Knowledge about hepatitis B and attitudes towards hepatitis B vaccination among university students in Thailand

A quantitative study

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Sammanfattning

Introduktion: Hepatit B är en mycket smittsam infektion. Grundläggande kunskap om hepatit B är nödvändigt, med större kunskapsunderlag kan individen förebygga sig mot att bli smittad t.ex. av att använda sticksäkra kanyler. I Thailand är uppskattningsvis 8-20 % av befolkningen smittade med hepatit B.

Syfte: Syftet var att undersöka kunskapen om hepatit B och attityden mot hepatit B vaccin hos thailändska universitetsstudenter.

Metod: En kvantitativ tvärsnittsstudie användes. 280 studenter medverkade i studien med ett deltagande på 93.9 %. Data analyserades med SPSS Statistics 20.

Resultat: Båda könen hade dålig kunskap om hepatit B, men 91.1 % av studenterna hade hört talas om infektionen. Ungefär hälften av studenterna (55.4 %) visste att hepatit B smittas via oskyddat samlag och 40.0 % visste att hepatit B kunde orsaka levercancer. Det fanns inte någon signifikant skillnad mellan könen gällande kunskapen om hepatit B. Attityderna mot vaccinet var tillfredsställande mellan båda könen, 89.3 % av studenterna visste att även friska personer behöver vaccineras och 81.1 % trodde att de själva kommer vaccinera sig i framtiden. Endast 43.6 % av studenterna visste att vaccinationen kunde vara kostnadsfri eller ha ett reducerat pris. Det fanns en signifikant skillnad (p-värde = 0.042) mellan könen; de manliga studenterna hade en mer positiv attityd till vaccinet än de kvinnliga studenterna.

Slutsats: Resultatet visade att mer information om hepatit B till thailändska studenter är nödvändigt för att öka kunskapen i denna målgrupp. Information om hur infektionen smittas är en viktig del för att förbättra folkhälsan. Det är även viktigt att förbättra individens egenvård samt att uppmuntra till vaccination. Från ett omvårdnadsperspektiv är det viktigt att öka kunskapen om hepatit B och en positiv attityd till vaccinet, i en förlängning bidra till att sänka prevalensen av hepatit B.

Nyckelord: Hepatit B, kunskap, Thailand, vaccination, förebyggande, egenvård, omvårdnad
Abstract

Introduction: Hepatitis B is a highly contagious infection. Basic knowledge about hepatitis B is necessary; with more knowledge people take preventive actions against hepatitis B, such as using stick proof cannulas. In Thailand an expected number of 8-20% of the population are currently carriers of the HBV infection.

Aim: The aim of the study was to investigate the knowledge about hepatitis B and the attitudes towards the vaccination among Thai university students.

Method: A cross-sectional study with a quantitative method was used. 280 students participated in the study, and the response rate was 93.9%. The data was analysed using SPSS Statistics 20.

Result: Both genders had poor knowledge about hepatitis B, however 91.1% of the students had heard about hepatitis B. About half of the students (55.4%) knew correctly that hepatitis B is sexually transmitted and 40.0% of the students knew that hepatitis B could cause liver cancer. There was no significant difference in knowledge between the genders. The attitudes towards the vaccine were satisfactory between both genders, 89.3% of the students knew that healthy people need the vaccination and 81.1% believed that they would receive the vaccination. However, only 43.6% knew that the vaccination could be free or low cost through certain programs. There was a significant difference (p-value = 0.042) between the genders; the male students had a more positive attitude towards the vaccine than the female students.

Conclusion: The results from the Thai students showed that more information about the Hepatitis infection is needed to raise awareness among this certain group of people. Information about how it is transmitted is essential to improve the public health. It is also important to improve the individual's self-care, to encourage them to receive the vaccination. From a nursing point of view improving the knowledge about HBV and a positive attitude towards the vaccine in the prolonging contribute to improve the public health by getting a lower rate of cases with HBV.

Keywords: Hepatitis B, knowledge, Thailand, vaccination, prevention, self-care, nursing
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Background

Hepatitis B – virus

Hepatitis stands for “inflammation of the liver” and five types of viruses can cause viral hepatitis. Hepatitis B (HBV) is according to the World Health Organization (2012) the most common liver infection in the world. HBV is a virus that only can infect humans and today 240 million people are infected by chronic HBV in the world (WHO, 2015). According to the World Health Organization (2015) the mortality rate in the world due to complications of HBV per year is more than 780,000 people.

The infectious agent in HBV is transmitted with body fluids such as blood, vaginal fluids, semen, saliva and mucous membranes. For example HBV can be transmitted from mother to child at birth (perinatal transmission), by sexual contact with an infected person, by using unclean needles, by unsafe blood transfusions and between children in the early childhood (Public Health authority of Sweden, 2015).

The HBV has a membrane called HBsAg, under the membrane there is other marks such as HBeAg and HBcAg. These ones or their corresponding antibodies will appear in blood samples of a person who has the infection. HBV can be an acute and chronic disease. Laboratory blood tests are used to test for HBV antibodies in the blood, the tests can distinguish if it is an acute or chronic infection (Public Health authority of Sweden, 2015). In most cases among adults, the infection heals. However, about 5 %, the infection becomes chronic and causes a liver inflammation. The risk of getting the chronic HBV is higher if the person is young when getting infected. The risk for newborn children to get the chronic HBV infection is as high as 90 % in transmission through body fluids (Public Health authority of Sweden, 2015).

According to the World Health Organization (2013), symptoms for HBV vary, and some get the infection but have no symptoms, while others can get symptom such as loss of appetite, abdominal pain, nausea, dark urine, acute illness, vomiting and fatigue that can last from weeks to months. Yellowing skin and eye-whites (jaundice) can appear. Some can even get severe liver inflammations that later on can turn into liver cancer (WHO, 2013).
There is no cure for acute HBV, for the chronic infection there is a treatment with oral antiviral agents (WHO, 2015). This treatment will slow the progress of cirrhosis, reduce the risk of it progressing to liver cancer and improve long-term survival.

**Hepatitis B - vaccine**

Since 1982 there is a vaccine against HBV that gives 95% protection against the infection (WHO, 2012). The World Health Organization recommends that all infants should get the HBV-vaccination, and their first dose within 24 hours after birth, followed by two more doses to complete the series. The protection lasts for 20 years and is possibly life-long (WHO, 2015).

The hepatitis B vaccine is counted as one of the safest vaccinations. People cannot get HBV from the vaccine and the most common side effects is soreness and redness in the arm where the injection was given (3 - 29%) and fever over 37.7°C (1 – 6%) (Centers for Disease Control and Prevention, 2015). The vaccine is the first “anti-cancer vaccine” because it protects from getting hepatitis B that is the main source for liver cancer. About 80% of all liver cancer cases are developed from HBV (Hepatitis B Foundation, 2015).

Some people have a greater risk of getting infected than the others, such as medical personnel, persons with sexual risk behavior, and people who inject drugs and partners to a person living with HBV (Public Health authority of Sweden, 2015). For these risk groups, vaccination is recommended and people are now more protected due to vaccination initiatives.

A study about the vaccination achievements for the last three decades has been made by Marinho, Meireles & van Damme (2015). Over the past 30 years investments in the primary prevention have been done to increase the coverage of the universal vaccination programs with great result. In the eighties the HBV vaccine was only given to persons with a great risk of getting the infection but today it is different. Today 179 countries in the world have vaccination against the infection in their routine vaccination program and are given to all infants. According to Marinho et al. (2015) the vaccination has proven to give good protection and it is a safe and effective way to prevent populations from developing acute or chronic hepatitis B.
The current vaccination has an efficacy over 90 %, after the complete treatment with three doses. The vaccine can be used against all HBV genotypes and serotypes. Marinho et al. (2015) point out that there still are big challenges to deal with, such as the occurrence of breakthrough infections, the effectiveness of the universal HBV vaccination and the effect of natural boosting.

