RESEARCH ARTICLE

Current Status of Knowledge about and Attitudes Toward the Hepatitis B Virus at A Private University in Southern Vietnam: A Cross-sectional Self-reported Study

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Abstract

Context: Hepatitis B is a common infectious disease and can be life-threatening. The rate of hepatitis B virus (HBV) infection is increasing, especially in developing countries, including Vietnam. Aims: The aim of this study is to explore knowledge about and attitudes toward HBV among undergraduate students at a private university in southern Vietnam. **Subjects and Methods:** A cross-sectional self-reported study was carried out among 535 undergraduate pharmacy students between December 2017 and February 2018 at the Faculty of Pharmacy, Lac Hong University. All data analysis was performed using SPSS 20.0. **Results:** Out of 620 distributed questionnaires, 535 were returned - a response rate of 86.3%. Out of a total of 535 students surveyed, 174 (32.5%) were male and 361 (67.5%) were female pharmacy students. Overall, there was not a significant variance in knowledge between males and females regarding the knowledge about hepatitis B. However, the attitude score of females was higher than that of males, with a mean score of 3.37 ± 0.09 for males and 3.42 ± 0.14 for females. There was no difference in knowledge between males and females, but there was a difference in attitudes toward hepatitis B vaccination. **Conclusions:** The overall knowledge of pharmacy students showed satisfactory outcomes. However, it is necessary to improve attitudes about HBV vaccine by disseminating information to students and the public, especially by showing friends and family the relevant HBV information and conducting a health education campaign for people to help them adopt proper attitudes toward a self-care educational program.

Key words: Attitude, hepatitis B virus, knowledge, pharmacy, private, student, Vietnam

INTRODUCTION

Hepatitis B is the leading cause of chronic hepatitis, cirrhosis, and hepatocellular carcinoma (HCC), which is life-threatening.[1] Previous epidemiological studies have shown that people who are chronically infected with hepatitis B virus (HBV) are 200 times more likely to develop HCC than those who are not infected.[2] The World Health Organization (WHO) estimated that 788,000 people die from primary liver cancer per year. Southeast Asia has the highest prevalence of chronic HBV infection in the world, with 130 million people infected with chronic HBV, which is highest in the 18–45 age group.

According to the WHO, chronic hepatitis B and C infections has serious consequences, accounting for more than half of the 100 million deaths reported, of which 43% were due to hepatitis B, and the rest (17%) were due to hepatitis C infection. In 2015, worldwide more than 325 million people were living with chronic hepatitis B and hepatitis C.[3]

Each year, approximately 600,000 people die from HBV infection, almost half of them in Asia (PATH, 2014). Vietnam is the country with a high prevalence of hepatitis B. In fact,

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Received: 16-03-2018
Revised: 26-05-2018
Accepted: 30-05-2018

8.6 million Vietnamese have tested positive for this illness. An estimated 8.8% of females and 12.3% of male are infected with HBV.[4] Children, in particular, are highly vulnerable. Approximately 80–90% of infants get infected during the very 1st year of life, causing chronic infections which can cause death from virus-related conditions, including liver cancer.[5]

Moreover, exposure to HBV usually results in self-limiting infection and may be asymptomatic or be presented as acute hepatitis, which is usually accompanied by immunity.[2,6] Hepatitis B is an acute systemic infection which mainly affects the liver and is usually transmitted by the parenteral route. In most cases, HBV exposure is due to accidental contact with human blood or other body fluids during sexual and nonsexual contacts. In Vietnam, only around 8% of the population is chronically infected with hepatitis B, although most Vietnamese are unaware of their status. The main route of hepatitis B transmission in Vietnam is from mother to her fetus.[7] Occupational infectious diseases, including hepatitis B, have been reported among healthcare workers (HCWs) in developing countries. A study from the Lao People's Democratic Republic showed that 86.5% of medical students there have a poor understanding of HBV's route of transmission.[8] Testing and diagnosis of HBV/HCV infection are the only way to implement prevention as well as care and treatment services. Those are crucial components of an effective response to the hepatitis epidemic. A new generation of vaccines that have been genetically engineered, synthesized, and do not contain any blood products was developed in 1986 and is currently going through an approval process in the United States. Approximately 80% of all liver cancer cases are caused by hepatitis B. Thus, a certain type of vaccine which is the first type of protection against hepatitis B infection can also help prevent liver cancer.[9]

