

KNOWLEDGE AND ATTITUDE REGARDING HUMAN
PAPILLOMAVIRUS, HUMAN PAPILLOMAVIRUS VACCINE AND CERVICAL
CANCER, HUMAN PAPILLOMAVIRUS VACCINATION HISTORY AMONG
FEMALE BACHELOR DEGREE STUDENTS AT
CHULALONGKORN UNIVERSITY

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(KNOWLEDGE AND ATTITUDE REGARDING HUMAN VIRUS, HUMAN PAPILOMAVIRUS VACCINE AND CERVICAL CANCER, HUMAN PAPILOMAVIRUS VACCINATION HISTORY AMONG FEMALE BACHELOR DEGREE STUDENTS AT CHULALONGKORN UNIVERSITY)

อ.ที่ปรึกษาวิทยานิพนธ์หลัก: ผศ.ดร.รัตนา สำโรงทอง, 73หน้า

การศึกษาครั้งนี้มีวัตถุประสงค์ เพื่อศึกษาอัตราใช้ และไม่ใช้เอชพีวีวัคซีนในนิติตปริญญาตรีหญิงจุฬาลงกรณ์ มหาวิทยาลัย และเพื่อศึกษาความสัมพันธ์ระหว่างความรู้ ทักษะคิด และปัจจัยต่าง ๆ ต่อการใช้และไม่ใช้เอชพีวีวัคซีน การศึกษาครั้งนี้เป็นการศึกษาแบบตัดขวาง (Cross Sectional Study) โดยการสุ่มอย่างง่าย กลุ่มตัวอย่างจำนวน 400 คน เก็บข้อมูลโดยใช้แบบสอบถามที่สร้างขึ้น การวิเคราะห์ข้อมูลใช้ร้อยละ ค่าเบี่ยงเบนมาตรฐาน ไคว้สแคว และการวิเคราะห์การถดถอยโลจิสติก ที่ระดับนัยสำคัญทางสถิติ ที่ p value 0.05

ผลการศึกษาพบว่านิติตร้อยละ 10.9 ใช้เอชพีวีวัคซีน นิติตส่วนใหญ่มีความรู้เรื่องเอชพีวี เอชพีวีวัคซีน มะเร็งปากมดลูกอยู่ในเกณฑ์ค่อนข้างต่ำ ผลการวิเคราะห์การถดถอยโลจิสติก พบว่าทักษะคิดต่อเอชพีวีวัคซีน และมะเร็งปากมดลูก และขณะที่นิติตศึกษา มีความสัมพันธ์กับความรู้ของเอชพีวี เอชพีวีวัคซีนและมะเร็งปากมดลูกอย่างมีระดับนัยสำคัญทางสถิติที่ p value < 0.001

นอกจากนี้ผลการศึกษา ยังพบว่ารายได้ผู้ปกครองมีความสัมพันธ์ต่อการใช้เอชพีวีวัคซีนในนิติตอย่างมีระดับนัยสำคัญทางสถิติที่ p value < 0.001

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ARTY KAUR SACHDEV: KNOWLEDGE AND ATTITUDE REGARDING
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The general objective of this study was to evaluate the level of knowledge, attitude of Human papillomavirus, Human papillomavirus vaccine and cervical cancer, to assess the rate of used and not used Human papillomavirus vaccine and to identify the association between knowledge, attitude, sociodemographic and other factors to students used and not used Human papillomavirus vaccine. It was a cross sectional study. There were a total of 400 students in the study. Simple random sampling was done to select five faculties in the University. Data were collected by constructed questionnaire and analyzed by percentage, arithmetic mean, standard deviation, chi square and logistic regression. Data was analyzed by using level of significance to be lesser than 0.05.

The results showed that the rate of used Human papillomavirus vaccine among female bachelor degree students is 10.9 %. Students had low level of knowledge regarding Human papillomavirus, Human papillomavirus vaccine and cervical cancer. Statistic analysis showed that Knowledge is significantly associated with attitude and students' faculty and practice of used Human papillomavirus vaccine is significantly associated with parents' income.

Since the results showed that knowledge regarding Human papillomavirus vaccine and rate of used vaccine is quite low more programs and other interventions are needed to improve the knowledge and increase the rate of used vaccine.

Field of Study : Public Health Student's Signature

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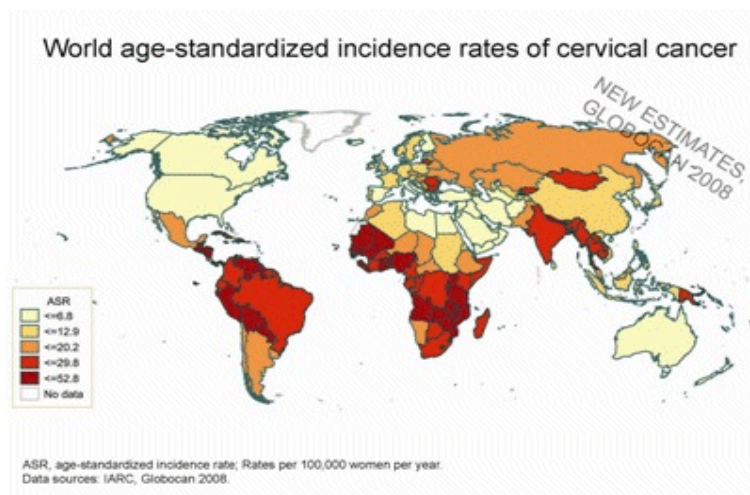
CHAPTER I

INTRODUCTION

Background and Rationale

Cervical cancer is the seventh most common cancer worldwide and it is the second most common cancer in females worldwide (Lora L. et al., 2009). Cervical cancer is one the most important public health problems. According to national cancer institute cervical cancer is diagnosed in nearly half a million women each year worldwide, claiming a quarter of a million lives annually. As cited in Weena Thaiangtham article the statistical estimates for the year 2000 allotted 466,000 new cases of cervical cancer patients worldwide and approximately 80 % of them will die from the disease, the rate is higher in developing countries. In 2009, Li Ping Wong and I Ching Sam mentioned in their article that eighty three percent of cervical cases occur in the developing world, where cervical cancer accounts for 15% of female cancers, as compared to just 3.6% in developed country. Half of the world's total cervical cancer cases (51.6%) and cervical cancer deaths (50.3%) are found in the Asia Pacific region alone also the rates appear to be higher in less developed relative to more developed Asian pacific countries. The cervical cancer age standardized incidence rate (ASR) for Malaysia is 15.7 per 100,000 women, China (6.8) , Japan (8.0), Singapore (13.2), Thailand (19.8), Cambodia(38.7) and India (30.7) (Parkin DM,2008)

However, according to Thailand fact sheet 2010 on Human papillomavirus and related cancers the burden of cervical cancer age standardized incidence rate is 24.5 and mortality is 12.8 (WHO) . Thailand fact sheet 2010 also reported that every year 9999 women are diagnosed from the disease and 5216 die from the disease. Cervical cancer rank as the second most frequent cancer and cause of mortality among women in Thailand for all age groups.



According to National cancer institute , there are various risk factors for cervical cancer including early age at first intercourse, a history of multiple sexual partners, genital Human papillomavirus infection or other sexually transmitted disease (STD), smoking, long term used of contraceptive pills. However, many review literatures including Charlotte Devereaux Walsh mentioned that it has been known since 1970 that one of the major causes of cervical cancer is through infection with Human papillomavirus (HPV) subtypes that causes transformation of cervical epithelial (Charlotte Devereaux Walsh et al., 2008) Infection with oncogenic types of Human papillomavirus (HPV) causes virtually all cases of cervical cancer and precancerous intraepithelial lesions.(Bernard Duval et.al, 2007) . Human papillomaviruses (HPVs) are a group of more than 150 related viruses, of which more than 40 can be sexually transmitted. Some sexually transmitted HPVs cause genital warts, whereas others, called high-risk or oncogenic HPVs, can cause cancer (National Cancer Institute). Fifteen of these forty put women at a high risk of cervical cancer. In the UK and many other countries HPV 16 and 18 are the most common subtypes that believe to be responsible cause of 70 % cervical carcinoma. (Charlotte et al, 2008) One of the most common cause of sexually transmitted infection in sexually active adolescent girls and women of several economically developed countries is Human papillomavirus (G.Di Guiseppe et al, 2008) Epidemiological studies have shown that cervical cancer is most prevalent among women with a history of active sexual intercourse and stated that cervical cancer is a “cancer of sexual contact” (Weena Thiangtham et, 2010) .

Fortunately, cervical cancer can be prevented at an early stage. In Thailand, the incidence of cervical cancer is continuously rising (Moore et al.,2010). , the strategies for effective cervical cancer prevention are of utmost relevance (Yupin Phianmongkol et al , 2011) Avoiding risk factors and increasing protective factors may help prevent cancer. Weena Thiantham had pointed the prevention to be at two levels, that is primary and secondary level. Primary prevention emphasizes the control or avoidance of risk factors causing cervical cancer, such as avoidance of multiple sex partners, stop smoking, avoiding long term use of contraceptive pills. Weena Thiantham has also included Human papilloma virus vaccine to be at the primary prevention level. The secondary prevention includes cervical smear exam commonly known as PAP smear. The development of this vaccine gives hope to women that this dangerous cancer can be prevented. In 2006, the first vaccine against this Human papillomavirus was approved by the United States Food and Drug Administration.

Universal vaccination can reduce cervical cancer rate by 70% and narrow the racial and socioeconomic disparities in cervical cancer incidence and mortality (Jessica A.Kahn et al, 2008) . As of the end of 2006, the vaccine had been approved in 49 countries worldwide. But even for developed countries, cost is a major barrier to making the vaccine widely available. (Bulletin of the WHO, vaccinating against cervical cancer) In Thailand the effort to control cervical cancer began since 1960, when the Pap smear was introduced. In 2002, the MoPH's Department of Medical Services established a cytology-based screening program for the entire female population aged 35 to 60 years and in 2004 the screening approach was included in prevention package of UC. In 2007, two HPV vaccine products were licensed in Thailand. However, in Thailand there is no strong public movement on this issue. (Jomkwan Yothisamut, 2010)

Moreover, the vaccine will be highly effective in preventing cervical only if the women has never had HPV infection. Therefore, for optimal effect of a vaccine a person should get vaccinated before the age of having sexual activity. (WHO) Country specific factors will be important factor in determining the exact age for routine vaccination and the ages for the catch up vaccination. Elfren J Domingo mentioned in his article that from the sexual behavior survey in Thailand the median age of sexual debut reported among adolescents age 13 – 25 years was 16 years for male and 18 years for females. According to report card of HIV prevention for girls and young women Thailand 2004, International Planned Parenthood federation, UNFPA, The global coalition on women and AIDS. The median age at first sex among females is 20 years old

Although HPV infections remain prevalent across the life span, the prevalence of HPV infection peaks among young adults in their 20s, which include many college aged students (Andrea S Licht , 2011) College age women are at risks as they tend to be sexually active and have higher number of sexual partners according to Li Ping the study conducted in Malaysia the sexual transmitted infection are also higher among young women compare to older women. The studies in the western countries have also shown that even highly educated adolescents and young women know very little about HPV infection despite the high prevalence of HPV infection among young women. (Li Ping , 2009) Jennifer D. Allen mentioned in the article that the availability of vaccine does not ensure the population uptake and those who are most at risk of vaccine preventable disease are the least to take them since the cervical cancer does not occur until later life. Little has been written about young women's knowledge of HPV in the south east Asia region. Because most sexually active

individuals will become exposed to the virus throughout their their lifes and because the HPV vaccine is available, it is extremely important to gather data on HPV infection and vaccination (,G.Di Guiseppe, 2008) The purpose of this study is to evaluate the knowledge , attitude of college students toward HPV, HPV vaccination , cervical cancer and to assess the used and not used of HPV vaccination rate among college students.

Research Questions

1. What is the level of **knowledge** regarding Human papillomavirus, Human papillomavirus vaccine and cervical cancer among female bachelor degree students at Chulalongkorn University?
2. What is the level of **attitude** regarding Human papillomavirus vaccine and cervical cancer among bachelor degree students at Chulalongkorn University?
3. What is the rate of female bachelor degree students used and not used HPV vaccine?
4. What are the factors that associate with **students used and not used Human papillomavirus vaccine** among female bachelor degree students at Chulalongkorn University students?

