Knowledge and beliefs about HPV and HPV vaccine among young Thai females

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ABSTRACT

Background: Human Papilloma Virus (HPV) is the recognized main reason for developing cervical cancer. HPV vaccine given to females is the most effective prevention. Purpose: To investigate knowledge and beliefs about HPV, cervical cancer and HPV vaccine among young Thai females in north-eastern part of Thailand. Further, to discover potential differences between those stating having knowledge about HPV and cervical cancer (group SHK), and those stating not having knowledge about HPV and cervical cancer (group SNHK). Method: A cross-sectional survey using a questionnaire about knowledge and beliefs of HPV where 221 young Thai females, aged 18-21, participated. Orem’s self-care theory was used as theoretical framework. Result: Less than 50% of the participants knew about visible signs and symptoms of HPV infection. However, over 70% had knowledge regarding HPV’s relation to sexual activity. Internet was the greatest source of information about HPV. Participants had positive belief towards the vaccine and more than 95% wished to get vaccinated. Group SHK had more knowledge then group SNHK with significant difference in seven out of fourteen knowledge items, and showed more positive beliefs with significant difference in six out of sixteen belief statements. Conclusion: The overall level of knowledge about HPV and cervical cancer was insufficient. However, this did not affect the participant’s beliefs in the subject negatively. Health care should provide viable internet sites with information about HPV to ensure that young Thai females get requisites, enabling self-care on preventing HPV infections by vaccination.

Keywords
Thailand, HPV, beliefs, knowledge, young females
SAMMANFATTNING

Bakgrund: Humant Papillom Virus (HPV) är den erkänd främsta orsaken till livmoderhalscancer. Vaccinering av unga kvinnor är den erkänd mest effektiva preventionen.

Syfte: Att undersöka kunskap och åsikter om HPV, livmoderhalscancer och HPV vaccin bland unga thailändska kvinnor i nordöstra Thailand. Vidare, att undersöka om det fanns några skillnader mellan dem som säger sig ha kunskap om HPV och livmoderhalscancer (grupp SHK) och de som säger sig inte ha någon kunskap om HPV och livmoderhalscancer (grupp SNHK).

Metod: En tvärsnittsstudie med ett frågeformulär om kunskap och åsikter om HPV som 221 unga thailändska kvinnor, i åldern 18-21, besvarade. Dorotea Orem omvårdnadsteori användes som teoretisk ram.

Resultat: Mindre än 50 % av deltagarna hade kunskap om symtom av en HPV infektion. Över 70 % hade kunskap om HPV och dess relation till sexuell aktivitet. Största källan för information om HPV var internet. Deltagarna hade positiva åsikter inför vaccinet, mer än 95 % skulle vilja vaccinera sig. Grupp SHK hade mer kunskap än grupp SNHK med signifikant skillnad i sju av fjorton kunskapsämnen, och visade mer positiva åsikter med signifikant skillnad i sex av sexton påståenden rörande åsikter.

 slutsats: Nivån av kunskap rörande HPV och livmoderhalscancer är otillräcklig, men det påverkar inte unga thailändska kvinnors åsikter om HPV vaccin i negativ riktning. Hälso- och sjukvården bör erbjuda korrekta och trovärdiga websidor med information om HPV för att ge unga thailändska kvinnor de förutsättningar som krävs för egenvård i prevention av HPV infektion genom vaccinering.

Nyckelord: Thailand, HPV, åsikter, kunskap, unga kvinnor
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BACKGROUND

HPV facts and history

Human Papilloma virus (HPV) is a sexually transmitted wart virus. Among the sexually transmitted diseases (STDs) it is the most common. Almost all sexually active men and women gets HPV at some points throughout their life, and it is contagious even if the infected person shows no sign of symptoms (Centres for Disease Control and Prevention, 2015). The virus infects the epithelium or mucous membranes of epidermis, where it creates a latent infection (Melhus, 2010; Owsianka & Ganczak, 2015). In an early stage the virus produces virus proteins which is stimulating cell division. When the skin cell is starting to evolve, a lot of virus particles develop, which turns into a wart that is full of infectious human papilloma virus (Melhus, 2010). Vaginal intercourse is the predominant mode of genital HPV transmission (Winer, Le, Hughes, Adam, Kiviat & Koutsky, 2002). However the virus can also be transmitted through skin contact (Winer et al., 2002). In the 1980s scientists achieved to isolate HPV type 16 and 18 from cervical cancer samples and a hypothesis was formed, recalling that cervical cancer was caused by HPV (Hausen, 2011).

HPV - correlation to cervical cancer

HPV is now recognized for being the main reason for developing cervical cancer. However, not all types of HPV cause cancer (Nubia Muñoz et al., 2003). HPV exists in over 100 various types of which about 40 types infect genitals. The types are classified into low- and high risk types where high risk types, such as type 16, 18 and 31, are associated with cancer (Jacobs et al., 1995; Hariri, Dunne, Saraiya, Unger & Markowitz, 2014).

HPV vaccine

The discovery of the correlation between HPV and cervical cancer led to the development of preventive vaccine against HPV (Hausen, 2011). Vaccination is today’s most effective intervention preventing cervical cancer caused by HPV (Serrano et al., 2015). Two prophylactic vaccines are approved by European Medicine Agency and by US Food and Drug Administration. One is a quadrivalent vaccine for HPV types 6, 11, 16 and 18 and the other is a bivalent vaccine towards HPV types 16 and 18. Both vaccines contain of non HPV DNA so they are not infectious and should be given in a three-dose vaccination schedule. These vaccines do not cover for all HPV associated cancer diagnosis; therefore cervical screening by
pap-smear, a method to identify HPV- DNA in cervix, should be carried out for women. HPV vaccine is very expensive implying that incorporating the vaccine into national programmes is difficult whereby the low- and middle-income countries have a much lower rate of introducing HPV vaccine in their national vaccination programmes in comparison to high-income countries. To achieve major reduction in cervical cancer for women ages 20-29 until the year 2025, at least 80 % of girls have to be vaccinated before having sexual relations (Poljak, 2012; WHO, 2015). Van Kriekinge, Castellsagué, Cibula & Demarteau (2013) suggest that if HPV vaccine coverage in Asia was 90%, 42 254 cervical cancer-related deaths could be avoided.

**Prevalence of HPV**

HPV type 16 and 18 alone causes worldwide 70 % of all cervical cancers (Clifford, Franceschi, Diaz, Munoz & Villa, 2006). World Health Organization (WHO) reported 266 000 deaths caused by cervical cancer in 2012. Further, 528 000 new cases of cervical cancer were reported, where approximately 85 % of the burden can be found in less developed regions of the world (WHO, 2015). Worldwide, people infected by HPV are estimated to 630 million. The prevalence of HPV is 50-80 % of sexual active women in age 15-24. Low- and middle income countries in Latin America, Africa and Southeast Asia have shown to be at significant risk of HPV infections. This study was carried out in Thailand where approximately 10 000 new cases of cervical cancer are found annually (WHO, 2010). Vaccine is today’s most effective prevention for HPV-caused cervical cancer and is given to adolescents, primarily girls (Serrano et al., 2015).