HCWs are at high risk of contracting blood-borne infections in health-care settings, including HBV infection.[10] The factors that contribute to the rising worldwide prevalence of HBV are of particular relevance in developing countries: Lack of awareness and lack of knowledge. It is worth mentioning that HCWs are not only medical staff such as nurses and doctors but also pharmacists who practice medicine and pharmacy. In other words, enhancing awareness of and changing attitudes toward chronic diseases in general and hepatitis B, in particular, is essential and urgent for HCWs and students in the health sector. Because medical and pharmacy students will be in direct contact with patients infected with hepatitis B in guiding patients infected to use correct medication and providing knowledge about hepatitis B for the people.

Moreover, their general knowledge of and attitude toward hepatitis B and its transmission and prevention by vaccination will go a long way toward safeguarding the well-being of these young people, who play a key role in providing health information and can stop this disease in society.[11,12] The study was undertaken to evaluate knowledge about and attitudes toward HBV among undergraduates at a private university in the southern part of Vietnam.

SUBJECTS AND METHODS

Study design

A cross-sectional self-reported study was carried out among pharmacy students between December 2017 and February 2018 at the Faculty of Pharmacy, Lac Hong University, Dongnai province. This province is located in the southeast of Vietnam, 30 km from Ho Chi Minh City. It is one of Vietnam's most populous provinces (ranked fifth) with a population of 2.84 million in 2014.[13] The province is located in the Southeast Economic Region, the most economically dynamic part of the country.

Lac Hong University has experienced many years of development in the field of education. It is a multidisciplinary university which is open to the pharmaceutical to provide quality pharmaceutical personnel, meeting the development needs of society.

Population, sample size, and determination

The sample size was calculated using the following formula with a 95% confidence level ($Z^2 = 1.96$); with 50% proportion and 5% margin of error.

$$N = \frac{Z^2 \times P(1-P)}{d^2}, N = \frac{1.96^2 \times 0.5(1-0.5)}{0.05^2} = 384$$

According to the theory, the sample needs 384 with 10% loss. Therefore, the total sample should be 423. However, in fact, the study has collected 535 (86.3%) valid in 620 samples emitted that is to increase credibility in the research process.

The internal consistency was assessed using Cronbach's alpha unit ($\alpha = 0.7$). The study was conducted at one academic institution, Lac Hong University and was followed by the systematic random sampling technique. The study instrument used was a pre-designed and pre-tested structured questionnaire for face-to-face data collection. The respondents filled out the questionnaires, and the questionnaires were subsequently collected after completion (direct interviews). Demographic data were collected while the questionnaire was distributed. The data included gender, year of study, type of job, cohabitants, and monthly expenses.

Research tool

A self-administered questionnaire was developed based on the previous work of certain scientists (Lee *et al*., 2007; Taylor *et al*., 2002) and the norms of Vietnamese culture. The questionnaire includes questions on various aspects of

hepatitis B. Each one consists of three parts, comprising 34 items questionnaires. Part 1 includes 12 questions regarding demographic characteristics, while Part 2 includes 18 questions which aim to explore students' knowledge of HBV's route of transmission, symptoms, and complications. The last part contains seven questions to assess student attitudes toward HBV vaccination. The questionnaire was used to collect information about the demographic characteristics of the respondents, their knowledge of hepatitis B, and the attitude among pharmacy students concerning hepatitis B vaccination.

The questionnaires utilized the Likert five-point scale which enables an individual to express how much they agree or disagree with each question. The mean knowledge score and attitude score were determined based on gender, with five options regarding the level of agreement: From strongly disagree, slightly disagree, and neutral to slightly agree, and strongly agree.