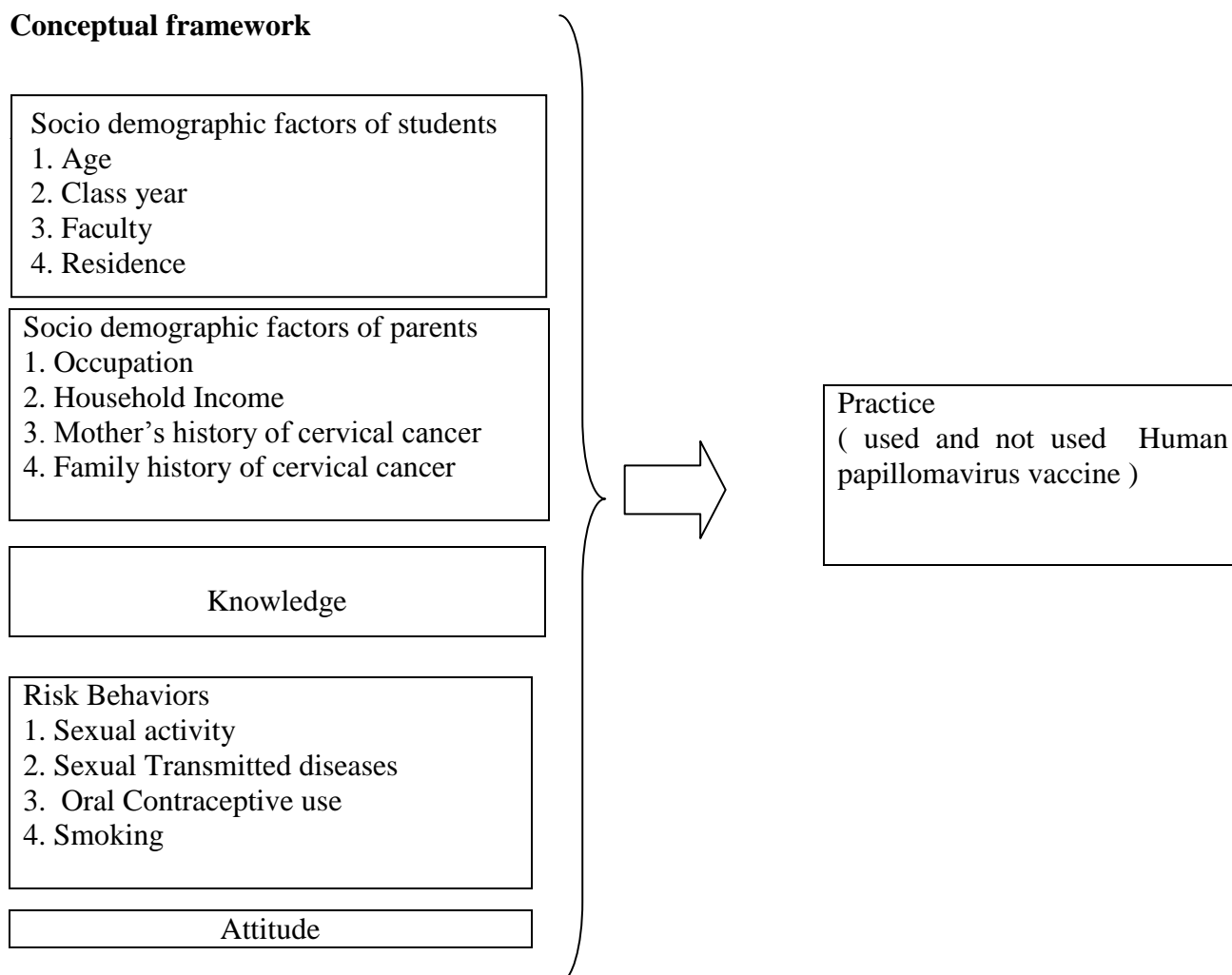
Research Hypotheses

1. There is a relationship between Human papillomavirus, Human papillomavirus vaccine, and cervical cancer **knowledge** and students **used and not used** Human papillomavirus vaccine among female bachelor degree students at Chulalongkorn university.
2. There is a relationship between **attitude** of Human papillomavirus vaccine and cervical cancer and students **used and not used** Human papillomavirus vaccine among bachelor degree students at Chulalongkorn university.
3. There is an association of **socio-demographic and other factors** and other risk factors with students **used and not used** Human papillomavirus vaccine among bachelor degree students at Chulalongkorn University.

Research Objectives

1. To evaluate the level of **knowledge, attitude** of Human papillomavirus, Human papillomavirus vaccine, and cervical cancer among bachelor degree students at Chulalongkorn University.
2. To assess **rate** of used and not used Human papillomavirus vaccine in among bachelor degree students at Chulalongkorn University.
3. To identify association between **knowledge, attitude** towards students **used and not used** human papillomavirus vaccine among bachelor degree students at Chulalongkorn University.
4. To identify the association between **socio-demographic and other factors** and students **used and not used** Human papillomavirus vaccine among bachelor degree students at Chulalongkorn University.

Conceptual framework



Operational Definitions

Knowledge: The understanding of cause, symptoms, spread and prevention of cervical cancer, Human Papillomavirus and the basic knowledge about Human Papillomavirus vaccine.

Attitude: a complex mental state involving beliefs and feelings and values and disposition to act in certain ways (Princeton University)

Sexual Transmitted diseases: Sexually transmitted diseases (STDs) are infections that you can get from having sex with someone who has the infection (CDC)

Contraceptive: Contraception (birth control) prevents pregnancy by interfering with the normal process of ovulation, fertilization, and implantation. There are different kinds of birth control that act at different points in the process.

Practice of used vaccine: students received complete three doses of Human papillomavirus vaccine.

CHAPTER II

LITERATURE REVIEW

2.1. Cervical cancer

2.1.1 Development of cervical cancer

Cervical cancers begin in the cells on the surface of the cervix. Two types of cells are found on the surface of the cervix, squamous cells and columnar cells. Most cervical cancers are from squamous cells. Cervical cancer usually develops very slowly. It begins as a precancerous condition known as [dysplasia](#). This precancerous condition can be detected by a Pap smear and is 100% treatable. Undetected precancerous changes can develop into cervical cancer. (US national library of medicine, National Institute of Health)

2.1.2 Risk factors of cervical cancer

2.1.2.1 Virus

Human Papillomavirus (HPV): Oncogenic types of HPV are the primary cause of cervical cancer. The worldwide HPV prevalence in cervical carcinomas is 99.7 percent. ([Walboomers JM](#) et al, 1999)

Herpes simplex virus type 2 virus: a recent epidemiological study suggested that a biological interaction between HSV 2 and HPV16 or HPV18 occurs during the development of cervical carcinoma. (Clinical biology review October, 1995, Clinton Jones, Cervical cancer)

Others: Human cytomegalovirus, Human herpes virus, Human Immunodeficiency Virus

In a population based study monogamous women herpes simplex virus type 2 seropositivity was associated HPV positivity. (Elfren J et al 2008)

2.1.2.2 Sexual Intercourse

Young age at first intercourse (<16 years) (Novak)

Multiple sexual partners High parity

2.1.2.3 Long term use of contraceptive pills.

Evidence shows that long-term use of oral contraceptive pills (5 or more years) may be associated with an increased risk of cancer of the cervix (National cancer institute 05/04/2006)

2.1.2.4. Smoking

Smoking increases the risk of developing many cancers, including cervical cancer. (WHO, tobacco free initiative)

Case control studies shown that increasing number of lifetime sexual partners, having one or more sexual transmitted infections, smoking, high parity , oral contraceptive use and decreasing age at first sexual intercourse are all risk factors for cervical squamous cell carcinoma (SCC) In monogomuos women the risk of cervical cancer increase with husbands first visited commercial sex workers at 19 years of age or younger or rarely hardly or never used condoms.(Efren Domingo et al 2008)

2.1.2.5 Weakened Immune system

People with weakened immune systems, such as those with HIV/AIDS, or transplant recipients taking immunosuppressive medications have a higher risk of developing cervical cancer.

2.1.2.6 Low socio economic status (Novak)

2.1.3 Symptoms of cervical cancer

The symptoms of cervical cancer aren't always obvious and it may not cause any symptoms at all until it has reached an advanced stage.

Unusual vaginal bleeding is the most common symptom occurring in patients with cancer of the cervix. Most often, this is postcoital bleeding, but it may occur as irregular or post menopausal bleeding. Patients with advanced stage may have malodourous vaginal discharge, weight loss or obstructive uropathy.

2.1.4 Prevention of cervical cancer

There are two levels of prevention, primary and secondary.

2.1.4.1 Primary prevention

Primary prevention focuses on avoidance of risk factors causing cervical cancer, this includes:

Avoidance of sexual relations at an early age

Limiting sexual relations with multiple sexual partners

Avoid sexually transmitted diseases

Quit smoking or Avoid cigarette smoking

Avoiding long term use of contraceptive pills

Use vaccine against Human Papillomavirus infection

2.1.4.2 Secondary prevention

Secondary prevention: includes the early detection of abnormal cells of cervix. This is done through screening test such as Pap smears, visual inspections with acetic acid (VIA) and HPV DNA test (Jomkwan et al, 2010)

Papinicolaou smear' or 'Pap smear' meaning cytodiagnosis of the ectocervix by collecting discharge from posterior ectocervix and endocervical canal to detect the abnormal cell change of the cervix at the early stage before the appearance of any symptoms. This method has high specificity of upto 91% (NIAID, Bethesda)

The cytological based screening by Pap testing is highly effective in preventing cervical cancer in industrialized countries and is expect to be very effective in countries where screening is not existent or limited as well (Elfren J.Domingo et al , 2008)

2.2 Human Papillomavirus

Globally, HPV is the most common sexually transmitted disease, although there is significant regional variability. (ACS) Approximately 20 million Americans are presently infected with HPV. And 6 million people become newly infected each year. HPV is very common that at least 50% of sexually active men and women get it at some point in their lives. (CDC, Atlanta)

2.2.1 About Human Papillomavirus

Human papillomaviruses (HPVs) are a group of more than 150 related viruses, of which more than 40 can be sexually transmitted. Some sexually transmitted HPVs cause genital warts, whereas others called high-risk or oncogenic HPVs, can cause cancer (National Cancer Institute). Fifteen of these forty put women at a high risk of cervical cancer. In the UK and many other countries HPV 16 and 18 are the most common subtypes that believe to be responsible cause of 70 % cervical carcinoma. (Charlotte et al, 2008)

2.2.2 Transmission of Human Papillomavirus

Genital Human papillomavirus (also called HPV) is the most common sexually transmitted infection (STI). (CDC, Atlanta) HPV is passed on through genital contact, most often during vaginal and anal sex. HPV can also be transmitted during oral sex and genital-to-genital contact, even when the partners have no sign or symptoms.

Transmission by non penetrative genital contact is rare, but infection has been reported in women who did not have a history penetrative intercourse (ACS, 2007)

2.2.3 Consequences of Human Papillomavirus infection

When a person is infected with Human Papillomavirus, the body immune system clears HPV virus naturally within two years, most people do not develop symptoms or health problems from it. However, sometimes HPV are not cleared and may cause diseases such as:

1. Cervical cancer: most frequently HPV 16 and 18 are found to be high cancer risk. Approximately 70% of cervical cancer is caused by HPV 16 or HPV 18 (American cancer society ACS, 2007)

2. Warts: skin warts, plantar warts, flat warts, genital condylomas and laryngeal papillomas.

Over 500,000 new cases of anogenital warts are diagnosed annually in the United States, and about 90% are caused by HPV types 6 and 11. Approximately 10 % of males and females will develop anogenital warts at some point in their life. Anogenital wart is a benign disease. (ACS, 2007)

3. **Other HPV-related cancers** include cancers of the anal ,vulva, penile, vaginal, urethral head and neck .Anal cancer is found in about 4,000 people annually (620 deaths) in the United States and about 80% of anal cancer is caused by either HPV 16 or HPV 18.Vulvar cancers number about 3,870 annually(870 deaths), and atleast 40% of these are HPV related.

4. Juvenile laryngeal papillomatosis:

This occurs in about 1 in 200,000 children under age 18 years, most before age 4 years, and lead to recurrent benign tumor that may cause respiratory obstruction. In rare circumstances this may transform to carcinoma that has reported to occur in larynx, esophagus and bronchi. HPV type 6 and 11 are most frequently found in respiratory papillomas in which some investigators found that HPV 11 is the one most associated with progression to cancer. (ACS, 2007)

2.2.4 Risk factors of developing cervical cancer from Human papillomavirus

Various conditions or co-factors have been associated with increased HPV infection progressing to cervical cancer.

HPV related factors;

1. viral type (HPV 16 or HPV 18)
2. Infection with several high risk HPV types
3. High amount of Virus (High virus load)

Host related factors;

1. Suppressed immune systems
2. Parity: the risk of cervical cancer increased with the number children a woman bears.

External factors;

1. Tobacco smoking
2. Use of contraceptive for 5 or more years.
3. Co infection with other sexually transmitted diseases , such as Chlamydia trachomatis and herpes virus type 2.

