure. Secondary prevention, the detection and treatment of premalignant lesion before it turns to be invasive cancer, can be done by several screening methods including cervical cytology either conventional Pap smear (Papanicolaou smear) or liquid-based cytology, high-risk human papillomavirus (HPV) testing, and visual inspection with acetic acid (VIA). Current evidence indicated that early detection of cervical cancer from secondary prevention can significantly reduce cervical cancer incidence and mortality at low cost even in both developed and developing countries(15, 16).

2.1.2 Cervical cancer and prevention situation in Thailand

Thailand has a population of 26.09 million women aged 15 years and older who are at risk of developing cervical cancer. Current estimates indicate that every year 9,999 women are diagnosed with cervical cancer and 5,216 die from the disease. Cervical cancer ranks as the 2nd most frequent cancer among women in Thailand, and the 2nd most frequent cancer among women between 15 and 44 years of age. About 8.6% of women in the general population are estimated to have cervical HPV infection at a given time, and 73.8% of invasive cervical cancers are attributed to HPVs 16 or 18 (17).

As recent local study found that the vaccine was considerably less cost-effective than cervical cancer screening in the Thai context(12) ,the conventional Pap smear is still considering the main secondary prevention in Thailand because of its cost effectiveness, convenience, simple instrument and easily to train. At present, the coverage in Thailand is still low. A study suggested that coverage with Pap smears and VIA was as low as 11% and 8%, respectively, of the defined target population in

2005(18) .From August to December 2008, the Thai Ministry of Public Health carried out a campaign to expand the coverage of its cervical cancer screening program, targeting one million women. However, the campaign was not successful and, did not achieve itstarget(19). Besides, the lack of effective program coordination for the 2 main screening methods (Pap Smear and VIA), which are managed separately by 2 different organizations in Thailand women knowledge, belief and attitude also played an important role in limiting Thai women's uptake to cervical cancer screening. Perceived low susceptibility, lack of awareness of the importance of early detection, lack of knowledge about screening measure, and fear of vaginal examination, and embarrassment are considered as the important barrier for cervical screening uptake among Thai women(20-24).

2.2 Human papillomavirus (HPV) infection and HPV vaccine

2.2.1 HPV infection

Genital HPV infection is a sexual transmitted disease (STD) that is caused by human papillomavirus (HPV). Human papillomavirus is the name of a group of viruses that includes more than 100 different strains or types. More than 30 of these viruses are sexually transmitted, and they can infect the genital area of men and women including the skin of the penis, vulva (area outside the vagina), or anus, and the linings of the vagina, cervix, or rectum. Most people who become infected with HPV will not have any symptoms and will clear the infection on their own. Some of these viruses are called "high-risk" types, and may cause abnormal Pap tests. They may also lead to cancer of the cervix, vulva, vagina, anus, or penis. Others are called "low-risk" types, and they may cause mild Pap test abnormalities or genital warts. Summary of HPV types is shown in table 2.1.

Genital warts usually appear as a small bump or group of bumps in the genital area. They can be small or large, raised or flat, or shaped like a cauliflower. Health care providers can diagnose warts by looking at the genital area during an office visit. Warts can appear within weeks or months after sexual contact with an infected partner—even if the infected partner has no signs of genital warts. If left

untreated, genital warts might go away, remain unchanged, or increase in size or number. However, genital wart will not turn into cancer.

HPV can cause normal cells on infected skin to turn abnormal. Most of the time, the cell change are unrecognized. In most cases, the body fights off HPV naturally and the infected cells then go back to normal. But in cases when the body does not fight off HPV, HPV can cause visible changes in the form of genital warts or cancer Globally, HPV infection accounts for an estimated 530,000 cervical cancer cases (~270,000 deaths) annually, with the majority (86% of cases, 88% of deaths) occurring in developing countries(16).

Table 2.1 Types of HPV

High-risk types (oncogenic or cancer-associated)	**Low –risk types (non-oncogenic)**
Common types: 16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 68, 82	Common types: 6, 11, 40, 42, 43, 44, 54, 61, 72, 73, 81
These are considered high-risk because they can be found in association with invasive cancer of the cervix, vulva, penis, or anus (as well as other sites). -HPV 16 is the most common high-risk type, found in almost half of all cervical cancers. It is also one of the most common types found in women without cancer. -HPV 18 is another common high-risk virus, found not only in squamous lesions but also in glandular lesions of the cervix. HPV 18 accounts for 10% to 12% of cervical cancers. All of the other high-risk typed can be associated with cervical cancer, but much less frequently than HPV 16, HPV types 31, 33, 45, 52 , and 58 each account for between 2% to 4% of cancers. Each of the other high-risk types account for 1% or less of cancers.	These can cause benign or low grade cervical cell changes and genital warts but are rarely, if ever, found in association with invasive cancers. -HPV 6 and HPV 11 are the low-risk viruses that are most commonly found in genital warts.

2.2.2 HPV vaccine

Two recombinant prophylactic HPV vaccines are currently approved: a quadrivalent vaccine (against HPV-6, 11, 16 and 18; Gardasil®) and a bivalent vaccine (against HPV -16 and 18; Cervarix®). Summary of the two HPV vaccines' characteristics is shown in table 2.2.

Table 2.2 Characteristics of HPV vaccine (25, 26)

HPV vaccine	Bivalent	Quadrivalent
Type of HPV	Protect against new infection with HPV 16 and 18which currently cause about 70% of cervical cancer cases. Type 16 is also associated with oropharyngeal squamous-cell carcinoma, a form of throat cancer	Protect against new infections with HPV 6,11,16 and 18 Types 16,18 that cause 70% of cervical cancer cases, and types 6,11 that cause 90% of genital warts cases
Recommended age	11-12 years	Gardasil is for girls, boys and young women ages 9 to 26 years
Injection time (Months)	0, 1, 6	0, 2, 6
Company	Glaxo Smith Kline	Merck
Safety	The safety profile indicated that there is no significant difference between bivalent and quadrivalent vaccine. The local reactions are common and similar in incidence. Both vaccines also had similar rates of serious adverse reactions.	

Table 2.2 Characteristics of HPV vaccine (25, 26) (cont.)

HPV vaccine	Bivalent	Quadrivalent
Efficacy	effectiveness increased when given to girls and young women before they become sexually active	
Duration of protection	10 years	5 years
Cost (Baht) / 3 doses	6,500 – 7,300	6,900 – 8,300
FDA Approved As of 1/15/2011	For girls and women aged 10 to 25 for the prevention of cervical cancer and cervical inter epithelial neoplasia	For both men and women from the ages of 9 to 26 for the prevention of genital warts, anal cancers, and anal inter epithelial neoplasias. It is also approved for the prevention of cervical cancer and vulva interepithelialneoplasia in young women

Both types of HPV vaccines are indicated to protect females against the types of HPV that cause most cervical cancers. On the other hand, only quadrivalent vaccine is indicated for boy and male, 9 through 26 years of age (14).

In the United Stated, the private sector list price of the Gardasil vaccine is $119.75 per dose (about $360 for full series). In Thailand, the vaccine has just been initially implemented in private hospitals in May 2007. The price of one shot is about 6,500 Baht or 18,000 for a 3 dose series. As of June, 2011, the price for 3 dose seriesin Thailand is about 6,500 baht to 7,300 baht for bivalent and quadrivalent about 6,900 baht to 8,300 baht in private hospitals. Since the end of 2012, Ministry of public health proposed to incorporate the HPV vaccine into the national programme that allow 400,000 girls aged over 12 to be vaccinated. Under the proposed plan, the ministry

would allocate about 600 million Baht or 500 Baht per dose to purchase vaccine. However, according to the study by the Health Intervention and Technology Assessment Programme (HITAP), the price of HPV vaccine should not exceed 190 Baht per dose to be considered cost-effective (13).

2.3 Psychological models used to explain health behavior

2.3.1 Health belief Model (HBM)

The Health Belief Model (HBM) is a psychological model that attempts to explain and predict health behaviors focusing on the attitudes and beliefs of individuals. The HBM was developed in the 1950s by social psychologistsin an attempt to understand the widespread failure ofpeople to accept disease preventives or screening tests for the early detection of asymptomatic disease(27).

According to the HBM, a person will take a health-related action if that person:

1. Fells that a negative health condition can be avoided,
2. Has a positive expectation that by taking a recommended action, he/she will avoid a negative health condition, and
3. Believes that he/she can successfully take a recommended health action

The components of HBM included the following concepts; the perceivedthreat and net benefits: perceived susceptibility, perceived severity, perceived benefits, and perceived barriers. These concepts were proposed as accounting for people “readiness to act.” An added concept, cues to action, would activate that readiness and stimulate overt behavior. A recent addition to the HBM is the concept of self-efficacy, or one’s confidence in the ability to successfully perform an action. This concept was added by Rosenstock and others in 1988(27), to help the HBM better fit the challengers of changing habitual unhealthy behaviors, such as being sedentary, smoking, or overeating. Concept of HBM is summarized in table 2.3 and Figure 2.1 below;

Table 2.3The Health Belief Model concept, definition and application (28)

Concept	**Definition**	**Application**
Perceived Susceptibility	One's opinion of chances of getting a condition	Define population(s) at risk, risk levels;personalize risk based on a person's features or behavior; heighten perceived susceptibility if too low**.**
Perceived Severity	One's opinion of how serious a condition and its consequences	Specify consequences of the risk and the condition
Perceived Benefit	One's belief in the efficacy of the advised action to reduce risk or seriousness of impact	Define action to take; how, Where, when; clarify the positive effects to be expected
Perceived Barrier	One's opinion of the tangible and psychological costs of the advises action	Identify and reduce barriers through reassurance, incentives, assistance
Cues to action	Strategies to activate "readiness"	Provide how –to information, promote awareness, reminders.
Self-efficacy	Confidence in one's ability to take action	Provide training, guidance in performing action

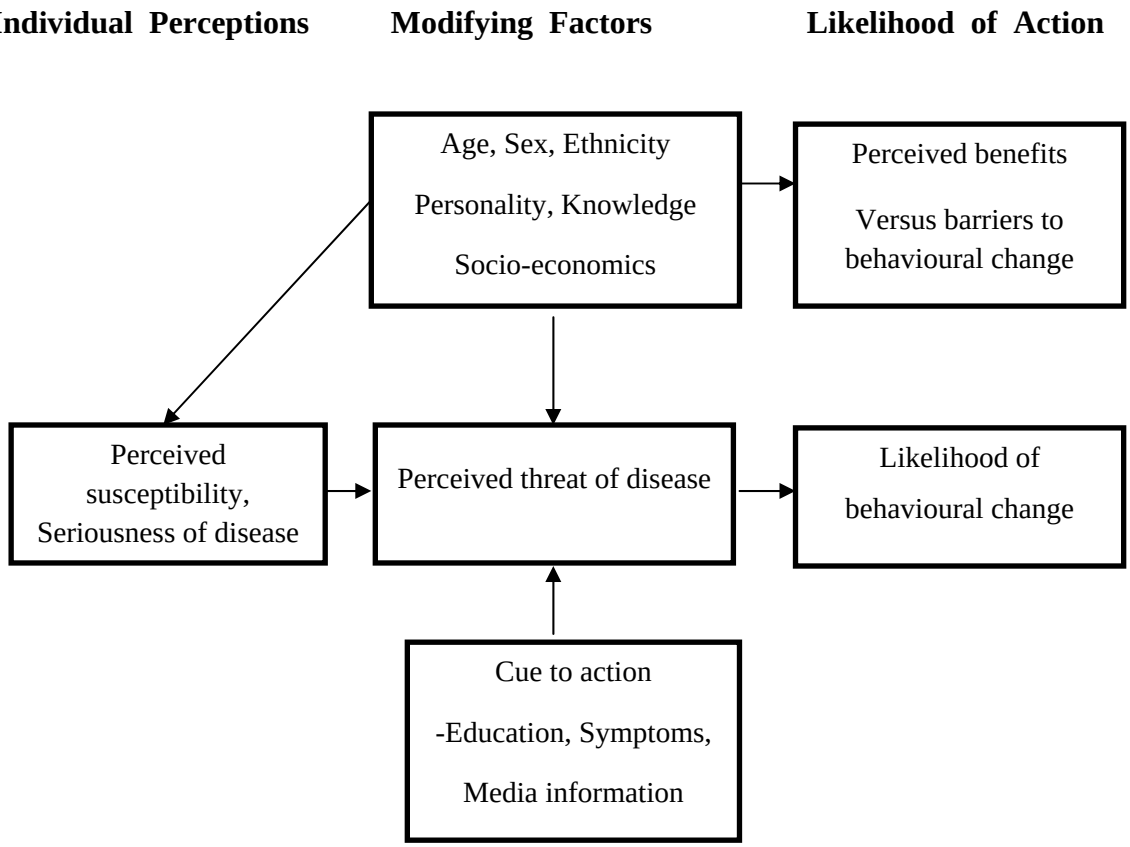

Figure 2.1 Health belief conceptual model

The Health Belief Model has been applied to a broad range of health behaviors and subject populations. Three broad areas can be identified(29).

1. Preventive health behaviors, which include health-promoting (e.g. diet, exercise) and health-risk (e.g. smoking) behaviors as well as vaccination and contraceptive practices.

2. Sick role behaviors, which refer to compliance with recommended medical regimens, usually following professional diagnosis of illness.

3. Clinic use, which includes physician visits for a variety of reasons(27).

HBM was successfully used to examine and predict HPV cervical cancer screening belief as well as intention to vaccinate against HPV in several studies(8, 30-34). It was found that overall HBM can significantly predict both HPV vaccination intention and practice(8). Evidences indicated that doctor's recommendation to get HPV vaccine (8, 30-34) perceived barriers perceived susceptibility(8, 33) and

perceived benefit(8, 32, 34, 35) are significantly associated with intention to vaccinate against HPV. On the other hand, it was found that perceived susceptibility and benefits independently affected HPV vaccination behavior (8).

2.3.2 Model for process of building consumer acceptance and willingness to pay

The model is synthesized from literature review on consumer acceptance in the paper by Lisa House, et al (36). The paper suggested that consumer acceptance mediates the relationship between three key antecedent variables and consumer's willingness to pay. This model treats consumer acceptance and a consumer's willingness to purchase as two distinct constructs. According to the model, the acceptance was impacted by the following three key antecedents: trust, benefits, and social norm.

Trust

The trust is one part of factor in consumer attitude. Trust has become an important topic of inquiry in a variety of disciplines, including management, ethics, sociology, psychology, and economics(37). A common thread running through nearly all the conceptualizations of trust is that both cognitive processed and affective influences play roles in its development. From Kramer 's review of the trust literature noted that scholars have begun to move beyond a view of trustworthiness as grounded solely in rational choice as too narrowly cognitive (38). Instead the field seems to have acknowledged that trust is a more complex psychological state that is dependent on cognitive processes emotional and social influences as suggested by the various conceptualizations of trust. Consistent with reasoning, it was argued that trust evolves from a pattern of careful, rational thinking (cognitive-based) coupled with an examination of one's feelings, instincts and intuition (affect-based). Simply put, "trust in everyday life is mix of feeling and rational thinking"(39). This suggested that trust develops from process, or a pattern of thinking and feeling, on the part of the trustor regarding the trustee.

Benefits

In addition to understanding how trust affects consumer acceptance, the model suggested that the perceived benefit accrued by the customer will affect

subsequent levels of customer acceptance. Utilitarian benefit is conceptualized as the customer's benefit based on the rational costs and gains associated with using the product. Affective benefit is conceptualized as a customer's benefit based on the level of positive and favorable emotion associated with using the product. Symbolic benefit is conceptualized as a customer benefit based on the ability to express oneself concept through using the product.

Social norms

Social norm it can be described in many ways. The descriptive definition of norms is what people in general do. The prescriptive definition is what people should do and the proscriptive definition is what people should not do. Many norms are useful for individuals and groups. They are the basis of common meanings for signs and symbols in our society and, therefore are the foundation of communication. They are also the basis for the coordinated behaviors we must perform as a society- for example time, driving regulations, and common definitions of weights and measures. As well, they are the foundation of social ethics and the common conceptions of what is right and wrong, and in the development of laws. Social Norms are the expectations about how people should act. Usually social norms are created by having the same sort of certain behaviors among social group members. Also, there are usually negative consequences when someone violates a social norm. Social norms consist of rules of conduct and models of behavior prescribed by a society. They are rooted in the customs, traditions and value systems that gradually develop in this society.

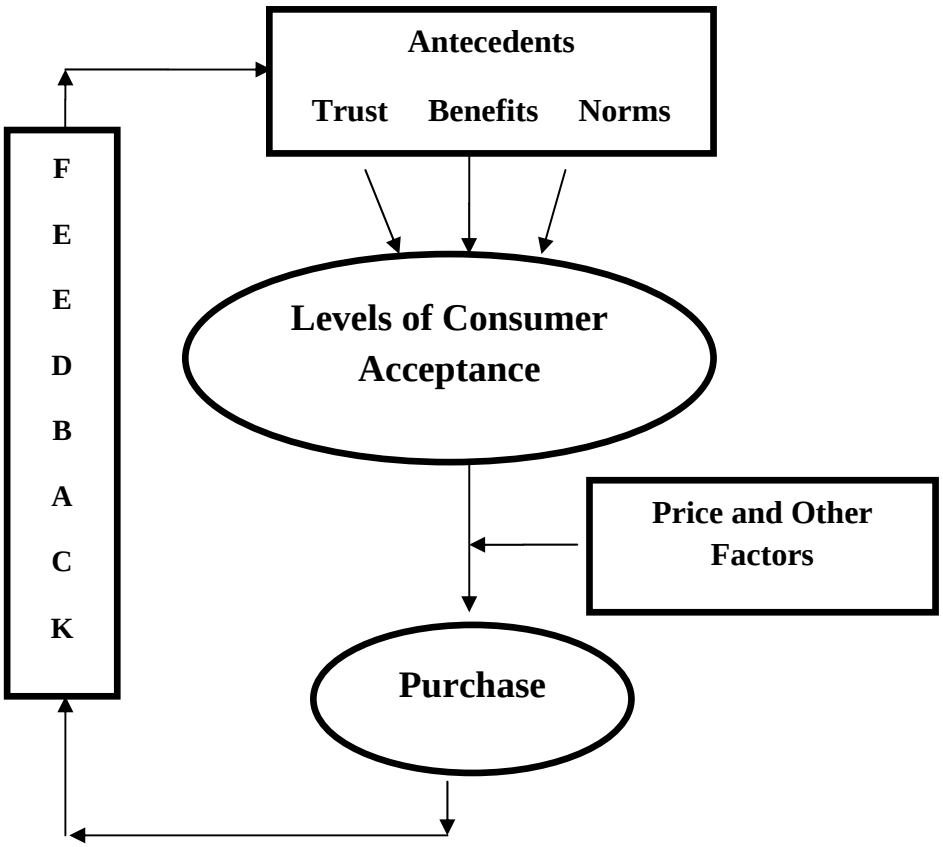

Figure 2.2 Conceptual Model for the Process of Building Consumer Acceptance and Willingness to Pay(36).