Hepatitis B - knowledge

A cross-sectional study by Bui et al. (2013) investigated Vietnamese Americans knowledge and the prevalence of hepatitis B. The results showed that there is a lack of knowledge about HBV, 32.9 % thought incorrectly that HBV was transmitted through casual contacts or by contaminated air or food. The results also showed that there was a lack of knowledge regarding the treatment, 42.7 % knew that there is a treatment for HBV and 50.4 % believed that a positive attitude could prevent HBV. The authors of the study discussed about herbal/alternative medication as a part of the Asian culture, that the Vietnamese Americans has not yet been influenced by Western culture and medicine.

A cross- sectional study by Gürakar, Idilman, Keskin and Malik (2014) was made in Turkey. The aim of the study was to investigate the public awareness about hepatitis B in Turkey and to use the result as a model over the universal effectiveness in health care policy. A questionnaire including 32 questions about awareness of HBV infections, ways of transmission and consequences after getting the infection was used. The result showed that 60 % of the participants had basic knowledge that hepatitis B is a transmissible infection and HBV is a major cause of serious liver disease. Promoting awareness of HBV should be a useful and effective strategy to prevent the spread of HBV, as well as it being a cost-effective strategy to use globally.

A cross-sectional study made in Lao investigated students in different health professions’ knowledge about hepatitis B and the vaccine (Buisson, Khampanisong, Latthaphasawang, Pathoumthong, Souvong & Quet, 2014). In this survey 961 respondents answered demographic questions, if they had been vaccinated and reasons if they were not vaccinated. The results showed that 53 % of the students were not vaccinated. The reason of not getting vaccinated was that they did not know where to get vaccinated or that the vaccine was too expensive. The study also showed that those who were vaccinated were mostly postgraduate students. The authors made a conclusion that postgraduate students had more knowledge
about the HBV infection and therefore had a more preventive attitude. Birungi, Korchmaros, Prescott and Ybarra (2015) also describe that information about prevention about infections/certain states should be given to a younger population.

Noreen, Kumar and Shaikh (2014) investigated the knowledge about HBV and vaccination among women in childbearing age (14-45 years old) in the Punjab province, Pakistan. A number of 430 women participated in the survey by answering a questionnaire with semi-structured questions. The results showed that only 34% of the participants had knowledge about the existence of a vaccine used for prevention and less than half of the women had knowledge that hepatitis B is transmitted through blood and sexual intercourse. Age, level of education and obstetric history was significantly associated with knowledge about HBV and the vaccination. The knowledge regarding hepatitis B and the vaccination among women of childbearing age in the Punjab province was strongly associated with the education level of the women. Lady health workers gave the main source of the information. Noreen et al. (2014) suggested that better health promotion and behavior change campaigns are needed to increase the level of knowledge about hepatitis B and its vaccination among women of rural areas of the world where they have little exposure to the mass media.

**Attitudes about vaccinations**

Carter et al. (2013) investigated in the USA if there is an association between parents and health care providers concerning attitudes and beliefs related vaccine. There were 1367 parents and 551 health care providers who completed the questionnaires. The result showed that the parents, who have positive attitude towards vaccination, were more likely to have a health care provider who had the same attitude. Health care providers had a strong influence on the parents’ decisions about vaccination. Carter et al. (2013) suggest giving more education to the health care providers to emphasize the importance of not letting the personal attitudes interfere with the patient communication.

A systematic review from the United Kingdom analyzed 1164 articles about vaccine hesitancy. Vaccine hesitancy is defined as “a behavior, influenced by a number of factors including issues of confidence, complacency and convenience”. Level of income was identified as one factor; a high income was seen as a promoter to vaccination. Considering the level of education – it could be both a promoter and a barrier against vaccination. For example
could high level of education be a barrier because of the amount of knowledge, people knew “too much” about vaccines/diseases that they drew conclusions by themselves to consider if vaccination is necessary or not (Eckersberger, Jarrett, Larson, Paterson & Smith, 2014).

A cross-sectional descriptive study was made in Lagos, Nigeria to investigate health workers knowledge and attitude towards hepatitis B vaccination (Abiola, Akodu & Omoyeni, 2013). There were 88 respondents who answered a structured questionnaire. The result showed that the majority had good knowledge about HBV and its’ vaccination (70.2 %), however only 45.1 % knew that a screening for HBV-antibodies is necessary to confirm protection after the immunization. Poor practice for the HBV vaccination was shown in 84.5 % of the respondents. The majority of these health workers said that the non-availability of the vaccine was a reason for not getting the vaccination. The authors made the conclusion that there needs to be good immunization policies for the healthcare workers as well as to provide the health workers with good information about blood-transmitted infections.

No recent studies about attitudes towards the HBV vaccination in Thailand have been found. However a study made in Thailand by Juntasopeepun, Phianmongkhol, Srisonboon and Suwan (2012) investigated factors that could influence the acceptance of human papillomavirus (HPV) vaccine among female students. A sample of 747 women between the ages of 18 – 24 years answered a questionnaire about the knowledge and beliefs towards cervical cancer and HPV. The result showed that nine percent of the participants had received the vaccine and 13 % had been recommended to be vaccinated. Those who recommended the vaccination were healthcare providers (59.8 %), friends (46.4 %), and parents (39.2 %). The result also showed that those participants who understood the seriousness of the HPV infection, were more likely to be vaccinated. Juntasopeepun et al. (2012) discussed that the acceptance of the vaccine was higher among those who got the recommendation from someone who they knew. They also discussed that it is embarrassing to receive the HPV vaccination as it is related to sexual behavior and sexual transmitted diseases.

**Hepatitis B globally**

Globally everyone is in risk of getting hepatitis B. For example by having unprotected intercourse, contact with blood and from mother to child at birth. Approximately 400 million people worldwide have the infection today and the Asian population has the highest rate of
HBV globally according to the Asian Liver Center at Stanford University (2015). The hepatitis B Foundation (2015) declares that 260 million of the infected persons live in Asia and that 10 % of them are carriers of the chronic kind of hepatitis B. According to Centers for Disease Control and Prevention (2015) the prevalence of chronic hepatitis B among adults in South East Asia, which includes Thailand, shows a high intermediate of hepatitis B (5 - 7 %).

The prevalence of chronic hepatitis B among adults varies over the world. The highest prevalence of HBV is found in the western region of Africa, over 8 % of the adult population has the infection. In the major part of Africa, South-East Asia and Central Asia the prevalence among the adult population is 5 - 7 % (Centers for Disease Control and Prevention, 2015).

The most common ways of getting infected are different between Asian people and non-Asian people. According to the Hepatitis B Foundation (2015), the most common way for non-Asians to get infected is young people who have unprotected intercourse. For Asians, getting hepatitis B as infants or in the early childhood is the most common way of transmission. Children can get the infection prenatally at birth, from other infected children or from family members they live close to (The hepatitis B Foundation, 2015).

**Hepatitis B situation in Thailand**

HBV is a major concern for the public health in Thailand (Chimparlee, Oota, Phikulsod, Poovorawan & Tangkijvanich, 2011). Thailand has a high endemicity and 8 – 20 % of the population are currently carriers of HBV (WHO, 2015). Of those who get infected, approximately 70 – 90 % of them are under the age of 40 years old. The infection rates are also very high among infants and continue through early childhood. In 2013, the South-East Asia region has an expected number of 1 380 000 cases of HBV with 300 000 deaths annually (WHO, 2013).