2.2.5 Prevention of Human Papillomavirus infection

There are several ways that people can lower their chances of getting HPV.

1. Vaccines can protect against some of the most common types of HPV that can lead to disease and cancer.

Girls and women: Two vaccines (Cervarix and Gardasil) are available to protect females against the types of HPV that cause most cervical cancers.

Boys and men: One available vaccine (Gardasil) protects males against most genital warts and anal cancers

2. Condoms: HPV can infect areas that are not covered by a condom - so condoms may not *fully* protect against HPV.

3. People can also lower their chances of getting HPV by avoiding risk factors such as multiple sexual partners.

2.3 Human Papillomavirus vaccine

Virtually all cases of cervical cancer globally is caused by infection with oncogenic types of Human papillomavirus (HPV) led to the development of prophylactic vaccines. Availability of the vaccine will significantly reduce public

health burden of HPV (Jennifer D.Allen, 2008) and also HPV vaccine is expected to reduce cervical cancer incidence (Bernard Duval et al, 2007).

The goal of prophylactic vaccination is to reduce the incidence of HPV related genital disease such as cervical, vaginal, vulvar, penile and anal cancer. Moreover, also the reduction in number of children with laryngeal papillomatosis since the quadrivalent vaccine will also reduce the incidence of genital warts.

2.3.1 Introduction of vaccine

In 2006, the first vaccine against human papillomavirus was launched in United States of American and approved by the United States Food and Drug Administration. In 2007, the two vaccine products (Gardasil and cervarix) against Human papillomavirus were licensed in Thailand . However, the Director General of the Department of disease control revealed that the Human papillomavirus vaccination will not be provided in the national vaccination program even though it could prevent up to 70% of infections and the reason for this is the price of the vaccine which costs 14000-21000 baht (400-600 USD) per 3 dose course. This was not affordable within the budget of the government and the conventional method of cervical cancer prevention was effective. Until 2009, the vaccine is still not included in national health program nor public health benefit plan but the vaccines are available at the private sector in which the consumers must pay on their own .(Jomkwan et al , 2010)

2.3.2 How does vaccine work?

According to National cancer institute HPV vaccines work like other **immunizations** that protect against **viral** infections. *The investigators hypothesized that the unique surface components of HPV might create an **antibody response** that is capable of protecting the body against infection, and that these components could be used to form the basis of a vaccine.*

HPV vaccine made up of surface component of the virus that interact to form virus like particles (VLP) , these viral like particles are not infectious since they do not contain viral DNA. These viral like particles will then attach

to host cells and allow the immune system to produce antibodies which prevent future infection from papillomavirus. The HPV vaccine prevent future occurrence of the virus but does not eliminate the existing virus.

2.3.3 Types of vaccine

There are two types of HPV vaccine:

1. A bivalent vaccine (Cervarix) containing HPV types 16 and 18
2. A quadrivalent vaccine (Gardasil) vaccine containing HPV types 6, 11, 16 and 18

Both vaccines protects against the HPV types that cause 70% of cervical cancers that is HPV types 16 and 18 ,and the quadrivalent HPV vaccine also protects against the types that cause 90% of genital warts that is HPV types 6 and 11.

Both HPV vaccines are administered as a 3-dose series of Intramuscular injections in a 6-month period, with the second and third doses given 1–2 and then 6 months after the first dose. For best benefit, the same vaccine product should be used for the 3-dose series. (CDC, Atlanta) According to national cancer institute, women who received two doses of Cervarix had just as much protection from persistent HPV 16/18 infection as much as women who received three doses, and the protection was observed in a recent study through 4 years of follow up (Kreimer A.R, 2011).However, whether fewer than three doses of the vaccine will provide adequate duration of protection will need to be evaluated by more research.

2.3.4 Efficacy of vaccine

The two vaccines which cover the main types of Human papillomavirus can reduce the potential of cervical cancer by 70%, therefore

screening for cervical cancer need to be continue every year (O.Ganry et al , France) Since HPV types 16 and 18 are responsible for 70% of all cervical cancers. (John G. Lenehan et al, 2007) However, none of these vaccines are effective against oncogenic types of viruses other than HPV 16 and HPV 18 leaving 30 % chance of cervical cancers among women who are vulnerable to infections.

The vaccines are nearly 100 % effective with any of the four types HPV 16, 18, 11 and 6 when administered before an infection.

According to national cancer institute HPV vaccination is found to prevent nearly 100 percent of the precancerous cervical cell changes that is caused by HPV 16/18. From the data the duration of protection for 6.4 years with Cervarix and Gardasil in females who were not infected with HPV at the time of vaccination (Romanovski B, 2011)

2.3.5 Safety of vaccine

According to Food and Drug association in United States of America there is no serious side effect associated with HPV vaccine. The most common problems have been brief soreness and other local symptoms at the injection site. The safety review find consistent rates adverse side effects with the safety review carried out before the vaccine was approved and were similar to those seen with other vaccines.

However, a higher proportion of syncope (fainting) and venous thrombotic events (blood clots) were seen with Gardasil than are usually seen with other vaccines. (NCI)

Both vaccines have demonstrated excellent safety profiles and are offered to girls. Some countries such as Australia based on safety and immunogenicity data have approved qualivalent vaccine to males, while others such as United States are waiting for efficacy data on males. (Lora L Black et al 2009)

Both vaccines demonstrate impressive efficacy and self limited side effects (Andrea S Licht et al, 2009)

2.3.6 Timing to get vaccine

American cancer society guideline for Human Papillomavirus suggested that from Public health point of view routine vaccination should begin before sexual debut or shortly after to achieve optimal effectiveness. *The lower age limit for vaccine efficacy studies of Gardasil is 16 years and of Cervarix is 15 years. In United States, 24 % of females report sexually active by age 15 years , 40% by age 16 years and 70% by age 18 years.*

According to World Health Organization, for optimal effect of a vaccine a person should get vaccinated before the age of having sexual activity. Country specific factors will be important factor in determining the exact age for routine vaccination and the ages for the catch up vaccination.

The median age at first sex among females is 20 years old according to report card of HIV prevention for girls and young women Thailand 2004 , International Planned Parenthood federation, UNFPA, The global coalition on women and AIDS. Finding from several surveys show that the median age of sexual debut reported among adolescents age 13-25 years was 16 years in males and 18 years for females (Efren J Domingo et al , 2008).

2.4 Human Papillomavirus vaccine and female college students

Andrea S Licht mentioned in his article that although infection with HPV remains prevalence across the lifetime the incidence peak at age 20s which include

many college students and despite being an important infection, awareness among general adult population in USA is limited.

Jennifer D mentioned that those most at risk for vaccine preventable disease are the least likely to obtain them since cervical cancer does not occur until later life those who are at high risk of contracting the infection may not see this as a significant threat.

Li Ping Wong mentioned that young women especially those of college age are at risk as they tend to be sexually active and have higher numbers of sexual partners.

The highest rate of HPV infection is found in adults' age 18-28 years (Koutsky, 1997). The high HPV prevalence in these college students may be partially due to the transmission of STIs that is often asymptomatic and not diagnosed, which can be associated with having multiple sexual partners. (Efren et al, 2008)

Research demonstrates that college age sexually active young women, (18-24) are infected with high risk HPV at any point in time (Ricardo et al, 2007)

In Cervical cancer action, coalition to stop cervical cancer issue brief Strategies for HPV vaccination in developing world. A public health perspective models suggest that the most effective way to reduce cervical cancer is to focus resources at more girls for HPV vaccination rather than to both girls and boys *Boys can become infected with HPV and they can develop other HPV associated diseases such as penile, oral and anal cancers or genital warts but only about 7% of cancers caused by HPV 16 and 18 occur in men.*

Given the high prevalence of HPV infection among college age students, and the fact that vaccine has optimal benefit when given prior to exposure which is given that the median age at first sex among females is 20 years old according to report card of HIV prevention for girls and young women Thailand 2004, it seems clear that college students are target group whose knowledge regarding this HPV caused diseases and their prevention should be assessed.

2.5 Situation of cervical cancer and its prevention in Thailand

WHO fact sheet Thailand indicates that every year 9999 women are diagnosed with cervical cancer and 5216 die from the disease. Cervical cancer ranks as the 2nd

most frequent cancer among women in Thailand, and the second most frequent cancer among women between 15 to 44 years of age.

Squamous cell carcinoma is the most common histopathological type accounts for 80-86 % followed by adenocarcinoma or adenosquamous carcinoma 12 – 19 %. . Women are diagnosed with cervical cancer as early as 20 years and peak in women 45-50 years. Most cases are diagnosed with advances stages of disease with 51 % in International Federation of Gynecology and Obstetrics (FIGO) stage II and 31% stage III. The overall 5 years survival rate is 54.5 % in Khon Kaen and 68.2 % in Chiang Mai.(Efren Domingo et al, 2008)

With regard to five most frequent HPV types in women with cervical cancer in Thailand, HPV 16 accounts for 52.3% of cervical cancers and HPV 18 accounts for 19.3 % of cervical cancers.HPV58,52 ,33 accounts for 5, 3 and 2.1 % of cervical cancer respectively. (Efren Domingo et al, 200)

In Thailand , the incidence of cervical cancer is continuously increasing. (Yupin et al, 2011)

While cervical screening has great potential to reduce cervical cancer, it is a great challenge for developing countries where there is lack of resources, limit coverage for cervical screening. (Li Ping Wong et al., 2009)

Since 1960 that Pap smears have been used in Thailand for screening of cervical cancer, however despite years of implementation there has been little impact. (Elfren Domingo, 2008). At that time there was no organized screening program in Thailand, only for females who attended hospital services such as pregnancy counseling, ante and post family planning natal clinics or sexually transmitted disease clinics. Doctors' charge for screening and some cost may be offset by sporadic campaigns from local health departments or charitable foundations. In this period the service did not aim for disease screening at population level therefore there was no data available on the coverage of Pap smear test. (Elfren Domingo et al., 2008 and Jomkwan et al., 2010)

Elfren Domingo demonstrated that in year 2000, only 33 % of women have been screened in their lifetime in Khon Kaen province. Most with abnormal smears were likely to loss follow up due to 1) did not receive an appropriate letter of their result 2) did not understand the information provided in the letter 3) received letter

indicates normal result 4) believe that the results were not serious 5) travel related issues.

Besides financial and technical limitations , multiple visits for testing , gaining access to results , subsequent treatment also inaccurate belief and poor knowledge of the disease among the target population are hindrance for effective screening, particularly people living in remote area.(Jomkwan et al 2010)

In 1999- 2001, pilot study evaluating cytology as a primary screening test carried out and the results formed proposal for national screening program from the government.

In 2002, the Ministry of Public Health Department of Medical Services established cytology based screening program for the every female population age 35 to 60 years at five years interval. In the first phase measures to build screening with cytology were initiated that include training for cytologists, nurses, public health education to improve knowledge and awareness on cervical cancer , education and training of health care workers. (Elfren Domingo et al , 2008)

In 2004, two screening approaches were included in the disease prevention benefit package supported by the UC scheme. In 2005, the Pap smear coverage rises to 67.6 % per preliminary report.

In 2008 , the Thai government organized a campaign that carried out over a three months period to enhance the uptake of cervical cancer screening program. However, difficulty was found in gaining access to large target group.

Since 1980 the association between Human papillomavirus and cervical cancer were discovered and this led to the development of prophylactic vaccine which is expected to greatly reduce morbidity and mortality from cervical cancer and other HPV related diseases.

In 2006 , United States of America Food and Drug Administration approved first vaccine against Human Papillomavirus. In 2007, the two vaccines were also licensed in Thailand.

2.6 Research Related

- G. Di Giuseppe reported in his study of Human papillomavirus and vaccination: knowledge, attitudes, and behavioural intention in adolescents and young women in Italy that only
 - 29.8 % or less than one third have heard about HPV infection
 - 52.6% reported having heard of cervical cancer before,
 - less than half 42.1% knows that the vaccine was a preventive measure

- The article Is use of human papillomavirus vaccine among female college students related to human papillomavirus knowledge and risk perception? reported that respondents demonstrated
 - high level of knowledge on HPV diseases outcome, transmission and availability of vaccine
 - Overall 46.3% students reported received at least one dose of vaccine.

- L. Wong studied in Malaysia among college students mentioned that only
 - 21.7 % had heard of HPV
 - 10.3% had heard of HPV vaccine
 - 48 % had an intention to receive vaccine

CHAPTER III

Research Methodology

3.1 Study Design

This research is a cross sectional study which aimed to measure the level of knowledge, attitude about Human Papillomavirus, Human Papillomavirus vaccine and cervical cancer, vaccination history among female bachelor degree students at Chulalongkorn University . This is a quantitative research, using close ended, self report questionnaire.