2.3.3. Theory of Planned Behaviour(TPB)

The Theory of Planned Behaviour(40, 41), was a model about how human action was guided. It predicts the occurrence of a specific behaviour provided that the behaviour is intentional. The model is depicted in Figure 2.3. The variable names in this model reflect psychological constructs and so they have a special meaning within the theory as described below;

Behaviour

An action that is carried out at a specified time and is described in terms of the action itself, its target and the context.

Intention

Although there is not a perfect relationship between behavioural intention and actual behaviour, intention can be used as a proximal measure of behaviour.

Attitudes (towards the behaviour)

Attitude toward the behaviour is a person's overall evaluation of the behaviour. It is assumed to have(behaviouralbeliefs; e.g. 'referring the patient for an x-ray will decrease future consultations') and thecorresponding positive or negative judgments about each these features of the behaviour (outcomeevaluations; e.g. 'decreasing future consultations is desirable/undesirable').

Subjective norms (about the behaviour)

Subjective norms are a person's own estimate of the social pressure to perform or not perform the target behaviour. Subjective norms are assumed to have two components which work in interaction: beliefs about how other people, who may be in some way important to the person, would like them to behave (normative beliefs), e.g. 'I feel pressure from patients to refer them for an x-ray') and the positive or negative judgements about each belief (outcome evaluations), e.g. 'in regard to my decision to x-ray, doing what patients think I should do is important/ unimportant'.

Perceived behavioural control (of the behaviour)

Perceived behavioural control is the extent to which a person feels able to enact the behaviour. It has two aspects: how much a person has control over the behaviour (e.g. low control over measuring blood pressure if the BP machine often malfunctions); and how confident a person feels about being able to perform or not perform the behaviour (e.g. not sufficiently skilled in measuring blood pressure). It is determined by control beliefs about the power of both situational and internal factors to inhibit or facilitate the performing of the behaviour (e.g.'Whether I measure a patient's blood pressure is entirely up to me'; 'I could measure my patient's blood pressure if I wanted to').

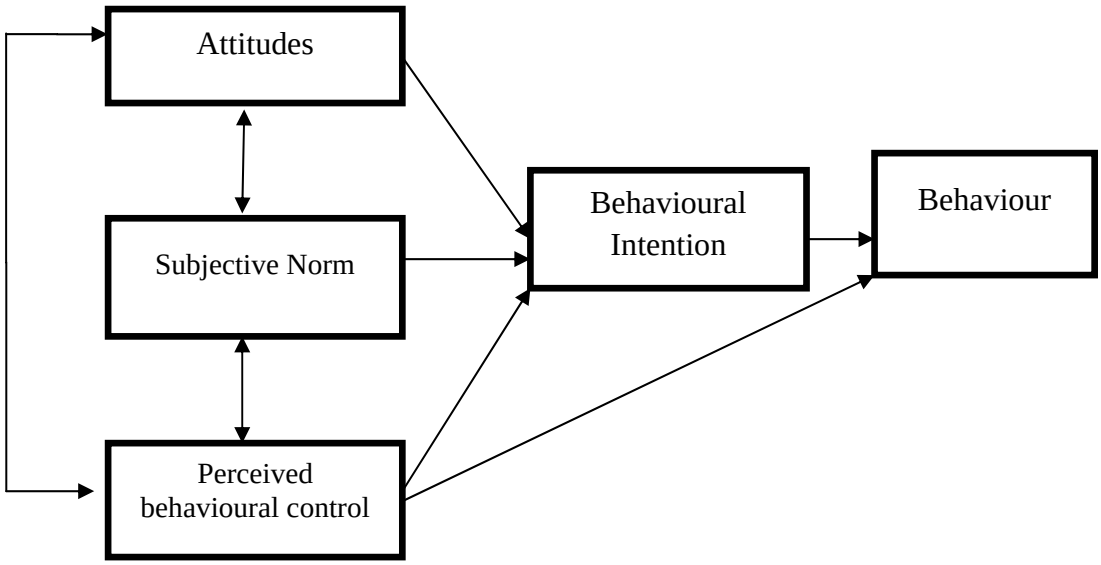

Figure 2.3The Theory of Planned Behaviour(41)

According to the meta-analysis of 185 independent studies, the TPB accounted for 27% and 39% of the variance in behavior and intention, respectively(42). The study was also found that perceived behavioural control was a strong factor significantly predicting both intention and behavior. In addition, intention was also significant predictors of behavior. On the other hand, subjective norm is generally found to be a weak predictor of intention(42). TPB has been used to examine factors associated with HPV vaccination intention among parent as well as factors related to physician's willingness to vaccinate girl against HPV (43, 44). According to the study(44)intention to vaccinate was driven by attitude and subjective norms. On the other hand, risk perceptions, experience with STIs, and beliefs about the vaccine encouraging sexual activity were not related to intention.

However, difference between intention and real behavior was also identified suggesting that other factors may make an important and unique contribution in motivating women to receive the HPV vaccine beyond other variables from both HBM and TPB(32).

2.4 HPV vaccine acceptance and factors affecting acceptance

According to a recent systematic review of 28 studies, most parents have high intention to vaccinate their daughter against HPV(8). According to the review, physician recommendation is associated with vaccine acceptability(7, 8). This is consistent with another study which indicated that parents wanted more information from physician in order to decide whether to vaccinate their child against HPV(7). When looking at the factors affecting parental intention to vaccinate their child against HPV, the systematic reviews found that perceived benefit of vaccine and perceived susceptibility towards cervical cancer (6-8) were significantly associated with HPV vaccine intent. On the other hand, cost is a barrier to vaccinate against HPV(6).

Concern over the safety is also negatively associated with intention to vaccinate in many studies(9). According to the systematic review (7) parents still had safety concern about HPV vaccine and that they want more information before making decision whether or not to vaccinate their daughter against HPV. On the other hand, subjective norm was also found to be positively associated with HPV vaccine acceptance in many studies (45, 46).

Mixed opinion about the parent concern about more risky sex behavior associated with HPV vaccination was found (7). However the systematic review indicated that concern that vaccination would promote adolescent sexual behavior were barrier to vaccination among parent (8). Age of the daughters was also negatively associated with parental intent to vaccinate their child with HPV vaccine in the recent systematic review (7). The lesser the age of daughter the less likely the parent intent to vaccinate against HPV. On the other hand, age of parent was found to be negatively associated with acceptance to vaccinate against HPV for their daughters in many studies (46, 47).

In addition, the systematic review found that parents who refused previous vaccines for children were less likely to vaccinate the children against HPV (7). When looking at the socioeconomic status, it was found that parents with lower levels of education (8, 48) and living in rural areas reported higher vaccine acceptability (48). Unawareness of the vaccine is an important barriers for HPV vaccination(49). Poor knowledge had negative effect on parental acceptance of HPV vaccine(50, 51).

However, knowledge regarding HPV and cervical cancer is not significant predictor of HPV vaccine acceptance in some studies (52).

According to the recent systematic review (7) knowledge about HPV infection and cervical cancer link was low, however, increasing. The percentage of parents who heard about HPV rose over time (from 60% in 2005 to 93% in 2009), as did their appreciation for the HPV infection and cervical cancer link (from 70% in 2003 to 91% in 2011).

Studies in Asian countries among non-health care workers found that knowledge regarding HPV and HPV vaccine was also low(47, 51,53). Only about 11% (in Vietnam) - 40% (in Thailand) of women in Asian countries have heard about HPV vaccine(47, 49,53-56). Similar to Western women, many of Asian women had positive attitude towards HPV vaccine (49, 51,57). A recent systematic review among women in the Asia pacific found that awareness and knowledge of HPV, HPV-related conditions, and HPV vaccination varied greatly among studies(9). Recent study in Thailand indicated that about 40% of women attending the gynecology clinic at Ramathibodi hospital had previously heard about HPV(47). A recent systematic review in Asia Pacific indicated that women's perceived susceptibility to HPV-related conditions, women's concerns about the vaccine's safety and efficacy, and social consequences and support from social referents were associated with HPV vaccine intent in many studies (8).

2.5 Willingness to pay for HPV vaccination

A systematic review was conducted by searching MEDLINE electronic database to identify relevant publications concerning willingness to pay for HPV vaccine. The literature searches were based on the combined searches of the following terms: ((Cervical Neoplasms [Mesh] AND vaccines [Mesh]) OR (Papillomavirus vaccines [Mesh])) AND ("willingness to pay" OR WTP OR preference). Bibliographies and expert communications were also used to identify additional further relevant studies. The titles and abstracts of the publications identified were assessed by two independent reviewers whether the willingness to pay for HPV vaccine were adequately reported. Only published original studies were included.

Non-English language publications were excluded. To facilitate comparison across studies, the willingness to pay values were also presented in 2010 $US values, using information from the World Economic Outlook Database by the International Monetary Fund (IMF) (58).

The initial search, conducted in July 2011, identified 13 records potential relevant articles from MEDLINE database. Of these, only 4 studies fulfilled the eligibility criteria(10, 59-61). One additional eligible study was identified through expert communications. Process of identification of studies for inclusion was summarized in figure 2.4

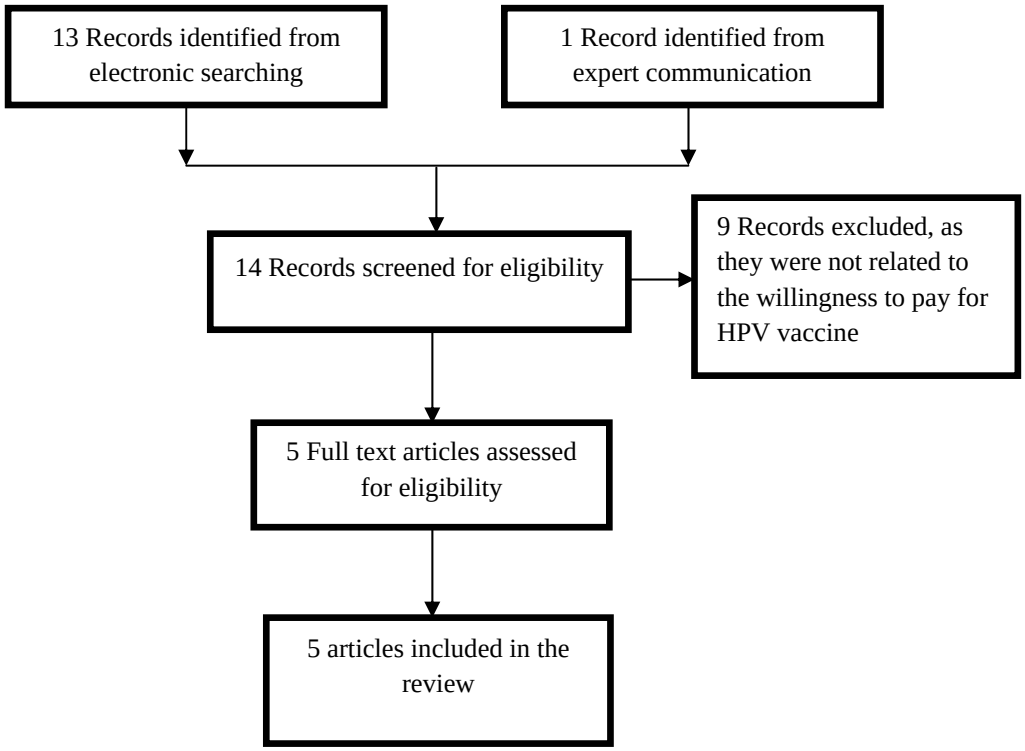

Figure 2.4 Identification of studies for inclusion

Characteristics of the 5 studies included in the review have been summarized in table 2.4These studies were conducted during 2007 – 2009 in 5 countries namely Taiwan, Kenya, Canada, United States, and Vietnam. For bivalent vaccine, the WTP ranged from less than US$ 4.19 (in 2010) in Kenya to US$ 201 (in 2010) in Vietnam, and to US$ 567 (in 2010) in the US. The WTP for ideal bivalent

vaccine, which provide 99 – 100% protection against cervical cancer ranged from US$ 387 (in 2010) in Vietnam to US$ 1,101 (in 2010) in the US, and to US$ 1,138 – US$ 1,267 (in 2010) in Taiwan. In the US, it was found that the WTP for quadrivalent vaccine was US$ 672 (in 2010) or about US$ 100 higher than that of the bivalent vaccine. In Canada, WTP to avoid a 1% increase in the risk of cervical cancer and genital warts were approximately US$ 44 and US$ 18 (in 2010), respectively.

Table 2.4 Characteristics of the included studies

Country (Year of study)	**Respondents**	**Mode of interview**	**WTP Method**	**WTP results**
1.Taiwan (2007)(60)	512 women aged 20-55 years with at least 1 daughter seeking care at 1 hospital	Face-to-Face interview	Double bound dichotomous choice questions under 2 scenarios (to protect themselves, and to protect their daughters Scenario: vaccine was 100% effective in preventing cervical cancer	WTP for vaccinating their daughter = US$ 1,098 - US$ 1,233 (US$ 1,138 – US$ 1,267 in 2010), assuming 100% protection of cervical cancer WTP for vaccinating themselves =US$ 913 - US$ 1,044 (US$ 946 – US$ 1,081 in 2010), assuming 100% protection of cervical cancer

Table 2.4 Characteristics of the included studies (cont.)

Country (Year of study)	Respondents	Mode of interview	WTP Method	WTP results
2. Kenya (2007) (59)	147 Women aged 15-49 years seeking maternal-child health or family planning services in 1 hospital	Face-to-face interview	Open ended questions	75% of the respondents willing to pay 100 Kenyan Shillings or less (4.19 US$PPP in 2010) for vaccinating their daughters 20% of the respondents willing to pay 100 – 500 Kenyan Shillings (4.19 – 20.98 US$PPP in 2010) for vaccinating their daughters
3.Canada (2008)(61)	1275 respondents aged 19 years or older, who were representative of the Canadian population	Online survey	Discrete choice experiment: (7 attributes)	WTP to avoid a 1% increase in the risk of cervical cancer = $C53 (US$ 44 in 2010) WTP to avoid a 1% increase in the risk of genital warts = $C22 (US$ 18 in 2010)

Table 2.4 Characteristics of the included studies (cont.)

Country (Year of study)	**Respondents**	**Mode of interview**	**WTP Method**	**WTP results**
4.United States (2008)(62)	307 National representative of U.S. mother with at least one daughter aged 13-17 years	Online survey	Conjoint analysis (included 8 main choice questions which are described by vaccine "attributes")	WTP for Vaccine, which can protect 70% of Cervical cancer and 90% of genital wart (10 year duration) = US$ 663 (US$ 672 in 2010) -WTP for vaccine, which can protect 80% on Cervical cancer + 0% of genital wart (10year duration)= US$ 560 (US$ 567). Respondents willing to pay US$ 238 (US$ 241 in 2010) more for a vaccine that provides 90% genital wart protection in relation to vaccine that provides no protection on Genital wart. WTP for ideal vaccine (100% cervical cancer protection in lifetime) = US$ 1,086 (US$ 1,101 in 2010)

Table 2.4 Characteristics of the included studies (cont.)