In 1988 the Ministry of Public Health in Thailand introduced a nationwide immunization programme of new-borns (Chimparlee et al., 2011). In the beginning there was a pilot project in two provinces: Chiang Mai and Chon Buri. In 1990 the project was expanded to ten additional provinces and it was nationwide in 1992. If an HBV-positive mother carried the infants, the vaccine was added with hepatitis B immunoglobulin. In 2011, 98 % of the new-borns were vaccinated against HBV. A study by Chaiear et al. (2006) investigated the
prevalence of HBsAg after the vaccine was introduced to the nationwide immunization programme to infants. The study showed that it decreased from 4.3 % to 0.7 %. This was a major breakthrough and motivated other countries in the South-East Asian region to take action against HBV.

Culture differences among the genders – Thailand
For the genders the Thai culture sets some differences, it is more accepted in the communities for males to have premarital sex than it is for females (Crozier, Pfeil & Sridawruang, 2010). However in the traditional Thai culture, premarital sex is strictly prohibited between both genders. The effect of this is that the families of the sexually active adolescents will be disappointed and have a negative attitude towards the adolescent (Crozier, Pfeil & Sridawruang, 2010). This leads to adolescents being unhonest about their sexual experiences, because this reveals the loss of their virginity.

There is a better attitude towards the males in the community if they are sexually active, because it is a normal experience for young males. The society accepts young males being sexually active because it is a way for him to show that he is being a mature man, this will not change the reputation of the young males’ family in comparison to the females. In the young females family, there will possibly be a negative reputation and attitude (Crozier, Pfeil & Sridawruang, 2010).

Nursing Responsibility
A study by Gust, Kennedy, Pickering, Smith and Wooten (2006) which investigated if the health care providers such as physicians and nurses have influence on parents beliefs about vaccination. A number of 7695 children between the ages of 19 to 35 months participated in this survey. The result showed that 5.7 % of the parents’ thought that vaccines were unsafe and 21.5 % of them declared that the decision of vaccinating their children was not influenced by any health care provider. Gust et al. (2006) made a conclusion that in those cases where the health care provider had a positive attitude, the parents where twice as likely to share the same positive attitude.

A study was made to investigate if patients educated by medical-, nursing- and pharmacy students’, improved the patients’ knowledge about hepatitis B (Chen, Lai, Lau, Ouyang, Sheu & Yuan, 2012). First- and second year medical, nursing and pharmacy students led the patient
education. The education script included transmission risk factors, complications of the chronic infection, screening, vaccination and HBV symptoms. The authors evaluated the knowledge of the respondents at three times: before education, after the initial visit and one month after the education was finished. The result showed that the participants’ score were 56.4 % before education, 66.6 % after initial visit and 68.3 % after the one month follow up. The authors’ conclusion suggests that disease-specific preventive education could be effective in improving patients’ health knowledge, which may lead to preventive behaviors.

**Theoretical framework**

The “health belief model” (HBM) is a theory based on the connection between the behaviour and the risk of getting a specific disease/infection (Glanz, Rimer & Lewis, 2002). The HBM has six primary concepts to predict why people decide or do not decide to control, prevent or screen for different illness conditions. The primary concepts are perceived susceptibility, benefits, severity, barrier and cues to action and self-efficacy.

According the Health Belief Model the persons own threat of a disease or illness together with the belief of the effectively of the treatment for the current disease or illness represent the probability that he or she will achieve the treatment or choose not to (Boston University School of Public Health, 2013).

HBM is based on two theories; one psychological theory and one behavioural theory. These two theories are important components in the science of the human health-related behaviour. The psychological side of the HBM is the belief a person has the effectiveness of a certain treatment, and the fact that the treatment will cure and prevent illness and disease. The behavioural side of the model is the action a person takes to prevent him or herself from getting sick or if he or she already has a disease try to get well (Boston University School of Public Health, 2013). To accept the recommended health action, such as getting the vaccination for hepatitis B, is one action a person can take to promote his or her health.

The Dorothea Orem’s self-care theory is based on the activities the individual himself can do to maintain their own health (The National Board of Health and Welfare, 2011). Vaccination can be seen as one way to maintain health. According to Orem, the personal self-care and wellbeing varies with age, life experience, condition of health and other resources such as
knowledge about how a specific infection spreads. Orem declares that the more knowledge a person has - the more responsibility the individual takes for his/hers own health. With more knowledge, the individual can be more active to be more health promoted. Increasing the knowledge among adolescents is essential for the future, these individuals have the possibility of improving the public health in the next generation. There can be a lower rate of diseases, such as hepatitis B and a more healthy population (Färdig & Lundberg, 2014).

Both the HBM and Dorothea Orem’s self-care theory are used in the study, because they complement each other well. The HBM is relevant for knowledge about hepatitis B, knowledge affects the behaviour the individual have about their health. This then lead to vaccination being behaviour, where vaccination can be as a self-care measure.

**Statement of the Problem**

A part of the role of being a nurse is to be supportive, give guidance and actively help a person to promote his or her own health (The Swedish Society of Nursing, 2014). From the literature, there is lack of knowledge of hepatitis B among young people in different countries. Little has been studied about hepatitis B knowledge and attitudes towards hepatitis B virus vaccine in Thailand. In order to increase awareness and prevention of the hepatitis B infection, the young people should have opportunity to receive correct information about the infection and ways that it transmits.

**Aim**

The aim was to investigate Thai university students’ knowledge about hepatitis B and their attitudes towards the hepatitis B virus vaccine, and also to examine if there is a difference in knowledge and attitudes between male and female university students.

**Research questions**

- How is the knowledge of hepatitis B among Thai university students?
- How is the attitude towards hepatitis B virus vaccine among Thai university students?
- Is there a difference in hepatitis B knowledge between male and female university students?
- Is there a difference in attitude towards hepatitis B virus vaccine between male and female university students?
Methodology

Design
A cross-sectional study with a quantitative method was used.

Setting
The data was collected during two weeks in November 2015 at two universities in Bangkok, Thailand. A total of five different classes with both male and female students participated in the study.

Procedure
The study was made under the Minor Field Study in collaboration with Ramathibodi School of Nursing, Faculty of Medicine, Ramathibodi Hospital, at Mahidol University, Thailand and the Department of Public Health and Caring Sciences at Uppsala University, Sweden. Assistant Professor Dr. Wantana Meneewongul and Assistant Professor Supanee Thrakul at Ramathibodi School of Nursing, acted as co-supervisors in this study. They submitted the ethical application form for approval from the Ethical Committee at the faculty before the study began (Appendix 3).

The participants were selected with the help of Assistant Professor Supanee Thrakul. Oral information about the study was given in the classroom, both in English by the authors and in Thai by the co-supervisor. The participants received an information letter in English, containing the aim of the study and the participants’ rights (Appendix 1). The information letter was given together with the questionnaire. The questionnaires were handed in to the authors after finishing it. The questionnaire took approximately 10 minutes to fill in. If the participants had questions, they could ask the authors as well as the co-supervisor who were present in the classroom during the data collection.

Sample
The participants were students at two different universities in Bangkok, Thailand. The students were selected using convenience sample. They were given oral information about the study in both English and Thai and were asked if they wanted to participate. In the first data collection a total of 200 students, both male and female participated in the study. In the
second data collection a total of 100 students, both male and female participated. Two of the participants did not return the questionnaire to the authors. The inclusion criteria to select the participants was that they were between 18-26 years old, that they were willing to participate in the study and that they answered all the questions in the questionnaire. A total of 298 students participated in the study, however 18 students were excluded because they did not answer all the questions in the questionnaire. The response rate was 93.9 %.