3.2 Study Population

This study was conducted among present female bachelor degree students at Chulalongkorn University from year 1 to year 4

3.2.1 Sampling Technique

Bachelor degree in Chulalongkorn University comprises of 18 majors and 5 majors were randomly selected by simple random sampling and female students from each faculty were again randomly selected.

3.2.2 Inclusion criteria

- Female bachelor degree students
- Students who are willing to participate
- Students who are currently studying at the university
- Students who are in the age range between 18 – 26 years.

3.2.3 Exclusion criteria

- Male students
- Students who were not available during the study, or those who were not willing to participate
- Students who underwent hysterectomy

3.2.4 Sample size

The Yamane's simplified formula is used to calculate the sample size this formula can be used when population size is known.

Yamane's ; $n = N / 1 + N (e)^2$, Where, n = Sample size,

N = Total Population,

$$4346/1+4346 (0.05)^2$$

366 students, taking 10 % as the missing data into account, the total sample size is 400 students.

No.	Faculties	Total Number of female students	n= sample size from each faculty	Proportional to size (%)
1	Science	1611	$1611 * 400 / 4346 = 148$ students	$148 * 100 / 1611 = 9\%$
2	Arts	1058	$1058 * 400 / 4346 = 97$ students	$97 * 100 / 1058 = 9\%$
3	Pharmacy	520	$520 * 400 / 4346 = 48$ students	$48 * 100 / 520 = 9\%$
4	Law	857	$857 * 400 / 4346 = 78$ students	$78 * 100 / 857 = 9\%$
5	Veterinary	340	$340 * 400 / 4346 = 32$ students	$32 * 100 / 340 = 9\%$
		4346	Total sample size = 400	

That is,

Science=148 students

Arts=97 students

Pharmacy 48 students

Law 78 students

Veterinary 32 students

3.3 Research Instruments and Level of Measurement

A questionnaire was used to measure demographic, knowledge, attitude regarding cervical cancer, Human Papillomavirus, Human Papillomavirus vaccine and the rate of used and not used Human Papillomavirus vaccine.

Socio-demographic factors

The socio–demographic factors of parents contained 4 items as follow:

Items	Level of Measurement
1. Occupation	Nominal
2. Household Income	Ordinal
3. Mother's history of cervical cancer	Nominal
4. Family history of cervical cancer	Nominal

Knowledge regarding Human papillomavirus, Human papillomavirus vaccine and cervical cancer was accessed by using close ended structured questionnaire. The knowledge part comprises of total 18 questions and the score was 1 for correct answer (Yes) and 0 for incorrect answer (No, Don't know) (Bloom's cut off point). Knowledge score was categorized as high, moderate and low level. High knowledge is considered when the participants answered correctly more than 80% (> 14) of total questions and moderate level is considered when the participants answered correctly between 60 to 80% (11 to 14) and low knowledge is considered when the respondent answered correctly less than 60% (< 11). The knowledge score ranged from 0 to 18. The mean knowledge score was 8.6 and around half of the respondents have knowledge score above the mean score.

The attitude towards Human papillomavirus vaccine and cervical cancer were accessed using the 11 attitude questions which comprised of both positive and negative statements. The variable was divided using the Likert scale into five categories that is strongly agree, agree, neutral, disagree and strongly disagree. For positive statements the score was given as 5 for strongly agree, 4 for agree, 3 for neutral, 2 for disagree and 1 for strongly disagree. For negative statements the score was given in reverse that is 5 for strongly disagree, 4 for disagree, 3 for neutral, 2 for agree and 1 for strongly agree.

3.4 Validity test of the Instrument

The developed questionnaire was distributed to public health staffs on this topic to validate the questionnaire. Validity of the questionnaire was done by three experts, all from College of Public Health Sciences, Chulalongkorn University. Questions were translated into Thai for better understanding in the final survey.

3.5 Reliability Test of the instrument

Before real data collection, a questionnaire was pilot tested on female college students from other university. Cronbach's alpha coefficient was utilized to measure reliability. The Cronbach score obtained for knowledge level was 0.78.

3.6 Data collection

The researcher requested the college of public health science Chulalongkorn University to send a letter of notification to five selected faculties of bachelor degree students. The head and dean of the chosen faculties will be arranged to present the project and the permission and collaboration will be obtained. The researcher will ask permission from the lecturer of the required class of each year in each faculty to allow students to participate in this research, with notification of research objectives and benefits to the students and allow students to answer the structured questionnaire during the last 15 minutes of the lecture. At the remaining fifteen minutes of the lecture the researcher will present in the class and give basic information about the consent form, including confidentiality and voluntary and inform students that after complete the questionnaire students may place the questionnaire in the envelope and put envelope with questionnaire inside into the box at the front of the class room before leaving the class room. Then the researchers will distribute the questionnaire to the students to where they are seated. The students read and sign on the consent form before replying to the questionnaire. After completed the questionnaire students need not wait to complete fifteen minutes but when finished students may placed the enveloped with questionnaire inside into the box at the front of the class room and may leave the room

3.7 Data Analysis Methods

The questionnaire was coded before entering into the computer.

Descriptive statistics such as frequency, percentage, mean and standard deviation were used to determine the level of knowledge, attitude regarding Human papillomavirus, Human papillomavirus vaccine, cervical cancer and the rate of used and not used Human papillomavirus vaccine.

Bivariate analysis: Chi square and Fisher exact test were used to determine the relationship between the independent and dependent variables.

Multivariate analysis: Logistic regression was used.

Data was analyzed using SPSS

3.8 Ethical Issue

The proposal was submitted to the Ethical Review Committee for research involving human subjects, Health science group Chulalongkorn University.

Privacy and confidentiality strictly protected , as no personal identifiers were included in the questionnaire

The purpose of the study was explained to the students before signing the consent form and all was voluntary participation, not compulsion.

If the students deny participating the reasons behind was not asked and all data collected will not be used for other purposes

3.9 Study Limitation

The findings in this study may not represent all bachelor degree students in Bangkok or Thailand.

This study is based on self administered questionnaire. The interpretation of each question is subjective and the participants may have omitted certain questions. Since the setting in which questionnaire is given is a public place, participants may have trouble dealing with issues of confidentiality and this may limit the truthfulness of their responses.

The research questions were investigated by cross sectional study design. Such design does not allow time determination and precludes causal relationships between different factors and outcome.

Due to time limitation, the time that data collection began most of the university students were having final exam and some already began the vocation, therefore data could not fully be collected in the class room exactly as the method mentioned above.

3.10 Expected Benefit

The findings will provide insight for necessary educational intervention to reduce risk of cervical cancer and effective HPV vaccination uptake among high risk

young adults such as college students. This will reduce the rate of cervical cancer and reduce expenditure for care and treatment of the disease

CHAPTER IV

RESULTS

There were a total of 400 female bachelor degree students participated in this study. The study was carried out at five faculties of Chulalongkorn University. The participants have been distributed in proportion to total students of each faculty.

This chapter presents a detail description of the results obtained from the data analysis and the data analysis is divided into two main sections: (1) descriptive information, (2) analytic findings: relationships among variables.

In descriptive information the variables are described as simple percentage, mean and standard deviation depending on the nature of variables. The descriptive part begins with socio-demographic characteristics of female bachelor degree students, followed by socio-demographic characteristics of students' parents, followed by risk behaviors of students. After that the level of knowledge and attitude regarding Human papillomavirus, Human papillomavirus vaccine and cervical cancer is described followed by the description of the variables of students who used Human papillomavirus vaccine.

The analytic part utilizes chi square and fisher exact test when appropriate to show the association between practice of used Human papillomavirus vaccine and knowledge regarding Human papillomavirus, Human papillomavirus vaccine and cervical cancer to other factors, and lastly logistic regression is utilized to show the relationship between practice of used vaccine to knowledge , attitude regarding Human papillomavirus, Human papillomavirus vaccine, cervical cancer and other factors.

Therefore, data collected have been evaluated in terms of statistics which can be divided into thirteen parts as follows:

Part I: Socio-demographic characteristics of female bachelor degree students at Chulalongkorn University.

Part II: Socio-demographic characteristics of participant's parents.

Part III: Risk behaviors of female bachelor degree students at Chulalongkorn University.

Part IV: Level of knowledge regarding Human papillomavirus, Human papillomavirus vaccine and cervical cancer among students.

Part V: Level of attitude regarding Human papillomavirus vaccine and cervical cancer among students.

Part VI: Vaccination history among female bachelor degree students at Chulalongkorn University.

Part VII: Relationship between students' attitude regarding Human papillomavirus vaccine and cervical cancer and students' knowledge regarding Human papillomavirus, Human papillomavirus vaccine and cervical cancer

Part VIII: Relationship between students' knowledge regarding human papillomavirus, human papillomavirus vaccine and cervical cancer and students used and not used Human papillomavirus vaccine.

Part IX Relationship between students' attitude regarding Human papillomavirus vaccine and cervical cancer and students used and not used Human papillomavirus vaccine.

Part X Relationship between students' knowledge regarding Human papillomavirus, Human papillomavirus vaccine and cervical cancer and students' faculty

Part XI Relationship between parent's household income and students used and not used Human papillomavirus vaccine.

Part XII Relationship between parent's occupation and students used and not used Human papillomavirus vaccine.

Part XIII Association of socio-demographic factors, risk factors with students used and not used Human papillomavirus vaccine by binary logistic regression

4.1 Socio-demographic characteristics of female bachelor degree students at Chulalongkorn University

Table 1 shows the frequency distribution of basic demographic characteristics of all the participants such as age, class year, faculty, relationship status and relative or friends with cervical cancer.

Age:

The age of students has been divided into three categories. Half or fifty percent of the subjects fall under the age group 18-20 (50.1%) and nearly the other half fall under the age group 21-23(46%). The mean age was 20.

Class year:

It showed that students in the first year were 33.6%, students in the second year were 12.8%, students in the third year were 30.3% , students in the fourth year were 17.5% and students in the year that is more than fourth year is 5.8%

Faculty:

Five faculties have been randomly selected from the total of eighteen faculties and the number of students has been distributed in proportion to the total population of the respective faculty. The students from faculty of arts represent 24.8%, students from faculty of science represent 35.2 %, students from faculty of law represent 19.8%, students from faculty of pharmacy represent 12% and student from faculty of veterinary represents 8.2 % of the total population.

Relationship status:

Almost all of the participants (97.7%) in the study were single with only 2.3 % of the total participants were married.

Relative or friends with cervical cancer:

Ninety four percent of the participants denied having any relative or friends with cervical cancer.

Family's people with cervical cancer

Almost all participants (97.5%) denied having family people with cervical cancer

Table 1: Socio-demographic characteristics of female bachelor degree students at Chulalongkorn University.

Students' characteristics	Number of students	Percentage
Age group (years)		
18-20	195	50.1
21-23	179	46.0
24-26	15	3.9
Total	389	100

Students' characteristics	Number of students	Perenatge
Class year		
1 st Year	134	33.6
2 nd Year	51	12.8
3 rd Year	121	30.3
4 th Year	70	17.5
More than 4 th year	23	5.8
Total	399	100
Faculty		
Arts	99	24.8
Science	141	35.2
Law	79	19.8
Pharmacy	48	12.0
Veterinary	33	8.2
Total	400	100
Relationship status		
Single	390	97.7
Married/ living together	4	1.0
Married/ separated	5	1.3
Total	399	100
Relative or friends with cervical cancer		
Yes	20	5.6
No	334	94.4
Total	354	100

2. Socio-demographic characteristics of participant's parents.

Table 2 shows the frequency distribution of basic demographic characteristics of all the participants' parents such as occupation, income, mother's history of cervical cancer and family history of cervical cancer.

Occupation

Thirty two percent of the participants' parents are engaged in government services, thirty seven percent of the participants' parents are business men, and twelve percent of participants' parents are employee and only two percent of the participants parents engaged in agricultural whereas fifteen percent of participants' parents engaged in other occupations such as in health, law and other related fields.

Parents' income

Nearly half (48.7%) of the participants parents earn between 50,000 to 100,000 Baht per month and thirty two point four percent earns less than 50,000 Baht per month whereas eighteen point nine percent earns more than 100,000 Baht per month.

Mothers' history of cervical cancer

Almost hundred percent of all the participants (99.7%) denied having mother with history of cervical cancer.

Table 2: Socio-demographic characteristics of participant's parents.