Country (Year of study)	Respondents	Mode of interview	WTP Method	WTP results
5.Vietnam (2009)(10)	300 women with at least 1 daughter aged between 9-17 years.	Face-to-face interview	Conjoint analysis: 3 attributes of vaccines were examined (effectiveness in CC protection, duration of effectiveness, and cost of vaccine)	WTP for 70% on cervical cancer protection (10 year duration) = US$ 185 (US$ 201 in 2010) WTP for 99% on cervical cancer protection (lifetime duration) = US$ 356 (US$ 387 in 2010)

Conceptual Framework

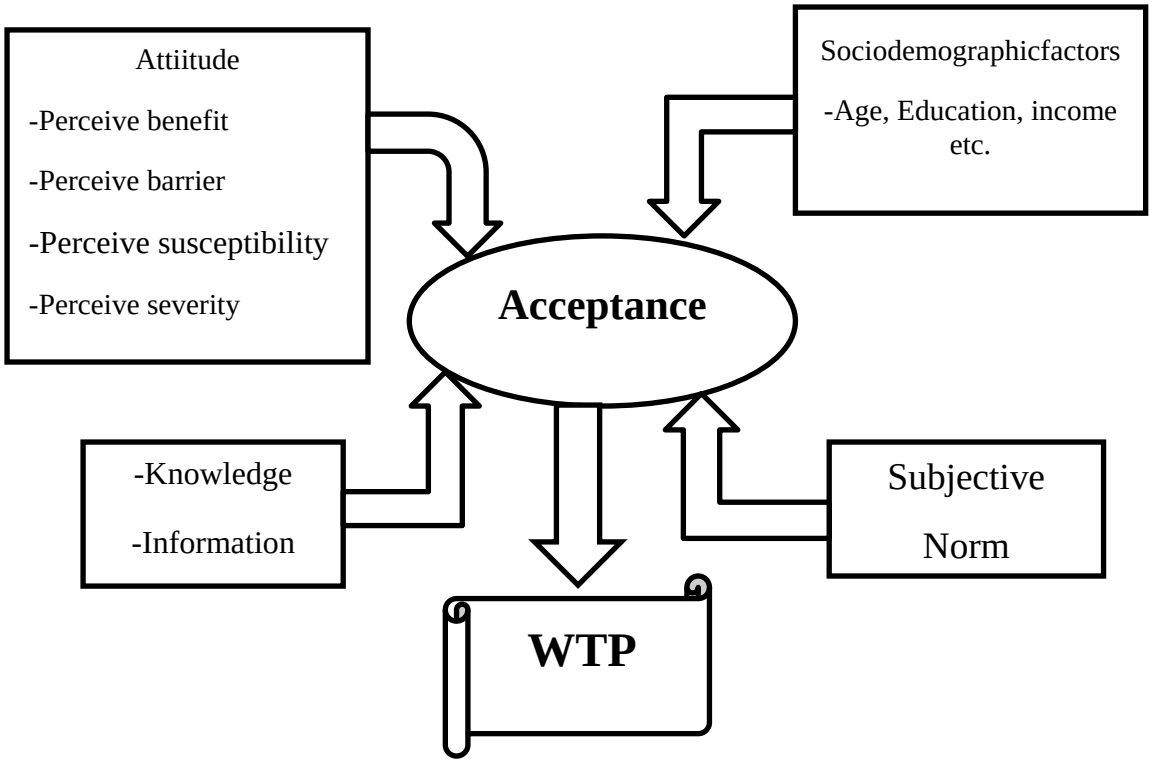

Figure 2.5. Conceptual Framework

Conceptual framework of this study was based on the extensive literature review as well as the following theories,

1. Health Belief Model (HBM)
2. Model for the Process of building consumer acceptance and willingness to pay
3. Theory of Planned Behaviour

According to the conceptual model, as shown in figure 5, acceptance was a significant predictor for willingness to pay. This relationship was derived according to the model for process of building consumer acceptance and willingness to pay(8, 63-67). In this study, mother HPV acceptance was measured based on the response to the following questions; “if the vaccine is free, will you vaccinate your daughter against HPV?” The women who answered “yes” were be classified as the acceptance,while

the one who answered “no” were classified as non-acceptance. On the other hand, mothers’ HPV willingness to pay was defined as a person who answersed “yes” to the following question; “if the vaccine is not free and you have to pay out of pocket by yourself, will you vaccinate your daughter against HPV? If so, what is the maximum amount that you will pay to have your daughter vaccinate against HPV?” Even though the practice is not measured in this study, however, according to the TPB (40, 41) intention is a significant predictor of behavior. Nevertheless, it should also be noted that difference between intention and real behavior may be observed (32).

As shown in figure 2.5 perceived benefit/barrier of vaccine, perceived susceptibility of cancer, norms, and other sociodemographic factors were associated with HPV acceptance. Perceived benefit was included in the model as it was an important factor predicting health behavior according to HBM(27) model for process of building consumer acceptance and willingness to pay(8, 63-67), and TPB(41). In addition, it was also identified as an important factors associated with HPV acceptance in many previous studies(8, 9). Similarly, perceived barrier and perceived susceptibility were included in the model as they were important predictors of health behavior according to HBM (27). In addition, many previous studies indicated that perceived barriers in term of costs (8), safety(9) and perceived susceptibility (7-9) were associated with HPV intent. Subjective norms were identified in this study as it was included in TPB(41)as well as model for process of building consumer acceptance and willingness to pay (8, 63-67). In addition, it was found that subjective norms was significantly associated with HPV acceptance in many studies (45, 46).

Regarding, sociodemographic factors, age of the mothers(46, 47)and income (8, 48)were also found to be associated with HPV intent, therefore, these factors will be further investigated in this study. Regarding knowledge regarding HPV vaccine, while the effects of knowledge on HPV acceptance were mixed very little was known about such knowledge among Thai parents. Therefore, level of knowledge, as well as the relationship between knowledge and HPV intent was investigated in our study.

CHAPTER III
METHODOLOGY

The methodology of this study consisted of 7 parts as follows;

1. Study design
2. Study population
3. Sample size calculation
4. Sampling method
5. Study instrument
6. Data collection
7. Data analysis

3.1. Study design

This study is a cross-sectional survey using self-administered questionnaires.

3.2 Study population

General Thai mother population, living in Bangkok**,** who has at least one daughter age between 12-15 years olds were eligible for the study.The eligibility criteria were specified below;

Inclusion criteria

- Thai mother population living in Bangkok
- Has at least 1 daughters aged 12-15 years studying in the selected school
- Be able to read and write Thai
- Be able to make decision whether or not to vaccinate their daughters

- Willing to collaborate with this study

Exclusion criteria

- Refuse to participant in the study

3.3 Sample size calculation

The sample size was calculated by the following formula

$$\mathbf{N = v*Z^2_{\alpha/2} *p*(1-p) / M^2}$$

Where, N = Desired sample size

$Z_{\alpha/2}$= Standard normal distribution value corresponding to upper tail $\alpha/2$

V = Design effect (usually is set at 2)

M = Margin of error

P = Proportion of respondent who would accept for HPV vaccine

When,Type 1 error is set at 0.05 (2 sided), V =2, M= 0.05, and P =0.5, sample size required is 384 or approximately 400 persons. To account for low response rate (30%), the sample size will be inflated to 1,200 persons.

3.4 Sample size calculation

Mothers, who met the eligibility criteriawill be recruited from the participating school. The participating school was selected using stratifying random sampling technic. In this study, secondary schools that have female students aged between12-15 years old will be stratified by types into government and private schools. The number of mothers in private school and public school were calculated according to the ratio of students in these 2 types of school. For each school, the total number of mother was primary set according to the number of female students. In order to specify the number of school, the total number of participants in each schoolwas primary set at 150. (50 for each level namely; Matthayom 1, Matthayom 2, and Matthayom 3). As the result, 8 schools were selected in this study. Then, the total number of schools was calculated for each type according to the ratio of public and

private. Of the total 8 schools, 6 schools were public schools while 2 schools were private schools. Finally, the random sampling was performed to select the school based on the types. After the school selection process, the researchers contacted the school and asked for permission to distribute questionnaire to eligible mothers. The actual, number of questionnaires distributed were calculated according to the proportion of eligible students in each schools.

3.5 Study instrument

Self-Administered questionnaires were developed as an instrument in this study. Questionnaires consisted of 5 parts, as follows in Appendices.

Part 1: General information and socio-demographic characteristics

This part consisted of main questions concerning socio-demographic characteristics status of the respondents such as age, relation with student, educational level, occupation, income, family's history cancer, family's history cervical cancer and history cervical screening.

Part 2: Awareness of HPV vaccine

This part examined awareness of HPV vaccine as well as the sources of information.In this part, participants were also asked if they knew someone who has been vaccinated against HPV.

Part 3: Knowledge regarding cervical cancer, HPV and HPV vaccination:

This part involved 7 questions regarding cervical cancer and 8 questions regarding HPV vaccine. For questions related to cervical cancer mode of transmission, HPV prevention measure, and risk and cause of cervical cancer were asked. For questions related to HPV vaccine, target group of HPV vaccine, vaccine efficacy and eligible candidate for vaccine were examined.

Part 4: Attitude towards Cervical cancer and HPV vaccine

In this part the questions examined attitudes towards HPV in term of safety, cost, efficacyand social norms were asked. For attitude towards cervical cancer, perceive susceptibility and perceive threats were asked.

Part 5: Acceptance of HPV vaccination and willingness to pay

Acceptance and willingness to pay for Bivalent and Quadrivalent were examined. In this study, mothers' HPV acceptance were measured based on the response to the following questions; "if the vaccine is free, will you vaccinate your daughter against HPV?" The women who answered "yes" were classified as the acceptance, while the one who answered "no" were classified as non-acceptance. On the other hand, mothers' HPV willingness to pay was defined as the answers "yes" to the following question; "if the vaccine is not free and you have to pay out of pocket by yourself, will you vaccinate your daughter against HPV? If so, what is the maximum amount that you will pay to have your daughter vaccinate against HPV? In this study "WTP values" was between 300-500 Baht for Bivalent and 100-500 Baht for quadrivalent vaccine and were determined based on the price of HPV vaccine that the government intended to buy from the company and the price that is considered cost-effective in Thailand.

3.6 Study instrument

Questionnaires were distributed to the eligible respondents via school's teacher. Respondents were requested to send the completed questionnaire within 3 days – 7 days. Pilot testing wasconductedamong 25 women selected by convenient sampling before the actual data collection begins to ensure the clarity and understanding.

3.7 Data analysis

Acceptance rate was described in term of percentage. Willingness to pay were described in term of percentage of respondents who indicate willing to pay for HPV vaccination. Among those willingness to pay for HPV vaccine, mean (SD) of WTP was calculated. Univariate statistics, using chi-square, T-test or other appropriate non-parametric statistics was used to examine factors affecting with acceptability and willingness to pay. The variables derived by HBM and TPB that were found to be significant in univariate analysis were put into the multiple linear regression to examine factors affecting with acceptability and willingness to pay.

CHAPTER IV
RESULTS

The results of this study are presented in two parts. Part I contains descriptive characteristics of the respondents including socio-demographic information, knowledge regarding cervical cancer and HPV vaccine, attitude toward cervical cancer and HPV vaccine, HPV vaccine acceptance, and willingness to pay for HPV vaccine.

Part II focuses on the factors associated with HPV vaccine acceptability and willingness to pay for HPV vaccine.

Part I: Descriptive characteristics of the respondents

The response rate from 8 schools is presented in the table 4.1. As shown in the table, the response rate is about 71.72% (861/1,200). The response rate is highest (97.57%) in Satrivoranartschool while the lowest response (49.76%) are from Benjamarachalai school.

Table 4.1Response rateclassified by school

Schools	**Submitted**	**Response**
Public schools	**N**	**N(%)**
1.Sainamphung school	275	182(66.18)
2.Santirat wittayalai school	99	51(51.51)
3.Senanicom school	30	20(66.66)
4.Benjamarachalai school	213	106(49.76)
5.Watnairong school	54	48(88.88)
6.Saipanya school	214	158(73.83)

Table 4.1 Response rateclassified by school (cont.)

Schools	**Submitted**	**Response**
Private school	**N**	**N(%)**
1.Satrivoranart school	165	161(97.57)
2.Rajinibon school	150	135(90.0)
Total	1,200	861(71.75)

Socio-demographic information of the respondents is displayed in table 4.2. As show in the table, most of the respondents (87.2%) are mother while the rest are female parents of the girl. The mean age of the respondents is 43.47 years old while the mean (SD) age of the daughter or girls under supervision is 13.72 (1.26) years old. About 40% of the respondents graduated with bachelor degree. One third of them have monthly household income between 10,000-29,999 baht.

Table 4.2 Socio-demographic characteristics of the respondents

		N (%) or Mean (SD)
Relationship with the student (N=861)		
	Mother	751 (87.22)
	Relatives	110 (12.78)
Age of Respondents (Years) (N=681)		43.47(6.56)
Age of student(Years) (N =808)		13.72(1.26)
Education level of the respondent (N = 852)		
	Primary school or lower	132 (15.50)
	Secondary school (Grade 7-9)	86 (10.10)
	Secondary school (Grade 10-12)	157 (18.40)
	Certificate	84 (9.90)
	Bachelor degree	342 (40.10)
	Higher than Bachelor degree	51 (6.00)

Table 4.2 Socio demographic characteristics of the respondents (cont.)

		N (%) or Mean (SD)
Occupation (N = 860)		
	Agriculturist	1 (0.12)
	Temporary worker	85 (9.87)
	Government officer /State Enterprises officer	128 (14.87)
	Private company employee	187 (21.72)
	Self employed	250 (29.03)
	Housewife	182 (21.14)
	Other	27 (3.14)
Monthly household income (Baht) (N = 852)		
	Less than 5,000	38 (4.50)
	5,000 – 9,999	113 (13.30)
	10,000 – 29,999	281 (33.30)
	30,000 – 49,999	173 (20.30)
	50,000 – 100,000	197 (23.10)
	More than 100,000	50 (5.90)

Family history of cancer and cervical cancer screening experience of the respondents are shown in table 4.3. From table 4.3, most of the respondents do not have family history of cancer (69.90%) nor cervical cancer (84.92%). About 64% of them indicated having experience in cervical cancer screening.

Table 4.3 Family history of cancer and cervical cancer screening experience

	N(%)	
	Yes	No
1. Do you have family history of cancer? (N=834)	251(30.10)	583(69.90)
2. Do you have family history of cervical cancer?(N=834)	38(4.56)	796(95.44)
3. Have you ever received a screening for cervical cancer? (N=834)	551(63.99)	283(36.01)

HPV vaccine awareness among the respondents is displayed in the table 4.4, It is found that most of respondents (70%) indicated they have ever received information about HPV vaccine before. However, only 17% of the respondents indicated having someone in her family including herself vaccinated against HPV. About 30% indicated that they knew someone who has been vaccinate against HPV.

Table 4.4 HPV vaccine awareness

	N(%)	
	Yes	**No**
1. Have you ever received information regarding HPV vaccine (N=851)	588(69.10)	263(30.9)
2. You or someone in your family has ever been vaccinated against HPV(N=588)	100(17.01)	488(82.99)
3. Daughter or students in the care of you have been vaccinatedagainst HPV(N=588)	41(6.97)	547(93.03)
4. People you know have been vaccinated against HPV (N=585)	167(28.40)	421(71.60)

Sources of HPV vaccine information among the respondents who have received information about HPV vaccine are shown in table 4.5,It is found that hospital/health care provider (65.65%) is the major source of information, followed by TV /radio (50.34%), and Newspaper/magazine (38.10%), respectively.

Table 4.5 Sources of HPV vaccine information received by the respondents

	N(%)
1 Television / Radio	296(50.34)
2 Newspaper / Magazines	224(38.10)
3 Advertising board	89(15.14)
4 Hospital / Health care provider	386(65.65)
5 Friends, Relations	172(29.25)
6 Internet	102(17.35)
7 Other	10(1.70)

Knowledge regarding cervical cancer and HPV vaccine of the respondents is displayed in table 4.6 In respect to knowledge regarding cervical cancer, about 57% of the respondents knew that cervical cancer is not a genetic disease. Only about 50% of the respondent knew that viral infection is the cause of cervical cancer. Approximately two third (59.74%) of the respondents knew that virus that causes cervical cancer, can be transmitted through sexual relationship and that having sex at early age increases the risk for cervical cancer (63.55%). In addition, only 38.74% of the respondents knew that vaginal bleeding is the early symptom of cervical cancer. On the other hand, almost all of the respondents (93.50%) knew that women aged 30 years and over should be regularly screened for cervical cancer and that early detection of cervical cancer can improve survival time (89.9%).

Concerning knowledge regarding HPV vaccine, only 21.24% knew that some types of HPV vaccine can also provide protection against genital warts. About one-third of the respondents correctly answered that HPV vaccine cannot be used as a treatment even for early stage of cervical cancer (32.09%). The efficacy of vaccine is different between women with and without sexual experience (28.52%), and the efficacy of HPV vaccine is not as high as 100% (33.95%). About 42% of the respondents correctly indicated that women aged 35 years or more should not be vaccinated against HPV. Almost half of the respondents (49.42%) knew that efficacyof HPV vaccine was not lifelong. On the other hand, about 70% of the respondents knew that there is still a need to use condom and to regularly screen for

cervical cancer after being vaccinated against HPV and that there is still a need to regularly screen for cervical cancer once you have been vaccinated against HPV.

As show in the table 4.7, average knowledge score related to cancer, HPV vaccine and total score were 4.20, 3.50, and 7.70, respectively.

Table 4.6 Knowledge regarding cervical cancer and HPV vaccine

	N(%)		
	Yes	**No**	**Don't know**
1. Cervical cancer is not a genetic disease (N=857)	**491(57.30)**	203(23.69)	163(19.01)
2. Virus infection is not the cause of cervical cancer (N=857)	213(24.85)	**422(49.24)**	222(25.91)
3. Virus that causes cervical cancer can be transmitted through sexual relationship (N=857)	**512(59.74)**	182(21.24)	163(19.02)
4. Having sex at an early age does not increase the risk for cervical cancer (N=856)	173(20.21)	**544(63.55)**	139(16.24)
5.Women age 30 years and over should be annually screened for cervical cancer (N=861)	**805(93.50)**	20(2.32)	36(4.18)
6. Early detection of cervical cancer can increase survival rate(N=861)	**774(89.90)**	30(3.48)	57(6.62)
7.Vaginal bleeding is the early symptoms of cervical cancer(N=857)	**332(38.74)**	196(22.87)	329(38.50)
8. If early detected, HPV vaccine can be used to cure cervical cancer (N=857)	**230(26.84)**	275(32.09)	352(41.07)

Table 4.6 Knowledge regarding cervical cancer and HPV vaccine (cont.)