Data Collection
A questionnaire was developed for this study by the main supervisor Pranee Lundberg, Associate Professor at the Department of Public Health and Caring Sciences, Uppsala University (Appendix 2). The questionnaire was first written in English and then translated into Thai with the help of Assistant Professor Dr. Wantana Meneewongul and Assistant Professor Supunnee Tharakul. The questionnaire was divided into three parts: demographic characteristics, knowledge about HBV infection, and attitudes towards HBV vaccination.

Part I consists of 11 questions regarding age, gender, education, religion, relationship status, sexual intercourse, employment, with whom they lived, if they had heard about HBV before and if they were vaccinated against it. The participants could choose from predetermined options and could type their own answer if it was not among the options.

Part II concerns knowledge about hepatitis B virus infection and consists of 12 questions. The participants could choose between three predetermined options which were “yes”, “no” and “do not know”.

Part III is about attitudes towards HBV vaccination, which contains six questions such as who needs vaccination, where can you get it and how much does it cost are examples of questions in this part. The participants had three predetermined options to choose between which were “yes”, “no” and “do not know”.

Data Analysis
For this study the Statistical Package for the Social Sciences, SPSS 20.0 was used to analyze the data that had been collected. The questionnaire contained non-parametric data. The questionnaire was divided into three parts.
The first part (part I) was about demographic characteristics. This part was based on numeric and nominal scales and the data was coded into numbers before it got registered in the SPSS-programme using descriptive statistics (Polit & Beck, 2008).

The second part (part II) was about knowledge about hepatitis B. Part II was based on a numeric scale where the answer were ranked: Yes (2), No (1) and Do not know (0). The third part (part III) was about Students attitudes towards Hepatitis B vaccination. Part III was also based on a numeric scale with the answers ranked the same way as in part II.

In part II and part III the correct answer on the questions could vary between being “yes” and “no”. Therefore, the answers in the questionnaires were compared to a template with the correct answers. Every question in part II and part III was separately re-coded in the SPSS 20.0. If, for example, the answer “yes” was the correct answer on the question it was re-labelled; Yes (1), No (0) and Do not know (0). If “No” was the correct answer the question were re-labelled; No (1), Yes (0) and Do not know (0). In this study the aim was to investigate if there is any difference in the level of knowledge about hepatitis B between the genders. To compare if there was any significant difference in the level of knowledge between the male and female students the Chi-Square test was used and a significant difference was accepted at a p-value equal to or lower than 0.05 (Polit and Beck, 2008). The results of the study were presented in the text and tables.

The questionnaire contained 12 questions about the knowledge and in consultation with the co-supervisors the number of correct answered questions was divided into three groups depending on the level of knowledge. If the participant had six correct answers or fewer he or she came in the group “Poor knowledge”, if the participant had 7-8 correct answered questions he or she was counted into the group “Fair knowledge” and if the participant had 9 or more correct answers it was counted in the group “Good knowledge”. The maximum score was 12 and the minimum score was zero.

The part of the questionnaire, which considered attitudes about hepatitis B vaccination, contained six questions. The number of correct answered questions was categorized into three groups. If the participant had three correct answers or fewer he or she came in the group “Poor attitude”, if the participant had 4-5 correct answered questions he or she was counted into the group “fair attitude” and if the participant had five or more correct answers he or she
was counted in the group “Good knowledge”. The maximum score was six and the minimum score was zero.

**Ethical Considerations**

Dr. Wantana Meneewongul, Ramathibodi School of Nursing, Faculty of Medicine, Mahidol University, Thailand submitted the study and received ethical approval from the Ethic Committee at the university.

Oral- and written information about the study was given to the participants, both in English and Thai, before the questionnaires were handed out. The participation was voluntary and anonymous. The data was analyzed and handled carefully. The participants could cancel their participation at any time. The participants received a consent form written in Thai in addition to the questionnaire. The consent form informed the participants that if the questionnaire was returned to the authors, they approved participating in the study.

**Results**

**Demographic background of Thai university students**

A total of 280 students participated in the study, 113 female students (40.4 %) and 167 male students (59.6 %). The students were in the age between 18 and 26 years old. The majority of the students were 20 years old (31.8 %), Buddhists (95.4 %), have not had a partner (40.4 %), never had sexual intercourse (51.8 %) and no employment (93.9 %). There were 255 students who had heard about hepatitis B (91.1 %) and 178 students had been vaccinated against HBV (63.6 %). The majority of the male students had received the HBV vaccination (79.0 %), while less than half of the female students (40.7 %) had received the vaccination. The demographic characteristics of the students are presented in Table 1.
Table 1. Demographic characteristics of the participated students.

<table>
<thead>
<tr>
<th>Demographic characteristics</th>
<th>Total (N = 280)</th>
<th>Male (N = 167)</th>
<th>Female (N = 113)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td><strong>Age (years)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>15</td>
<td>5.4</td>
<td>4</td>
</tr>
<tr>
<td>19</td>
<td>76</td>
<td>27.1</td>
<td>27</td>
</tr>
<tr>
<td>20</td>
<td>89</td>
<td>31.8</td>
<td>53</td>
</tr>
<tr>
<td>21</td>
<td>70</td>
<td>25.8</td>
<td>63</td>
</tr>
<tr>
<td>22</td>
<td>13</td>
<td>4.6</td>
<td>10</td>
</tr>
<tr>
<td>23</td>
<td>9</td>
<td>3.2</td>
<td>4</td>
</tr>
<tr>
<td>24</td>
<td>1</td>
<td>0.4</td>
<td>1</td>
</tr>
<tr>
<td>25</td>
<td>4</td>
<td>1.4</td>
<td>2</td>
</tr>
<tr>
<td>26</td>
<td>3</td>
<td>1.1</td>
<td>3</td>
</tr>
<tr>
<td><strong>In which school year are you now?</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First</td>
<td>53</td>
<td>18.9</td>
<td>19</td>
</tr>
<tr>
<td>Second</td>
<td>216</td>
<td>77.1</td>
<td>144</td>
</tr>
<tr>
<td>Third</td>
<td>11</td>
<td>3.9</td>
<td>4</td>
</tr>
<tr>
<td><strong>Religion</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non religion</td>
<td>2</td>
<td>0.7</td>
<td>1</td>
</tr>
<tr>
<td>Buddhist</td>
<td>267</td>
<td>95.4</td>
<td>160</td>
</tr>
<tr>
<td>Christian (Protestant)</td>
<td>4</td>
<td>1.4</td>
<td>2</td>
</tr>
<tr>
<td>Muslim</td>
<td>6</td>
<td>2.1</td>
<td>3</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
<td>0.4</td>
<td>1</td>
</tr>
<tr>
<td><strong>Do you have an extra job?</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>263</td>
<td>93.9</td>
<td>159</td>
</tr>
<tr>
<td>Yes</td>
<td>17</td>
<td>6.1</td>
<td>8</td>
</tr>
<tr>
<td><strong>With whom do you live?</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parents/family</td>
<td>202</td>
<td>72.1</td>
<td>124</td>
</tr>
<tr>
<td>Friends</td>
<td>52</td>
<td>18.6</td>
<td>30</td>
</tr>
<tr>
<td>By myself</td>
<td>16</td>
<td>5.7</td>
<td>8</td>
</tr>
<tr>
<td>Other/ others</td>
<td>10</td>
<td>3.6</td>
<td>5</td>
</tr>
<tr>
<td><strong>Do you have a partner?</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>113</td>
<td>40.4</td>
<td>54</td>
</tr>
<tr>
<td>Used to have</td>
<td>66</td>
<td>23.6</td>
<td>46</td>
</tr>
<tr>
<td>Currently have</td>
<td>101</td>
<td>36.1</td>
<td>67</td>
</tr>
<tr>
<td><strong>Have you ever had sexual intercourse?</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>145</td>
<td>51.8</td>
<td>64</td>
</tr>
<tr>
<td>Yes</td>
<td>135</td>
<td>48.2</td>
<td>103</td>
</tr>
<tr>
<td><strong>Have you heard of the HBV-infection?</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>25</td>
<td>8.9</td>
<td>19</td>
</tr>
<tr>
<td>Yes</td>
<td>255</td>
<td>91.1</td>
<td>148</td>
</tr>
<tr>
<td><strong>Have you got the HBV vaccination?</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>50</td>
<td>17.9</td>
<td>18</td>
</tr>
<tr>
<td>Yes</td>
<td>178</td>
<td>63.6</td>
<td>132</td>
</tr>
<tr>
<td>Do not know</td>
<td>52</td>
<td>18.6</td>
<td>17</td>
</tr>
</tbody>
</table>
Knowledge about HBV infection among Thai university students and differences between the genders