Parents' characteristics	Number of parents	Percentage
Parents' occupation		
Government service	131	32.0
Business men	149	37.0
Employee	51	12.8
Agricultural	9	2.2
Others	60	15.0
Total	400	100

Parents' characteristics	Number of parents	Percentage
Parents' income per month		
Less than 50,000 Baht	122	32.4
Between 50,000-100,000 Baht	183	48.7
More than 100,000 Baht	71	18.9
Total	376	100
Mothers' history of cervical cancer		
Yes	1	.3
No	394	99.7
Total	395	100
Family's people with cervical cancer		
Yes	10	2.5
No	385	97.5
Total	395	100

4.3 Risk behaviors of female bachelor degree students at Chulalongkorn University

History of sexual activity

Only close to five percent of all participants reported to be sexually active or ever had sexual activity before.

History of sexual transmitted disease

Less than one percent of all participants admitted to have history of sexually transmitted disease.

History of used or currently used oral contraceptive pills

Close to six percent of all the participants reported to use oral contraceptive pills.

History of smoking or current smokers

Close to six percent of all the participants reported to be previous smokers or current smokers.

Table 3 Risk behaviors of female bachelor degree students at Chulalongkorn University

Risk Behaviors	Number of students	Percentage
History of sexual activity		
Yes	19	4.8
No	378	95.2
Total	397	100
History of sexual transmitted disease		
Yes	2	.5
No	396	99.5
Total	398	100
History of used or currently use oral		
Contraceptive pills		
Yes	23	5.8
No	374	94.2
Total	397	100
History of smoking or currently smokers		
Yes	23	5.8
No	375	94.2
Total	398	100

4.4 Level of knowledge regarding Human papillomavirus, Human papillomavirus vaccine and cervical cancer.

According to the data collected it was found that majority of the respondents (68.2 %) had low knowledge level while only a quarter had moderate knowledge level and less than ten percent that is 6.2% of all the participants has high knowledge regarding Human papillomavirus Human papillomavirus vaccine and cervical cancer.

Table 4: Distribution of knowledge regarding Human papillomavirus, Human papillomavirus vaccine and cervical cancer.

Level of knowledge	Number of students	Percentage
Low(0-10 scores)	273	68.2
Moderate (11-14 scores)	102	25.5
High(15-18 scores)	25	6.2
Total	400	100
Minimum = 0	Maximum=18	Mean=8.6

Table 5 shows the frequency of participants who answered correctly to each question regarding knowledge of Human papillomavirus, Human papillomavirus vaccine and cervical cancer. Less than half of the participants have heard of Human papillomavirus before and know that Human papillomavirus is one of the causes of cervical cancer. Nearly sixty percent (59.5%) of all participants know that cervical cancer can be prevented with the use of vaccine. Less than half (41.5%) of all participants know that Human papillomavirus is a sexually transmitted disease. Less than a quarter of all participants know that vaccine has no serious side effects.

Table 5 Number and percentages of the items on knowledge regarding Human papillomavirus, Human papillomavirus vaccine and cervical cancer

Questions	Correct (N)	Percentage
1.HPV virus is one of the causes of cervical cancer	190	47.5
2.Smoking increases the risk of cervical cancer	215	53.8
3. Multiple sexual partners increases the risk of cervical cancer	320	80
4. Early age sexual activity increases the risk of cervical cancer	261	65.2
*5. Commonly seen symptoms of cervical cancer is vaginal bleeding	194	48.5
6. Cervical cancer screening decreases death rate of cervical cancer	295	73.8
7. Cervical cancer can be treated if diagnosed at an early stage	312	78
8. At present cervical cancer can be prevented with the use of vaccine	238	59.5
9. Have heard of HPV virus before	188	47
10. People infected with HPV virus usually have no symptoms	69	17.4
11. Patients can transmit HPV virus to sexual partners even when have no symptoms	161	40.5
12. HPV virus can cause disease in both men and women	106	26.6
*13.HPV virus can be prevented by good hygiene only	140	35.2
14. HPV virus is a sexual transmitted disease	166	41.5
15. HPV vaccine has no serious side effect	68	17
*16.People who have been vaccinated with HPV vaccine need not undergo cervical cancer screening	201	50.2
17. The optimum age to get HPV vaccine is before sexual activity	178	44.5
*18. People who have been vaccinated cannot develop cervical cancer	159	39.8

***represents false statement**

4.5 Level of attitude regarding Human papillomavirus vaccine and cervical cancer among students.

The attitude observed score was range from 21 to 50. The mean score was found to be 38.48 and the standard deviation was 4.25.

In this study attitude is categorized into three categories of negative attitude, moderate attitude and positive attitude by using the standard method that is mean +/- standard deviation. The score $< \text{mean} - \text{standard deviation}$ (<34 scores) refers to negative attitude and the score within mean + standard deviation and mean – standard deviation refers to moderate attitude (35-42) and the score more than mean + standard deviation refers to positive attitude (>42 scores).

Majority of the respondents (68%) have moderate attitude regarding Human papillomavirus vaccine and cervical cancer while the score for positive and negative attitude towards Human papillomavirus vaccine and cervical cancer is found to be 16.8% and 15.2% respectively.

Table 6: Distribution of attitude levels regarding human papillomavirus vaccine and cervical cancer

Level of Attitudes	Number of students	Percentage
Negative attitude (21-34 scores)	55	15.2
Moderate attitude (35-42 scores)	247	68
Positive attitude (43-50 scores)	61	16.8
Total	363	100
Mean=38.48	SD=4.25	Minimum=21
		Maximum=50

Table 7 Percentage of participants by the attitude towards Human papillomavirus vaccine and cervical cancer of each individual statement.

Statements	Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
	%	%	%	%	%
1. I think I can develop cervical cancer	5.5	37.2	35.2	8.5	13.6
*2. I believe that cervical cancer is not dangerous	1.0	3.0	7.8	43.5	44.7
*3. Cervical cancer screening is not necessary for me	2.3	3.8	19.0	43.1	31.8
*4. I usually use condoms therefore I think I cannot get cervical cancer	4.1	7.0	55.7	14.5	18.7
*5. I keep good hygiene of my sexual organ therefore there is no chance for me to get cervical cancer	6.9	20.9	38.2	24.4	9.7
6. I am afraid that I will get cervical cancer	14.9	46.8	31.4	4.1	2.8
*7. Cervical cancer is a disgusting illness	4.0	7.6	43.9	31.1	13.4
8. I know that cervical cancer can be prevented	22.2	56.4	18.6	1.5	1.3
9. I believe that HPV vaccine will decrease the risk of cervical cancer	9.8	49.4	37.8	1.5	1.5
10. I know that HPV vaccine has no serious side effects	3.0	16.1	68.8	10.1	2.0
11. HPV vaccine for cervical cancer prevention is too expensive for me	4.0	11.3	59.0	19.3	6.3

*represents statement with negative attitude

4.6 Vaccination history among female bachelor degree students at Chulalongkorn University.

Table 8 shows the number and percentage of female bachelor degree students at Chulalongkorn University who used and not used Human papillomavirus vaccine. Only 10.9 % of all students reported to have used Human papillomavirus vaccine.

Table 8: Frequency of vaccination history among female bachelor degree students at Chulalongkorn University.

History of HPV vaccination	Number of students	Percentage
Yes	42	10.9
No	342	89.1
Total	384	100

4.7 Relationship between students' attitude regarding Human papillomavirus, Human papillomavirus vaccine and cervical cancer and students' knowledge regarding Human papillomavirus, Human papillomavirus vaccine and cervical cancer.

Table 9 shows that students who have low knowledge (1-10) regarding Human papillomavirus, Human papillomavirus vaccine and cervical cancer most of them have neutral attitude regarding Human papillomavirus vaccine and cervical cancer and almost twelve percent of them have positive attitude regarding Human papillomavirus vaccine and cervical cancer and students who have moderate knowledge (11-14) regarding Human papillomavirus, Human papillomavirus vaccine and cervical cancer again most of them have neutral attitude regarding Human papillomavirus vaccine and cervical cancer but around quarter of them have positive attitude towards Human papillomavirus vaccine. Students who have high knowledge

15-18) regarding Human papillomavirus, Human papillomavirus vaccine and cervical cancer again most of them have neutral attitude regarding Human papillomavirus vaccine and cervical cancer however, nearly half of them have positive attitude regarding Human papillomavirus vaccine and cervical cancer.

It was found that students' knowledge regarding Human papillomavirus, Human papillomavirus vaccine and cervical cancer is significantly associated directly with students' attitude regarding Human papillomavirus vaccine and cervical cancer

Table 9 Relationship between students' knowledge regarding Human papillomavirus, Human papillomavirus vaccine and cervical cancer and students' attitude regarding Human papillomavirus vaccine and cervical cancer.

Knowledge	Attitude			χ^2	P value
	Negative	Moderate	Positive		
Low 7 (7.4)	46(18.6) 64 (68.1)	172(69.6) 23 (24.5)	29(11.7)	20.499	0.001 Moderate
High	2 (9.1)	11 (50.0)	9 (40.9)		

4.8 Relationship between students' knowledge regarding Human papillomavirus, Human papillomavirus vaccine and cervical cancer and students' used and not used Human papillomavirus vaccine

Table 10 shows that students who have low knowledge (0-10) regarding Human papillomavirus, Human papillomavirus vaccine and cervical cancer ten percent of them used Human papillomavirus vaccine and students who have moderate knowledge (11-14) regarding Human papillomavirus, Human papillomavirus vaccine and cervical cancer eight percent of them used Human papillomavirus vaccine whereas students who have high knowledge (15-18) regarding Human papillomavirus, Human papillomavirus vaccine and cervical cancer twenty four percent of them used Human papillomavirus vaccine. It was found that knowledge is directly associated with the practice of used vaccine against Human papillomavirus however, statistically this association is not significant (p-value=0.072)

Table 10 Relationship between Human papillomavirus, Human papillomavirus vaccine and cervical cancer knowledge and students used and not used Human papillomavirus vaccine among bachelor degree students at Chulalongkorn University.

Knowledge	Practice of used vaccine			χ^2	p-value
	no or less than 3 times n (%)	completed 3 times n (%)	Total n (%)		
Low	231 (89.2)	28 (10.8)	259(100)	5.269	0.072
Medium	92 (92.0)	8 (8.0)	100(100)		
High	19 (76.0)	6 (24.0)	25(100)		

4.9 Relationship between students' attitude regarding Human papillomavirus, Human papillomavirus vaccine and cervical cancer and students used and not used Human papillomavirus vaccine.

Table 11 shows that students who have negative attitude (21-34) regarding Human papillomavirus vaccine and cervical cancer twelve percent of them used Human papillomavirus vaccine and students who have neutral attitude (35-42) regarding Human papillomavirus vaccine and cervical cancer around ten percent of them used Human papillomavirus vaccine whereas students who have positive attitude (43-50) regarding Human papillomavirus vaccine and cervical cancer almost twelve percent of them used Human papillomavirus vaccine.

It was found that attitude is not associated with the practice of used vaccine against Human papillomavirus and also show statistically insignificant (p-value=0.925)

Table 11: Relationship between attitude regarding Human papillomavirus vaccine and cervical cancer and students used and not used Human papillomavirus vaccine.

Attitude	Practice of used vaccine			χ^2	p-value
	no or less n (%)	3 times n (%)	Total n (%)		
Negative	44 (88.0)	6 (12.0)	50 (100)	.156	.925
Moderate	215(89.6)	25 (10.4)	240(100)		
Positive	53 (88.3)	7 (11.7)	60(100)		

4.10 Relationship between students' knowledge regarding Human papillomavirus, Human papillomavirus vaccine and cervical cancer and students' faculty

Table 12 shows that among all students who have high knowledge score (15-18) half (48%) of them are from pharmacy department and twelve percent are from Veterinary, Science and Arts whereas sixteen percent of Law students have high knowledge score

It was found that knowledge regarding Human papillomavirus, Human papillomavirus vaccine and cervical cancer is significantly associated with faculty of the students.

Table 12 Relationship between students' knowledge regarding Human papillomavirus, Human papillomavirus vaccine and cervical cancer and students' faculty

Students' Faculties	Knowledge			χ^2	P-value
	Low	Medium	High		
Arts	80(29.3)	16(15.7)	3(12)	81.0	>0.001
Pharmacy	12(4.4)	24(23.5)	12(48)		
Veterinary	14(5.1)	16(15.7)	3(12)		
Science	102(37.4)	36(35.3)	3 (12)		
Law	65(23.8)	10(9.8)	4(16)		

4.11 Relationship between parent's household income and students used and not used Human papillomavirus vaccine.

Table 13 shows that six percent of students whose parents' income is lesser than 50,000 Baht per month used vaccine and seven percent of students whose parents' income is between 50,000-100,000 Baht used vaccine. However, more than a quarter (27%) of students whose parents' income between 50,000 to 100,000 Baht per month used Human papillomavirus vaccine.