	N(%)		
	Yes	**No**	**Don't know**
9. Efficacy of the vaccine is not different among women with and without sexual experience (N=859)	**199(23.17)**	245(28.52))	415(48.31)
10. Efficacy of HPV vaccine in prevention of cervical cancer is nearly 100% (N=860)	284(33.02)	**292(33.95)**	284(33.02)
11.Vaccination against cervical cancer should be performed in women aged 35 years or more (N=859)	253(29.45)	**362(42.14)**	244(28.41)
12. There is no need to use condom once you have been vaccinated against HPV (N=860)	52(6.05)	**634(73.72)**	174(20.23)
13. Some type of HPV vaccine can also protect against genital warts (N=857)	**182(21.24)**	97(11.32)	578(67.44)
14. Efficacy of HPV vaccine is lifelong (N=860)	90(10.47)	**425(49.42)**	345(40.11)
15. There is no need to regularly screen for cervical cancer once you have been vaccinated against HPV (N=860)	78(9.07)	**610(70.93)**	172(20.0)

Bold = Correct answer

Table 4.7 Summary knowledge score related to cervical cancer and HPV vaccine

	Mean (SD)
Knowledge score related to cancer * (N=851)	**4.2(1.50)**
Knowledge score related to HPV vaccine ** (N=853)	**3.5(2.04)**
Total knowledge score *** (N=843)	**7.7(2.94)**

* full score = 7, ** full score = 8, *** full score = 15

Attitude towards cervical cancer and HPV vaccine was shown in table 4.8. Perceived threat of cervical cancer is measured using question: “cervical cancer is a severe disease” while perceived susceptibility are measured using 2 questions: “you are at high risk for cervical cancer in the future” and “your daughters are at low risk for cervical cancer in the future”. Perceived safety of vaccine is measured using the question: “HPV vaccine is a highly safe vaccine’ while the perceived barrier is measured in term of cost of HPV vaccine. Regarding perceived efficacy, the question used is “HPV vaccination can actually prevent cervical cancer”. For the social norms, the respondents were asked if they agreed with the following statement “all parents should take her daughter to vaccinate against HPV”.

About 72% of the respondents indicated that cervical cancer is a severe disease. However, only 17% thought that they were at high risk of being diagnosed with cervical cancer in the future while about 46.08% thought that their daughters/ girls under supervision were at high risk for cervical cancer. Concerning HPV vaccine, about 43% of the respondents believed that HPV vaccine was highly safe while about 27% believed that HPV vaccine can actually prevent cervical cancer. Approximately 50% of the respondents perceived that HPV vaccine was expensive and that all parents should take their daughters to vaccinate against HPV.

HPV vaccine acceptability and willingness to pay for HPV vaccine was described in table 4.9. In our study, acceptability was determined by the following question “If the government’s campaign for girls aged 12-15 years old to be vaccinated against cervical cancer is free will you allow your daughter to be

vaccinated or not?" On the other hand, willingness to pay was determined by the following question "If the vaccine is not totally free but you have to copay if you were willing to have your daughter vaccinate, will you willing to pay for the vaccine?" For vaccine acceptability, it was found that about 74.41% to 76.8% of the respondents show their intention to have their daughters or girls under supervision vaccinated against HPV if it was provided by Government with no charge. Regarding willingness to pay, about 67.29% - 68.90% of the respondents indicated that they were willingness to pay extra charge in term of co-payment for vaccinating their daughters / girls under supervision against HPV vaccine.

Table 4.8 Attitude towards of Cervical cancer and HPV vaccine

	N (%)				
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1. Cervical cancer is a severe disease (N=858)	43(5.01)	42(4.90)	159(18.53)	191(22.26)	423(49.30)
2. You are at high risk for cervical cancer in the future (N=856)	250(29.21)	205(23.95)	255(29.79)	74(8.64)	72(8.41)
3. Your daughters/students under your supervision are at low risk for cervical cancer in the future. (N=856)	227(26.52)	170(19.86)	222(25.93)	121(14.14)	116(13.55)
4. HPV vaccine is a highly safe vaccine (N=851)	35(4.11)	95(11.16)	346(40.66)	244(28.67)	131(15.40)
5. HPV vaccine is expensive. (N=849)	46(5.42)	74(8.72)	259(30.50)	204(24.03)	266(31.33)
6. HPV vaccination can actually prevent cervical cancer (N=853)	75(8.79)	148(17.35)	395(46.31)	180(21.10)	55(6.45)
7. All parents should take their daughters to vaccinate against HPV (N=854)	85(9.95)	98(11.48)	254(29.74)	153(17.92)	264(30.91)

Table 4.9 Acceptance of HPV vaccination and Willingness to pay

Type of vaccine	**N (%)**
Acceptance	
Bivalent (N=861)	651(76.86)
Quadrivalent (N=758)	564(74.41)
Willingness to pay	
Bivalent (N=636)	438(68.90)
Quadrivalent (N=639)	430(67.29)

Reasons for no acceptability were shown in table 4.10 The main reasons for not acceptance for both bivalent and quadrivalent were concerns about HPV vaccine's side effect followed by the perception that their daughters or students under supervision were at low risk of cervical cancer, and not confident about the efficacy of vaccine, respectively.

Table 4.10 Reasons for no acceptability classified by type of vaccine

	No acceptance, N(%)	
	Bivalent (N=196)	Quadrivalent (N=194)
1. My daughter is a low risk of cervical cancer	57(29.08)	67(34.54)
2. Not confident about efficacy of vaccine	54(27.55)	58(29.90)
3. Concern about adverse effect of vaccine	90(45.92)	88(45.36)
4. Physician did not recommend	30(15.31)	33(17.01)
5. Most people I knew have not been vaccinated against HPV before	43(21.94)	40(20.62)
6. Concern about the inappropriate sexual behavior caused by the misconception that vaccine can prevent all sexual transmitted disease	37(18.88)	15(7.73)
7. Other reasons	16(8.16)	6(3.09)

Reasons for unwilling to pay for vaccine were shown in table 4.11. The main reasons for unwilling to pay for both bivalent and quadrivalent were the financial limitation followed by the perception that it should be the responsibility of the government to provide free vaccination, and that the vaccine is not necessary at the moment respectively**.**

Table 4.11 Reasons for Unwilling to pay classified by type of vaccine

Reason for unwilling to pay	Unwillingness to pay, N(%)	
	Bivalent (N=198)	Quadrivalent (N=209)
1. It should be the responsibility of the government to provide free vaccination	66(33.33)	63(30.14)
2. Vaccine is important but I can't afford it	85(42.93)	82(39.23)
3. The vaccine is not necessary at the moment	55(27.78)	57(27.27)
4. Others	9(4.55)	15(7.18)

Table 4.12 Willingness to pay amount for 3 doses of bivalent vaccine

Willing to pay amount for 3 doses of bivalent vaccine (N=445)	N (%)
1. Less than 300 bath	19 (4.28)
2. 300-500 bath	140 (31.46)
3. 500-1,000 bath	134 (30.11)
4. 1,000-1,500 bath	77 (17.30)
5. 1,500-2,000 bath	46 (10.33)
6. More than 2,000 bath	29 (6.52)

From the table 4.12, it was found that about 32% indicated that the amount of willingness to pay for 3 doses of bivalent vaccine were 300-500 baht while about 30% indicated that they would pay 500- 1,000 baht for 3 doses of bivalent vaccine.

When looking at the amount of willingness to pay for quadrivalent vaccine, it was found that 61.2% of the respondents indicated that they would pay more for quadrivalent vaccine as compared to bivalent vaccine. For those who indicated that they would pay more for quadrivalent, 60% indicated that the extra amount was about 100-500 baht. The main reasons (43%) for paying similar amount for bivalent vaccine and quadrivalent vaccine was that their daughters or girls under supervision were at low risk for genital wart.

Table 4.13 Amount of willingness to pay for quadrivalent vaccine as compared to bivalent vaccine

Amount of willingness to pay for quadrivalent vaccine (N =384)		N(%)
	Similar to the bivalent vaccine	149(38.80)
	Higher than bivalent vaccine	235(61.60)
Reason for paying the same amount for bivalent and quadrivalent vaccine (N= 108)		
	Daughters / students in your care have a lower risk for genital warts.	64(42.95)
	Genital wart is not a severe disease	28 (18.79)
	Other	16 (10.74)
Additional amount of willingness to pay for quadrivalent vaccine as compared to bivalent vaccine (N =219)		
	< 100 bath	5(2.13)
	100 – 500 bath	144(61.28)
	> 500 bath	70(29.79)

Table 4.14, summarized the factors affecting with acceptability and willingness to pay by univariate analysis. It was found that perceived susceptibility of cervical cancer, perceived benefit of vaccine, perceived risk of adverse event from vaccine, ever receiving information regarding vaccine, perceived norm, and knowledge of vaccine and cervical cancer were found to be associated with acceptance

and willingness to pay for both bivalent and quadrivalent vaccine. In addition, family income was also significantly associated with willingness to pay for both bivalent and quadrivalent vaccine.

Part II focuses on the factors associated with HPV vaccine

Table 4.14 :**Factors associated with acceptability and willingness to pay for bivalent and quadrivalent vaccine by univariate analysis**

		Model 1: OR (95%CI), acceptance for bivalent vaccine	Model 2: OR (95%CI), WTP for bivalent vaccine	Model 3: OR (95%CI), acceptance for quadrivalent vaccine	Model 4: OR (95%CI), WTP for quadrivalent vaccine
School					
Education					
	<= primary school	0.229	0.039	0.349	0.098
	Secondary school	0.711(0.304)	1.34(0.402)	0.82(0.579)	1.04(0.914)
	Tertiary school	1.169(0.610)	1.001(0.997)	1.09(0.773)	1.4(0.225)
	Certificate	0.912(0.788)	1.75(0.109)	0.95(0.891)	2.06(0.041)
	Bachelor	0.779(0.323)	1.56(0.072)	0.71(0.186)	1.58(0.063)
	Higher than bachelor	0.505(0.069)	4.49(0.009)	0.58(0.148)	2.8(0.028)
Family income per month					
	< 5,000	0.705	<0.001	0.182	<0.001
	5,000-9,999	1.472(0.380)	0.917(0.846)	2.92(0.015)	0.73(0.513)
	10,000-29,999	1.385(0.416)	0.97(0.948)	2.21(0.037)	1.32(0.527)
	30,000-49,999	1.453(0.375)	2.67(0.028)	2.25(0.04)	2.36(0.067)
	50,000-100,000	1.146(0.758)	2.88(0.018)	1.91(0.093)	2.61(0.039)
	>100,000	0.934(0.889)	3.09(0.059)	1.5(0.397)	2.5(0.116)
Family history of cancer		0.945(0.751)	0.85(0.381)	0.89(0.501)	1.02(0.127)
Age of mothers		0.984(0.203)	1.004(0.782)	0.98(0.138)	1.08(0.683)
Information received					
	Yes vs Never	1.96(<0.001)	1.73(0.003)	1.68(0.004)	2.28(<0.001)
Knowledge score		1.108(<0.001)	1.092(0.004)	1.10(<0.001)	1.13(<0.001)
Believe that they are at risk of cervical cancer (Disagree = reference)		0.712	0.111	0.333	0.422
	Neutral	0.9(0.738)	1.35(0.352)	0.72(0.311)	0.69(0.277)
	Agree	1.067(0.814)	1.72(0.05)	0.97(0.925)	0.90(0.722)

Table 4.14 :Factors associated with acceptability and willingness to pay for bivalent and quadrivalent vaccine by univariate analysis (cont.)

		Model 1: OR (95%CI), acceptance for bivalent vaccine	Model 2: OR (95%CI), WTP for bivalent vaccine	Model 3: OR (95%CI), acceptance for quadrivalent vaccine	Model 4: OR (95%CI), WTP for quadrivalent vaccine
Believe that their children are at risk of cervical cancer		0.544	0.187	0.389	0.113
	Neutral	0.996(0.983)	0.739(0.124)	1.23(0.285)	0.85(0.395)
	agree	1.285(0.292)	0.717(0.150)	1.31(0.264)	0.62(0.037)
Believes that cervical cancer Is serious disease (Disagree = reference)		0.699	0.203	0.761	0.558
	Neutral	0.993(0.971)	1.11(0.615)	1.02(0.916)	1.22(0.348)
	agree	1.168(0.437)	1.46(0.075)	1.16(0.471)	1.19(0.406)
Believe that HPV vaccine is a highly safe(Disagree = reference)		<0.001	0.005	<0.001	0.035
	Neutral	1.635(0.026)	0.795(0.405)	1.57(0.051)	0.587(0.058)
	agree	3.021(<0.001)	1.449(0.182)	3.02(<0.001)	0.89(0.676)
Believe that HPV vaccine is expensive(Disagree = reference)		0.124	0.178	0.682	0.571
	Neutral	1.11(0.677)	1.37(0.283)	1.11(0.69)	0.97(0.935)
	agree	1.49(0.089)	0.942(0.819)	1.22(0.41)	0.821(0.447)
Believe that HPV vaccine can actually prevent cervical cancer(Disagree = reference)		0.015	0.051	0.001	0.970
	Neutral	1.32(0.144)	1.48(0.062)	1.57(0.021)	0.98(0.944)
	agree	1.94(0.04)	1.73(0.019)	2.31(<0.001)	1.03(0.883)
Believe that all parents should take their daughters to vaccinate against HPV (Disagree = reference)		<0.001	<0.001	<0.001	0.002
	Neutral	2.05(<0.001)	1.21(0.443)	1.79(0.007)	1.37(0.21)
	agree	3.92(<0.001)	2.23(0.001)	4.118(<0.001)	2.12(0.001)

Factors associated with bivalent vaccine acceptability by logistic regression were shown in table 4.15. It was found that knowledge regarding HPV vaccine was positively associated with acceptance towards bivalent vaccine. For 1-unit increase in knowledge score, the acceptability is increased by 1.108 times (OR = 1.108, p =0.0014). Similarly, those who agree that all parents should take their daughter to vaccinate with bivalent vaccine were 3.102 times more likely to allow their daughters to vaccinated with bivalent vaccine if it is for free (OR = 3.102, p<0.001).

Table 4.15 Factors associated with bivalent vaccine acceptability

	B	S.E.	Sig.	Exp(B)
Constant	-0.508	0.313	0.105	0.602
Knowledge regarding cervical cancer*	0.103	0.030	0.001	1.108
HPV vaccine is a highly safe vaccine (disagree = reference)			0.231	
Neutral	0.157	0.250	0.531	1.170
Agree	0.452	0.284	0.112	1.571
HPV vaccination can actually prevent cervical cancer (disagree = reference)			0.917	
Neutral	-0.022	0.217	0.919	0.978
Agree	0.077	0.275	0.780	1.080
All parents should take her daughter to vaccinate against HPV (disagree = reference)			<0.001	
Neutral	0.688	0.236	0.004	1.989
Agree	1.132	0.241	<0.001	3.102
You are at high risk for cervical cancer in the future (disagree = reference)			0.423	
Neutral	-0.168	0.197	0.393	0.845
Agree	0.184	0.253	0.468	1.202

Cox & Snell R square = 0.072, Nagelkerke R square = 0.109

* odd is associated with a 1-unit increase in knowledge score

Factors associated with quadrivalent vaccine acceptabality by logistic regression were shown in table 4.16. Similarly, those who agree that all parents should take their daughter to vaccinate with bivalent vaccine were 3.47 times more likely to allow theirdaughters to vaccinated with bivalent vaccine if it is for free (OR = 3.47, $p<0.001$). It was also found that knowledge regarding HPV vaccine was

positively associated with acceptance towards bivalent vaccine. For 1 score increase, the chance of acceptance increase by 1.109 times (OR = 1.109, p = 0.011)

Table 4.16 Factorsassociated withquadrivalent vaccine acceptability

	B	S.E.	Sig.	Exp(B)
Constant	-0.744	0.330	0.024	0.475
Knowledge regarding cervical cancer	0.104	0.031	0.001	1.109
Attitude towards safety of vaccine (negative attitude = reference)			0.479	
Neutral attitude	0.042	0.267	0.876	1.043
Positive attitude	0.285	0.296	0.335	1.330
Attitude towards effectiveness of vaccine (negative attitude = reference)			0.604	
Neutral attitude	0.188	0.225	0.405	1.207
Positive attitude	0.261	0.280	0.352	1.298
Social norms (negative norm = reference)			<0.001	
All parents should take your daughter to HPV vaccination (neutral)	0.545	0.245	0.026	1.725
All parents should take your daughter to HPV vaccination (agree)	1.229	0.255	<0.001	3.417
Perceive susceptability (low susceptibility = reference)			0.723	
Neutral	0.016	0.208	0.937	1.017
High susceptability	0.205	0.258	0.426	1.227

Cox & Snell R square = 0.084, Nagelkerke R square = 0.124

* odd is associated with a 1-unit increase in knowledge score

Factors associated with bivalent vaccine and willingness to pay by logistic regression were shown in table 4.17. It was found that income was positively related with the willingness to pay for bivalent vaccine. Those who have income 30,000 to 49,000 Baht were 2.840 times more likely to pay for bivalent vaccine as compared to

those with income lower than 5,000 baht. Those who have income 50,000 to 100,000 Baht were 3.196 times more likely to pay for bivalent vaccine as compared to those with income lower than 5,000 baht. Similarly, those who agree that all parents should take their daughter to vaccinate with bivalent vaccine were 2.07 times more likely to allow their daughters to vaccinated with bivalent vaccine if it is not free (OR = 2.07, p =0.009)

Table 4.17 Factors associated with Willingness to pay for bivalent vaccine

	B	S.E.	Sig.	Exp(B)
Constant	-0.188	0.525	0.265	1.039
Knowledge regarding cervical cancer*	0.038	0.034	0.265	1.039
Attitude towards safety of vaccine (negative attitude = reference)			0.065	
Neutral attitude	-0.626	0.320	0.051	0.535
Positive attitude	-0.241	0.346	0.487	0.786
Attitude towards effectiveness of vaccine (negative attitude = reference)			0.096	
Neutral attitude	0.455	0.237	0.055	1.576
Positive attitude	0.550	0.285	0.053	1.734
Social norms (negative norm = reference)			0.014	
All parents should take your daughter to HPV vaccination (neutral)	0.201	0.284	0.479	1.223
All parents should take your daughter to HPV vaccination (agree)	0.715	0.282	0.011	2.045

Table 4.17 Factors associated with Willingness to pay for bivalent vaccine (cont.)