**HPV vaccine coverage in the world**

Australia was the first country with vaccination free of charge among 12-13 years old girls. Furthermore, countries where parents were supplied with information on HPV, showed a higher coverage rate, such as in Canada and United States of America. Countries health-cares policy on HPV and the vaccine affects coverage rate on vaccinated girls, which is proven by regional differences between the states of United States. Further, in South America Ministries of Health took action incorporating the vaccine into schools vaccine-programmes due to reports showing that girls get sexual active at the age of 15. This action resulted in a high coverage rate. In Europe the economical factor of the vaccine results in a big differences in coverage rate for vaccinated girls, depending on if patients cover the cost themselves or if it’s provided free of charge by the government. Western Europe and Scandinavia show a
higher coverage rate, with Sweden having 98% coverage of HPV vaccinated girls among 14 year olds because the country recently incorporated the vaccine into the school-based vaccination programme. Many countries in Europe have policy to promote the vaccination towards HPV in their health programmes but persons must pay for the vaccine themselves. Thus, the coverage ranges substantially among the countries in Europe. In Africa similar problem is shown as in South America with girls being sexual active at an early age. Low- and middle-income countries have a recognized problem introducing new vaccines to the public. By help from PATH (Programme of Advanced through Health and Education), countries such as Uganda are provided with the vaccine free of charge at schools, which increased the vaccination coverage to 83% in adolescent girls. Countries in Asia also work together with PATH, where Vietnam was a pilot country within PATH, introducing vaccine free of charge, whereby the coverage among 14 year old girls increased to 94%. The coverage rate in Thailand among 12 year old girls is about 60%. Hence, the total vaccinating coverage among girls would increase if vaccine-programmes were incorporated in schools, which also are the most cost-effective way of vaccinating (Owsianka & Ganczak, 2015).

**Knowledge and attitudes**

Few studies have investigated young females own knowledge and especially beliefs and attitudes towards HPV and the vaccine (Li et al., 2015). Cetin et al. (2013) showed that over 70% out of 390 girls in Istanbul, Turkey, did not have any information about HPV and half of them stated inadequate information. High cost was the main reason not wanting to be vaccinated. Girls with mothers who had completed higher education (graduation from high school and/or university) had more information about HPV than the girls with mothers with lower education (up to secondary school).

Li et al., (2015) performed a study among rural Chinese women by investigating knowledge of HPV and attitudes toward HPV vaccine before and after an education intervention in the subject by doctors and nurses. The education increased the number of women having knowledge from a few percent to over 50%. Further the majority would vaccinate their daughter even though they lacked knowledge about HPV and cervical cancer. They also found that females in rural areas had lower rate of vaccine coverage.

Charakorn et al. (2011) studied 764 women in Bangkok where just under half the sample knew about HPV and about one third had heard about the vaccine. The main causes for
accepting vaccine were fear of cervical cancer or following medical practitioner´s advice. Two thirds of the women were positive for vaccinating their daughters even though they lacked knowledge about HPV. The main reasons for rejecting vaccine were high cost and fear of unknown side effects. Songthap, Pitisuttithum, Kaewkungwall, Fungladda and Bussaratid (2012) also conducted a study in Bangkok, including 664 adolescents’, which showed that they believed women die of cervical cancer. The adolescent had an overall positive attitude towards the vaccine and most of them thought that girls should be vaccinated before they are sexually active. They further agreed that within the Thai culture, family communication on HPV vaccination subject would be beneficial if parents were given more knowledge that the vaccine would not lead to more risky sexual behavior. Juntasopeepun, Suwan, Pianmongkhol and Srisomboon (2012) did a similar study among 747 young female students, aged 18-24, in northern Thailand. Nearly everyone in that study received recommendation to get vaccinated, mostly from healthcare providers, friends or parents. However, only one tenth stated that they had any knowledge about HPV, cervical cancer and symptoms. But, over 50 % had high intension to get HPV vaccination within the following year. The high intension group showed to be of higher age, they had more sexual experiences and higher level of knowledge about HPV and its correlation to cervical cancer than the ones with lower intension.

Further, Juntasopeepun, Davidson, Suwan, Phianmongkhol and Srisomboon (2012) studied factors influencing acceptance of HPV vaccine in northern Thailand, in the city Chiang Mai. Almost 50 % out of 391 young females had heard about HPV vaccine and one sixth reported being recommended to get vaccinated primarily from health care providers. Sixty percent knew that HPV can cause cervical cancer. More positive attitudes towards the vaccine were shown by women who were sexual active and/or had been recommended to get the vaccine than the women with a more negative attitude.

Caring Sciences and theoretical framework
The theoretical framework of this study was Dorothea Orem’s self-care theory. Main focus in the theory is self-care, which she defines as “performances of activities that an individual initiates and executes with him- or herself in focus, with the purpose to maintain life, health and wellbeing”. Orem claims that human beings are, by nature, conscious, rational and determined. Orem also describes that if a person possesses knowledge and/or skills to identify his or her self-care requisites, he or she will. If a person can’t identify or satisfy his or her self-care requisite, he or she needs help from healthcare to compensate for the lack - with
the goal of repossessing his or her self-care capacity. The theory further claims that self-care includes changing, and requires knowledge to develop. If one have knowledge it will increase their ability for maintaining health and wellbeing (Orem, 1991).

**Rational of research**

The fact that almost all sexually active people have been carriers of HPV (Centres for Disease Control and Prevention, 2015) as well as HPV’s confirmed correlation to cervix cancer (Hausen, 2011) makes it a public health matter. HPV is a major factor for genital cancer and the primarily prevention to HPV is vaccine. One of the important parts of public health is prevention. For prevention work one has to understand the level of knowledge among whom it concerns. Increased number of vaccinated women would prevent cases of HPV infection. Henceforth, it would enhance global public health by decreasing the risk for women to develop cervical cancer.

Several studies showed a low HPV vaccine coverage rate in low- and middle-income countries, such as Thailand. So far, few studies have been carried out about knowledge and beliefs about HPV and HPV-vaccine among Thai young females, particularly in the northern part of Thailand. Therefore, it is of importance to investigate knowledge and beliefs of HPV and HPV vaccine among young females to increase healthcare professionals understanding about what variables that effect girls/women decision on vaccination.

**Purpose**

The aim of this study was to investigate knowledge and beliefs of HPV, cervical cancer and HPV vaccine among young Thai females aged 18-22 years in the upper North-eastern part of Thailand.

**Research questions**

1. What is the knowledge of HPV and cervical cancer among young Thai females in the upper North-eastern part of Thailand?

2. Is there any differences regarding knowledge of HPV and cervical cancer between the females who stated having knowledge of HPV and cervical cancer and those who stated not having knowledge of HPV and cervical cancer?
3. What are the beliefs of HPV and HPV vaccine among young Thai female in the upper North-eastern part of Thailand?

4. Is there any differences regarding beliefs of HPV and HPV vaccine between the females who stated having knowledge of HPV and cervical cancer and those who stated not having knowledge of HPV and cervical cancer?

**METHOD**

**Design**
This was a cross-sectional survey using a structured questionnaire. The design was chosen for its suitability to describe a curtain phenomenon, in this study knowledge and beliefs about HPV and HPV vaccine, at a fixed point. This study had a narrow time frame, a limited budget as well as a language barrier (the authors have poor skills in Thai language). The chosen design is recognized for being economical, easy to manage and timesaving (Polit & Beck, 2010), whereby it was considered suitable for this study.

**Settings**
The study took place at a Nursing College in Nakhon Phanom, which is the main city of Nakhon Phanom Province, located in the upper North-eastern part of Thailand. The Mekong-river dominates the city, and offers beautiful landscapes as well as agriculture and fishing industry. Due to its history and location the province consists of diverse ethnic groups and cultures whereas people from Laos and Vietnam is represented in the population (Tourismthailand, 2016)

**Sample**
A nonprobability sampling method was used to select young Thai females, aged 18-22 years. In cooperation with the dean and teachers at the nursing college, 277 female nursing students from the 1st and 2nd year who had not yet learned about HPV at college were invited to take part in the study, with the aim to reach 200 participants. Inclusion criteria were to be (1) a young female with the age of 18-22, (2) living in Nakhon Phanom Province of Thailand, and (3) willing to participate by answering every questions of a questionnaire. Criteria for
exclusion were (1) persons who were not willing to participate, (2) male gender (3) persons under aged 18 and over 22 and (4) persons who were not able to understand the written information and consent letter. If the questionnaire was not filled in completely, it was not included in the study.