It was found that parents' income is significantly associated directly with students' used of Human papillomavirus vaccine.

Table 13 Relationship between parent's household income and students used and not used Human papillomavirus vaccine.

Parents' income per month	Practice of used vaccine			χ^2	p-value
	No or less than 3 times n (%)	Completed 3 times n (%)	Total n (%)		
Less than 50,000	107(93.9)	7 (6.1)	114(100)	24.13	0.001
50,000-100,000	168(92.8)	13(7.2)	181(100)		
More than 100,000	48(72.7)	18(27.3)	66 (100)		

4.12 Relationship between parents' occupations and students used and not used Human papillomavirus vaccine.

Table 14 shows that different parents' occupations show different rate of used Human papillomavirus vaccine among students.

It was found that different parents' occupation show different rate of used vaccine among students and this shows statically significant on chi square test.

Table 14 Relationship between parents' occupations and students used and not used Human papillomavirus vaccine.

Parents' occupation	Practice of used vaccine			χ^2	p-value
	No or less than 3 times n (%)	Completed 3 times n (%)	Total n (%)		
Government service	115(92)	10(8)	125(100)	10.138	0.038
Business	129(88.4)	17(11.6)	46(100)		
Employee	46(93.9)	3(6.1)	49(100)		
Agriculture	9(100)	0(0)	9 (100)		
Others	43(78.2)	12(21.8)	55(100)		

4.13 Association of socio-demographic characteristics, risk behavior of students, parents' socio-demographic characteristics with students' used and not used Human papillomavirus vaccine.

Logistic regression was used to examine the probability of used and not used Human papillomavirus vaccine, to provide strength of association between factors with the practice of used and not used vaccine and the odd ratio is also provided.

The significant predictor of students used vaccine is parents' income
(OR=2.745, 95% CI 1.636-4.607)

The table showed that none of the students' socio-demographic characteristics or risk behaviors are significant predictors of students used and not used Human papillomavirus vaccine.

Table 15 Association of students' socio demographic characteristics, risk behavior of students , parents' socio demographic characteristics with students' used and not used Human papillomavirus vaccine.

Variable	OR	SE	95% CI	P-Value
<i>Outcome : History of used and not used vaccine</i>				
Student's socio-demographic characteristics				
Age	0.851	.110	.687-1.055	0.141
Grade	0.856	.132	.661-1.109	0.240
Faculty	0.891	.109	.719-1.104	0.290
Relative or friends with cervical cancer	1.024	.768	.227-4.611	0.975
Parent's sociodemographic characteristics				
Parents' income	2.745	.264	1.636-4.607	0.001
Family's people with cervical cancer	1.060	1.068	0.131-8.595	0.956
Students' risk behaviors				
Sexual activity	2.236	1.041	0 0.291-17.202	0.440
History of used oral contraceptive pills	0.526	0.577	0.176-1.691	0.294
History of smoking	0.546	0.577	0 0.176-1.691	0.294

4.14 Summary

This chapter provides study findings in detail description. The findings from data collected were shown according to individual item and also overall scores obtained from all the items. The relationship among different factors with practice of used and not used Human papillomavirus vaccine were tested for statistic significant.

The next chapter will bring these findings into discussion and will also discuss the significance findings in detail. It will also point out recommendations for future research and limitations of these findings

CHAPTER V

DISCUSSION, CONCLUSION AND RECOMMENDATION

This was a cross sectional study carried out among 400 bachelor degree female students at five faculties Arts, Science, Pharmacy, Veterinary and Law which were randomly selected at Chulalongkorn University. The aim of the study was to evaluate the level of knowledge, attitude of Human papillomavirus, Human papillomavirus vaccine and cervical cancer, to assess the rate of used and not used Human papillomavirus vaccine and to identify the association between knowledge, attitude, socio-demographic and other factors to students used and not used Human papillomavirus vaccine.

In this chapter major findings and their significance to practice will be discussed in brief along with its limitation and recommendation.

5.1 Socio-demographic characteristics of students

The result of this study showed that demographic characteristics of students were not associated with the practice of used Human papillomavirus vaccine. However, this study showed that students' socio-demographic characteristic, faculty, is significantly associated with students' knowledge regarding Human papillomavirus, Human papillomavirus vaccine and cervical cancer.

Faculty is one of the important factors since it is significantly associated with students' knowledge regarding Human papillomavirus, Human papillomavirus vaccine and cervical cancer. Pharmacy students have highest percentage of students with high knowledge score this could be due to the fact that the topic is about vaccine which is directly link to students' subject, the second highest knowledge score is seen among Law and followed by Science, Veterinary and Arts which have same percentage of high knowledge score.

5.2 Socio-demographic characteristics of parents

This study showed that among social demographic characteristics of parents, parents' income is strongly significantly associated directly with students' practice of used vaccine by both chi square test and binary logistic regression test. This is one of the important

factors since it significantly predicts the practice of used and not used Human papillomavirus vaccine.

In Thailand the vaccine has been licensed for around five years however the ministry have not consider putting the HPV vaccination into its program even though it could prevent up to 70% of infections and the reason for this is that the vaccine price of 14,000-21,000 baht (400-600 USD) per 3 dose course was unaffordable within the government budget as mentioned in the article *Scaling up cervical cancer in the midst of Human papillomavirus vaccination advocacy in Thailand* (Jomkwan et al, 2010).As of now the vaccine has not been included in the national immunization programme, it is available in the private sector for people who could afford to pay out of pocket , this could explain our finding that income is an important factor that predicts the use of Human papillomavirus vaccine.

Our finding coincides with the study done by Raika Durusoy on HPV Vaccine Awareness and Willingness of First-Year students Entering University in Western Turkey 2010 that higher income plays a significant role in increasing awareness regarding HPV vaccine.(Raika et al,2010) also mentioned that before licensing of the vaccine the understanding regarding HPV was limited among adults and adolescents but after their introduction, awareness and knowledge on HPV and its vaccine has risen, especially in countries where women have less financial obstacle to get vaccine. This suggests that finance plays an important role for vaccine uptake among population.

J.Li et al, 2008 mentioned in his article that financing of newly recommended vaccines become a barrier to receiving them, *HPV vaccines are the most expensive vaccine ever.*

Kahn et al article on Rates of Human Papillomavirus Vaccination, Attitudes About Vaccination,and Human Papillomavirus prevalence in Young Women, 2008 cited that to maximize vaccine uptake, intervention must address broader systemic barriers to vaccination including access to and cost of vaccines. Also mentioned that public health effort must ensure that vaccines are not only acceptable but affordable particularly for low income families, which again emphasize our finding the income plays a significant role in vaccine use.

Another socio-demographic characteristic of parents which shows significant association with students' used of vaccination is parents' occupation. Different occupations show different rate of vaccination and this shows significance on chi square test. .

5.3 Risk behaviors

Risk behaviors includes sexual activity, sexual transmitted disease , oral contraceptive use, these are the sensitive subjects and could be potentially embarrassing for the participants and may have deterred honest response as also mentioned by Charlotte Devereaux et al article on Public knowledge and attitudes towards Human papillomavirus (HPV) vaccination,2008. This study showed that only five percent of students reported to experience sexual activity, one percent admitted having sexual transmitted disease , nearly six percent of students reported to be using oral contraceptive pills, and also nearly six percent of all students reported to be smoking. The findings also showed that none of the risk behaviors is associated with the practice of used Human papillomavirus vaccine.

5.4 Knowledge regarding Human papillomavirus, Human papillomavirus vaccine and cervical cancer

The mean knowledge score was 8.65 from a possible of 18 points with a standard deviation of 3.85. It is shown clearly that more than half of the participants in this study have low knowledge (68.2%).

However, the result is not very surprising since many literature reviews from many countries show similar result, such as, Li Ping Wong article on Ethnically diverse female university students' knowledge and attitudes toward human papillomavirus (HPV), HPV vaccination and cervical cancer, 2010 that despite high prevalence of Human papillomavirus infection among young women studies in western countries shown that adolescents and young women know very little about Human papillomavirus infection. G.Di Giuseppe et al.article on Human papillomavirus and vaccination: knowledge, attitudes and behavioral intention in adolescents and young women in Italy, 2008 reported that women's knowledge about Human papillomavirus infection and cervical cancer was remarkably poor.

Even studied done in USA by andrea S Licht et al. in the article ' is use of Human papillomavirus vaccine among female college students related to human

papillomavirus knowledge and risk perception?' 2010 reported that despite Human papillomavirus being an important infection, awareness among general adult population in USA is limited.

The research on nurses knowledge regarding Human papillomavirus infection and cervical cancer in Chiang Mai University Hospital by Yupin et al,2011 showed that most participants(81.8%) knew that HPV is a cause of cervical cancer but the general knowledge about natural course and prevention of HPV infection was generally limited. This suggests that the detail about natural course of cervical progression should be incorporated into information program even for health personnel.

This study showed that knowledge is associated with practice but this is not statistically significant. This does not mean that knowledge is not an important factor for students used and not used Human papillomavirus vaccine but there may be other factors that hinder to apply knowledge into practice. However, the study showed that knowledge is significantly associated with students' faculties and students' attitude regarding Human papillomavirus vaccine and cervical cancer.

5.4.1 Knowledge discussion by item

The highest average percentage scored by the respondents was the question on risk of cervical cancer which includes multiple sexual partners. The result indicated that 80% of the respondents were aware that multiple sexual partners increase the risk of cervical cancer. L.P. Wong et al, 2010 finding indicated that 62% of all students identify multiple sexual partners as a risk of cervical cancer.

Most of the respondents (78%) answered correctly that cervical cancer can be treated if diagnosed at an early age.

The participants in this study also have a good knowledge that cervical cancer screening decreases death rate of cervical cancer. A high percentage of 73.8% of the participants answered this item correctly. G Di Giuseppe et al studied in Italy in 2008 showed that 60.2 % of all students know that death

can be prevented through detection of precancerous changes in cervix by using the Pap test.

The percentage regarding the association between Human papillomavirus and cervical cancer is quite good compared to other studies since nearly half (47.5%) of the participants answered that item correctly. Compared to L.P.Wong study in 2010, majority (72.8%) of all students were not sure that HPV is related to cervical cancer. Raika Durusoy studied in Turkey 2010 showed that 32.3 % of all students answered correctly that HPV causes cervical cancer. However, when compared to study done in USA in 2010 among female college students by Andrea S. Lischt et al, more than 95% of all students answered correctly that HPV can cause cervical cancer

More than half (59.5%) of the participants know that cervical cancer can be prevented with the use of vaccine which is one of the important information which would determine vaccine use among participants. This showed almost the same result with L.P.Wong study in 2010, 59.7% of all students answered correctly that vaccine is to protect against cervical cancer. G Di Giuseppe et al studied in Italy in 2008 shown that half know that vaccine was a preventive measure. Raika Durusoy studied in Turkey in 2010 showed 27.6 % of all students answered correctly that HPV is effective in protection against cervical cancer. In study done in USA in 2010 among female college students by Andrea S. Lischt et al more than 90% answered correctly that vaccine is available to prevent HPV.

Majority of the participants that is more than 80 % does not know that Human papillomavirus vaccine has no serious side effect. Referring to table 5 only 17% answered correctly that HPV vaccine has no serious effect. A study by Yupin Phianmongkol et al, 2010 among nurses in Chiangmai University Hospital found that 27.7% of all nurses answered correctly that HPV vaccine has no major side effects; therefore it is not very surprising that most of the college students could not answer this item correctly. This could be partly explained that HPV vaccine is a new vaccine and also not yet in an insurance program in our country, the knowledge regarding HPV vaccine should be

strongly emphasize for the health personnel as well since most of the reviews also suggested that health personnel plays an important role for students knowledge and practice of used and not used Human papillomavirus vaccine.

Another very important area is regarding Human papillomavirus as a sexually transmitted disease, only 41.5% of all participants answered this item correctly and the other nearly 60 % of all participants do not know that Human papillomavirus which causes cervical cancer is a sexually transmitted disease. This is an important area which need to be emphasized during the prevention program. In L.P. Wong studied in 2010, the mode of transmission of HPV was only known by 10% of all students. Raika Durusoy studied in Turkey in 2010 showed that 22.6 % of all students answered correctly regarding sexual transmission as a mode of transmission of HPV.