Data analysis

The collected data which were input using SPSS 20.0 software was utilized for the data analysis in this study. To examine the demographic characteristics of the study, both frequency analysis and descriptive statistics were calculated, such as mean ± standard deviation (SD). Both descriptive statistics for the prevalence and the Pearson Chi-square particle correlation test were used to check the correlation between quantitative social variables, according to gender, year of study, and monthly expenses (US dollars). Correlation analysis was conducted to examine the relationship between knowledge, attitude toward HBV, and attitude toward HBV vaccination. The continuous variables were represented by mean, SD, median, and range (25^{th}–75^{th} percentile), while the categorical variables were measured in percent and the significance level set at $P = 0.05$.

Bivariate and multivariate analysis was used to check the relationship between the outcome variables (mean knowledge and attitude) and sociodemographic characteristics (gender, expenditure, and year of study).

Ethical considerations

The study was approved by the Faculty of Pharmacy, Lac Hong University. Written informed consent was obtained from participants involved in the study before the specimen collection and questionnaire survey.

RESULTS

In the sample of 535 subjects, there were 174 males (32.5%) and 361 females (67.5%). In particular, there were 66 freshmen (12.3%), 102 sophomores (19.1%), 66 juniors (12.3%), 36 seniors (6.7%), and 265 students in their 5^{th} year

Table 1: Overall knowledge and attitude by sociodemographic characteristics, Lac Hong University, Dongnai Province, 2017 (*n*=535, *n*[%])

Characteristics	Male	Female	Total
Gender	174 (32.5)	361(67.5)	535 (100.0)
Year of study			
1st	23 (4.3)	43 (8.0)	66 (12.3)
2nd	39 (7.3)	63 (11.8)	102 (19.1)
3rd	19 (3.6)	47 (8.7)	66 (12.3)
4th	8 (1.5)	28 (5.2)	36 (6.7)
5th	85 (15.9)	180 (33.7)	265 (49.6)
Part-time job			
No	103 (19.3)	254 (47.4)	357 (66.7)
Yes	71 (13.3)	107 (20.0)	178 (33.3)
Locality			
Urban	129 (24.1)	295 (55.2)	424 (79.3)
Rural	45 (8.4)	66 (12.3)	111 (20.7)
Cohabitants			
Parents	64 (12.0)	151 (28.2)	215 (40.2)
Relatives	30 (5.6)	68 (12.7)	98 (18.3)
Friends	24 (4.5)	76 (14.2)	100 (18.7)
Alone	43 (8.0)	53 (9.9)	96 (17.9)
Others([a])	13 (2.4)	13 (2.5)	26 (4.9)

(Contd...)

Table 1: *(Continued)*

Characteristics	Male	Female	Total
Monthly expense (USD)*			
<90	46 (8.6)	105 (19.6)	151 (28.2)
90–<130	61 (11.4)	141 (26.4)	202 (37.8)
130–<180	29 (5.4)	59 (11.0)	88 (16.4)
≥180	38 (7.1)	56 (10.5)	94 (17.6)
Do you think it's enough for your life?			
Yes	131 (24.5)	274 (40.5)	348 (65.0)
No	43 (8.0)	87 (27.0)	187 (35.0)
Have you been immunized with HBV vaccine?			
Yes	111 (20.7)	237 (44.3)	348 (65.0)
No	63 (11.8)	124 (23.2)	187 (35.0)
Why do no you want to be vaccinated?	63 (33.7)	124 (66.3)	187 (100.0)
Do not know where to get vaccinated	14 (7.5)	23 (12.3)	37 (19.8)
The vaccine is too expensive	4 (2.1)	11 (5.9)	15 (8.0)
Fear of side effects of the vaccine	5 (2.7)	10 (5.3)	15 (8.0)
Fear some needles	9 (4.8)	24 (12.8)	33 (17.6)
No fear of catching HBV	7 (3.7)	7 (3.7)	14 (7.4)
Others([b])	24 (12.9)	49 (26.3)	73 (39.2)
Do you intend to get vaccinated for HBV?			
Yes	39 (20.9)	101 (54.0)	140 (74.9)
No	24 (12.8)	23 (12.3)	47 (25.1)
The willingness to pay for vaccination (USD)*			
<15	26 (13.9)	49 (26.2)	75 (40.1)
15–<20	16 (8.6)	33 (17.6)	49 (26.2)
20–<30	12 (6.4)	36 (19.3)	48 (25.7)
≥30	9 (4.8)	6 (3.2)	15 (8.0)