	B	S.E.	Sig.	Exp(B)
Perceive susceptability (low susceptibility = reference)			0.044	
Neutral	-0.508	0.216	0.019	0.602
High susceptability	-0.396	0.258	0.126	0.673
Income (< 5,000 Baht = Reference)			<0.001	
5,000-9,999 Baht	-0.052	0.476	0.913	0.949
10,000-29,999 Baht	0.036	0.439	0.934	1.037
30,000 – 49,999 Baht	1.037	0.477	0.029	2.822
50,000 -100,000 Baht	1.166	0.484	0.016	3.208
> 100,000 Baht	1.197	0.633	0.059	3.309

Cox & Snell R square = 0.110, Nagelkerke R square = 0.154

* odd is associated with a 1-unit increase in knowledge score

Factors associated with quadrivalent vaccine and willingness to pay by logistic regression was shown in table 4.18. Similarly, those who agree that all parents should take their daughter to vaccinate with quadrivalent vaccine were 2.428 times more likely to allow their daughters to vaccinated with bivalent vaccine if it is not free (OR = 2.428, p =0.001). Income is also associated with WTP for quadrivalent vaccine.

Table 4.18 Factors associated with willingness to pay for quadrivalent vaccine

	B	S.E.	Sig.	Exp(B)
Constant	-0.720	0.588	0.221	0.487
Knowledge regarding cervical cancer*	0.079	0.033	0.018	1.082
Attitude towards safety of vaccine (negative attitude = reference)			0.004	
Neutral attitude	0.798	0.349	0.022	2.221
Positive attitude	-0.274	0.217	0.207	0.760
Attitude towards effectiveness of vaccine (negative attitude = reference)			0.911	
Neutral attitude	0.085	0.239	0.722	1.089
Positive attitude	0.116	0.283	0.683	1.123
Social norms (negative norm = reference)			0.005	
All parents should take your daughter to HPV vaccination (neutral)	0.518	0.287	0.071	1.679
All parents should take your daughter to HPV vaccination (agree)	0.887	0.279	0.001	2.428
Perceive susceptibility (low susceptibility = reference)			0.057	
Neutral	-0.298	0.210	0.155	0.742
High susceptability	-0.573	0.252	0.023	0.564
Income			0.002	
< 5,000 Baht	-0.333	0.506	0.510	0.716
5,000-9,999 Baht	0.185	0.474	0.697	1.203
10,000-29,999 Baht	0.808	0.502	0.107	2.243
30,000 – 49,999 Baht	0.758	0.503	0.132	2.134
> 50,000 Baht	0.694	0.621	0.264	2.001

Cox & Snell R square = 0.091, Nagelkerke R square = 0.127

* odd is associated with a 1-unit increase in knowledge score

CHAPTER V
DISCUSSION

This chapter was divided into 5 parts as follows,

1. Awareness of HPV vaccine
2. Knowledge regarding cervical cancer and HPV vaccine
3. Attitude towards cervical cancer and HPV vaccine
4.Acceptance rate and willingness to pay for HPV vaccine
5.Factors affecting acceptance and willingness to pay for HPV vaccine

Awareness of HPV vaccine

In our study about 70% of mothers have heard about HPV vaccine. The proportion of those have heard about HPV vaccine in our study is higher than those of 2 previous studies conducted among women in Bangkok which found that about 40% (47) to 50% (68) of the women indicated that they have heard about HPV vaccine. It may be supported by the change over time as the systematic review indicated that the percentage of parent who heard about HPV vaccine rose over time (7). Similar to the previous study conducted in Bangkok in 2009 most of respondents in our study received information regarding the vaccine from hospital/health care provider (65.65%), followed by TV/radio (50.34%).

When looking at the knowledge regarding cervical cancer, only 39% of the respondent knew about the early symptoms of cervical cancer and about 50% knew that viral infection is associated with cervical cancer. On the other hand, about 90% knew that women aged 30 years and over should be regularly screened for cervical cancer and that early detection of cervical cancer can improve survival time.

Consistent with the previous study (47) the knowledge about screening is higher than that of HPV vaccine. In our studies, only approximately 30% of the respondents knew that efficacy of vaccine is different between women with and

without sexual experience, the efficacy of vaccine is not nearly 100%, and that HPV vaccine cannot be used to cure cervical cancer even detected at the early stage. On the other hand, we found that about 70% knew that there is still a need to use condom and regularly screen for cervical cancer after being vaccinated against HPV. The high level of knowledge about the screening and awareness of condom use may be the result of previous campaign about condom use and screening in Thailand (19, 69).

When looking at the acceptance, consistently with previous studies in Bangkok (47) and recent systematic review (8) which found that most parent have high intention to vaccinate their daughters against HPV, our study found that acceptance towards HPV vaccine is high ranging between 74% for bivalent to 76% for quadrivalent vaccine. It was found that acceptance rate among other countries in Asia (56, 70, 71) was also high ranging from 79% in Korea to 96% in Indonesia. In contrast, the acceptance rate in the US was low ranged from 48 – 65% (56, 71-73).

Regarding the willingness to pay, we found that the WTP for HPV vaccine ranged from 67% to 69%. About 32%, and 30% of the respondents indicated that they would be willing to pay 300-500 baht, and 500-4000 Baht for whole 3 doses of bivalent vaccine given that the efficacy of vaccine is 70% and the duration of coverage is 6 years. When compared the result with other previous studies, it was found that the result varied widely. In Japan, the WTP is around 95.6% (71) and most of the respondent indicated that they would pay about 2000-4000 Yen (20-40 $US) . Similar to the result from Korea, which found that about 40% of the respondents indicated that they would pay up to 50 $US to vaccinate their daughter against HPV (72). On the other hand, in Taiwan it was found that median WTP to vaccinate daughter ranged for 1,098- 1,223 $US (60). For Kenya, it was found that about 75% of the respondent willing to pay 100 Kenyan Shilling or less (4.16$ US PPP) to vaccinate their daughter against HPV. When looking specifically at the bivalent vaccine with 70% efficacy for 10-year coverage, the WTP in Vietnam for such vaccine was estimated at 185$ US.(10), while in the US it was estimated around at $663 (62). However, when compared the amount of WTP for bivalent and quadrivalent vaccine, it was found that mother in the US would pay 238$ more for quadrivalent vaccine than bivalent vaccine (62). On the other hand, about 60% of the respondents in our study indicated that they would pay more for quadrivalent vaccine than bivalent vaccine. However, most of the

respondents indicated that they would pay only 100-500 Baht more for quadrivalent vaccine as compared to bivalent vaccine. This may be due to the fact that the genital wart is not prevalent in Thailand and that the mother perceived that their daughter was at lower risk of developing genital wart (74).

Regarding the factors affecting acceptance towards HPV vaccines, in our univariate analyses we found that ever received information regarding HPV vaccine, knowledge regarding cervical cancer and HPV vaccine, perceived safety, perceived efficacy, and social norms are associated with acceptance. These mentioned factors along with income level are found to be the predictor for WTP for HPV vaccine in our study.

Consistent with previous studies (68, 71) those who indicated ever received information was more likely to accept and willing to pay for HPV vaccine. Similar to the previous study (68) we also found that those who indicated have ever received information had higher knowledge than those who had never received information and that knowledge is positively related with acceptance(50, 51, 60). In addition, we also found that knowledge is the significant predictor of acceptance in multivariate analysis (50, 51).

Regarding safety, about 45.5% of non-acceptors in our study indicated their concern about adverse event of vaccine. This finding was similar to those of previous studies which found that safety concern is the barrier of acceptance. (7-9, 65, 71, 75).

In our study we also found that perceived benefit of vaccine is associated with acceptance. This finding was similar to those of previous studies (7-9). On the other hand, while perceived susceptibility was associated with acceptance in several studies (7-9, 31, 71) it is not the case in our study. Although cost of vaccine was identified as a significant barrier for vaccine acceptance in previous study (8), it is not the factor associated with acceptance and WTP in our study even though about 50% of the respondents indicated that the cost of vaccine is high. On the other hand, we found that income was a significant associated with WTP in both univariate analysis and multivariate analysis.

Similar to several studies(43-45)social norms is identified as a significant predictor of acceptance and willingness to pay for HPV vaccine in both

univariateanalyses and multivariate analyses. This can be explained by the fact that social norms is a significant predictors of several health behaviors in Thailand. (43-46, 76, 77).

Finally, it should be noted that there are other identifiable limitations in this study. For one, the samples in our study only reflect the female parents from Bangkok as the results, our findings may overestimate the knowledge level as well as willingness to pay amount for HPV vaccine. Furthermore, it should be noted that difference between intention and real behavior might exist. This can also be the case for the willingness to pay response. Another limitation needed to be addressed was that in our study the amount of willingness to pay was assessed using payment scale, which the given ranged can affect the result. However, to reflect the real scenario in Thailand we determined the range given to the respondents based on the price that the government willing to pay for the vaccine acquisition and that the price which considered cost-effective in the countries. Lastly, from the questionnaires, it should be noted that there was some missing data in the part of willingness to pay due to the complexity of the questionnaire. If possible, face-to-face interview might be more appropriate. Besides the mentioned limitation, our strength is that our respondents are the female parents of daughter aged between 12-15 years old not the general women. So, the knowledge, attitude and intention to vaccinate their daughters are relevant to the actual situation. In addition, to our knowledge, our study is the first study examining the different between bivalent and quadrivalent vaccine in term of both acceptance and willingness to pay.

CHAPTER VI
CONCLUSION

To this point, consistent with previous studies in other countries, we can conclude that the acceptance towards HPV vaccine is high while the knowledge towards cervical cancer and HPV vaccine is low.As we found that knowledge is positively associated with acceptance, in order to increase the uptake of vaccine if it was included in the national coverage, the government should provide appropriate education program for the mothers. Based on our findings, education program in Thailand should emphasize the safety of vaccine, efficacy of vaccine, difference benefit of vaccine among women with and without sexual experiences, target group of vaccine, early symptoms of cervical cancer as well as the link between HPV infection and cervical cancer. When looking at the major source of information, we suggest that physician and hospital is still the most important source of information for parents.

As we also found that social norms is the significant predictor of both acceptance and willingness to pay. To increase the vaccine acceptability as well as uptake, the related organization should also implement a campaign aim at increasing positive social norms on the HPV vaccine among the parents.

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APPENDICES

APPENDIX A
QUESTIONNAIRE

Questionnaire for parents

เอกสารแนะนำโครงการ

โครงการวิจัยเรื่อง “ความรู้ การยอมรับต่อวัคซีนป้องกันมะเร็งปากมดลูกและความเต็มใจจ่ายของมารดาที่มีลูกสาวอายุระหว่าง 12-15 ปีในเขตกรุงเทพมหานคร”

โครงการวิจัยนี้มีวัตถุประสงค์เพื่อสำรวจความรู้ การยอมรับต่อวัคซีนป้องกันมะเร็งปากมดลูกและความเต็มใจจ่ายของมารดาที่ลูกสาวอายุระหว่าง 12-15 ปีในเขตกทม. รวมถึงศึกษาถึงปัจจัยต่างๆที่มีผลต่อการยอมรับและความเต็มใจจ่ายต่อวัคซีนดังกล่าวผลที่ได้จากการศึกษาในครั้งนี้จะเป็นประโยชน์ในการส่งเสริมความรู้ความใจที่ถูกต้องและในการตัดสินใจเชิงนโยบายที่เกี่ยวข้องกับวัคซีนป้องกันมะเร็งปากมดลูกต่อไปในอนาคตซึ่งท่านได้รับการคัดเลือกเพื่อเป็นกลุ่มตัวอย่างของการศึกษาในครั้งนี้เนื่องจากท่านมีบุตรสาวหรือนักเรียนในความดูแลซึ่งกำลังศึกษาระดับชั้นมัธยมศึกษาในโรงเรียนที่ถูกสุ่มขึ้นมาเพื่อเป็นตัวอย่างจากจำนวนทั้งสิ้น 8 โรงเรียนในกรุงเทพมหานคร ทั้งนี้ผู้ที่ตอบแบบสอบถามนี้ควรเป็นมารดาที่มีลูกสาวอายุระหว่าง12 – 15 ปี อย่างไรก็ตามในกรณีที่มารดาไม่สะดวกที่จะตอบแบบสอบถามสามารถผู้ปกครองเพศหญิงท่านอื่นตอบแทนได้

ท่านมีสิทธิปฏิเสธไม่เข้าร่วมโครงการวิจัยได้โดยไม่มีผลกระทบใดๆ ทั้งต่อตัวท่านและนักเรียนในความดูแลของท่าน แต่หากท่านยินดีเข้าร่วมโครงการวิจัย ขอความกรุณาให้ท่านตอบแบบสอบถามตามความเป็นจริงโดยไม่ต้องกังวลว่าจะถูกหรือผิด และเมื่อทำเสร็จแล้วกรุณานำส่งโดยให้นักเรียนนำไปหย่อนที่กล่องรับคืนแบบสอบถามที่ชั้นเรียน ทั้งนี้ข้อมูลที่ได้จะถูกเก็บเป็นความลับและใช้ประโยชน์ในการวิจัยโดยไม่มีการเปิดเผยชื่อของท่านหรือนักเรียนในความดูแลของท่านแต่อย่างไร

แบบสอบถามนี้ประกอบด้วย 42 ข้อ โดยแบ่งออกเป็น 5 ส่วนได้แก่ ข้อมูลทั่วไปของผู้ตอบ การรับรู้เกี่ยวกับวัคซีนป้องกันมะเร็งปากมดลูก ความรู้เกี่ยวกับโรคมะเร็งปากมดลูกและวัคซีนป้องกันมะเร็งปากมดลูก ทัศนคติเกี่ยวกับโรคมะเร็งปากมดลูกและวัคซีนป้องกันมะเร็งปาก

มดลูก และการยอมรับและความเต็มใจจ่าย ทั้งนี้การตอบแบบสอบถามจะใช้เวลาประมาณ 10-15 นาที กรุณาตอบคำถามตามความเป็นจริงตามลำดับทีละส่วนเริ่มจากส่วนที่ 1, 2, 3, 4 และ 5 ตามลำดับหากท่านมีข้อคำถามใดเกี่ยวกับการสำรวจนี้กรุณาติดต่อผู้รับผิดชอบโครงการ ดังนี้

1. ภญ. ศิรภรณ์ กรุยรุ่งโรจน์
2. ผศ. ดร มนทรัตม์ ถาวรเจริญทรัพย์

สถานที่ติดต่อภาควิชาเภสัชกรรม คณะเภสัชศาสตร์ มหาวิทยาลัยมหิดล 447 ถนนศรีอยุธยา ราชเทวี กรุงเทพฯ 10400 โทรศัพท์ 644-8677-91

APPENDIX B
QUESTIONNAIRE FOR PARENTS

โครงการวิจัยเรื่อง "ความรู้ การยอมรับต่อวัคซีนป้องกันมะเร็งปากมดลูกและความเต็มใจจ่ายของมารดาที่มีลูกสาวอายุระหว่าง 12-15 ปีในเขตกรุงเทพมหานคร"

<u>คำชี้แจง</u>: โครงการวิจัยนี้มีวัตถุประสงค์เพื่อสำรวจความรู้ การยอมรับต่อวัคซีนป้องกันมะเร็งปากมดลูกและความเต็มใจจ่ายของมารดาที่ลูกสาวอายุระหว่าง 12-15 ปีในเขตกทม. รวมถึงศึกษาถึงปัจจัยต่างๆที่มีผลต่อการยอมรับและความเต็มใจจ่ายต่อวัคซีนดังกล่าวผลที่ได้จากการศึกษาในครั้งนี้จะเป็นประโยชน์ในการส่งเสริมความรู้ความใจที่ถูกต้องและในการตัดสินใจเชิงนโยบายที่เกี่ยวข้องกับวัคซีนป้องกันมะเร็งปากมดลูกต่อไปในอนาคต **ผู้ที่ตอบแบบสอบถามนี้ควรเป็นมารดาที่มีลูกสาวอายุระหว่าง 12 – 15 ปี** ทั้งนี้ในกรณีที่มารดาไม่สะดวกที่จะตอบแบบสอบถามสามารถให้**ผู้ปกครองเพศหญิง**ท่านอื่นตอบแทนได้
แบบสอบถามนี้ประกอบด้วย42 ข้อ 6 หน้าและใช้เวลาตอบประมาณ 10-15 นาที กรุณาตอบคำถามตามความเป็นจริง**ตามลำดับทีละส่วนเริ่มจากส่วนที่ 1, 2, 3, 4 และ 5 ตามลำดับเมื่อทำเสร็จแล้วกรุณานำส่งโดยให้นักเรียนนำไปหย่อนที่กล่องรับคืนแบบสอบถามที่ชั้นเรียน ขอขอบคุณอย่างสูงในความร่วมมือ**