More than 80 % of the participants answered incorrectly on the question that infection with Human papillomavirus usually has no symptoms. It is seen that only 17.4 % of all participants answered this item correctly. Lack of knowledge regarding symptoms of HPV may hinder respondents to take the prevention method against the disease seriously. Raika Durusoy studied in Turkey in 2010 showed that only 10.2% of all students in Turkey know that HPV infection may show no symptoms.

Less than half of the participants (44.5 %) are aware that the **optimum age** to be vaccinated against Human papillomavirus is before sexual activity. This is another area which should be considered when educating students regarding Human papillomavirus vaccine.

The reason that most of the students in study by Andrea S. Licht in USA ,2010 could answer most of the knowledge questions correctly could be due to the fact that the survey took place around 4 years after the vaccine was licensed. Also there is a use of vaccine for children program available at health insurance and/or greater use of health care services. Andrea mentioned that however, it is not clear whether campaigns, conversation with clinicians,

school based educational program or other factors might have contributed to knowledge of this specific outcome.

5.5 Attitude regarding Human papillomavirus vaccine and cervical cancer

In this study the mean score for attitude was found to be 38.5 from a possible 55 points with a standard deviation of 4.25.

This study showed that attitude has no association with practice; however attitude has strong significant direct association with students' knowledge. The second finding is consistent with the one found by Li Ping Wong, 2010 where they conducted study on Ethnically diverse female university students' knowledge and attitude towards human papillomavirus, HPV vaccination and cervical cancer in public university located in Kuala Lumpur, Malaysia and found out that intention to receive HPV vaccine was significantly associated with the scores of knowledge of HPV and genital warts and knowledge of cervical screening and cervical cancer risk factors.

The attitude score in this study reveals that more than half of the participants believed that HPV vaccine will decrease the risk of cervical cancer. In the attitude score, more than half (79%) of the participants agree that cervical cancer can be prevented. The study showed by Charlotte et al, 2008 on Public knowledge and attitudes towards Human papillomavirus (HPV) vaccination 88.1 % of all participants agreed or strongly agreed with HPV vaccination and attitude did not differ significantly by social class, gender or parental status which coincides with our study. The study showed by Chantal sauvageau et al, 2007, on Human papillomavirus vaccine and cervical cancer screening acceptability among adults in Quebec, Canada shown that eighty seven percent of participants agreed that vaccine will decrease the risk of cervical cancer.

More than half have no opinion on side effects of vaccine and less than 20% agree or strongly agree that HPV vaccine has no serious side effect which consistent with the review by L.P Wong article on attitude part that of those students who refuse to receive vaccine 50.9% were concerned about the safety and efficacy of the new vaccine. Therefore

future education which will provide knowledge and background of HPV vaccine and cervical cancer should also give emphasize on the safety and efficacy of the vaccine.

5.6 Practice of used and not used Human papillomavirus vaccine among students

In this study only 10.9% of the participants have used vaccine. The practice of used vaccine is significantly directly associated with parents' income. It is also associated with students knowledge score however; the latter does not show any statistic significance. The students' attitude does not show any association with the practice of used vaccine even though student's knowledge and attitude shows strong significant statistical association. Our findings show similarities with many other reviews however, timing of the survey and country specific timing of vaccine licensure should be considered when comparing these datas to understand the factors related to it, which also mentioned by Raika Durosov et al, 2010 in the article on HPV Vaccine Awareness and Willingness of First-Year Students Entering University in Western Turkey.

In our study group, the vaccination rate was low, 10.9 %. In Raika studied on first year university students in western Turkey, 2010, rate of vaccination was 0.4% and also similar figures observed in Eastern populations (Hsu et al., 2009; Kang and Moneyham,2010). Rates are higher when the state covered the HPV vaccination cost. Vaccination cost has been an important issue for intention in other studies also (Conry et al, 2009; Donners et al., 2009; Kang and Moneyham, 2010; Liddon et al., 2010).

J.Y. Lai et al article on Factors influencing uptake of the human papillomavirus (HPV) vaccine to prevent cervical cancer (CC) 2010 mentioned that despite the vaccine ability to prevent cervical cancer the rates of HPV vaccination are relatively low. CDC study reported in March 2010 that only 11 % reported receiving all three doses of vaccine (2010 National STD Prevention Conference (NSTDP): Abstract LBp. Presented March 10, 2010 The reasons for poor uptake of the vaccine could be due to several factors include cost of vaccination, limited access to health care providers among patients with lower

socioeconomic background and lack of knowledge of HPV as a causative agent of cervical cancer.

Studied from many reviews also support our findings that income plays a significant role in predicting the used of Human papillomavirus vaccine. For instances John G. Lenehan et al, 2007 that women's willingness to get HPV vaccination varied significantly in response to different conditions, the most positive influence was a doctor's recommendation and the most important negative influence was cost. Mark A Kane et al ,2006 cited in the article 'Chapter 15 : HPV vaccine use in developing world' that in industrialized world the high cost vaccine will be affordable and welcome by most health workers, adolescents and parents whereas in poorer countries it usually need two decades for new vaccines to become available in the public sector. In developing countries, expensive newer vaccines are available to those that can afford them on the private sector long before they will be available on a public sector. Much attention has been paid for the last few years of new way to give people in developing countries to access the new vaccine sooner. However, much effort, political will and money will be needed to avoid the delaying of the benefit of HPV vaccine. Jennifer L. Winkler et al, 2008 studied in the article Determinant of Human Papillomavirus Vaccine Accpetability in Latin America and the Caribbean mentioned that to accelerate the availability of vaccine to women who need it most, country and regional advocacy for vaccine should begin now, aiming to lower prices within few years.

5.7 CONCLUSIONS

The result showed that most students participated have low level of knowledge regarding Human papillomavirus, Human papillomavirus vaccine and cervical cancer. Only 10.9 % of all students reported used Human papillomavirus vaccine.

The result of this study showed that demographic data of students, students' attitude were not associated with the practice of used or not used Human papillomavirus vaccine. The students' knowledge regarding Human papillomavirus, Human papillomavirus vaccine and cervical cancer is directly associated with students' practice of used and not used Human papillomavirus vaccine, however, this does not show statistic significant. The socio demographic factor of parents that is parents income is significantly directly associated with

students used and not used Human papillomavirus vaccine. As the income of the parents increases the number of students used Human papillomavirus vaccine increases. Parents' income is the main predictor for students used the vaccine. The price of this HPV vaccine could be a barrier to receiving them.

As the result shown for knowledge, it is found that one of the socio-demographic factors of students that is students' faculty, and students' attitude are significantly directly associated with students knowledge regarding Human papillomavirus, Human papillomavirus vaccine and cervical cancer. Different faculties' students have different knowledge regarding Human papillomavirus, Human papillomavirus vaccine and cervical cancer. It is also shown that students with high knowledge has high attitude regarding Human papillomavirus, Human papillomavirus vaccine and cervical cancer.

5.8 RECOMMENDATIONS

As of findings in this study, the following issues should be considered to increase the rate of used vaccine among female bachelor degree students.

5.8.1 General recommendation

Public education is necessary since it is shown in this study that the knowledge regarding Human papillomavirus, Human papillomavirus vaccine and cervical cancer is quite low among bachelor degree female students. As in the prior studies our result also suggests that effort is needed to educate young women. Timely education will reduce the cost, morbidity and mortality associated with HPV related diseases. Education could be in various ways including:

- Televisions, journals, magazines, advertisement
- Through health care providers in college clinic during office visit
- Peer role model, since it has been successfully employed on college campus to promote range of health behaviors.
- Integration of HPV education to college curriculum should be considered

- National medical association schemes to provide knowledge to females of various age.

5.8.2 Policy recommendation

A policy to increase the use of Human papillomavirus vaccine should be developed at both National and University level.

Since it is shown that parents' income is significantly associated with students used and not used Human papillomavirus vaccine. Several policies should come up which will reduce cost on Human papillomavirus vaccine.

5.8.2.1 National level

Human papillomavirus vaccine must be country driven and well planned with full support and involvement of policymakers.

- i) Modification of pricing of the vaccine would be one of the tasks for increasing vaccination rate or even aiming to pursue publicly finance HPV vaccination as part of national immunization program and the universal coverage scheme.
- ii) Partnerships between sexual reproductive health (SRH), immunization, adolescent health and cancer control community may work together to implement the policy.
- iii) Adolescents health program which aim to develop adolescent-friendly services and also provide counseling on sexual and reproductive health

5.8.2.2 University Level

As mentioned in Chapter 2 that HPV routine vaccination should begin before sexual debut or shortly after to achieve optimal effectiveness and the median age at first sex among females is 20 years old according to report card of HIV prevention for girls and young women Thailand 2004, therefore policy at university level plays a very important role to prevent females from future cervical cancer by increasing the uptake of Human papillomavirus vaccine.

Various policies could be considered such as adolescents friendly clinic which includes delivery of vaccination package to college students along with provision of sex education and reproductive health information to students. Encouraging university students to communicate with medical practitioner regarding overall and sexual health. Programs should emphasize the high likelihood of HPV infection and high vaccine effectiveness along with acknowledge students about where to get the service.

5.8.3 Future research recommendations

In the future, more research should be conducted in other locations in Thailand to study the knowledge and attitude regarding Human papillomavirus, Human papillomavirus vaccine and cervical cancer among females of different age groups who are at risk of developing cervical cancer.

Since the study carried out among female students at Chulalongkorn university among few faculties this would not represent the entire college students knowledge and attitude towards Human papillomavirus, Human papillomavirus vaccine, cervical cancer and the practice of used and not used Human papillomavirus vaccine.

In the measurement tool, at the attitude part, few statement are quite difficult to interpret, therefore future research should consider the attitude statement carefully especially when it is regarding sensitive issue such as sexual behavior.

More in depth research would be needed to better understand hindrance factors associate with used and not used Human papillomavirus vaccine.

Further study on cost effectiveness should be considered to compare if the expenditure on cervical cancer screening and treatment would be lower than the expenditure on prevention method with the use of Human papillomavirus vaccine.

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APPENDICES

Appendix A

แบบสอบถาม (ภาษาไทย)

ความรู้ ทักษะคิดต่อ เอชพีวี เอชพีวีวัคซีน มะเร็งปากมดลูก และการได้รับวัคซีน ในนิติตปริญาตรีหญิงจุฬาลงกรณ์มหาวิทยาลัย
แบบสอบถาม แบ่งเป็น 5 ส่วน ดังนี้

1. แบบสอบถามเกี่ยวกับประวัติผู้ตอบแบบสอบถาม
แบบสอบถามเกี่ยวกับประวัติผู้ปกครอง
2. แบบสอบถามเกี่ยวกับปัจจัยเสี่ยง
3. แบบสอบถามเกี่ยวกับความรู้ของมะเร็งปากมดลูก เอชพีวีไวรัส และเอชพีวีไวรัสวัคซีน
4. แบบสอบถามเกี่ยวกับทัศนคติของมะเร็งปากมดลูก และเอชพีวีไวรัสวัคซีน
5. แบบสอบถามเกี่ยวกับการใช้ และไม่ใช้เอชพีวีวัคซีน

Part 1

วิธีการตอบแบบสอบถามลักษณะ : กรุณาทำเครื่องหมาย (X) หน้าคำตอบที่ท่านต้องการเลือก

1.1. ประวัติผู้ตอบแบบสอบถาม

- 1.1.1 ปัจจุบันคุณอายุเท่าไร ปี
- 1.1.2 ชั้นปี () 1. ปีที่ 1 () 2. ปีที่ 2 () 3. ปีที่ 3 () 4. ปีที่ 4 () 5. มากกว่าปีที่ 4
- 1.1.3 คณะ () 1. อักษรศาสตร์ () 2. เกษตรศาสตร์ () 3. สัตวแพทยศาสตร์
 () 4. วิทยาศาสตร์ () 5. นิติศาสตร์
- 1.1.4 สถานภาพ () 1. โสด () 2. คู่ / สมรส อยู่ด้วยกัน () 3. คู่ / สมรส แยกกันอยู่
 () 4. หย่า () 5. หม้าย / คู่สมรสเสียชีวิต () 6. คู่ / ยังไม่ได้สมรส
- 1.1.5 ท่านมีญาติหรือคนรู้จักเป็นมะเร็งปากมดลูกหรือไม่ () 1. มี () 2. ไม่มี

1.2. ประวัติผู้ปกครองของผู้ตอบแบบสอบถาม

- 1.2.1 อาชีพผู้ปกครอง.....
- 1.2.2 ผู้ปกครองมีรายได้ต่อเดือนเท่าไร () 1. น้อยกว่า 50,000 บาท () 2. 50,000 -100,000 บาท
 () 3. มากกว่า 100,000 บาท
- 1.2.3 ประวัติมารดาเคยเป็นมะเร็งปากมดลูก () 1. เป็น () 2. ไม่เป็น
- 1.2.4 คนในครอบครัวมีประวัติเป็นมะเร็งปากมดลูกหรือไม่ () 1. เป็น () 2. ไม่เป็น