([a]): Dormitory, rented house, ([b]): Do not know HBV can be infected, do not like, *USD: US Dollar. HBV: Hepatitis B virus

(49.6%). With regard to cohabitants, there were 215 students (40.2%) living with parents, while 98 of them (18.3%) were living with other relatives, 100 (18.7%) with friends, and 22.8% with others, and more than three-quarters of students lived in urban areas. The number of students intending to get vaccinated was 74.9% while 47 students (25.1%) not intending to get hepatitis B vaccination. The adolescents' demographic characteristics are shown in Table 1.

In this study, the average score for students' knowledge toward HBV was 3.51 ± 0.18 (ranging from 2.0 to 5.0). In general, the knowledge of hepatitis B transmission, symptoms, and complications did not differ much between genders; the mean score was 3.51 ± 0.19. With respect to the attitude question "only children aged from 0 to 10 years need to be vaccinated for HBV," more than half of the surveyed students answered this question incorrectly. The proportions of each gender responding to each individual question in the knowledge and attitude sections are shown in Table 2.

Regarding knowledge and attitudes toward HBV infection and vaccination by year of the study, overall less than half of the students knew that hepatitis B was not genetic in origin, while only 18.2% of the 1st year students, 35.3% of the 2nd-year, and a third of the 3rd–5th-year students knew this ($P = 0.002$). There was no difference between students' cohorts with regard to HBV symptoms and complications (80% students responded correctly) [Table 3].

There were no significant differences with regard to monthly expenditures ($P > 0.05$) and Monthly individual expidenture does not affect knowledge or attitudes about hepatitis B vaccination in this study. Most of the students (60%) knew that HBV was not transmitted through the air ($P = 0.027$). More than 70% of them answered correctly that HBV can be transmitted through contaminated needles that were previously used by infected people. Half of the students (50%) thought that it was necessary to get newborn babies vaccinated within a few hours after birth, while 25% of them thought the opposite, and 15% of them reported that they

Table 2: The proportion of gender providing the answer for each individual section and the total score ([n=535], n[%])