About one third (33.9%) of the students knew correctly that HBV is not heritable. Less than half of the students (43.2%) knew correctly that people do not get HBV through the air. A majority of the students (55.4%) were correct when answering that HBV can be sexually transmitted. Less than half of the students (42.5%) answered incorrectly that HBV is not prenatally transmitted, while almost one third (32.9%) knew correctly that it is transmitted prenatally. More than half of the students (67.1%) answered incorrectly that people could get HBV by sharing spoons or bowls for food, more than half of the students (53.9%) were also correct when answering that people do not get HBV by eating food prepared by an infected person. A majority of the students (78.9%) knew correctly that eating food that has been prechewed by an infected person could transmit HBV. More than half of the students (67.5%) knew correctly that people could get HBV by sharing a toothbrush with an infected person, while 12.1% answered incorrectly that people cannot get HBV by sharing toothbrushes. A majority of the students (79.3%) answered correctly that HBV does not transmit by holding hands with an infected person. About one fourth of the students (26.4%) answered correctly that HBV have signs or symptoms, some students (37.5%) answered incorrectly that HBV does not have signs or symptoms. Less than half of the students (40.0%) answered correctly that HBV could cause liver cancer. In addition, a majority of the students (70.4%) knew that an infected person showing no signs or symptoms could spread HBV. See table 2.

The result of the data showed that there was no significant difference in knowledge between the genders (p-value: 0.292). Table 3 shows the level of knowledge about hepatitis B for the total amount of students and for each gender. The questionnaire contained 12 questions about the knowledge and in consultation with the co-supervisors the number of correct answered questions was divided into three groups depending on the level of knowledge. If the participant had six correct answers or fewer he or she came in the group “Poor knowledge”, if the participant had 7-8 correct answered questions he or she was counted into the group “Fair knowledge” and if the participant had 9 or more correct answers it was counted in the group “Good knowledge”. The maximum score was 12 and the minimum score was zero. See table 3 for categorized answers.
Table 2. Knowledge about HBV infection among Thai university students and differences between the genders.

<table>
<thead>
<tr>
<th>Knowledge</th>
<th>Total (280)</th>
<th>Males (167)</th>
<th>Females (113)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes N (%)</td>
<td>No N (%)</td>
<td>Incorrect answer or did not know N (%)</td>
</tr>
<tr>
<td>Do people get HBV from genes (heredity)?</td>
<td>104 (37.1)</td>
<td>95 (33.9)</td>
<td>81 (28.9)</td>
</tr>
<tr>
<td>Do people get HBV through the air (coughing or staying in the same room)?</td>
<td>95 (33.9)</td>
<td>121 (43.2)</td>
<td>64 (22.9)</td>
</tr>
<tr>
<td>Do people get HBV from sexual relationship?</td>
<td>155 (55.4)</td>
<td>53 (18.9)</td>
<td>72 (25.7)</td>
</tr>
<tr>
<td>Do people get HBV during birth?</td>
<td>92 (32.9)</td>
<td>119 (42.5)</td>
<td>69 (24.6)</td>
</tr>
<tr>
<td>Do people get HBV by sharing spoons or bowls for food?</td>
<td>188 (67.1)</td>
<td>50 (17.9)</td>
<td>42 (15.0)</td>
</tr>
<tr>
<td>Do people get HBV by eating food prepared by an infected person?</td>
<td>65 (23.2)</td>
<td>150 (53.6)</td>
<td>65 (23.2)</td>
</tr>
<tr>
<td>Do people get HBV by eating food that has been prechewed by an infected person?</td>
<td>221 (78.9)</td>
<td>19 (6.8)</td>
<td>40 (14.3)</td>
</tr>
<tr>
<td>Do people get HBV by sharing a toothbrush with an infected person?</td>
<td>189 (67.5)</td>
<td>34 (12.1)</td>
<td>57 (20.4)</td>
</tr>
<tr>
<td>Do people get HBV by holding hands with an infected person?</td>
<td>15 (5.3)</td>
<td>222 (79.3)</td>
<td>43 (15.4)</td>
</tr>
<tr>
<td>Does hepatitis HBV have signs or symptom?</td>
<td>74 (26.4)</td>
<td>105 (37.5)</td>
<td>101 (36.1)</td>
</tr>
<tr>
<td>Does HBV cause livercancer?</td>
<td>112 (40.0)</td>
<td>25 (8.9)</td>
<td>143 (51.1)</td>
</tr>
</tbody>
</table>

If someone is infected with hepatitis B but they look and feel healthy, do you think that person can spread hepatitis B?

|                                                                           | Yes N (%)   | No N (%)    | Incorrect answer or did not know N (%) | Correct answer N (%) | Incorrect answer or did not know N (%) | Correct answer N (%) | Incorrect answer or did not know N (%) |
|                                                                           | 197 (70.4)  | 22 (7.8)    | 61 (21.8)    | 124 (74.3)       | 43 (25.7)     | 80 (65.6)   | 42 (34.4)    |
Table 3. Knowledge about HBV among Thai university students and differences between the genders.

<table>
<thead>
<tr>
<th>Categorized answers (score)</th>
<th>Knowledge about hepatitis B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total (N = 280)</td>
</tr>
<tr>
<td></td>
<td>N (%)</td>
</tr>
<tr>
<td>Poor knowledge (&lt; 6)</td>
<td>146 (52.1)</td>
</tr>
<tr>
<td>Fair knowledge (7-8)</td>
<td>102 (36.4)</td>
</tr>
<tr>
<td>Good knowledge (&gt; 9)</td>
<td>32 (11.4)</td>
</tr>
</tbody>
</table>

Attitudes towards HBV vaccination among Thai university students and differences between the genders

A majority of the students (89.3 %) thought that healthy people need vaccination, as well as the majority (80.4 %) believed that people in the same age as themselves need vaccination. Over half of the students (65.0 %) thought that not only children less than two years old need to be vaccinated. A majority of the students (70.7 %) knew where to get vaccinated. Less than half of the students knew that vaccinations could be free or low-cost through certain programs. See table 4.

The result of this study shows a significant difference in the attitude towards the hepatitis B vaccination between the genders (p-value = 0.042). The male students had a more positive attitude towards the vaccine than the female students. 91.6 % of the male students believed that healthy people need vaccination, in comparison to 85.8 % of the female students. Less than half of both genders, 49.1 % of the male students compared to 35.4 % of the female students knew that vaccinations could be free or low-cost. Table 5 shows the results of the attitudes towards the HBV vaccination for the total amount of students and for each gender.