Out of the 277 female students, 221 answered the questionnaire (response rate 79.8 %). Two women did not want to participate, and 54 participants did not fit the inclusion criteria (2=extern loss, 54= intern loss).

**Instrument**

A modified questionnaire (Appendix 1), developed from a validated questionnaire (Charakorn et al., 2011; Juntasopeepum et al., 2011) was used for data collection in this study. The modifications consisted of withdrawals as well as adding of question to fit the purpose of this study. The final version consists of 11 questions: Questions 1- 7 are background characteristics of the study participants; Question 8 (a- j) is background knowledge about HPV and HPV vaccine; Question 9 (a-n) is knowledge about HPV and cervical cancer; Question 10 is whether the study participants would, if possible, like to receive HPV vaccine; and Question 11 (a - p) is beliefs of HPV and HPV. The modified questionnaire was translated into Thai language with help from supervisor Dr. Lundberg and co-supervisor Dr. Dumrongpakapakorn.

**Procedure**

This study was a collaboration between a Nursing College at Nakhon Phanom University, Nakhon Phanom Province, Thailand and the Department of Public Health and Caring Sciences, Uppsala University, Sweden. A thorough review of literature was made by the authors to investigate what previously have been researched in this subject. A letter of information and consent (Appendix 2) was written by the authors, and translated into Thai with help from two teachers at the college who also helped to recheck the questionnaire, making sure the translated version still answered to the purpose of the study. Minor adjustments were made and approved by co-supervisor Dr. Dumrongpakapakorn. The Institutional Review Board, and the Institutions’ committee of ethics in Thailand gave their approval to carry out the study (reference number NPU252900I0, Appendix 3). A letter was also written to the Dean of the nursing college for permission to carry out the study (Appendix 4).
For validation of the modified questionnaire, the English version was tested on a group, consisting of 10 female university students (aged 18-23) in Sweden. The group completed the questionnaire without questions or objections. The Thai version was tested on a group, consisting of 10 female college students (aged 18-23) in Thailand. Out of the 10 females four did not answer all the questions. This outcome indicated the need for clearer and more precise verbal information.

One of the teachers helped to find a suitable time for data collection at the nursing programme. Three classrooms at the college were selected for data collection, one for each class at three different times throughout the day. The author’s distributed the questionnaires to the students, together with the letter of information and consent. Verbal information about the study and the rights of the participants were given in English by the authors and translated into Thai by one of the teachers. Females who didn’t want to participate were asked to mark the questionnaire with an X, while the other who would like to participate were asked to sign the consent letter and fill in every box in the questionnaire. When the questionnaires, by the participants, were considered completed they were left upside down at the seats and then collected by the authors. The authors stayed in the classrooms if the participants would have any questions and also to make sure there were no discussions among participants and checked that they didn’t use internet or other tools for finding out about HPV.

After completed data collection the authors checked the consent letters and questionnaires and selected the completed questionnaires, and excluded those who did not want to participate.

**Data processing and analysis**

The questions in the questionnaire were coded before analyzed. The coding was performed in accordance with the original version of the questionnaire (Juntasopeepum et al., 2011). For fully coded questionnaire see Appendix 5.

When analyzing beliefs about HPV and HPV vaccine the participants were given scores. Due to different characters of the belief statements in the questionnaire, “strongly agree” as well as “strongly disagree” can be either a negative or a positive belief. Score 1 equals very negative beliefs, score 2 equals negative beliefs, score 3 equals unsure beliefs, score 4 equals positive beliefs and score 5 equals very positive beliefs.
Data were analyzed by using the statistic programme Statistical Package for the Social Sciences version 20. Research question 1 and 3 were analyzed by using descriptive statistics. Research question 2 was analyzed using a Chi-Square Test and research question 4 was analyzed using a Mann Whitney U-test. Differences were considered significant if p≤0.05. All data were analyzed by using non-parametric descriptive statistics (Polit & Beck, 2010).

To analyze research question 2 and 4 the sample were divided into two groups according to the aim of the study; the females who stated having knowledge of HPV and cervical cancer, henceforth referred as group SHK (stated having knowledge) and those who stated not having knowledge about HPV and cervical cancer, henceforth referred as group SNHK (stated not having knowledge).

**Ethical consideration**
In accordance with SFS (2003:460) the participants were informed in their own language to secure that all participant knew the purpose of the study and what their role and rights in this study were, i.e. to assure that they understood that partaking in the study was voluntary and that they could at any time withdraw from the study. Also that their participation would have no effect or risk for future contact with healthcare or in their education. With respect for participants’ privacy the researchers followed the ethical principals presented by the Belmont Report: Beneficence (ensure that the benefits are maximized), Respect for Human Dignity (the role of self-determination) and Justice (ensure the participants’ right to fair treatment and respect for their privacy) (Polit & Beck, 2013).

**RESULT**

**Demographic background**
The female students were between 18 and 21 years old: 6.3 % (n=14) was 18 years old, 44.3% (n=98) was 19 years old, 42.5 % (n=94) was 20 years old and 6.8 % (n=15) was 21 years old. All participants were university students, 53.8 % (n=119) was in the 1st year of university, and 46.2 % (n=102) was in the 2nd year of university. Only 5 % (n=11) had a family history of cervical cancer.
Background knowledge about HPV and HPV vaccine

Out of the 221 participants 73.8 % (n=163) had heard about HPV and the greatest source of information was internet (77.4 %, n=171). Other sources of information were mass media (57%, n=126), advertisement (45.2 %, n=100), nurse or physician (43.4 %, n=96), friends (24 %, n=53) and/or family (21.3 %, n=47). Furthermore, 48 % (n=106) of the students stated having knowledge of HPV and cervical cancer.

Knowledge about HPV and cervical cancer

In eight out of the fourteen items less than 50 % answered correctly. Less than 30 % of the participants answered correctly regarding the item “HPV infection can be treated by antibiotics” and only 12.2 % answered correctly regarding the statement “HPV infection can be prevented by vaginal douching after intercourse”, (see table 1).

The results showed that the participants had knowledge, with more than 70 % correct answers, in the questions “having multiple sexual partners increases risk of HPV infection”, “HPV infection can cause cervical cancer” and “sex at early age increases risk of HPV infection” (see table 1).

Table 1. Knowledge about HPV and cervical cancer among young females (n=221).

<table>
<thead>
<tr>
<th>Question</th>
<th>Right answer</th>
<th>Wrong answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>HPV infection is contracted by sexual contact.</td>
<td>68.9 %</td>
<td>31.1 %</td>
</tr>
<tr>
<td>People can transmit HPV to their partner(s) even if they have no symptoms of HPV infection</td>
<td>47.1 %</td>
<td>52.9 %</td>
</tr>
<tr>
<td>Having multiple sexual partners’ increases risk of HPV infection.</td>
<td>84.2 %</td>
<td>15.8 %</td>
</tr>
<tr>
<td>Sex at early age increases risk of HPV infection</td>
<td>72.4 %</td>
<td>27.6 %</td>
</tr>
<tr>
<td>Genital warts are caused by HPV infection</td>
<td>39.8 %</td>
<td>60.2 %</td>
</tr>
</tbody>
</table>
Most people with genital HPV have no visible signs or symptoms.  
35.3 %
(n=78)  
64.7 %
(n=143)

HPV infection can be prevented by vaginal douching after intercourse.  
12.2 %
(n=27)  
97.8 %
(n=194)

HPV infection can be treated by antibiotics.  
29.9 %
(n=66)  
70.1 %
(n=155)