<u>คำชี้แจง</u> กรุณาทำเครื่องหมาย √ หรือ X ลงในช่อง ☐ ตามความเป็นจริง

<u>ส่วนที่ 1: ข้อมูลทั่วไปของผู้ตอบ</u>

1.	ท่านเกี่ยวข้องอย่างไรกับนักเรียน	
	☐ 1. เป็นมารดา	☐ 2. เป็นญาติ/ผู้ปกครองที่มิใช่มารดา
2.	ปัจจุบันท่านมีอายุ …… ปี	
3.	ระดับการศึกษาสูงสุดของท่าน	
	☐ 1. ประถมศึกษาหรือต่ำกว่า	☐ 2. มัธยมศึกษาตอนต้น
	☐ 3. มัธยมศึกษาตอนปลายหรือเทียบเท่า	☐ 4. อนุปริญญาหรือเทียบเท่า
	☐ 5. ปริญญาตรี	☐ 6. สูงกว่าปริญญาตรี
4.	ปัจจุบันท่านมีอาชีพ (เลือกเพียง 1 ข้อ)	
	☐ 1. เกษตรกรรม เลี้ยงสัตว์ ประมง	☐ 2. รับจ้างทั่วไป
	☐ 3. ข้าราชการ	☐ 4. พนักงานรัฐวิสาหกิจ
	☐ 5. พนักงานบริษัท	☐ 6. ค้าขาย
	☐ 7. ธุรกิจส่วนตัว	☐ 8. แม่บ้าน
	☐ 9. อื่นๆ, โปรดระบุ…… ……	

5.	รายได้ครอบครัว (บาท/เดือน)	
	☐ 1. <5,000	☐ 2. 5,000-9,999
	☐ 3. 10,000- 29,999	☐ 4. 30,000 – 49,999
	☐ 5. 50,000- 100,000	☐ 6. > 100,000
6.	อายุของบุตรสาวหรือนักเรียนในความดูแลของท่าน ……....ปี	
7.	ท่านมีสมาชิกในครอบครัวหรือญาติที่เป็นมะเร็งหรือไม่	
	☐ 1. ไม่มี (ข้ามไปตอบข้อที่ 9 ได้เลย)	☐ 2. มี
8.	ท่านมีสมาชิกในครอบครัวหรือญาติที่เป็นมะเร็งปากมดลูกหรือไม่	
	☐ 1. ไม่มี	☐ 2. มี
9.	ท่านเคยได้รับการตรวจภายในเพื่อคัดกรองมะเร็งปากมดลูก หรือไม่	
	☐ 1. ไม่เคย	☐ 2. เคย

<u>ส่วนที่ 2: การรับรู้เกี่ยวกับวัคซีนป้องกันมะเร็งปากมดลูก</u>

10.	ท่านเคยได้รับข้อมูลข่าวสารหรือรู้จักวัคซีนป้องกันมะเร็งปากมดลูก หรือไม่	
	☐ 1. ไม่เคย ข้ามไปตอบข้อ 15	☐ 2. เคย
11.	ท่านได้รับข้อมูลเกี่ยวกับวัคซีนดังกล่าวจากที่ใดบ้าง (ตอบได้มากกว่า 1 ข้อ)	
	☐ 1. โทรทัศน์/วิทยุ	☐ 2. หนังสือพิมพ์ / นิตยสาร
	☐ 3. ป้ายโฆษณา	☐ 4. โรงพยาบาล/ บุคลากรทางการแพทย์
	☐ 5. ญาติ/ เพื่อน/ คนรู้จัก	☐ 6. อินเตอร์เนต
	☐ 7. อื่นๆ โปรด ระบุ……..	
12.	ท่านหรือบุคคลในครอบครัวของท่านเคยได้รับการฉีดวัคซีนป้องกันมะเร็งปากมดลูกบ้างหรือไม่	
	☐ 1. ไม่เคย ข้ามไปตอบข้อ 14	☐ 2. เคย
13.	บุตรสาวหรือนักเรียนในความดูแลของท่านเคยได้รับการฉีดวัคซีนป้องกันมะเร็งปากมดลูกหรือไม่	
	☐ 1. ไม่เคย	☐ 2. เคย
14.	คนที่ท่านรู้จักมีใครเคยได้รับการฉีดวัคซีนป้องกันมะเร็งปากมดลูกบ้างหรือไม่	
	☐ 1. ไม่มี	☐ 2. มี

<u>ส่วนที่ 3: ความรู้เกี่ยวกับโรคมะเร็งปากมดลูกและวัคซีนป้องกันมะเร็งปากมดลูก</u>

กรุณาตอบคำถามต่อไปนี้ตามความรู้ความเข้าใจในปัจจุบันของท่านโดยไม่ต้องกังวลว่าจะถูกต้องหรือไม่

ท่านคิดว่า		**ถูก**	**ผิด**	**ไม่ทราบ**
15.	มะเร็งปากมดลูกไม่ใช่โรคที่เกิดจากพันธุกรรม			
16.	การติดเชื้อไวรัสไม่ใช่สาเหตุของการเป็นมะเร็งปากมดลูก			
17.	ไวรัสที่เป็นสาเหตุของมะเร็งปากมดลูกสามารถติดต่อได้ทางเพศสัมพันธ์			
18.	การมีเพศสัมพันธ์ตั้งแต่อายุยังน้อยไม่ใช่ปัจจัยเสี่ยงของการเป็นมะเร็งปากมดลูก			
	ท่านคิดว่า	**ถูก**	**ผิด**	**ไม่ทราบ**
19.	ผู้หญิงที่มีอายุ 30 ปี ขึ้นไปควรทำการตรวจภายในเพื่อค้นหามะเร็งปากมดลูกเป็นประจำทุกปี			
20.	หากตรวจพบมะเร็งปากมดลูกตั้งแต่เริ่มแรกจะสามารถรักษาให้มีชีวิตยืนยาวได้นานกว่าการตรวจพบภายหลังเป็นมานานแล้ว			
21.	การมีเลือดออกทางช่องคลอดเป็นอาการเริ่มแรกของการเป็นมะเร็งปากมดลูก			
22.	หากตรวจพบมะเร็งปากมดลูกในระยะเริ่มต้น สามารถฉีดวัคซีนเพื่อรักษาให้หายขาดได้			
23.	วัคซีนให้ผลไม่แตกต่างกันระหว่างผู้ที่เคยมีเพศสัมพันธ์แล้วกับผู้ที่ไม่เคยมีเพศสัมพันธ์			
24.	การฉีดวัคซีนป้องกันมะเร็งปากมดลูกจะสามารถป้องกันไม่ให้เป็นมะเร็งปากมดลูกได้เกือบ 100%			
25.	การฉีดวัคซีนเพื่อป้องกันมะเร็งปากมดลูกควรทำในผู้หญิงที่มีอายุ 35 ปีขึ้นไปจึงจะให้ผลดีเพราะเป็นกลุ่มที่มีความเสี่ยงสูงที่จะเป็นมะเร็งปากมดลูก			
26.	หลังฉีดวัคซีนป้องกันมะเร็งปากมดลูกแล้วไม่จำเป็นต้องสวมถุงยางอนามัยเพื่อป้องกันโรคติดต่อทางเพศสัมพันธ์			
27.	วัคซีนป้องกันมะเร็งปากมดลูกบางชนิดสามารถป้องกันโรคหูดหงอนไก่ได้ด้วย			
28.	การฉีดวัคซีนป้องกันมะเร็งปากมดลูกสามารถป้องกันไม่ให้เป็นมะเร็งปากมดลูกได้นานชั่วชีวิต			
29.	หากฉีดวัคซีนป้องกันมะเร็งปากมดลูกแล้วไม่มีความจำเป็นต้องตรวจภายในเพื่อค้นหามะเร็งปากมดลูกเป็นประจำ			

<u>ส่วนที่ 4</u>ทัศนคติเกี่ยวกับโรคมะเร็งปากมดลูกและวัคซีนป้องกันมะเร็งปากมดลูก

ท่านคิดว่า		1 เห็นด้วยน้อยที่สุด →5 เห็นด้วยมากที่สุด				
		1	2	3	4	5
30.	มะเร็งปากมดลูกเป็นโรคที่มีความรุนแรงมาก					
31.	ท่านมีความเสี่ยงสูงต่อการเป็นมะเร็งปากมดลูกในอนาคต					
32.	บุตรสาว/นักเรียนในความดูแลของท่านมีความเสี่ยงน้อยต่อการเป็นมะเร็งปากมดลูกในอนาคต					
33.	วัคซีนป้องกันมะเร็งปากมดลูกเป็นวัคซีนที่มีความปลอดภัยสูง					
34.	วัคซีนป้องกันมะเร็งปากมดลูกมีราคาแพง					
35.	การฉีดวัคซีนป้องกันมะเร็งปากมดลูกสามารถป้องกันมะเร็งปากมดลูกได้แน่นอน					
36.	ผู้ปกครองทุกคนควรพาลูกสาวไปฉีดวัคซีนป้องกันมะเร็งปากมดลูก					

<u>ส่วนที่ 5: การยอมรับและความเต็มใจจ่าย</u>

<u>กรุณาอ่านข้อความในกรอบสี่เหลี่ยมข้างล่างนี้อย่างรอบคอบก่อนตอบคำถามในข้อ 38- 43</u>

จากสถิติทั่วโลก มะเร็งปากมดลูกเป็นมะเร็งของอวัยวะสืบพันธุ์สตรีที่พบบ่อยเป็นอันดับสองรองจากมะเร็งเต้านม สำหรับประเทศไทยมะเร็งปากมดลูกเป็นมะเร็งที่พบมากที่สุดของสตรีโดยในแต่ละปีจะมีผู้ป่วยมะเร็งปากมดลูกใหม่เพิ่มขึ้น 6,243 รายและเสียชีวิต 2,620 รายหรือกล่าวได้ว่าทุกๆวันจะมีสตรีไทยเสียชีวิตด้วยโรคมะเร็งปากมดลูกถึงวันละ 9 ราย ปัจจุบันนี้เป็นที่ยอมรับแล้วว่าการติดเชื้อไวรัสบางชนิดเป็นสาเหตุทำให้เกิดมะเร็งปากมดลูกได้ทั้งนี้ไวรัสดังกล่าวสามารถติดต่อได้ทางเพศสัมพันธ์ การมีเพศสัมพันธ์ตั้งแต่อายุยังน้อย การเปลี่ยนคู่นอนหลายคน สามีมีคู่นอนหลายคน รวมถึงการไม่สวมถุงยางอนามัยเป็นปัจจัยเสี่ยงสำคัญที่ทำให้เป็นมะเร็งปากมดลูกได้ ทั้งนี้ในสตรีที่มีอายุ 30 ปี ขึ้นไปการตรวจภายในเป็นประจำทุกปีจะทำให้สามารถตรวจพบมะเร็งปากมดลูกได้อย่างเนิ่นๆ และสามารถรักษาให้มีชีวิตได้ยืนยาวได้

ในปัจจุบันมีวัคซีนที่สามารถต้านเชื้อไวรัสที่เป็นสาเหตุของการเกิดมะเร็งปากมดลูกได้ โดยเมื่อฉีดวัคซีนครบ 3 เข็มจะสามารถป้องกันมะเร็งปากมดลูกได้ 70% กล่าวคือแม้จะฉีดวัคซีนก็ยังมีโอกาสอีก 30% ที่จะเป็นมะเร็งปากมดลูก อย่างไรก็ตามยังไม่มีการยืนยันที่แน่นอนถึงประสิทธิผลในระยะยาวของวัคซีนโดยยังไม่ทราบหลังจาก 6 ปีไปแล้ววัคซีนจะมีผลในการป้องกันการเป็นมะเร็งปากมดลูกหรือมีผลข้างเคียงอย่างไรการฉีดวัคซีนจะเริ่มฉีดได้ตั้งแต่อายุ 12 ปีเป็นต้นไปก่อนมีเพศสัมพันธ์ครั้งแรกจึงจะมีประสิทธิภาพสูงสุด อาการข้างเคียงของวัคซีนที่อาจเกิดขึ้นได้แก่ จุดบวมแดง มีอาการปวดบริเวณที่ฉีด ปวดศีรษะ หรือ ปวดกล้ามเนื้อ ทั้งนี้แม้จะมีการฉีดวัคซีนแล้วก็ยังคงต้องมีการตรวจคัดกรองมะเร็งปากมดลูกเป็นประจำร่วมด้วย

37. หากรัฐบาลมีโครงการรณรงค์ให้เด็กหญิงอายุ 12-15 ปีสามารถไปรับการฉีดวัคซีนป้องกันมะเร็งปากมดลูก ซึ่งมีคุณสมบัติดังที่กล่าวไว้ข้างต้นได้**ฟรี** ท่านจะอนุญาตให้บุตรสาวหรือนักเรียนในการดูแลของท่านไปรับการฉีดวัคซีนดังกล่าวหรือไม่	
☐ 1. ยินดี	
☐ 2. ไม่ยินดี กรุณาให้เหตุผลและ ข้ามไปข้อที่ 40	
	☐ 1. บุตรสาวหรือนักเรียนในการดูแลของท่านไม่มีความเสี่ยงหรือมีความเสี่ยงต่ำในการเป็นมะเร็งปากมดลูก
	☐ 2. ไม่เชื่อมั่นในประสิทธิภาพของวัคซีน
	☐ 3. กังวลว่าการฉีดวัคซีนอาจทำให้เกิดอาการข้างเคียงได้
	☐ 4. แพทย์ไม่ได้แนะนำให้ฉีด
	☐ 5. คนที่รู้จักส่วนใหญ่ไม่มีใครเคยฉีดวัคซีนดังกล่าวมาก่อน
	☐ 6. กังวลว่าบุตรหลานจะเข้าใจผิดคิดว่า วัคซีนสามารถป้องกันโรคติดเชื้อทางเพศสัมพันธ์ได้ทุกชนิด จึงส่งเสริมให้มีเพศสัมพันธ์อย่างไม่ปลอดภัย
	☐ อื่นๆ โปรด ระบุ……
38. หากการฉีดวัคซีนป้องกันมะเร็งปากมดลูก**ไม่ฟรี** ทั้งหมดแต่ท่านจะต้องร่วมจ่ายเงินด้วยหากต้องการจะฉีดวัคซีนดังกล่าว ท่านยินดีจะร่วมจ่ายเงินเพื่อให้บุตรสาวหรือนักเรียนในการดูแลของท่านได้รับการฉีดวัคซีนหรือไม่โดยจำนวนเงินที่จ่ายจะมากหรือน้อยเท่าไหร่ก็ได้	
☐ 1. ยินดี	
☐ 2. ไม่ยินดี กรุณาให้เหตุผลและ ข้ามไปข้อที่ 41	
	☐ 1.ควรเป็นความรับผิดชอบของรัฐบาลในการฉีดวัคซีนฟรี
	☐ 2. เห็นความสำคัญของวัคซีนแต่มีเงินไม่เพียงพอ
	☐ 3. คิดว่ายังไม่ใช่เรื่องจำเป็นมากในขณะนี้
	☐ 4. อื่นๆ โปรดระบุ ……
39. ข้อคำถามนี้จะเป็นเหตุการณ์สมมติ ในความเป็นจริงท่านไม่ต้องจ่ายเงินใดๆ เลยแต่ขอให้ท่านพิจารณาให้รอบคอบก่อนตอบ โดยคำนึงว่าท่านต้องสามารถหาเงินจำนวนนั้นมาจ่ายได้จริงๆ หากท่านเลือกจ่ายน้อยเกินไปท่านอาจไม่ได้รับการฉีดวัคซีนเพราะไม่เพียงพอต่อราคาวัคซีนจริง แต่หากท่านจ่ายมากเกินไปจะมีผลกระทบต่อค่าใช้จ่ายในด้านอื่นๆ ของครอบครัวท่านด้วย ทั้งนี้สมมติว่าการจ่ายเงินจะต้องจ่ายภายใน 6 เดือน นับจากวันนี้เป็นต้นไป และจ่ายทีเดียวทั้งก้อน	

ท่านยินดีจะร่วมจ่ายเงินมากที่สุดทั้งหมดเท่าไหร่เพื่อให้บุตรสาวหรือนักเรียนในการดูแลของท่านได้รับการฉีดวัคซีนป้องกันมะเร็งปากมดลูก จนครบ 3 เข็ม(เลือกคำตอบข้างล่างเพียง 1 ข้อ)	
	☐ 1. น้อยกว่า 300 บาทโปรดระบุจำนวนเงิน …….
	☐ 2. 300 – 500 บาท
	☐ 3 .500 – 1,000 บาท
	☐ 4 .1,000 – 1,500 บาท
	☐ 5. 1,500 – 2,000 บาท
	☐ 6. มากกว่า 2,000 บาท โปรดระบุจำนวนเงิน ……
40. หากรัฐบาลมีโครงการรณรงค์ให้เด็กหญิงอายุ 12-15 ปีสามารถไปรับการฉีดวัคซีนชนิดใหม่ซึ่ง**สามารถป้องกันได้ทั้ง มะเร็งปากมดลูก (ดังที่กล่าวไว้ข้างต้น) และโรคหูดหงอนไก่ <u>ฟรี</u>**ท่านจะอนุญาตให้บุตรสาวหรือนักเรียนในการดูแลของท่านไปรับการฉีดวัคซีนชนิดใหม่นี้หรือไม่ทั้งนี้โรคหูดหงอนไก่เป็นโรคติดต่อทางเพศสัมพันธ์มีอาการแสบคัน มีตุ่มน้ำขึ้นตามอวัยวะเพศ และสามารถรักษาให้หายได้โดยใช้ยาทา	
☐ 1. ยินดี (กรุณาตอบข้อ 41 ต่อไปค่ะ)	
☐ 2. ไม่ยินดี กรุณาให้เหตุผล (จบการทำแบบสอบถาม…… ขอขอบคุณมากในความร่วมมือค่ะ)	
	☐ 1. บุตรสาวหรือนักเรียนในการดูแลของท่านไม่มีความเสี่ยงหรือมีความเสี่ยงต่ำในการเป็นโรคดังกล่าว
	☐ 2. ไม่เชื่อมั่นในประสิทธิภาพของวัคซีน
	☐ 3. กังวลว่าการฉีดวัคซีนอาจทำให้เกิดอาการข้างเคียงได้
	☐ 4. แพทย์ไม่ได้แนะนำให้ฉีด
	☐ 5. คนที่รู้จักส่วนใหญ่ไม่มีใครเคยฉีดวัคซีนดังกล่าวมาก่อน
	☐ 6. กังวลว่าบุตรหลานจะเข้าใจผิดคิดว่า วัคซีนสามารถป้องกันโรคติดเชื้อทางเพศสัมพันธ์ได้ทุกชนิด จึงส่งเสริมให้มีเพศสัมพันธ์อย่างไม่ปลอดภัย
	☐ 7. อื่นๆ โปรดระบุ …… ……..