The part of the questionnaire, which considered attitudes about hepatitis B vaccination, contained six questions. The number of correct answered questions was categorized into three groups. If the participant had three correct answers or fewer he or she came in the group “Poor attitude”, if the participant had 4-5 correct answered questions he or she was counted into the group “fair attitude” and if the participant had five or more correct answers he or she
was counted in the group “Good knowledge”. The maximum score was six and the minimum score was zero. See table 5 for categorized answers.

Table 4. Attitudes towards HBV vaccination among Thai university students and differences between the genders.

<table>
<thead>
<tr>
<th>Attitudes</th>
<th>Total (280)</th>
<th>Male (167)</th>
<th>Female (113)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes N (%)</td>
<td>No N (%)</td>
<td>Incorrect answer or did not know N (%)</td>
</tr>
<tr>
<td>Do you know if healthy people need vaccination?</td>
<td>250 (89.3)</td>
<td>16 (5.7)</td>
<td>14 (5.0)</td>
</tr>
<tr>
<td>Do you know if you need vaccination at your age?</td>
<td>225 (80.4)</td>
<td>15 (5.3)</td>
<td>40 (14.3)</td>
</tr>
<tr>
<td>Do you know if only children less than two years old need to be vaccinated?</td>
<td>18 (6.4)</td>
<td>182 (65.0)</td>
<td>80 (28.6)</td>
</tr>
<tr>
<td>Do you know the place where one can get hepatitis B immunizations?</td>
<td>198 (70.7)</td>
<td>3 (1.1)</td>
<td>79 (28.2)</td>
</tr>
<tr>
<td>Do you know if vaccinations can be free or low-cost through certain programs?</td>
<td>122 (43.6)</td>
<td>22 (7.8)</td>
<td>136 (48.6)</td>
</tr>
<tr>
<td>Do you think you will receive hepatitis B vaccination?</td>
<td>227 (81.1)</td>
<td>15 (5.3)</td>
<td>38 (13.6)</td>
</tr>
</tbody>
</table>
Table 5. Attitude towards the HBV vaccination among Thai university students and differences between the genders.

<table>
<thead>
<tr>
<th>Categorized answers (score)</th>
<th>Attitude towards the hepatitis B vaccine</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total (N = 280)</td>
</tr>
<tr>
<td></td>
<td>Male (N = 167)</td>
</tr>
<tr>
<td></td>
<td>Female (N = 113)</td>
</tr>
<tr>
<td>Poor attitude (&lt; 3)</td>
<td>N (%)</td>
</tr>
<tr>
<td></td>
<td>68 (24.3)</td>
</tr>
<tr>
<td></td>
<td>35 (21.0)</td>
</tr>
<tr>
<td></td>
<td>33 (29.2)</td>
</tr>
<tr>
<td>Fair attitude (4-5)</td>
<td>148 (52.9)</td>
</tr>
<tr>
<td></td>
<td>88 (52.7)</td>
</tr>
<tr>
<td></td>
<td>60 (53.1)</td>
</tr>
<tr>
<td>Good attitude (&gt; 5)</td>
<td>64 (22.9)</td>
</tr>
<tr>
<td></td>
<td>44 (26.3)</td>
</tr>
<tr>
<td></td>
<td>20 (17.7)</td>
</tr>
</tbody>
</table>

Discussion

The result of the study showed that the majority of the participants had less than 50 % correct answers on the part in the questionnaire about knowledge about HBV. Almost all of the students had heard about the hepatitis B infection. About one third of the students knew that HBV is not heritable. Less than half of the students knew that HBV is not transmitted by air. About half of the students knew correctly that HBV is sexually transmitted while less than half of the students answered incorrectly that HBV is not transmitted prenatally. About one fourth of the students knew that HBV have signs and symptoms and less than half believed that HBV could cause liver cancer. The result showed that 52.1 % of the students had poor knowledge about hepatitis B. There was no statistic significant difference in knowledge about hepatitis B between the genders, however a significant difference was found in the attitude towards the hepatitis B vaccination. The majority of the students knew the place where to get vaccinated and believed that they would receive the vaccination (70.7 % & 81.1 %). The male students had better attitude towards the vaccination than the female students. The result showed that the majority of the students (52.9 %) had a fair attitude towards the hepatitis B vaccination.

Result discussion

Knowledge about HBV infection among Thai university students and differences between genders

Less than half (43.2 %) of the participants in our study were correct when answering that HBV is not transmitted through air. The result is similar with several previous studies.
(Esteghamati et al., 2013; Choe et al., 2006; Bui et al., 2013). Less than half of the Thai students knew that HBV could cause liver cancer, the same result was also found in the study by Esteghamati et al. (2013). Some of the Thai students answered incorrectly that HBV is transmitted through contaminated food, which also is found in previous studies (Bui et al., 2013; Choe., 2006). Several studies also showed that the majority of the participants does not know that HBV is sexually transmitted (Bui et al., 2013; Esteghmati et al., 2013; Choe et al., 2006), this counteracts with the Thai students result.

The majority of the Thai students knew it is sexually transmitted. The majority of the Thai students knew that HBV is not transmitted by holding hands; this result is also found in a study by Choe et al. (2005). In the same previous study the result showed that the majority (72.0 %) knew that HBV is transmitted by sharing toothbrushes, when comparing with this study only 12.1 % of the participating Thai students. About one third of the Thai students knew that HBV is transmitted prenaturally, this result counteracts with previous studies (Choe et al., 2005) where the majority of those participants knew it is transmitted prenationally (83.0%).

More than half of the students in our study had poor knowledge about hepatitis B. This result is supported by Amany et al. (2015) and Bui et al. (2013). A study from Iran shows that females tend to have better knowledge about hepatitis B than the males (Esteghmati et al., 2013). This contradicts from several studies (Amany et al., 2015; Akbari et al., 2014; Amany et al., 2015; Choe et al., 2006) as well as the Thai students in the present study where there was no significant difference in knowledge among the genders. The results of this study showed the poor knowledge of Hepatitis B among the Thai student. According to Orem’s self-care theory it can be explained that these Thai students were not active in their self-care for prevention such as they did not know if they had received the HBV-vaccination. Healthcare providers should pay attention to give correct knowledge and information about HBV and HBV-vaccine as well as how to prevent themselves to the students at university.

*Attitudes towards HBV vaccination among Thai university students and differences between genders*

A vaccination programme against hepatitis B was introduced in Thailand in the nineties (Chimparlee et al., 2011), where infants received the vaccination at birth. This could explain
why almost a third of the participating female students answered that they did not know if they had received the vaccination, they might have got it at birth without knowing. The majority of the participants were born in the nineties, when this was accurate (Chaiear et al. (2006).

Compared to studies in other countries (Kumar et al., 2014; Buisson, 2014), the Thai students had good attitudes towards the hepatitis B vaccine and over half of the students (63.6%) had received the vaccine. The national vaccination programme can explain the vaccination coverage among the students (Chimparlee et al., 2011). However it is contradicting that 63.6 % of the students reported having received the vaccine and 81.1 % of them believed they would receive the vaccination in the future. A reason for this could be that some of the participants had not yet received the full three doses of the vaccine yet (Bell, Finelli, Fiore, Shepard & Simard, 2006). The positive attitude could be because Thailand has a high endemicity of HBV (Centres for Disease Control and Prevention, 2015; Bell et al., 2006). However, the Thai population have a more positive attitude towards the preventive measures for HBV. The positive attitude could also indicate that the vaccine is safe and people trust its’ effects (Bell et al., 2006). The level of knowledge among the participants could also explain the more positive attitude towards the vaccine among the students (Eckersberger et al., 2014; Buisson et al., 2014). Therefore, these studies have showed that people with a higher education tends to have a better attitude towards vaccinations in general, which also is declared in Orem’s self-care theory.