Smoking increases risk of cervical cancer.  
39.4 %
(n=87)  
60.6 %
(n=134)

HPV infection can cause cervical cancer.  
81.9 %
(n=181)  
18.1 %
(n=40)

Cervical cancer symptoms are commonly vaginal discharge or bleeding even in early stages of the disease  
57.5 %
(n=127)  
42.5 %
(n=94)

Cervical cancer can possibly cause bleeding after sex.  
44.8 %
(n=99)  
55.2 %
(n=122)

A pap smear is only performed among women with vaginal discharge or bleeding.  
38.9 %
(n=86)  
61.1 %
(n=135)

Unmarried women are not supposed to have a pap smear.  
69.7 %
(n=154)  
30.3 %
(n=67)

Differences of knowledge about HPV and cervical cancer

Participants in group SHK had greater knowledge in some items about HPV and cervical cancer, then those in group SNHK. In group SHK 59.4 % (n=63) knew that HPV can be transmitted without showing symptoms, while only 35.7 % (n=41) of the female students knew that in group SNHK. Further, in group SHK 39.6 % (n=42) knew that most people with genital HPV have no signs and symptoms, while 31.3 % (n=36) knew about this in group SNHK (see table 2).

When comparing knowledge of HPV and cervical cancer between the two groups significant differences (p≤0.05) were found in seven out of fourteen items. See table 2.

Table 2. Differences between group SHK and group SNHK in knowledge about HPV and cervical cancer.

<table>
<thead>
<tr>
<th>Question</th>
<th>Group SHK</th>
<th>Group SNHK</th>
<th>Pearson Chi-Square test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>%</td>
<td>x² value</td>
</tr>
<tr>
<td></td>
<td>(n)</td>
<td>(n)</td>
<td>(p-value)</td>
</tr>
<tr>
<td>Most people with genital HPV have no visible signs or symptoms.</td>
<td>35.3 %</td>
<td>64.7 %</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(n=78)</td>
<td>(n=143)</td>
<td></td>
</tr>
<tr>
<td>HPV infection can be prevented by vaginal douching after intercourse.</td>
<td>12.2 %</td>
<td>97.8 %</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(n=27)</td>
<td>(n=194)</td>
<td></td>
</tr>
<tr>
<td>HPV infection can be treated by antibiotics.</td>
<td>29.9 %</td>
<td>70.1 %</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(n=66)</td>
<td>(n=155)</td>
<td></td>
</tr>
<tr>
<td>Smoking increases risk of cervical cancer.</td>
<td>39.4 %</td>
<td>60.6 %</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(n=87)</td>
<td>(n=134)</td>
<td></td>
</tr>
<tr>
<td>HPV infection can cause cervical cancer.</td>
<td>81.9 %</td>
<td>18.1 %</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(n=181)</td>
<td>(n=40)</td>
<td></td>
</tr>
<tr>
<td>Cervical cancer symptoms are commonly vaginal discharge or bleeding</td>
<td>57.5 %</td>
<td>42.5 %</td>
<td></td>
</tr>
<tr>
<td>even in early stages of the disease</td>
<td>(n=127)</td>
<td>(n=94)</td>
<td></td>
</tr>
<tr>
<td>Cervical cancer can possibly cause bleeding after sex.</td>
<td>44.8 %</td>
<td>55.2 %</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(n=99)</td>
<td>(n=122)</td>
<td></td>
</tr>
<tr>
<td>A pap smear is only performed among women with vaginal discharge or</td>
<td>38.9 %</td>
<td>61.1 %</td>
<td></td>
</tr>
<tr>
<td>bleeding.</td>
<td>(n=86)</td>
<td>(n=135)</td>
<td></td>
</tr>
<tr>
<td>Unmarried women are not supposed to have a pap smear.</td>
<td>69.7 %</td>
<td>30.3 %</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(n=154)</td>
<td>(n=67)</td>
<td></td>
</tr>
</tbody>
</table>
HPV infection is contracted by sexual contact.  

<table>
<thead>
<tr>
<th></th>
<th>Group SHK (n=106)</th>
<th>Group SNHK (n=115)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>People can transmit HPV to their partner(s) even if they have no symptoms of HPV infection</td>
<td>59.4 % (n=63)</td>
<td>35.7 % (n=41)</td>
<td>0.000</td>
</tr>
<tr>
<td>Having multiple sexual partners’ increases risk of HPV infection.</td>
<td>90.6 % (n=96)</td>
<td>78.3 % (n=90)</td>
<td>0.012</td>
</tr>
<tr>
<td>Sex at early age increases risk of HPV infection</td>
<td>76.4 % (n=81)</td>
<td>68.7 % (n=79)</td>
<td>0.200</td>
</tr>
<tr>
<td>Genital warts are caused by HPV infection</td>
<td>48.1 % (n=51)</td>
<td>32.2 % (n=37)</td>
<td>0.016</td>
</tr>
<tr>
<td>Most people with genital HPV have no visible signs or symptoms.</td>
<td>39.6 % (n=42)</td>
<td>31.3 % (n=36)</td>
<td>0.196</td>
</tr>
<tr>
<td>HPV infection can be prevented by vaginal douching after intercourse.</td>
<td>12.3 % (n=13)</td>
<td>12.2 % (n=14)</td>
<td>0.984</td>
</tr>
<tr>
<td>HPV infection can be treated by antibiotics.</td>
<td>33.0 % (n=35)</td>
<td>27.0 % (n=31)</td>
<td>0.325</td>
</tr>
<tr>
<td>Smoking increases risk of cervical cancer.</td>
<td>34.9 % (n=37)</td>
<td>43.5 % (n=50)</td>
<td>0.193</td>
</tr>
<tr>
<td>HPV infection can cause cervical cancer.</td>
<td>83.9 % (n=89)</td>
<td>80.0 % (n=92)</td>
<td>0.445</td>
</tr>
<tr>
<td>Cervical cancer symptoms are commonly vaginal discharge or bleeding even in early stages of the disease</td>
<td>64.2 % (n=68)</td>
<td>51.3 % (n=59)</td>
<td>0.054</td>
</tr>
<tr>
<td>Cervical cancer can possibly cause bleeding after sex.</td>
<td>51.8 % (n=55)</td>
<td>38.3 % (n=44)</td>
<td>0.042</td>
</tr>
<tr>
<td>A pap smear is only performed among women with vaginal discharge or bleeding.</td>
<td>56.6 % (n=60)</td>
<td>22.6 % (n=26)</td>
<td>0.000</td>
</tr>
<tr>
<td>Unmarried women are not supposed to have a pap smear.</td>
<td>77.4 % (n=82)</td>
<td>62.6 % (n=72)</td>
<td>0.017</td>
</tr>
</tbody>
</table>

Note: Female students who stated having knowledge = group SHK (n=106) and female students who stated not having knowledge = group SNHK (n=115). Significant difference: p≤0.05

Beliefs about HPV and HPV vaccine

Over 50 % of the total observations in all questions except three was in the positive end of the scale (score 4 or 5). The three items that did not have a positive majority were HPV vaccine related and answered by the option unsure (score 3) by >60 % of the total sample (see table 3).
The results showed that 43.9% (n=97) strongly agreed (score 5) that HPV is a serious health disease, and 55.7% (n=123) agreed (score 4) they trust the HPV vaccine. More than 60% of the females reported that they agree (score 4) that there is a “risk for young women to contract HPV” and “risk for young women to contact cervical cancer (see table 3). Out of the participants 34.4% (n=76) disagreed (score 4) and 57.9% (n=128) strongly disagreed (score 5) that vaccination would make them sexually active earlier. Further 27.1% (n=60) disagreed (score 4) and 67.4% (n=149) strongly disagreed (score 5) that HPV vaccine does increase number of sex partners (see table 3). On the question “Would you like to receive HPV vaccine if you have a possibility to get it” 95.5% (n=211) answered yes.