Items	Gender						Mean score±SD		Total		χ^2 (*P*)
	Male (*n*=174)			Female (*n*=361)			Male (*n*=174)	Female (*n*=361)	Mean±SD	IQR (25–75)	
	1	2	3	1	2	3					
Knowledge											
K1	65 (37.4)	26 (14.9)	83 (47.7)	117 (32.4)	47 (13.0)	197 (54.6)	3.09±1.47	3.25±1.45	3.20±1.46	4.0 (2.0–4.0)	2.221 (0.329)
K2	114 (65.5)	23 (13.2)	37 (21.3)	254 (70.4)	44 (12.1)	63 (17.5)	2.22±1.34	2.09±1.26	2.13±1.29	2.0 (1.0–3.0)	1.413 (0.493)
K3	110 (63.2)	23 (13.2)	41 (23.6)	200 (55.4)	62 (17.2)	99 (27.4)	3.70±1.37	3.42±1.40	3.51±1.39	4.0 (2.0–5.0)	3.063 (0.216)
K4	80 (46.0)	28 (16.1)	66 (37.9)	266 (73.7)	52 (14.4)	43 (11.9)	3.90±1.16	3.93±1.14	3.92±1.14	4.0 (3.0–5.0)	53.176 (0.000)
K5	80 (46.0)	28 (16.1)	66 (37.9)	147 (40.7)	71 (19.7)	143 (39.6)	2.80±1.51	2.91±1.43	2.87±1.46	3.0 (1.0–4.0)	1.661 (0.436)
K6	140 (80.5)	23 (13.2)	11 (6.3)	286 (79.2)	43 (11.9)	32 (8.9)	4.17±0.98	4.08±1.06	4.11±1.04	4.0 (4.0–5.0)	1.129 (0.569)
K7	95 (54.6)	41 (23.6)	38 (21.8)	198 (54.8)	78 (21.6)	85 (23.5)	3.44±1.26	3.38±1.32	3.40±1.30	4.0 (3.0–4.0)	0.352 (0.839)
K8	144 (82.8)	14 (8.0)	16 (9.2)	299 (82.8)	38 (10.5)	24 (6.6)	1.69±1.12	1.67±1.03	1.68±1.06	1.0 (1.0–2.0)	1.762 (0.414)
K9	140 (80.5)	22 (12.6)	12 (6.9)	286 (79.2)	39 (10.8)	36 (10.0)	4.16±1.02	4.08±1.11	4.11±1.09	4.0 (4.0–5.0)	1.609 (0.447)
K10	113 (64.9)	29 (16.7)	32 (18.4)	239 (66.2)	62 (17.2)	60 (16.6)	2.18±1.34	2.12±1.27	2.14±1.29	2.0 (1.0–3.0)	0.260 (0.878)
K11	134 (77.0)	28 (16.1)	12 (6.9)	284 (78.7)	47 (13.0)	30 (8.3)	4.04±0.99	4.03±1.00	4.04±0.99	4.0 (4.0–5.0)	1.131 (0.568)
K12	101 (58.0)	33 (19.0)	40 (23.0)	194 (53.7)	92 (25.5)	75 (20.8)	3.49±1.33	3.45±1.21	3.47±1.25	4.0 (3.0–4.0)	2.798 (0.247)
K13	146 (83.9)	19 (10.9)	9 (5.2)	314 (87.0)	28 (7.8)	19 (5.3)	4.24±0.92	4.25±0.93	4.25±0.93	4.0 (4.0–5.0)	1.468 (0.480)
K14	34 (19.5)	56 (32.2)	84 (48.3)	68 (18.8)	105 (29.1)	188 (52.1)	3.41±1.21	3.45±1.15	3.44±1.17	4.0 (3.0–4.0)	0.739 (0.691)
K15	136 (78.2)	22 (12.6)	16 (9.2)	283 (78.4)	51 (14.1)	27 (7.5)	4.07±1.04	4.06±1.02	4.06±1.02	4.0 (4.0–5.0)	0.620 (0.733)
K16	128 (73.6)	26 (14.9)	20 (11.5)	299 (82.8)	48 (13.3)	14 (3.9)	3.96±1.14	4.15±0.88	4.09±0.98	4.0 (4.0–5.0)	12.208 (0.002)
K17	150 (86.2)	10 (5.7)	14 (8.1)	331 (91.7)	19 (5.3)	11 (3.0)	4.30±0.99	4.42±0.83	4.39±0.89	5.0 (4.0–5.0)	0.672 (0.035)
K18	154 (88.6)	10 (5.7)	10 (5.7)	317 (87.8)	24 (6.6)	20 (5.5)	4.39±0.92	4.33±0.97	4.35±0.95	5.0 (4.0–5.0)	0.165 (0.921)
Total	2064 (65.9)	461 (14.7)	607 (19.4)	4382 (67.4)	950 (14.6)	1166 (18)	3.51±0.19	3.50±0.19	3.51±0.18	4.0 (2.0–5.0)	4.803 (0.461)
Attitude											
A1	73 (42.0)	25 (14.4)	76 (43.6)	149 (41.3)	59 (16.3)	153 (42.4)	2.98±1.58	3.05±1.46	3.02±0.08	3.0 (2.0–4.0)	0.351 (0.839)
A2	137 (78.7)	17 (9.8)	20 (11.5)	292 (80.9)	36 (10.0)	33 (9.1)	4.08±1.17	4.12±1.10	4.10±0.05	4.0 (4.0–5.0)	0.729 (0.695)
A3	78 (44.8)	64 (36.8)	32 (18.4)	199 (55.1)	104 (28.8)	58 (16.1)	3.41±1.25	3.59±1.21	3.50±0.05	4.0 (3.0–5.0)	5.158 (0.076)
A4	58 (33.4)	66 (37.9)	50 (28.7)	121 (33.5)	140 (38.8)	100 (27.7)	3.05±1.26	3.06±1.17	3.06±0.06	3.0 (2.0–4.0)	0.068 (0.967)
A5	78 (44.9)	58 (33.3)	38 (21.8)	158 (43.8)	125 (34.6)	78 (21.6)	3.36±1.13	3.30±1.14	3.33±0.01	3.0 (3.0–4.0)	0.090 (0.956)
Total	424 (48.7)	230 (26.4)	216 (24.9)	919 (50.9)	464 (25.7)	422 (23.4)	3.37±0.18	3.42±0.14	3.40±0.03	3.0 (2.0–5.0)	1.279 (0.707)