In this study, the male students had a better attitude than the female students towards the vaccine is contradicted with previous studies (Klewer, Kugler, Jacob, Münch, Mädung & von Lindeman, 2014; Buisson et al., 2014). Several studies have showed that other factors than gender influence the decision of getting vaccinated, such as economic, fear of needles and beliefs that vaccinations are unnecessary and other attitudes towards the vaccine (Carter et al., 2013; Eckersberger et al., 2013; Gust et al., 2006; Klewer et al., 2014). According to the Health Belief Model, the students in this study may have a belief that the vaccination is unnecessary for them, therefore they did not take action for their self-care to get vaccination, especially the cost of vaccination is expensive for them to pay and perhaps they did not know the place where they can be vaccinated.
**Theoretical framework discussion**

The Health Belief Model (HBM) is a theory based on the connection between behaviour and the risk of getting a disease (Glanz, Rimer & Lewis, 2002). The low knowledge among the Thai students combined with the theory that HBM stands for, could predict that the Thai students were in the risk of getting HBV. The low knowledge indicates that the students do not know how the infection is transmitted or the severity of it. If they underestimate the infection and therefore ignore ways to protect themselves, the risk of them getting the infection increases (Glanz, Rimer & Lewis, 2002). Information should be given to the adolescents about the importance of the vaccine; hence it is a simple and easy way to protect them. According to HBM, the students from this study had lack of knowledge about HBV and HBV vaccine so they could not be able to act actively for prevention. If they have enough knowledge they can be able to prevent themselves.

Orem’s self-care theory also declares that the higher level of knowledge a person has the more responsibility he or she take for his or her own health and wellbeing.

Dorothea Orem’s self-care theory is based on what a person can do to maintain his or her own health (The National Board of Health and Welfare, 2011). In the Orem’s self-care theory is mentioned that every individual himself/herself have to make his/her own observations and evaluations, which would lead to understanding of the current knowledge about, as well as the shortcoming in the person’s self-care (Aldrin & Björkqvist, 2013). A higher knowledge of every individual's own self-care would probably lower the risk behaviour due to a higher level of knowledge makes the person take safer decisions regarding their own health. It is important for adolescents to know a way of transmission of the disease of the sick person to other persons (Färdig & Lundberg, 2014).

People take the vaccination against hepatitis B is a good example that Orem advocated. A number of 63.6% of the participating students in this study knew that they were vaccinated against HBV, which is a step they have taken in their own self-care. According to Orem’s self-care theory it is the nurses’ responsibility to get information about what the self-care needs is for people with self-care restrictions. Orem declares that limitations regarding the patient’s own self-care can be better with more knowledge and practice (Aldrin & Björkqvist, 2013). Therefore, the non-vaccinated persons are needed more education from nurses who will be a contributing information for getting the vaccination, due to not being vaccinated the person will has a higher risk of getting the disease and also transmit it to others.
Methodology discussion

Research design
A cross-sectional study with a quantitative method was used. A cross-sectional study with a quantitative method is a good way for identifying knowledge over a specific subject for a selected group of people at one single time (The National Board of Health and Welfare, 2015), it is therefore easier for the authors of this study to get an overview of the knowledge about HBV. In the questionnaire which was used, there was no space for the respondents to explain their answers hence there were answers prepared for them.

Sample
A convenience sample was used for this study; it is a suitable method to receive the data from young people to investigate the students’ knowledge and attitudes towards the HBV vaccination for this study during the short time in the field. The reason was also that a convenience sample is easier to get a more equal number of male and female participants in order to examine the differences between the genders. It is also a quick working method to get a high number of participants and therefore a big amount of completely filled in questionnaires. With a big amount of completely filled in questionnaires, the results were showed trustworthy.

Measuring instruments
The measuring instrument used for the study was the SPSS Statistic 20. SPSS is well known and used in many of the quantitative studies that are made in recent studies globally. In SPSS Statistic the authors could do calculations, analyses, compare results between different groups (for example the knowledge about hepatitis B between male and female students), calculate the average value for a certain group etc. The authors therefore found SPSS Statistic as an appropriate measuring instrument for this study.

Strengths and weaknesses of the study
The use of a convenience sample was strength for the study because it made it easier to get almost an equal amount of male and female participants and the requested number of questionnaires was quickly collected related to the time effectiveness with it. The use of a convenience sample did indeed have its benefit; however the disadvantage could be that the participants were targeted. The participants were chosen because of their gender i.e. However if a randomized sample were chosen, there could have been a risk of getting an unequal
amount of male and female students. Since two of the research questions were to investigate if there could be a difference between genders, it was essential that a good sample of participants and an equal number among the genders were chosen to participate.

One weakness in the study is that the part of attitudes towards the hepatitis B vaccine in the questionnaire, had questions with too many alternative answers. The questions in the questionnaire were constructed in a way which made the answers “No” and “Do not know,” mean the same thing. If those questions in the questionnaire were constructed in a different way, with an more open approach, the participants could have determine the right answer for what they believed in every certain question. In this study the answer “No” and “Do not know” blend into each other, making it hard for the authors to know whether the participant did not understand the question or simply answered that they disagree with the question.

Another weakness in the study was during the data collection at the universities, some students came in late for class, which made them miss the oral information that was given. Even though there was information letter attached to the questionnaire (written in English), some students did not read the letter and went straight into answering the questions. The participants could because of coming late, have missed the information that completing the whole questionnaire was a criteria for participating in the study and missed the aim of the study. A number of 18 participants were excluded from the study because of not completing the questionnaire.

**Ethical considerations**

Before starting this study an ethical application form was submitted by Assistant Professor Dr. Wantana Meneewongul and Assistant Professor. Supanee Thrakul at Ramathibodi School of Nursing to the Ethical Committee at the Faculty of Medicine, Ramathibodi Hospital. The project has been approved by the Ethical Committee before data collection.

To ensure that the study would be correct ethically, the participants were given oral information about the study in both English and Thai. The students were also given written information about the study in English. In the written information was told that the students themselves decided if they wanted to participate in the study or not. The students were also informed that they at any time could cancel their participation without have to give a reason why and that their participation would be completely anonymous. One of the questions in the
demographic part of the questionnaire was “Have you ever had sexual intercourse?” with the answer alternatives “Yes” and “No”, this could be a little sensitive for the students to answer because the traditional Thai culture prohibits premarital sexual activities.

**Further Research**

The authors believe that more research about adolescents’ knowledge about hepatitis B and the attitude towards the HBV vaccination is needed for getting a clearer view on how the situation is in Thailand. This study showed that many students have heard about hepatitis B, however there is little knowledge about how it is transmitted and the complications of the infection. The future study should be included a higher number of participants in order to get a more generalized view on knowledge about HBV among adolescents in Thailand. This can be used for new evidence-based strategies to improve the public health and the individual's health behaviour. It is also important to carry out the seriousness of the infection and that the infection could lead to liver-cirrhosis and cancer. To get a lower rate of cases with hepatitis B, more public information is needed with a focus on preventive measures (Choe et al., 2006).

For future studies a qualitative method could be used to get more in-depth information about attitude towards vaccination among adolescents. To know more about how the students’ felt about vaccination in general, an interview-based study would give the respondents’ an opportunity to be more flexible in their answers.