Table 3. Beliefs about HPV and HPV vaccine among the female students (n=221).

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly agreed</th>
<th>Agreed</th>
<th>Unsure</th>
<th>Disagreed</th>
<th>Strongly disagreed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk for young women to contract HPV</td>
<td>16.3% (n=36)</td>
<td>68.3% (n=151)</td>
<td>12.7% (n=28)</td>
<td>1.8% (n=4)</td>
<td>0.9% (n=2)</td>
</tr>
<tr>
<td>Risk for young women to contract cervical cancer</td>
<td>20.4% (n=45)</td>
<td>61.1% (n=135)</td>
<td>14.5% (n=32)</td>
<td>4.1% (n=9)</td>
<td>0% (n=0)</td>
</tr>
<tr>
<td>HPV infection is a serious health concern</td>
<td>21.7% (n=48)</td>
<td>43.9% (n=97)</td>
<td>27.6% (n=61)</td>
<td>6.3% (n=14)</td>
<td>0.5% (n=1)</td>
</tr>
<tr>
<td>Cervical cancer is a serious disease</td>
<td>43.9% (n=97)</td>
<td>46.6% (n=103)</td>
<td>7.7% (n=17)</td>
<td>0.9% (n=2)</td>
<td>0.9% (n=2)</td>
</tr>
<tr>
<td>HPV vaccine is effective in preventing condyloplasma</td>
<td>4.1% (n=9)</td>
<td>25.3% (n=56)</td>
<td>67.4% (n=149)</td>
<td>2.3% (n=5)</td>
<td>0.9% (n=2)</td>
</tr>
<tr>
<td>HPV vaccine is effective in preventing cervical cancer</td>
<td>11.8% (n=26)</td>
<td>45.7% (n=101)</td>
<td>42.1% (n=93)</td>
<td>0.5% (n=1)</td>
<td>0% (n=0)</td>
</tr>
<tr>
<td>I trust the HPV vaccination</td>
<td>11.8% (n=26)</td>
<td>55.7% (n=123)</td>
<td>32.1% (n=71)</td>
<td>0.5% (n=1)</td>
<td>0% (n=0)</td>
</tr>
<tr>
<td>HPV vaccine can cause adverse effects</td>
<td>2.3% (n=5)</td>
<td>22.2% (n=49)</td>
<td>71.5% (n=158)</td>
<td>3.6% (n=89)</td>
<td>0.5% (n=1)</td>
</tr>
<tr>
<td>Problematic that HPV vaccination requires three injections</td>
<td>1.8% (n=4)</td>
<td>13.1% (n=29)</td>
<td>21.7% (n=48)</td>
<td>52.5% (n=116)</td>
<td>10.9% (n=24)</td>
</tr>
<tr>
<td>The efficiency of HPV vaccine is unclear</td>
<td>2.3% (n=5)</td>
<td>23.5% (n=52)</td>
<td>68.8% (n=152)</td>
<td>5.4% (n=12)</td>
<td>0% (n=0)</td>
</tr>
<tr>
<td>HPV vaccine is harmful</td>
<td>0.5% (n=1)</td>
<td>0.9% (n=2)</td>
<td>60.6% (n=134)</td>
<td>32.1% (n=71)</td>
<td>5.9% (n=13)</td>
</tr>
<tr>
<td>Women who have been HPV vaccinated should have pap smear annually</td>
<td>19.5% (n=43)</td>
<td>62.0% (n=137)</td>
<td>18.0% (n=40)</td>
<td>0.5% (n=1)</td>
<td>0% (n=0)</td>
</tr>
<tr>
<td>HPV vaccination decreases condom use</td>
<td>0.5% (n=1)</td>
<td>0.9% (n=2)</td>
<td>9.0% (n=20)</td>
<td>38.9% (n=86)</td>
<td>50.7% (n=112)</td>
</tr>
<tr>
<td>HPV vaccination causes me to be sexually active early</td>
<td>0% (n=0)</td>
<td>0.9% (n=2)</td>
<td>6.8% (n=15)</td>
<td>34.4% (n=76)</td>
<td>57.9% (n=128)</td>
</tr>
<tr>
<td>HPV vaccination increases number of sexual partners</td>
<td>0% (n=0)</td>
<td>0.5% (n=1)</td>
<td>5.0% (n=11)</td>
<td>27.1% (n=60)</td>
<td>67.4% (n=149)</td>
</tr>
<tr>
<td>HPV vaccination increases awareness of sexually transmitted diseases</td>
<td>30.3% (n=67)</td>
<td>53.8% (n=119)</td>
<td>13.6% (n=30)</td>
<td>1.4% (n=3)</td>
<td>0.9% (n=2)</td>
</tr>
</tbody>
</table>
Differences of beliefs about HPV and HPV vaccine

Participants in group SHK had more positive belief (mean score =4.6) then group SNHK (mean score= 4.4) regarding “HPV vaccine causes me to be “sexual active earlier”. SHK also had more positive belief (mean score= 4.2) then group SNHK (mean score 4.0) regarding “vaccination increases awareness about sexually transmitted diseases”.

Between group SHK and group SNHK there were significant differences (p≤0.05) in six out of sixteen items. See table 4.

Table 4: Differences between group SHK and group SNHK in belief about HPV and HPV vaccine.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Group SHK</th>
<th>Group SNHK</th>
<th>Mann Whitney U-test z-value</th>
<th>Mann Whitney U-test p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk for young women to contract HPV</td>
<td>4.0 (0.66)</td>
<td>3.9 (0.67)</td>
<td>5525.500</td>
<td>0.144</td>
</tr>
<tr>
<td>Risk for young women to contract cervical cancer</td>
<td>4.0 (0.68)</td>
<td>4.0 (0.75)</td>
<td>5925.000</td>
<td>0.681</td>
</tr>
<tr>
<td>HPV infection is a serious health concern</td>
<td>3.8 (0.89)</td>
<td>3.8 (0.85)</td>
<td>6047.000</td>
<td>0.914</td>
</tr>
<tr>
<td>Cervical cancer is a serious disease</td>
<td>4.2 (0.80)</td>
<td>4.4 (0.67)</td>
<td>5774.500</td>
<td>0.454</td>
</tr>
<tr>
<td>HPV vaccine is effective in preventing condyloma</td>
<td>3.3 (0.62)</td>
<td>3.3 (0.63)</td>
<td>5848.000</td>
<td>0.527</td>
</tr>
<tr>
<td>HPV vaccine is effective in preventing cervical cancer</td>
<td>3.7 (0.70)</td>
<td>2.7 (0.66)</td>
<td>5723.000</td>
<td>0.389</td>
</tr>
<tr>
<td>I trust the HPV vaccination</td>
<td>3.8 (0.63)</td>
<td>3.8 (0.66)</td>
<td>5977.500</td>
<td>0.781</td>
</tr>
<tr>
<td>HPV vaccine can cause adverse effects</td>
<td>2.7 (0.61)</td>
<td>2.8 (0.51)</td>
<td>5578.500</td>
<td>0.168</td>
</tr>
<tr>
<td>Problematic that HPV vaccination requires three injections</td>
<td>3.6 (0.86)</td>
<td>3.5 (0.96)</td>
<td>5396.500</td>
<td>0.109</td>
</tr>
<tr>
<td>The efficiency of HPV vaccine is unclear</td>
<td>2.8 (0.63)</td>
<td>2.7 (0.52)</td>
<td>5627.500</td>
<td>0.226</td>
</tr>
<tr>
<td>HPV vaccine is harmful</td>
<td>3.5 (0.68)</td>
<td>3.4 (0.59)</td>
<td>6209.000</td>
<td>0.031</td>
</tr>
<tr>
<td>Women who have been HPV vaccinated should have pap smear annually</td>
<td>4.1 (0.57)</td>
<td>3.9 (0.66)</td>
<td>5103.000</td>
<td>0.016</td>
</tr>
<tr>
<td>HPV vaccination decreases condom use</td>
<td>4.6 (0.65)</td>
<td>4.2 (0.76)</td>
<td>4403.500</td>
<td>0.000</td>
</tr>
<tr>
<td>HPV vaccination causes me to be sexually active early</td>
<td>4.6 (0.57)</td>
<td>4.4 (0.72)</td>
<td>4881.000</td>
<td>0.003</td>
</tr>
<tr>
<td>HPV vaccination increases number of sexual partners</td>
<td>4.8 (0.54)</td>
<td>4.5 (0.64)</td>
<td>4795.000</td>
<td>0.001</td>
</tr>
<tr>
<td>HPV vaccination increases awareness of sexually transmitted diseases</td>
<td>4.2 (0.71)</td>
<td>4.0 (0.77)</td>
<td>5112.000</td>
<td>0.022</td>
</tr>
</tbody>
</table>