Part 2 พฤติกรรมเสี่ยง

วิธีการตอบแบบสอบถาม : กรุณาทำเครื่องหมาย (X) หน้าคำตอบที่ท่านต้องการเลือก

- 2.1 ท่านเคยมีเพศสัมพันธ์มาก่อนหรือไม่ () 1. มี () 2. ไม่มี
- 2.2 ท่านเคยเป็นโรคติดต่อทางเพศสัมพันธ์หรือไม่ () 1. เคยเป็น () 2. ไม่เคยเป็น
- 2.3 ท่านใช้หรือเคยใช้ยาเม็ดคุมกำเนิดหรือไม่ () 1. ใช่ () 2. ไม่ใช่
- 2.4 ท่านสูบบุหรี่หรือเคยสูบบุหรี่หรือไม่ () 1. สูบบุหรี่ () 2. ไม่สูบบุหรี่
- 2.5 จำนวนคนที่ท่านเคยมีเพศสัมพันธ์มาก่อน () 1. ไม่มี () 2. 1 คน () 3. มากกว่า 1 คน

Part 3 ความรู้ของมะเร็งปากมดลูก เอชพีวีไวรัส และเอชพีวีวัคซีน

วิธีการตอบแบบสอบถาม กรุณาทำเครื่องหมาย (X) ในช่องที่ท่านต้องการเลือกคำตอบเพียงช่องเดียว

- ถูกต้อง หมายถึง ข้อความนั้นถูกต้อง
- ผิด หมายถึง ข้อความนั้นไม่ถูกต้อง
- กรุณาเลือกไม่แน่ใจ ถ้าท่านไม่สามารถตัดสินใจได้

ข้อ	ข้อความ	ถูกต้อง	ไม่แน่ใจ	ผิด
1.	เอชพีวีไวรัส เป็นสาเหตุหนึ่งของมะเร็งปากมดลูก			
2.	การสูบบุหรี่ เพิ่มความเสี่ยงต่อการเกิดมะเร็งปากมดลูก			
3.	การมีเพศสัมพันธ์กับคนหลายคนเพิ่มความเสี่ยงต่อการเกิดมะเร็งปากมดลูก			
4.	การมีเพศสัมพันธ์ตั้งแต่อายุน้อย เพิ่มความเสี่ยงต่อการเกิดมะเร็งปากมดลูก			
5.	อาการที่พบบ่อยในระยะเริ่มแรกของมะเร็งปากมดลูก คือการมีเลือดออกจากช่องคลอด			
6.	การตรวจคัดกรองมะเร็งปากมดลูก ลดอัตราการตายของมะเร็งปากมดลูก			
7.	มะเร็งปากมดลูกสามารถรักษาได้ หากตรวจพบตั้งแต่ระยะเริ่มต้น			
8.	ปัจจุบันมะเร็งปากมดลูกสามารถป้องกันได้ด้วยวัคซีน			
9.	เคยได้ยินเกี่ยวกับเอชพีวีไวรัสมาก่อน			
10.	คนที่ได้รับเชื้อเอชพีวีมักไม่มีอาการใด ๆ ทั้งสิ้น			
11.	ผู้ป่วยสามารถแพร่กระจายเชื้อเอชพีวีต่อผู้ที่มีเพศสัมพันธ์ด้วย แม้ไม่มีอาการใด ๆ ทั้งสิ้น			
12.	เอชพีวีไวรัสสามารถก่อให้เกิดโรคได้ทั้งในชายและหญิง			
13.	เอชพีวีไวรัสสามารถป้องกันได้ด้วยการรักษาความสะอาดอย่างดีเพียงอย่างเดียว			
14.	เอชพีวีไวรัสเป็นโรคติดต่อทางเพศสัมพันธ์			
15.	เอชพีวีวัคซีนไม่มีผลข้างเคียงที่ร้ายแรง			

ข้อ	ข้อความ	ถูกต้อง	ไม่แน่ใจ	ผิด
16.	ผู้ที่ได้รับวัคซีนแล้วไม่จำเป็นต้องตรวจคัดกรองมะเร็งปากมดลูก			
17.	อายุที่เหมาะสมที่สุดต่อการได้รับวัคซีน คือก่อนการมีเพศสัมพันธ์			
18.	ผู้ที่ได้รับวัคซีนไม่มีโอกาสเกิดโรคมะเร็งปากมดลูก			

Part 4 ทศนคติต่อมะเร็งปากมดลูก และเอชพีวีไวรัสวัคซีน

วิธีการตอบแบบสอบถาม: กรุณาทำเครื่องหมาย (X) ในช่องที่ท่านต้องการเลือกคำตอบเพียงช่องเดียว

1. เห็นด้วยอย่างยิ่ง หมายถึง เห็นด้วยอย่างยิ่ง กับข้อความนี้
2. เห็นด้วย หมายถึง เห็นด้วย กับข้อความนี้
3. ไม่มีความเห็น หมายถึง ไม่มีความเห็นกับข้อความนี้
4. ไม่เห็นด้วย หมายถึง ไม่เห็นด้วยกับข้อความนี้
5. ไม่เห็นด้วยอย่างยิ่ง หมายถึง ไม่เห็นด้วยอย่างยิ่งกับข้อความนี้

ข้อ	ข้อความ	เห็นด้วย อย่างยิ่ง	เห็น ด้วย	ไม่มี ความเห็น	ไม่เห็น ด้วย	ไม่เห็นด้วย อย่างยิ่ง
1.	ฉันคิดว่าฉันสามารถเป็นมะเร็งปากมดลูก					
2.	ฉันเชื่อว่ามะเร็งปากมดลูกไม่อันตราย					
3.	การตรวจคัดกรองมะเร็งปากมดลูกไม่จำเป็นสำหรับฉัน					
4.	ฉันใช้ถุงยางอนามัยเป็นประจำ ฉันจึงคิดว่ามะเร็งปากมดลูกจะไม่เกิดขึ้นกับฉัน					
5.	ฉันรักษาความสะอาดบริเวณอวัยวะเพศเป็นอย่างดี ฉันจึงไม่มีโอกาสเป็นมะเร็งปากมดลูก					
6.	ฉันกลัวว่ามะเร็งปากมดลูกจะเกิดขึ้นกับฉัน					
7.	มะเร็งปากมดลูกเป็นโรครที่น่ารักเกียจ					
8.	ฉันรู้ว่ามะเร็งปากมดลูกป้องกันได้					
9.	ฉันเชื่อว่าเอชพีวีวัคซีนจะลดโอกาสการเกิดมะเร็งปากมดลูก					
10.	ฉันรู้ว่าเอชพีวีวัคซีนไม่มีผลข้างเคียงที่ร้ายแรง					
11.	วัคซีนเอชพีวีเพื่อป้องกันมะเร็งปากมดลูก แพงเกินไปสำหรับฉัน					

Part 5 ประวัติการได้รับเอชพีวีวัคซีนของท่าน

- () 1. ท่านได้รับครบทั้ง 3 ครั้ง () 2. ท่านไม่ได้รับ หรือ ได้รับน้อยกว่า 3 ครั้ง

Appendix B

Questionnaire

Knowledge and attitude regarding Human papillomavirus, Human papillomavirus vaccine and cervical cancer, Human papillomavirus vaccination history among female bachelor degree students at Chulalongkorn University

Questionnaire comprise of five parts

1. Socio Demographic characteristics of respondents
Socio Demographic characteristics of respondent's parents
2. Risk behaviors
3. Knowledge regarding Human papillomavirus, Human papillomavirus vaccine and cervical cancer
4. Attitude regarding Human papillomavirus vaccine and cervical cancer
5. Practice if used and not used Human papillomavirus vaccine

Part 1

Instruction: Please mark X in the parenthesis ().

1. **1.1.** Socio Demographic characteristics of respondents
 - 1.1.1 Age Years
 - 1.1.2 Class Year () 1. First year () 2. Second year () 3. Third year
() 4. Forth year () 5. More than year four
 - 1.1.3 Faculty () 1. Arts () 2. Pharmacy () 3. Veterinary
() 4. Science () 5. Law
 - 1.1.4 Status () 1. Single () 2. couple / married live together
() 3 couple / married separate () 4. Divorced () 5. Widow () 6. couple/ not married
 - 1.1.5 Relative of familiarity with cervical cancer () 1. yes () 2. no
- 1.2** Socio Demographic characteristics of respondent's parents
 - 1.2.1 Parents' occupation.....
 - 1.2.2 Parents' income () 1 Less than 50,000 Baht () 2. 50,000 -100,000 Baht
() 3. More than 100,000 Baht
 - 1.2.3 History of mother's with cervical cancer () 1.yes () 2. no
 - 1.2.4 Family history with cervicalcancer () 1. yes () 2. no

Part 2 Risk Behaviors

Instruction : Please mark X in the parenthesis

- 2.1 History of sexual activity () 1. yes () 2. no
- 2.2 History of sexual transmitted diseases () 1. yes () 2. no
- 2.3 History of oral contraceptive pills () 1. yes () 2. no
- 2.4 History of smoking () 1. yes () 2. no
- 2.5 Number of sexual partners till now() 1. none () 2. 1 person() 3. More than 1 person

Part 3 Knowledge regarding Human papillomavirus, Human papillomavirus vaccine and cervical cancer

Instruction : please mark X in the column , only one column for each question

1. Correct means you think the statement is correct
2. Incorrect means you think statement is incorrect
3. Not sure means you are not sure regarding the statement

No.	Statement	Correct	Not Sure	Incorrect
1.	HPV virus is one of the causes of cervical cancer			
2.	Smoking increases the risk of cervical cancer			
3.	Multiple sexual partners increases the risk of cervical cancer			
4.	Early age sexual activity increases the risk of cervical cancer			
5.	Commonly seen symptoms of cervical cancer is vaginal bleeding			
6.	Cervical cancer screening decreases death rate of cervical cancer			
7.	Cervical cancer can be treated if diagnosed at an early age			
8.	At present cervical cancer can be prevented with the use of vaccine			
9.	Have heard of HPV virus before			
10.	People infected with HPV virus usually have no symptoms			
11.	Patients can transmit HPV virus to sexual partners even when have no symptoms			
12.	HPV virus can cause disease in both men and women			
13.	HPV virus can be prevented by good hygiene only			
14.	HPV virus is a sexual transmitted disease			
15.	HPV vaccine has no serious side effect			
16.	People who have been vaccinated with HPV vaccine need not undergo cervical cancer screening			
17.	The optimum age to get HPV vaccine is before sexual activity			
18.	People who have been vaccinated cannot develop cervical cancer			

Part 4 Attitude to Human papillomavirus vaccine and cervical cancer

Instruction: please mark X in the column for one best answer only

	Statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1.	I think I can develop cervical cancer					
2.	I believe that cervical cancer is not dangerous					
3.	Cervical cancer screening is not necessary for me					
4.	I usually use condoms therefore I think I cannot get cervical cancer					
5.	I keep good hygiene of my sexual organ therefore there is no chance for me to get cervical cancer					
6.	I am afraid that I will get cervical cancer					
7.	Cervical cancer is a disgusting illness					
8.	I know that cervical cancer can be prevented					
9.	I believe that HPV vaccine will decrease the risk of cervical cancer					
10.	I know that HPV vaccine has no serious side effects					
11.	HPV vaccine for cervical cancer prevention is too expensive for me					

Part 5 History of your Human papillomavirus vaccination

() 1. You received three doses complete () 2. You did not received or received less than three doses

Appendix C
Time Schedule

Project Procedure	Time Frame (Month)									
	Aug 11	Sep 11	Oct 11	Nov 11	Dec 11	Jan 11	Feb1 1	Mar 11	Apr 11	May 11
1. Literature review										
2. Writing Thesis proposal										
3. Submission for Proposal exam										
4. Proposal Exam										
5. Ethical consideration from Chulalongkorn University (CPHS)										
6. Pretest Questionnaire										
7. Field preparation and data collection										
8. Data analysis										
9. Thesis and article writing										
10. Final thesis exam										
11. Submission of article for publication										
12. Submission of thesis										

Appendix D

Budget

Activities	price
1. Data entering staffs and procedures(5 persons, 500 B each minimum 10 days)	25,000
2. Paper+ Printing	5,000
3. Photocopy	2,000
4. Stationary	2,000
5. Binding paper	2,000
6. Souveniers for respondents(100 B each)	4,000
7. Publication	5,000
8. Miscellaneous (telephone, internet)	5,000
Total	50,000

VITAE

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