41. หากการฉีด**วัคซีนชนิดใหม่ที่สามารถป้องกันได้ทั้งมะเร็งปากมดลูกและหูดหงอนไก่** ไม่ฟรีทั้งหมดแต่ท่านจะต้องร่วมจ่ายเงินเองหากต้องการจะฉีดวัคซีนชนิดดังกล่าว ท่านยินดีจะจ่ายเงินเพื่อให้บุตรสาวหรือนักเรียนในการดูแลของท่านได้รับการฉีดวัคซีนชนิดใหม่นี้หรือไม่ โดยจำนวนเงินที่ร่วมจ่ายจะมากหรือน้อยเท่าไหร่ก็ได้		
☐ 1. ยินดี (กรุณาตอบข้อ 42 ต่อไปค่ะ)		
☐ 2. ไม่ยินดี กรุณาให้เหตุผล (จบการทำแบบสอบถาม…… ขอขอบคุณมากในความร่วมมือค่ะ)		
	☐ 1. ควรเป็นความรับผิดชอบของรัฐบาลในการฉีดวัคซีนฟรี	
	☐ 2. เห็นความสำคัญของวัคซีนแต่มีเงินไม่เพียงพอ	
	☐ 3. คิดว่ายังไม่ใช่เรื่องจำเป็นมากในขณะนี้	
	☐ 4. อื่นๆ โปรดระบุ ……	
42. สำหรับท่านเมื่อเปรียบเทียบจำนวนเงินที่ท่านยินดีจะร่วมจ่ายสำหรับวัคซีน 2 ชนิดข้างต้น ข้อใดตรงกับความคิดเห็นของท่านมากที่สุด **(เลือกคำตอบข้างล่างเพียง 1 ข้อ)**		
	☐ 1. จำนวนเงินที่จะจ่ายสำหรับวัคซีนที่ป้องกันมะเร็งปากมดลูกและหูดหงอนไก่มีค่าเท่ากับวัคซีนที่ป้องกันทั้งมะเร็งปากมดลูก อย่างเดียว เพราะ……	
		☐ บุตรสาว/ นักเรียนในความดูแลของท่านมีความเสี่ยงต่ำต่อการเป็นหูดหงอนไก่ต่ำ
		☐ โรคหูดหงอนไก่ต่ำมีอันตรายน้อย
		☐ อื่นๆ โปรด ระบุ……
	☐ 2. จำนวนเงินที่จะจ่ายสำหรับวัคซีนที่ป้องกันมะเร็งปากมดลูกและหูดหงอนไก่(ทั้งสามเข็ม)มีค่ามากกว่า วัคซีนที่ป้องกันทั้งมะเร็งปากมดลูก อย่างเดียว เป็นจำนวน ……..บาท	
		☐ น้อยกว่า 100 บาท โปรดระบุ……
		☐ 100 – 500 บาท
		☐ มากกว่า 500 บาท โปรดระบุ……

สิ้นสุดการทำแบบสอบถาม กรุณานำส่งโดยให้นักเรียนนำไปหย่อนที่กล่องรับคืนแบบสอบถามที่ชั้นเรียน

ขอขอบคุณในความร่วมมือค่ะ

APPENDIX C

Bivalent with Acceptance

Table C.1 Schools

Schools	Bivalent		P value
	Acceptance N(%)	Not acceptance N(%)	
1.Satriwaranat	123(77.8)	35(22.2)	0.006
2.Senanicom	17(85)	3(15)	
3.Santirat	42(85.7)	7(14.3)	
4.Benjamalashalai	91(86.7)	14(13.3)	
5.Sainamphung	132(73.7)	47(26.3)	
6.Nailoung	50(65.8)	26(34.2)	
7.Saipanya	103(81.1)	24(18.9)	
8.Rachinee Bon	93(69.9)	40(30.1)	
Total	651(76.9)	196(23.1)	

Table C.2 Education

Education	Bivalent		P value
	Acceptance N(%)	Not acceptance N(%)	
1.Primary school or lower	103(79.8)	26(20.2)	0.221
2.Secondary school (Grade 7-9)	62(73.8)	22(26.2)	
3.Secondary school (Grade 10-12)	125(82.2)	27(17.8)	
4.Certificate	65(78.3)	18(21.7)	
5.Bachelor degree	256(75.5)	83(34.5)	
6.Higher than Bachelor degree	34(66.7)	17(33.3)	
Total	645(77.0)	193(23.0)	

Table C.3 Occupation

Occupation	Bivalent		P value
	Acceptance N(%)	Not acceptance N(%)	
1.Agriculturist	1(100)	0(0)	0.221
2.Temporary worker	59(71.1)	24(28.9)	
3.Government officer/ State Enterprises officer	91(71.1)	36(28.3)	
4.Private company employee	143(77.7)	41(22.3)	
5.Self employed	189(77.1)	56(22.9)	
6.House wife	142(79.3)	37(20.7)	
7.Other	25(92.6)	2(7.4)	
Total	650(76.8)	196(23.2)	

Table C.4 Income

Monthly household income (Baht)	Bivalent		P value
	Acceptance N(%)	Not acceptance N(%)	
1.Less than 5,000	26(72.2)	10(27.8)	0.702
2.5,000-9,999	88(79.3)	23(20.7)	
3.10,000-29,999	216(78.3)	60(21.7)	
4.30,000-49,999	136(79.1)	36(20.9)	
5.50,000-100,000	146(74.9)	49(25.1)	
6.More than 100,000	34(70.8)	14(29.2)	
Total	646(77.1)	192(22.9)	

Table C.5 Do you have a family member or relative who has cancer or not?

	Bivalent		P value
	Acceptance N(%)	Not acceptance N(%)	
1.No	440(76.9)	132(23.1)	0.788
2.Yes	189(75.9)	60(24.1)	
Total	629(76.6)	192(23.4)	

Table C.6 Have you ever received a Screening for cervical cancer (Pap smear)?

	Bivalent		P value
	Acceptance N(%)	Not acceptance N(%)	
1.No	208(75.1)	69(24.9)	0.433
2.Yes	422(77.6)	122(22.4)	
Total	630(76.7)	191(23.3)	

Table C.7 Have you ever received information about HPV vaccine?

	Bivalent		P value
	Acceptance N(%)	Not acceptance N(%)	
1.No	176(68.5)	81(31.5)	<0.001
2.Yes	468(80.6)	113(19.4)	
Total	644(76.8)	194(23.2)	

Table C.8 Cervical cancer is a serious disease

	Bivalent		P value
	Acceptance N(%)	Not acceptance N(%)	
1.Strongly disagree	34(79.1)	9(20.9)	0.727
2.Disagree	31(73.8)	11(26.2)	
3.Neutral	117(74.5)	40(25.5)	
4.Agree	150(80.2)	37(19.8)	
5.Strongly agree	318(76.4)	98(23.6)	
Total	650(76.9)	195(23.1)	

Table C.9 You are high risk for cervical cancer in the future

	Bivalent		P value
	Acceptance N(%)	Not acceptance N(%)	
1.Strongly disagree	174(71.0)	71(29.0)	0.039
2.Disagree	168(82.4)	36(17.6)	
3.Neutral	191(76.1)	60(23.9)	
4.Agree	61(83.6)	12(16.4)	
5.Strongly agree	54(77.1)	16(22.9)	
Total	648(76.9)	195(23.1)	

Table C.10 Daughters/ students in your care are low risk for cervical cancer in the future

	Bivalent		P value
	Acceptance N(%)	Not acceptance N(%)	
1.Strongly disagree	165(73.7)	59(26.3)	0.580
2.Disagree	134(79.8)	34(20.2)	
3.Neutral	166(76.1)	52(23.9)	
4.Agree	92(78.0)	26(22.0)	
5.Strongly agree	92(80.0)	23(20.0)	
Total	649(77.0)	194(23.0)	

Table C.11 HPV vaccine is highly safe vaccine

	Bivalent		P value
	Acceptance N(%)	Not acceptance N(%)	
1.Strongly disagree	23(67.6)	11(32.4)	<0.001
2.Disagree	59(62.1)	36(37.9)	
3.Neutral	251(74.0)	88(26.0)	
4.Agree	208(86.7)	32(13.3)	
5.Strongly agree	103(79.2)	27(20.8)	
Total	644(76.8)	194(23.2)	

Table C.12 HPV vaccine is expensive

	Bivalent		P value
	Acceptance N(%)	Not acceptance N(%)	
1.Strongly disagree	35(76.1)	11(23.9)	0.287
2.Disagree	51(69.9)	22(30.1)	
3.Neutral	188(74.3)	65(25.7)	
4.Agree	161(80.5)	39(19.5)	
5.Strongly agree	208(78.8)	56(21.2)	
Total	643(76.9)	193(23.1)	

Table C.13 HPV vaccination can exactly prevent cervical cancer

	Bivalent		P value
	Acceptance N(%)	Not acceptance N(%)	
1.Strongly disagree	45(60.8)	29(39.2)	0.004
2.Disagree	111(76.6)	34(23.4)	
3.Neutral	298(76.6)	91(23.4)	
4.Agree	148(83.1)	30(16.9)	
5.Strongly agree	44(81.5)	10(18.5)	
Total	646(76.9)	194(23.1)	

Table C.14 All parents should take your daughter to HPV vaccination

	Bivalent		P value
	Acceptance N(%)	Not acceptance N(%)	
1.Strongly disagree	47(56.0)	37(44.0)	<0.001
2.Disagree	62(63.3)	36(36.7)	
3.Neutral	187(75.4)	61(24.6)	
4.Agree	127(83.0)	26(17.0)	
5.Strongly agree	224(86.8)	34(13.2)	
Total	647(76.9)	194(23.1)	

Table C.15 Group statistic

	Mean (SD)		P value
	Acceptance N(%)	Not acceptance N(%)	
Age(NS)	43.3(6.615)	43.99(6.335)	<0.001
Total knowledge score	8.27(2.80)	7.31(2.97)	
Knowledge vaccine score	3.3(1.70)	2.77(1.64)	
Total knowledge score related to Cancer	4.94(1.59)	4.55(1.84)	

Quadrivalent with Acceptance

Table C.16 Schools

Schools	Quadrivalent		P value
	Acceptance N(%)	Not acceptance N(%)	
1.Satriwaranat	94(71.2)	38(28.8)	<0.001
2.Senanicom	17(85.0)	3(15.0)	
3.Santirat	35(83.3)	7(16.7)	
4.Benjamalashalai	88(88.9)	11(11.1)	
5.Sainamphung	116(72.5)	44(27.5)	
6.Nailoung	41(57.7)	30(42.3)	
7.Saipanya	90(81.1)	21(18.9)	
8.Rachinee Bon	83(67.5)	40(32.5)	
Total	564(74.4)	194(25.6)	

Table C.17 Education

Education	Quadrivalent		P value
	Acceptance N(%)	Not acceptance N(%)	
1.Primary school or lower	86(78.2)	24(21.8)	0.344
2.Secondary school (Grade 7-9)	56(74.7)	19(25.3)	
3.Secondary school (Grade 10-12)	106(79.7)	27(20.3)	
4.Certificate	58(77.3)	17(22.7)	
5.Bachelor degree	220(71.7)	87(28.3)	
6.Higher than Bachelor degree	33(67.3)	16(32.7)	
Total	559(74.6)	190(25.4)	

Table C.18 Occupation

Occupation	Quadrivalent		P value
	Acceptance N(%)	Not acceptance N(%)	
1.Agriculturist	1(100.0)	0(0)	0.366
2.Temporary worker	46(68.7)	21(31.3)	
3.Government officer/ State Enterprises officer	81(70.4)	34(29.6)	
4.Private company employee	121(74.7)	41(25.3)	
5.Self employed	169(73.8)	60(26.2)	
6.House wife	125(77.6)	36(22.4)	
7.Other	20(90.9)	2(9.1)	
Total	563(74.4)	194(25.6)	

Table C.19 Income

Monthy household income (Baht)	Quadrivalent		P value
	Acceptance N(%)	Not acceptance N(%)	
1.Less than 5,000	20(58.8)	14(41.2)	0.168
2.5,000-9,999	71(80.7)	17(19.3)	
3.10,000-29,999	183(75.9)	58(24.1)	
4.30,000-49,999	122(76.3)	38(23.8)	
5.50,000-100,000	134(73.2)	49(26.8)	
6.More than 100,000	30(68.2)	14(31.8)	
Total	560(74.7)	190(25.3)	

Table C.20 Do you have a family member or relative who has cancer or not?

	Quadrivalent		P value
	Acceptance N(%)	Not acceptance N(%)	
1.No	379(74.6)	129(25.4)	0.525
2.Yes	164(72.2)	63(27.8)	
Total	543(73.9)	192(26.1)	

Table C.21 Have you ever received a Screening for cervical cancer (Pap smear)?

	Quadrivalent		P value
	Acceptance N(%)	Not acceptance N(%)	
1.No	167(68.7)	76(31.3)	0.015
2.Yes	378(77.1)	112(22.9)	
Total	545(74.4)	188(25.6)	

Table C.22 Have you ever received information about HPV vaccine?

	Quadrivalent		P value
	Acceptance N(%)	Not acceptance N(%)	
1.No	147(67.1)	72(32.9)	0.004
2.Yes	411(77.4)	120(22.6)	
Total	558(74.4)	192(25.6)	

Table C.23 Cervical cancer is a serious disease

	Quadrivalent		P value
	Acceptance N(%)	Not acceptance N(%)	
1.Strongly disagree	28(73.7)	10(26.3)	0.529
2.Disagree	29(78.4)	8(21.6)	
3.Neutral	93(69.4)	41(30.6)	
4.Agree	137(77.8)	39(22.2)	
5.Strongly agree	276(74.4)	95(25.6)	
Total	563(74.5)	193(25.5)	

Table C.24 You are high risk for cervical cancer in the future

	Quadrivalent		P value
	Acceptance N(%)	Not acceptance N(%)	
1.Strongly disagree	147(65.9)	76(34.1)	0.006
2.Disagree	149(80.5)	36(19.5)	
3.Neutral	166(76.5)	51(23.5)	
4.Agree	54(81.8)	12(18.2)	
5.Strongly agree	46(73.0)	17(27.0)	
Total	562(74.5)	192(25.5)	

Table C.25 Daughters/ students in your care are low risk for cervical cancer in the future

	Quadrivalent		P value
	Acceptance N(%)	Not acceptance N(%)	
1.Strongly disagree	141(70.1)	60(29.9)	0.418
2.Disagree	115(78.2)	32(21.8)	
3.Neutral	145(74.0)	51(26.0)	
4.Agree	83(78.3)	23(21.7)	
5.Strongly agree	78(74.3)	27(25.7)	
Total	562(74.4)	193(25.6)	

Table C.26 HPV vaccine is highly safe vaccine

	Quadrivalent		P value
	Acceptance N(%)	Not acceptance N(%)	
1.Strongly disagree	20(66.7)	10(33.3)	<0.001
2.Disagree	49(58.3)	35(41.7)	
3.Neutral	207(70.6)	86(29.4)	
4.Agree	191(85.3)	33(14.7)	
5.Strongly agree	91(76.5)	28(23.5)	
Total	558(74.4)	192(25.6)	

Table C.27 HPV vaccine is expensive

	Quadrivalent		P value
	Acceptance N(%)	Not acceptance N(%)	
1.Strongly disagree	33(82.5)	7(17.5)	0.318
2.Disagree	43(65.2)	23(34.8)	
3.Neutral	166(73.8)	59(26.2)	
4.Agree	143(75.7)	46(24.3)	
5.Strongly agree	173(75.5)	56(24.5)	
Total	558(74.5)	191(25.5)	

Table C.28 HPV vaccination can exactly prevent cervical cancer

	Quadrivalent		P value
	Acceptance N(%)	Not acceptance N(%)	
1.Strongly disagree	34(56.7)	26(43.3)	0.002
2.Disagree	89(69.5)	39(30.5)	
3.Neutral	262(74.9)	88(25.1)	
4.Agree	137(82.0)	30(18.0)	
5.Strongly agree	38(81.5)	10(20.8)	
Total	560(74.4)	193(25.6)	

Table C.29 All parents should take your daughter to HPV vaccination

	Quadrivalent		P value
	Acceptance N(%)	Not acceptance N(%)	
1.Strongly disagree	44(57.9)	32(42.1)	<0.001
2.Disagree	47(56.0)	37(44.0)	
3.Neutral	154(70.3)	65(29.7)	
4.Agree	110(81.5)	25(18.5)	
5.Strongly agree	205(86.1)	33(13.9)	
Total	560(74.5)	192(25.5)	

Table C.30 Group statistic

	Mean (SD)		P value
	Acceptance	Notacceptance	
Age(NS)	43.38(6.49)	44.19(6.14)	<0.001
Total knowledge score	8.35(2.81)	7.44(2.74)	
Knowledge vaccine score	3.35(1.70)	2.91(1.62)	
Total knowledge score related to Cancer	5.0(1.59)	4.56(1.72)	

APPENDIX D

Bivalent with Willingness to pay

Table D.1 Schools

Schools	Bivalent		P value
	Willingness to pay N(%)	Unwillingness to pay N(%)	
1.Satriwaranat	75(64.7)	41(35.3)	0.322
2.Senanicom	11(61.1)	7(38.9)	
3.Santirat	23(56.1)	18(43.9)	
4.Benjamalashalai	66(73.3)	24(26.7)	
5.Sainamphung	88(67.2)	43(32.8)	
6.Nailoung	38(74.5)	13(25.5)	
7.Saipanya	70(70.0)	30(30.0)	
8.Rachinee Bon	67(75.3)	22(24.7)	
Total	438(68.9)	198(31.1)	

Table D.2 Education

Education	Bivalent		P value
	Willingness to pay N(%)	Unwillingness to pay N(%)	
1.Primary school or lower	63(61.8)	39(38.2)	0.029
2.Secondary school (Grade 7-9)	39(68.4)	18(31.6)	
3.Secondary school (Grade 10-12)	76(61.8)	47(38.2)	
4.Certificate	48(73.8)	17(26.2)	
5.Bachelor degree	179(71.6)	71(28.4)	
6.Higher than Bachelor degree	29(87.9)	4(12.1)	
Total	434(68.9)	196(31.1)	

Table D.3 Occupation

Occupation	Bivalent		P value
	Willingness to pay N(%)	Unwillingness to pay N(%)	
1.Agriculturist	1(100.0)	0(0)	0.176
2.Temporary worker	31(54.4)	26(45.6)	
3.Government officer/ State Enterprises officer	58(65.9)	30(34.1)	
4.Private company employee	105(73.9)	37(26.1)	
5.Self employed	131(71.6)	52(28.4)	
6.House wife	94(67.6)	45(32.4)	
7.Other	18(72.0)	7(28.0)	
Total	438(69.0)	197(31.0)	

Table D.4 Income

Monthy household income (Baht)	Bivalent		P value
	Willingness to pay N(%)	Unwillingness to pay N(%)	
1.Less than 5,000	16(59.3)	11(40.7)	<0.001
2.5,000-9,999	48(57.1)	36(42.9)	
3.10,000-29,999	126(58.6)	89(41.4)	
4.30,000-49,999	105(79.5)	27(20.5)	
5.50,000-100,000	113(80.7)	27(19.3)	
6.More than 100,000	27(81.8)	6(18.2)	
Total	435(68.9)	196(31.1)	

Table D.5 Do you have a family member or relative who has cancer or not?