Note: Female students who stated having knowledge = group SHK (n=106) and female students who stated not having knowledge = group SNHK (n=115). Significant difference: p≤0.05
DISCUSSION

Level of knowledge among young Thai females in northern part of Thailand was insufficient as over 50% answered incorrectly in eight out of fourteen knowledge items. Also, only 12% knew that HPV infection can be prevented by vaginal douching after intercourse and only 30% knew it can not be treated by antibiotics. Further, few knew about visible signs and symptoms of HPV infection. The majority of the study participants (>70%) had knowledge that multiple sex partners and that sex at early age increases the risk of HPV infection, and also that HPV infection can cause cervical cancer. Internet was the greatest source of information about HPV. There were significant difference between group SHK and group SNHK in seven out of fourteen items, those seven items concerned knowledge of HPV and its relation to sexual activity. The majority had positive beliefs about HPV vaccine, 67% strongly agreed that HPV vaccine does not increase number of sex partners while 72% were unsure that HPV vaccine could cause adverse effects. There were also significant differences between the two groups in six out of sixteen items about beliefs. Out of all participants more than 95% would take the vaccine if they had a possibility to get it.

Discussion of result

Knowledge

Slightly less than half of the young females (48%) stated that they had knowledge about HPV and cervical cancer. This is in line with the study of Cetin et al. (2013) where around fifty percent of young women had knowledge about HPV. A similar result is also shown in a study by Charakorn et al. (2011) where half of the participants from Bangkok knew about HPV. However, Cetin et al. (2013) found that among 501 females in Turkey the majority (78%) stated not having any information about HPV. In the current study the result has been the opposite where almost three quarter (74%) stated that they had heard about HPV but fewer claimed to have knowledge (52%). Juntasopeepun et al. (2012) found that only a tenth of the young females aged 18-24 in the northern part of Thailand knew about HPV. Evidently knowledge about HPV differs within regions in Thailand. Therefore, health professionals should consider that regional differences might exist when planning for information towards young females at college or university.

Level of knowledge among young Thai females in north-eastern part of Thailand was shown to be insufficient. Whereas a majority (>65%) thought antibiotics could cure HPV infection,
which in fact is incorrect. This result could risk that these females do not take preventing action on HPV by getting vaccinated. Because that vaccine is today’s only effective act for preventing HPV (Serrano et al., 2015), young Thai females should be provided with this knowledge, so they can be able to make a decision about vaccination. A majority of the young females also lacked knowledge that HPV infection can be prevented by vaginal douching after intercourse. Chu, Chang and Ding (2013) show that vaginal douching within 30 minutes after sexual contacts reduces the HPV infectious virus by 90 %, and within 6 hours it reduces the risk for infection by 60 %. This is important information to spread to young females, that they by a simple procedure such as vaginal douching can prevent the prevalence of infections and disease. Further few of the young females knew that people with genital HPV have no visible signs and symptoms, that people can transmit the virus to their partner even if they don’t have symptoms of HPV infection and that a pap smear is not only performed among women with vaginal discharge or bleeding. This may affect young Thai women to make a decision to conduct a pap smear. Juntasopeepun et al. (2012) also showed that knowledge on HPV affects willingness among young women to get vaccinated and conducting a pap smear. Increased knowledge may thereby lead to that more young Thai women would take action to know if they are infected by HPV by conducting a pap smear, making it an important act for preventing transmission of HPV. Many females in this study answered that unmarried women are not supposed to have a pap smear which further proves they lack knowledge about pap smear. Almost all sexual active women or men are infected by HPV sometimes throughout their lives (Centres of Disease Control and Prevention, 2015). Therefore, the information that a pap smear could be conducted among all women with or without symptoms, and married or not, should be spread.

Among the female participants a majority had knowledge that multiple sex partners increases the risk of HPV infection, and that HPV infection can cause cervical cancer. This indicates that young females in the upper Northeast of Thailand have been informed about HPV in some specific topics. The level of knowledge might have increased over the years because in 2012 only 60 % of the young females attending college knew about HPV (Juntasopeppun et al., 2012). Living in different regions of a country might explain the increased number having knowledge about HPV in this study as suggested by Songthap et al., (2012), in comparison with the study made by Juntasopeppun et al., (2012). Another arguable explanation might be that the government have taken more action for promoting knowledge and information about HPV since 2012 (Owsianka & Ganczak, 2015).
Most of the females also knew that HPV is contracted by sexual contact which is proven to be correct by Winer et al., (2012) who states that HPV is mainly contracted through vaginal intercourse. Further, participants in this study knew that sex at early age increases risk of HPV infection. These females might be in position to act more consciously if they would be, or are, sexual active. This is also supported by Juntasopeepun et al. (2012) where young females reported to have higher level of knowledge if being sexual active and having sexual experience. This study do not investigate if young Thai females sexual activity or experience which would be of interest for health care professionals if planning for information on HPV. This would ensure that they receive relevant and suitable information based on their experiences, which is one of the health care professionals’ responsibilities (Orem, 1991).

**Difference in knowledge**

Group SHK had higher level of knowledge than group SNHK in seven items regarding HPV and its relation to sexual activity and visible signs and symptoms. Higher level of knowledge has shown to be an important issue for taking preventing actions in form of HPV vaccination (Juntasopeepun et al., 2012). Level of knowledge was different between the two groups but both groups intended to get vaccinated, concluding that level of knowledge do not affect their wish for getting the vaccine. This is supported by several studies (Huang & Qiao, 2015; Charakorn et al., 2011).

**Belief**

Most of the females answered in the positive range about beliefs on HPV and HPV vaccine. The majority of the females believed that HPV is a serious health concern and cervical cancer is a serious disease, even if they had or lacked knowledge about HPV. This indicates that young Thai females know HPV is an important issue and that cancer is a subject of concern. Furthermore they had positive beliefs about the vaccine and wanted to get HPV vaccine even though they were uncertain about its efficiency and whether the vaccine is harmful or not. This has also been shown by Li et al. (2015).

Poljak (2012) clarify that the best effect of the vaccine occurs when given in three-dose vaccination schedule. A majority of the females in this research did not believe that vaccination provided by three injections was problematic. This means they believed it should be possible to vaccinate young Thai women. Further, individuals in the northern part of
Thailand has to pay for HPV vaccination by themselves (Juntasopeepun et al., 2012), and this is a factor resulting in lower coverage rates in countries (Owsianka & Ganczak, 2015). Hence, if schools in upper north-eastern part of Thailand would incorporate the HPV vaccination programme, the outcome would tentatively result in higher numbers of HPV vaccinated women, as shown in the study of Owsianka and Ganczak (2015). Females in this study also believed that getting vaccinated is not related to have more risk of sexual behaviors. A result that should be given to parents in Thailand, who need to be ensured that vaccination would not lead to more risk of sexual behaviors in their children (Li et al., 2015; Owsianka & Ganczak, 2015; Songthap et al., 2012).