**Nursing implications**

**Nursing**

The result of this study showed that with the Thai national immunization programme (Chimparlee et al., 2011), the students had good attitudes towards the vaccine and the majority had received the vaccination. It is therefore important with a good public health system, where health promotion is one of the main goals (Chaiear et al., 2006). The nursing implication should be to give information about the infection and its vaccine to adolescents’, informing the importance of how people can prevent them self and insist on receiving the vaccine (Birungi, 2015). Since the hepatitis B virus is highly contagious and is transmitted through blood and other body fluids, more information to the society needs to be given about being careful when dealing with needles, razors etc (Chen et al., 2012).
Individual

From a nursing point of view, the nurse should encourage the individual self-care (International Council of Nurse [ICN], 2012). The higher level of the self-care knowledge we have in the society for hepatitis B, will probably prevent the unknowing transmission of the disease and reduce the number of infected persons (Glanz et al., 2001). A higher level of self-care knowledge may also increase the number of people that will choose to get the vaccination. As a study by Carter et al. (2013) suggests, it is important not to let the health care providers’ own feelings and predetermination to interfere with the patient's’ autonomy. The health care provider should encourage the patient to make active decisions (such as get vaccinated etc.), which is correlated with Orems self-care theory (The National Board of Health and Welfare, 2011).

Health

The level of knowledge was quite low among the students and more information about hepatitis B (and all viral hepatitis) is needed. Information should be given in children's education to increase the knowledge about what hepatitis B is and could therefore be a preventive action in reducing the spread of hepatitis B. A study by Chen et al. (2012) & Gürakar et al. (2014) suggests giving disease specific education to improve patients health knowledge and could lead to health preventive behaviours. Information to both adolescents’ and patients could improve the individual's health and health behaviour.

Society

Having good health is one of the most important part in a person's life. Out of a health perspective, prevention for transmission is extremely important, both for the individual person and seen from a societal perspective. It is therefore important to give the right education to health care personnel (Abiola et al., 2013 & Carter et al., 2013), since health care personnel educates patients in how to improve their health behavior. If the health care personnel uses evidence-based care (Gürakar et al., 2014), the patient gets the newest information about HBV and can therefore use the new information to promote their own health behavior.

Conclusion

The result of this study showed the majority of the participants had less than 50 % correct answers on the part in the questionnaire about knowledge about HBV. A statistical significant difference could not be shown between the genders for the level of knowledge. The result of
the students’ attitude towards the vaccination for hepatitis B was fairly good and more than half of the participants had a score of four to five out of six in the attitude part of the questionnaire. The result showed a significant difference between the genders where the males had a more positive attitude towards the vaccination than the participating females. From a nursing point of view improving the knowledge about HBV and a positive attitude towards the vaccine can in the prolonging contribute to improve the public health by getting a lower rate of cases with HBV.

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References


Appendix 1.

Information Letter

We are four students studying Caring Science at Uppsala University in Sweden. We are here to do our final thesis about the knowledge about hepatitis B, attitudes towards the hepatitis B vaccine, sexual risk behaviours and attitude towards condom-use among Thai-students in Bangkok. This study will include 200 participants between the ages of 18-26.

The purpose of this study is to examine the students’ knowledge about hepatitis B infection, knowledge and attitudes towards hepatitis B virus vaccine and the habits regarding safe sex and condom use to prevent spreading of HIV. The questionnaire is divided into 5 parts: background characteristics, knowledge about hepatitis B, attitudes towards hepatitis B vaccine, safe sex behaviour and attitudes towards condom use.

Before you start we want you to know that the answers in this are a voluntary. The answers are completely anonymous and will only be seen by us during the analysing process. To keep the process as fair as possible we ask you to answer the questions truthfully and to hand in the questionnaire as soon as you are done. For us to be able to use your data we will need you to answer most of the questions. The questionnaire is of course optional, so if you find any questions too personal, there’s no constraint in answering them. You may end the participation at any time. The questionnaire will take about 5-10 minutes to answer and please ask if you have any questions or thoughts.

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Sincerely,

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Appendix 2.

Knowledge of Hepatitis B among students

The aim of this questionnaire is to examine students’ knowledge of hepatitis B infection. Your participation is voluntary to answer the following questionnaire. Your answers will be confidential. The result will be used to improve method of education and communication to young adults about health information.

Please answer every question in the questionnaire by marking “X” at the answer you choose.

Part I: Demographic characteristics

1. Age (years): …………………..
2. Gender:
   □ Male   □ Female
3. In which school year are you now?
   □ First   □ Second   □ Third
4. Religion:
   □ Non religion   □ Buddhist   □ Christian (Protestant)
   □ Muslim   □ Other (please specify)……………………………………
5. Extra job:
   □ No   □ Yes: (please specify)……………………………………
6. With whom do you live?
   □ Parents/family   □ Friends
   □ By myself   □ Other/others (please specify) ……………………
7. Do you have a partner?
   □ No   □ Used to have   □ Currently have
8. Have you ever had sexual intercourse?
   □ No   □ Yes
9. Have you heard about hepatitis B virus (HBV) infection?
   □ No   □ Yes
10. Have you got the hepatitis B vaccination?
    □ No   □ Yes   □ Do not know

Part II: Knowledge of HBV infection

10. Do people get HBV from genes (heredity)? □ Yes   □ No   □ Do not know
11. Do people get HBV through the air (coughing or staying in the same room)? □ Yes   □ No   □ Do not know
12. Do people get HBV from sexual relationships? □ Yes   □ No   □ Do not know
13. Do people get HBV during birth? □ Yes   □ No   □ Do not know
14. Do people get HBV by sharing spoons or bowls for food?  
   - Yes  
   - No  
   - Do not know

15. Do people get HBV by eating food prepared by an infected person?  
   - Yes  
   - No  
   - Do not know

16. Do people get HBV by eating food that has been prechewed by an infected person?  
   - Yes  
   - No  
   - Do not know

17. Do people get HBV by sharing a toothbrush with an infected person?  
   - Yes  
   - No  
   - Do not know

18. Do people get HBV by holding hands with an infected person?  
   - Yes  
   - No  
   - Do not know

19. Does hepatitis HBV have symptoms?  
   - Yes  
   - No  
   - Do not know

20. Does HBV cause liver cancer?  
   - Yes  
   - No  
   - Do not know

21. If someone is infected with hepatitis B but they look and feel healthy, do you think that person can spread hepatitis B?  
   - Yes  
   - No  
   - Do not know

Part III: Attitude towards HBV vaccination

23. Do you know if healthy people need a vaccination?  
   - Yes  
   - No  
   - Do not know

24. Do you know if you need a vaccination at your age?  
   - Yes  
   - No  
   - Do not know

25. Do you know if only children less than 2 years old need to be vaccinated?  
   - Yes  
   - No  
   - Do not know

26. Do you know the place where one can get hepatitis B immunizations?  
   - Yes  
   - No  
   - Do not know

27. Do you know if vaccinations can be free or low-cost through certain programs?  
   - Yes  
   - No  
   - Do not know

28. Do you think you will receive hepatitis B vaccinations?  
   - Yes  
   - No  
   - Do not know

Thank you for your participation
Appendix 3.

Documentary Proof of Ethical Clearance
Committee on Human Rights Related to Research Involving Human Subjects
Faculty of Medicine Ramathibodi Hospital, Mahidol University

MURA2015/516

Title of Project
(FC_580813)
Relationships between Knowledge about HIV and HBV, Attitudes to Condom Use and HBV Vaccine, and Sexual Risk Behavior among University Students

Protocol Number
ID 08-58-61

Principal Investigator
Asst. Prof. Dr. Wantana Maneesriwongul

Official Address
Ramathibodi School of Nursing
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Mahidol University

The aforementioned project has been reviewed and approved by the Committee on Human Rights Related to Research Involving Human Subjects, based on the Declaration of Helsinki.

Signature of Chairman
Committee on Human Rights Related to Research Involving Human Subjects
Prof. Pat Mahachoklertwattana, M.D.

Date of Approval
September 3, 201

Duration of Study
2 Months