	Bivalent		P value
	Willingness to pay N(%)	Unwillingness to pay N(%)	
1.No	299(69.7)	130(30.3)	0.395
2.Yes	123(66.1)	63(33.9)	
Total	422(68.6)	193(31.4)	

Table D.6 Have you ever received a Screening for cervical cancer (Pap smear)?

	Bivalent		P value
	Willingness to pay N(%)	Unwillingness to pay N(%)	
1.No	130(63.1)	76(36.9)	0.043
2.Yes	292(71.2)	118(28.8)	
Total	422(68.5)	194(31.5)	

Table D.7: Have you ever received information about HPV vaccine?

	Bivalent		P value
	Willingness to pay N(%)	Unwillingness to pay N(%)	
1.No	103(60.2)	68(39.8)	0.003
2.Yes	332(72.6)	125(27.4)	
Total	435(69.3)	193(30.7)	

Table D.8 Cervical cancer is a serious disease

	Bivalent		P value
	Willingness to pay N(%)	Unwillingness to pay N(%)	
1.Strongly disagree	17(53.1)	15(46.9)	0.013
2.Disagree	20(64.5)	11(35.5)	
3.Neutral	75(65.8)	39(34.2)	
4.Agree	116(79.5)	30(20.5)	
5.Strongly agree	209(67.0)	103(33.0)	
Total	437(68.8)	198(31.2)	

Table D.9 You are high risk for cervical cancer in the future

	Bivalent		P value
	Willingness to pay N(%)	Unwillingness to pay N(%)	
1.Strongly disagree	117(68.8)	53(31.2)	0.123
2.Disagree	123(75.5)	40(24.5)	
3.Neutral	122(65.6)	64(34.4)	
4.Agree	34(58.6)	24(41.4)	
5.Strongly agree	40(71.4)	16(28.6)	
Total	436(68.9)	197(31.1)	

Table D.10 Daughters/ students in your care are low risk for cervical cancer in the future

	Bivalent		P value
	Willingness to pay N(%)	Unwillingness to pay N(%)	
1.Strongly disagree	105(65.2)	56(34.8)	0.373
2.Disagree	89(66.9)	44(33.1)	
3.Neutral	112(68.3)	52(31.7)	
4.Agree	62(70.5)	26(29.5)	
5.Strongly agree	68(77.3)	20(22.7)	
Total	436(68.8)	198(31.2)	

Table D.11 HPV vaccine is highlysafe vaccine

	Bivalent		P value
	Willingness to pay N(%)	Unwillingness to pay N(%)	
1.Strongly disagree	11(52.4)	10(47.6)	0.003
2.Disagree	41(73.2)	15(26.8)	
3.Neutral	157(62.3)	95(37.7)	
4.Agree	157(78.1)	44(21.9)	
5.Strongly agree	69(69.0)	31(31.0)	
Total	435(69.0)	195(31.0)	

Table D.12 HPV vaccine is expensive

	Bivalent		P value
	Willingness to pay N(%)	Unwillingness to pay N(%)	
1.Strongly disagree	22(66.7)	11(33.3)	0.009
2.Disagree	33(68.8)	15(31.3)	
3.Neutral	136(74.3)	47(25.7)	
4.Agree	121(75.2)	40(24.8)	
5.Strongly agree	122(59.8)	82(40.2)	
Total	434(69.0)	195(31.0)	

Table D.13: HPV vaccination can exactly prevent cervical cancer

	Bivalent		P value
	Willingness to pay N(%)	Unwillingness to pay N(%)	
1.Strongly disagree	24(53.3)	21(46.7)	0.056
2.Disagree	69(64.5)	38(35.5)	
3.Neutral	203(70.0)	87(30.0)	
4.Agree	110(75.3)	36(24.7)	
5.Strongly agree	29(65.9)	15(34.1)	
Total	435(68.8)	197(31.2)	

Table D.14 All parents should take your daughter to HPV vaccination

	Bivalent		P value
	Willingness to pay N(%)	Unwillingness to pay N(%)	
1.Strongly disagree	29(61.7)	18(38.3)	0.001
2.Disagree	33(55.0)	27(45.0)	
3.Neutral	115(62.5)	69(37.5)	
4.Agree	85(72.0)	33(28.0)	
5.Strongly agree	173(77.2)	51(22.8)	
Total	435(68.7)	198(31.3)	

Table D.15 Group statistic

	Mean (SD)		P value
	Willingness to pay	Unwillingness to pay	
Age(NS)	43.34(6.524)	48.13(6.973)	0.005
Total knowledge score	8.46(2.74)	7.77(2.928)	
Knowledge vaccine score	3.44(1.669)	3.04(1.756)	
Total knowledge score related to Cancer	5.02(1.561)	4.72(1.683)	

Quadrivalent with Willingness to pay

Table D.16 Schools

Schools	Quadrivalent		P value
	Willingness to pay N(%)	Unwillingness to pay N(%)	
1.Satriwaranat	38(33.9)	74(66.1)	0.436
2.Senanicom	6(35.3)	11(64.7)	
3.Santirat	18(40.9)	26(59.1)	
4.Benjamalashalai	20(22.5)	69(77.5)	
5.Sainamphung	46(35.1)	85(64.9)	
6.Nailoung	13(27.7)	34(72.3)	
7.Saipanya	35(33.0)	71(67.0)	
8.Rachinee Bon	33(35.5)	60(64.5)	
Total	209(32.7)	430(67.3)	

Table D.17 Education

Education	Quadrivalent		P value
	Willingness to pay N(%)	Unwillingness to pay N(%)	
1.Primary school or lower	42(41.2)	60(58.8)	0.091
2.Secondary school (Grade 7-9)	25(40.3)	37(59.7)	
3.Secondary school (Grade 10-12)	41(33.3)	82(66.7)	
4.Certificate	16(25.4)	47(74.6)	
5.Bachelor degree	77(30.8)	173(69.2)	
6.Higher than Bachelor degree	7(20.0)	28(80.0)	
Total	208(32.8)	427(67.2)	

Table D.18 Occupation

Occupation	Quadrivalent		P value
	Willingness to pay N(%)	Unwillingness to pay N(%)	
1.Agriculturist	0(0)	1(100.0)	0.002
2.Temporary worker	36(57.1)	27(42.9)	
3.Government officer/ State Enterprises officer	27(29.3)	65(70.7)	
4.Private company employee	43(31.2)	95(68.8)	
5.Self employed	53(29.3)	128(70.7)	
6.House wife	44(31.9)	94(68.1)	
7.Other	5(20.0)	20(80.0)	
Total	208(69.0)	430(67.4)	

Table D.19 Income

Monthy house income (Baht)	Quadrivalent		P value
	Willingness to pay N(%)	Unwillingness to pay N(%)	
1.Less than 5,000	10(43.5)	13(56.5)	<0.001
2.5,000-9,999	44(51.2)	42(48.8)	
3.10,000-29,999	79(36.7)	136(63.3)	
4.30,000-49,999	32(24.6)	98(75.4)	
5.50,000-100,000	33(22.8)	112(77.2)	
6.More than 100,000	8(23.5)	26(76.5)	
Total	206(32.5)	427(67.5)	

Table D.20 Do you have a family member or relative who has cancer or not?

	Quadrivalent		P value
	Willingness to pay N(%)	Unwillingness to pay N(%)	
1.No	143(33.0)	290(67.0)	0.680
2.Yes	57(31.3)	125(68.7)	
Total	200(32.5)	415(67.5)	

Table D.21 Have you ever received a Screening for cervical cancer (Pap smear)?

	Quadrivalent		P value
	Willingness to pay N(%)	Unwillingness to pay N(%)	
1.No	77(38.7)	122(61.3)	0.044
2.Yes	128(30.3)	294(69.7)	
Total	205(33.0)	416(67.0)	

Table D.22 Have you ever received information about HPV vaccine?

	Quadrivalent		P value
	Willingness to pay N(%)	Unwillingness to pay N(%)	
1.No	84(46.2)	98(53.8)	<0.001
2.Yes	123(27.3)	327(72.7)	
Total	207(32.8)	425(67.2)	

Table D.23 Cervical cancer is a serious disease

	Quadrivalent		P value
	Willingness to pay N(%)	Unwillingness to pay N(%)	
1.Strongly disagree	10(31.3)	22(68.8)	0.229
2.Disagree	9(28.1)	23(71.9)	
3.Neutral	42(37.8)	69(62.2)	
4.Agree	38(25.7)	110(74.3)	
5.Strongly agree	110(34.8)	206(65.2)	
Total	209(32.7)	430(67.3)	

Table D.24 You are high risk for cervical cancer in the future

	Quadrivalent		P value
	Willingness to pay N(%)	Unwillingness to pay N(%)	
1.Strongly disagree	50(30.5)	114(69.5)	0.322
2.Disagree	48(29.1)	117(70.9)	
3.Neutral	66(33.3)	132(66.7)	
4.Agree	22(38.6)	35(61.4)	
5.Strongly agree	23(42.6)	31(57.4)	
Total	209(32.8)	429(67.2)	

Table D.25 Daughters/ students in your care are low risk for cervical cancer in the future

	Quadrivalent		P value
	Willingness to pay N(%)	Unwillingness to pay N(%)	
1.Strongly disagree	56(34.8)	105(65.2)	0.874
2.Disagree	47(34.8)	88(65.2)	
3.Neutral	50(30.5)	114(69.5)	
4.Agree	29(31.9)	62(68.1)	
5.Strongly agree	26(30.2)	60(69.8)	
Total	208(32.7)	429(67.3)	

Table D.26 HPV vaccine is highly safe vaccine

	Quadrivalent		P value
	Willingness to pay N(%)	Unwillingness to pay N(%)	
1.Strongly disagree	10(41.7)	14(58.3)	0.003
2.Disagree	12(20.7)	46(79.3)	
3.Neutral	95(38.5)	152(61.5)	
4.Agree	51(24.6)	156(75.4)	
5.Strongly agree	38(38.8)	60(61.2)	
Total	206(32.5)	428(67.5)	

Table D.27 HPV vaccine is expensive

	Quadrivalent		P value
	Willingness to pay N(%)	Unwillingness to pay N(%)	
1.Strongly disagree	13(35.1)	24(64.9)	0.024
2.Disagree	13(26.0)	37(74.0)	
3.Neutral	58(30.4)	133(69.6)	
4.Agree	39(25.5)	114(74.5)	
5.Strongly agree	82(40.8)	119(59.2)	
Total	205(32.4)	427(67.6)	

Table D.28 HPV vaccination can exactly prevent cervical cancer

	Quadrivalent		P value
	Willingness to pay N(%)	Unwillingness to pay N(%)	
1.Strongly disagree	24(53.3)	21(46.7)	0.003
2.Disagree	25(23.8)	80(76.2)	
3.Neutral	98(33.0)	199(67.0)	
4.Agree	41(28.3)	104(71.7)	
5.Strongly agree	19(44.2)	24(55.8)	
Total	207(32.6)	428(67.4)	

Table D.29 All parents should take your daughter to HPV vaccination

	Quadrivalent		P value
	Willingness to pay N(%)	Unwillingness to pay N(%)	
1.Strongly disagree	22(42.3)	30(57.7)	0.009
2.Disagree	27(45.8)	32(54.2)	
3.Neutral	66(36.7)	114(63.3)	
4.Agree	37(30.1)	86(69.9)	
5.Strongly agree	57(25.6)	166(74.4)	
Total	209(32.8)	428(67.2)	

Table D.30 Group statistic

	Mean (SD)		P value
	Willingness to pay	Unwillingness to pay	
Age(NS)	43.34(6.524)	48.13(6.973)	0.005
Total knowledge score	8.46(2.74)	7.77(2.928)	
Knowledge vaccine score	3.44(1.669)	3.04(1.756)	
Total knowledge score related to Cancer	5.02(1.561)	4.72(1.683)	

APPENDIX E

Factors associated with acceptability and willingness to pay for bivalent and quadrivalent vaccine by univariate.

Table E.1 Bivalent with Acceptance

Factors	P-Value
1.School	0.006
2.Information about HPV vaccine	<0.001
3.Source of information: Television/ Radio	0.05
4.Source of information :Hospital/ health care providers	0.001
5.Knowing that women aged 30 years and over should be annually screened for cervical cancer	0.009
6.Knowing that early detection of cervical cancer can increase survival time	0.029
7.Knowing that vaginal bleeding is the early symptom of cervical cancer	0.037
8.Knowing that if early detected HPV vaccine can be used to cure cervical cancer	0.038
9.Knowing that vaccination against cervical cancer should not be performed in women aged 35 years or more	0.009
10.Knowing that there is still a need to use condom once you have been vaccinated against HPV	0.022

Table E.1 Bivalent with Acceptance (cont.)

Factors	P-Value
11.Knowing that women aged 30 years and over should be annually screened for cervical cancer	0.009

Table E.2 Bivalent with Willingness to pay

Factors	P-Value
1.Education	0.029
2.Income	<0.001
3.Pap smear experience	0.043
4.Ever received information about HPV vaccine	0.003
5.Source of information: Newspaper/Magazine	0.019
6. Source of information: Hospital/ health care providers	0.001
7. Source of information: Friends/ relatives	0.038
8. Knowing that there is still a need to regularly screen for cervical cancer once you have been vaccinated against HPV	0.007
9. Perceived that HPV vaccine is a highly safe vaccine	0.005
10. Perceived that All parents should take your daughter to HPV vaccination	0.001
11. Knowledge regarding cervical cancer	0.044
12. Knowledge regarding HPV vaccine	0.014
13. Total knowledge score	0.008

Table E.3 Quadrivalent with Acceptance

Factors	P-Value
1.School	<0.001
2.Pap smear experience	0.015
3. Ever received information about HPV vaccine	0.004
4. Source of information: Hospital/ health care providers	0.005
5. Knowing that women aged 30 years and over should be annually screened for cervical cancer	0.030
6. Knowing that if early detected, HPV vaccine can be used to cure cervical cancer	0.048
7. Knowing that vaccination against cervical cancer should not be performed in women aged 35 years or more	0.008
8.Knowing that some type of HPV vaccine can also protect against genital warts	0.034
9.Perceived that HPV vaccine is a highly safe vaccine	<0.001
10. Perceived that HPV vaccination can exactly prevent cervical cancer	0.001
11.Perceived that All parents should take your daughter to HPV vaccination	<0.001
12. Knowledge regarding cervical cancer	0.008
13. Knowledge regarding HPV vaccine	0.013
14. Total knowledge score	0.001

TableE.4 Quadrivalent with Willingness to pay

Factors	P-Value
1.Income	<0.001
2.Occupation	0.002
3.Pap smear experience	0.044
4. Ever received information about HPV vaccine	<0.001
5.Source of information: Television/Radio	0.014
6.Source of information: Newspaper/Magazine	0.012
7.Source of information: Hospital/Health care provider	0.001
8.Knowing that cervical cancer is not a genetic disease	0.004
9.Knowing that vaginal bleeding is the early symptom of cervical cancer	0.025
10.Knowing that if early detected, HPV vaccine can be used to cure cervical cancer	0.003
11.Knowing that efficacy of the vaccine is different among women with and without sexual experience	0.021
12. Knowing that vaccination against cervical cancer should not be performed in women aged 35 years or more	0.003
13. Knowing that there is still a need to use condom once you have been vaccinated against HPV	0.006
14. Knowing that there is still a need to regularly screen for cervical cancer once you have been vaccinated against HPV	<0.001
15. Perceived that HPV vaccine is a highly safe vaccine	0.034
15. Perceived that All parents should take your daughter to HPV vaccination	0.002
16. Knowledge regarding cervical cancer	0.006
17. Knowledge regarding HPV vaccine	0.001
18. Total knowledge score	0.001

BIOGRAPHY

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