**Difference in beliefs**
Group SHK had more positive beliefs than group SNHK in six statements regarding the vaccine and that vaccine do not lead to more sexual activity or risk of sexual behaviors. This means knowledge can lead to stronger positive beliefs about a disease and its preventions such as vaccination. The females in group SHK also showed stronger positive belief that HPV vaccination would increase awareness of sexual transmitted diseases. HPV would therefor clearly be a topic of concern to educate young Thai woman in, by being the most common STDs worldwide (Centres for Disease Control and Prevention, 2015). The education on HPV could be performed during half of day, which has shown to improve knowledge and thereby influenced to stronger positive beliefs by Huang and Qiao (2015).

**Self-care according to the caring theory of Orem**
Self-care requires knowledge to develop and make conscious and rational decisions. If young females doesn’t know about HPV and HPV vaccine she lack the ability in identifying her self-care requisites (Orem, 1991). This study showed that information about HPV and HPV vaccine was to the largest extent received from the internet. Therefore, it might be profitable for health care to use internet to a greater occurrence for reaching young Thai women with information about HPV. Park, Kim and Steinhoff (2016) present that the majority of people use generic search engines such as Google to find health knowledge and information, but only 50 % felt that the information could be trustworthy. Further, they also showed that people think that the ability to use internet for health information would be beneficial. They expressed that one appropriate method for health care to reach out with information to the public would be by sending information letters by email on a regular basis, especially about common infections. As stated in this study, HPV is a very common infection in young women.
(Centres for Disease Control and Prevention, 2015) whereby it should be included if performing such information letters. Creating information sites or letters with the aim to reach out to the public would further ensure that the population would receive reliable data and information, in this case on HPV. Healthcare professionals should be responsible in teaching young women where to obtain information on the internet with questions about HPV and HPV vaccination. This would ensure that valid information is available, making it possible for young Thai females to retrieve the requisites they need to be able to perform self-care (Orem, 1991). This is of great importance as Poljak (2012) emphasizes that increasing coverage and completion of the vaccination schedule is public healthcare professionals’ most important task.

Health care professionals are, in this study, only the fourth source of information, which indicates that they do not answer to their task. Nurses has an important role for preventing disease and to promote health (Orem, 1991). More research on what kind of information, how and when the young females retrieved it, is needed. There is a lack of knowledge regarding HPV vaccine, its effects and potential adverse effects. Orem (1991) claims that knowledge is required if one is suggesting a change among a population. The population need knowledge for the ability to perform self-care and to maintain health. More research on young Thai females exact knowledge about HPV vaccine and its effects is thereby be required.

**Discussion of method**

*Setting*

The culture in Thailand is that students follow teacher’s quest. In this study, the participant’s teacher was also the interpreter, which could have had an effect on their decision on participation. To ensure voluntary participation it was of great concern to mediate that whether they chose to take part in the study or not, it would not affect their further schooling. The study took place in the student’s classrooms where often tests and lectures are carried out. Hence, it was also of importance to convey that this study was not a test, and would not affect their grades or further schooling. Still, the choice of setting may have had a negative effect on the external validity. A non-school-related setting might have been more relaxed and resulted in a different outcome (Polit & Beck, 2010). However, because the setting is known to the study participants it may also have made them more comfortable in answering question with a sensitive subject such as HPV and its relation to sexual activity. Setting thereby may
have been influential to the high number of participants in the study in different ways.

Sample
The sample was college students. Research in many fields shows that a higher level of education often equals a higher level of general knowledge, even if it’s not the specific subject studied (Li et al., 2015; Cetin et al., 2013). The current study focused on nurse students, and even if it’s not certain, one can perhaps assume that nurse students has more knowledge about STDs and vaccines in general, than others. This might decrease the internal validity. For this reason it would also be preferable with a more randomized sample (Polit & Beck, 2010). Having this said, the selected participants were in early years of their education. They had, according to their teacher, through school not yet learned about HPV. This fact increases the internal validity, and therefor also the generalizability towards the population “young Thai females” (Polit & Beck, 2010).

Instrument
A majority of the intern loss was believed to have misunderstood the multi-choice question eight in the questionnaire. They marked the boxes where they had gotten information, but left the other boxes empty, instead of marking them “no”. Question 10 was also left out by some. In the Thai version of the questionnaire this question was design-wise a little bit hidden, and could easily been missed. This is a weakness of the instrument, a threat to its reliability, which may have led to the fairly large intern loss (Polit & Beck, 2010).

The questions regarding if the participant’s had heard about HPV, and sources of information were either poorly constructed in the instrument or misunderstood by some participants, whereas 77% (n=171) answered that they had heard about HPV from the internet and only 74% (n=163) participants stated they sometime had heard about HPV at all. To increase the reliability of the instrument, the follow up question “from where have you heard about HPV” should have been placed directly after the question “have you some time heard about HPV” (Polit & Beck, 2010). However, this result does not interfere with the purpose of this study.

A threat towards the instruments’ validity regarding the knowledge in the questions might be that the participants have a 50 % chance to guess the correct answer, if they chose not to fill in the “I don’t know” box. The validity is threatened in a sense the questionnaire might not measure the participants knowledge, but their ability to guess (Polit & Beck, 2010)
The original questionnaire was validated by supervisor Dr. Lundberg before used as a base in this research. The modified questionnaire was validated through two test-groups before used in this study. The English test-group questionnaires were completely filled in, while four out of ten questionnaires in the Thai test-group were not completely filled in. This finding led to more precise and clear verbal information to the participants before data collection. The instrument was considered having valid questions that answered the purpose of this study. (Polit & Beck, 2010).

Language and cultural differences
The study was performed in a foreign language, which the authors have limited knowledge about. This obstacle required translation, both in terms of information and the questionnaire. There is a risk that some information were lost or that questions were translated in such way it didn’t fully answered to the purpose. However, actions were made to avoid this, erasing any form of misunderstandings in the translating process. The translators were excellent in English, extra meetings were also held to discuss and validate the questionnaire to make sure the questions would still answer to the purpose. The letter of information and consent as well as the oral information were thoroughly discussed.

The vision for this study was that participation should be completely voluntarily. Throughout the process of giving information it was clarified multiple times that participation was voluntarily, as well as that withdrawal was acceptable at all times. However, after spending some time in Thailand it became clear to the authors that the culture urges people to help others. This may have led to that people participated even though they didn’t wanted to, but because they were asked to (Polit & Beck, 2010).

Clinical implication
As indicated by this study, nurses and physicians play an important role in informing about HPV and its vaccine. Healthcare professionals should take responsibility to increase knowledge of HPV, cervical cancer and HPV vaccine to young women. It is important to emphasize to young women about self-care and health behavior for promoting women’s health. Nurses thereby should provide information on HPV (Orem, 1991). This study showed that the most effective channel for information to young Thai women in the upper north-
eastern part was the internet. Sexual activity and STDs is a subject not spoken openly about in Thai culture (Songthap et al., 2012) making the internet an important source for young Thai women where they can be anonymous, particularly if health care could provide safe internet sites with information. This would ensure that the information is correct and reliable.

**Conclusion**

Level of knowledge about HPV and cervical cancer was insufficient among young Thai females, but it was not a factor that affects their beliefs about HPV vaccine in a negative way. There was uncertainty about the vaccines efficiency and adverse effects. However, the study participants were willing to get vaccinated. Further research regarding vaccinating rate and reasons not to get vaccinated, among young females in the upper north-east of Thailand, should be carried out. Health care should provide accurate and viable sites with information and knowledge about HPV through internet to reach out to young Thai females. This could ensure that they get requisites needed to conduct self-care on preventing HPV infections by vaccination.

**ACKNOWLEDGEMENT**

We would like to give our sincerest gratitude for the organization SIDA, via Univeristets- och högskolerådet (UHR) for making this work and thesis possible to begin with through Minor Field Study (MFS) scholarship. Without this scholarship, mentorship and experience from UHR and SIDA none of this experience would have been viable.

Further we want to give coordinator and supervisor dr. Pranee Lundberg our greatest thanks. Her knowledge and support made the thesis, journey and collaboration with Nakhon Phanom University possible.

Our sincerest gratitude to the Boromarajonani Nursing College, Nakhon Phanom University, the Dean and all staff members for opening up their college for the first time for exchange students. The university in cooperation with our co-supervisor Dr. Phensiri Dumrongpakapakorn, through her guidance and mentorship have made this study and research possible to conduct, we are deeply grateful and forever thankful. Without her and the Boromarajonani College we would not have had the opportunity for this experience, which we will remember and treasure throughout our lives. Special thanks to teachers, Jarinton Koteprom and Surachai Chaniang, for their consulting and help with organizing and making
the research possible to conduct. Without their translation, engagement and support this research would not have been manageable.

Last but not least we want to thank all the young women who participated in this study for their time and effort, without them no data, thereby thesis, would have been made.
REFERENCES


Appendix 1: Questionnaire (Removed due to copyright reasons)
Appendix 2: Letter of information and consent

Our names are Conny Öberg and Sofia Josefsson. We are students at the Nursing Programme at Uppsala University, Sweden.

We are working with our Bachelor Degree thesis about young Thai females’ knowledge of Human Papilloma Virus (HPV) and cervix cancer, and beliefs of HPV and HPV vaccine. The reason for this study is to examine the female students’ knowledge and beliefs concerning these issues in order to preparing an intervention programme by increase knowledge and understanding for young female about HPV and HPV vaccine. In addition, nurses and healthcare providers could take actions for prevention by spreading information and knowledge of HPV, cervix cancer and HPV vaccine. You, nursing student, (aged 18-23 years) can participate in this study by answering every question in the questionnaire. Your participation is valuable for our study.

Participation is voluntarily and you can withdraw at any time from the study. Your participation is anonymous and it will not be at any time possible to trace it to you personally. Your participation will not have any effect on your further schooling and/or grade. All collected questionnaires will be destroyed after finishing our thesis. It will take around 15 minutes to answer the questionnaire.

Before your participation in this study we want to ensure that you have understood this information and that you give consent for participating by signing this consent letter.

If you have any question, please contact us via our e-mail address.

We thank you for your time!

Sincerley,

Student: Conny Öberg Conny.oberg@gmail.com

Student: Sofia Josefsson Sofiajosefsson89@gmail.com
Main Supervisor: Associate Professor Dr. Pranee Lundberg, Uppsala University, Sweden
Co-supervisor: Dr. Phensiri Dumrongpakapakorn, Nakhon Phanom University, Thailand

I hereby confirm that I have read and understood the consent letter regarding the study “Knowledge and beliefs about HPV and cervical cancer among young female in the upper northeast of Thailand”.

I hereby give my approval and consent to participate in the study.

Signature
___________________________________________________________
Name in print
___________________________________________________________
Appendix 3 Approval by committee of ethics

- ข้อใดผิดควรกระทำ

ภาษาไทย:

ภาษาอังกฤษ: Knowledge and beliefs toward HPV and HPV Vaccine among Young Thai females.

1. มีคุณค่าในการวิจัย

2. รายชื่อผู้วิจัย

3. เอกสาร

3.1 เอกสารชี้แจงรายละเอียดงานวิจัยแยกกลุ่มตัวอย่าง

☐ ใช้ภาษาเข้าใจง่าย ไม่มีผลต่อจิตใจกลุ่มตัวอย่าง
☐ อธิบายเกี่ยวกับกระบวนการวิจัยชัดเจน
☐ อธิบายถึงการแยกกลุ่มตัวอย่างของข้อมูลของกลุ่มตัวอย่างได้ดี
☐ อธิบายผลลัพธ์ของกลุ่มตัวอย่างเมื่อต้องการยกจากกระบวนการวิจัย โดยไม่มีผลกระทบใดๆ
☐ อธิบายการดำเนินขั้นตอนการวิจัยจากขั้นตอนการวิจัยไปขั้นตอน

3.2 เอกสารอธิบายชี้แจงกระบวนการวิจัย

☐ ครบถ้วน ชัดเจน

3.3 เครื่องมือที่ใช้ในการวิจัย (ไม่สามารถใช้ได้จากเครื่องมืออื่นใด)

☐ เครื่องมือมาตรฐาน

☐ เครื่องมือที่มีผลคุณภาพมากจากเครื่องมือมาตรฐาน

☐ เครื่องมือที่สร้างขึ้นใหม่
3.4 เครื่องมือที่ใช้ในการทดลอง (ให้มี ตอกข้อ 3.4-3.6)

3.5 ความเสี่ยงที่อาจเกิดขึ้นจากการทดลอง

3.6 การควบคุมเงื่อนไขเมื่อผู้มีส่วนอย่างเกิดความเสี่ยงจากการทดลอง

ส่วนของผู้ประเมิน

จากรายละเอียดคัดเลือกและประเมินการพิจารณาจ้างระบบการวิจัยในมนุษย์ ดังนี้
☐ ผ่าน อย่างไม่มีเรื่องใด
☐ ผ่าน อย่างมีเรื่องใด เมื่อปรับแก้ไขแล้วไม่ต้องสงสัย
☐ ผ่าน อย่างมีเรื่องใด เมื่อปรับแก้ไขแล้วให้ส่งประเมินการพิจารณาจ้างระบบการวิจัยในมนุษย์

หมาย
☐ ไม่ผ่าน

Serina Josefsso* (ลงชื่อนำหน้าโครงการวิจัย)

Conny Söberg

(หมายเลขทะเบียน)

Supianne Sittikan

(ลงชื่อผู้ประเมินโครงการวิจัยในมนุษย์)

วันเดือนปี
Appendix 4: Inquiry of research

Department of Public Health and Caring Sciences

Dear dr. Phensiri Dumrongpakapakorn!

Our names are Conny Öberg and Sofia Josefsson. We are senior students at the Nursing Programme at Uppsala University, Sweden. Conny Öberg is 31 years old and Sofia Josefsson 27 years old. We will graduate as registered nurses 4th of June 2016. We are interested in doing our research at your nursing college of Nakhon Phanom University from the 1st to the 30th of April 2016. To target young Thai females in the northeast part of Thailand we find your college appropriate to carry out research according to the aim of the study.

The research is for our Bachelor Degree thesis about young Thai females' knowledge of Human Papilloma Virus (HPV) and cervix cancer, and beliefs of HPV and HPV vaccine. The reason for this study is to examine the female students’ knowledge and beliefs concerning these issues in order to preparing an intervention programme by increase knowledge and understanding for young Thai female about HPV and HPV vaccine. In addition, nurses and healthcare providers could take actions for prevention by spreading information and knowledge of HPV, cervix cancer and HPV vaccine.

We hope you will be interested in our study and we would be happy to be able work in cooperation with you and your college.  
If you have any questions or remarks please contact us.

Sincerely

________________________________________________________________________
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Appendix 5: Coded questionnaire (Removed due to copyright reasons)