Knowledge question (K1-K18), Attitude question (A1-A5), Response from participants (1: Correct; 2: Do not know; 3: Incorrect). SD: Standard SD: Standard deviation, HBV: Hepatitis B virus, HCV: Hepatitis C virus, HDV: Hepatitis D virus, NEPI: Vienam's National Expanded Program on Immunization

Table 3: Knowledge of and attitudes toward HBV infection differences by year of study among undergraduates ([*n*=535], *n*[%])

Items	Year of study															χ^2 (*P*)
	Year 1			Year 2			Year 3			Year 4			Year 5			
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	
Knowledge																
K1	12 (18.2)	9 (13.6)	45 (68.2)	36 (35.3)	20 (19.6)	46 (45.1)	27 (40.9)	9 (13.6)	30 (45.5)	12 (33.3)	10 (27.8)	14 (38.9)	95 (35.8)	25 (9.4)	145 (54.8)	23.789 (0.002)
K2	44 (66.7)	13 (19.7)	9 (13.6)	75 (73.5)	7 (6.9)	20 (19.6)	54 (81.8)	4 (6.1)	8 (12.1)	24 (66.7)	6 (16.7)	6 (16.6)	171 (64.5)	37 (14.0)	145 (54.8)	14.860 (0.062)
K3	31 (46.9)	18 (27.3)	17 (25.8)	62 (60.8)	13 (12.7)	27 (26.5)	47 (71.2)	9 (13.6)	10 (15.2)	24 (66.6)	6 (16.7)	6 (16.7)	145 (54.8)	39 (14.7)	80 (30.2)	16.782 (0.032)
K4	45 (68.2)	13 (19.7)	8 (12.1)	69 (67.6)	16 (15.7)	17 (16.7)	50 (75.8)	13 (19.7)	3 (4.5)	25 (69.4)	6 (16.7)	5 (13.9)	203 (76.6)	28 (10.6)	34 (12.8)	11.622 (0.169)
K5	18 (27.3)	18 (27.3)	30 (45.4)	50 (49)	15 (14.7)	37 (36.3)	32 (48.5)	15 (22.7)	19 (28.8)	20 (55.6)	4 (11.1)	12 (33.3)	107 (40.4)	47 (17.7)	111 (41.9)	15.755 (0.046)
K6	50 (75.8)	13 (19.7)	3 (4.5)	83 (81.4)	10 (9.8)	9 (8.8)	55 (83.3)	7 (10.6)	4 (6.1)	30 (83.3)	5 (13.9)	1 (2.8)	209 (78.9)	30 (11.3)	26 (9.8)	7.958 (0.438)
K7	37 (56.1)	13 (19.7)	16 (24.2)	59 (57.9)	18 (17.6)	25 (24.5)	39 (59.1)	19 (28.8)	8 (12.1)	22 (61.2)	7 (19.4)	7 (19.4)	136 (51.3)	62 (23.4)	67 (25.3)	8.320 (0.403)
K8	51 (77.3)	9 (13.6)	6 (9.1)	86 (84.3)	7 (6.9)	9 (8.8)	57 (86.4)	5 (7.6)	4 (6.0)	30 (83.3)	5 (13.9)	1 (2.8)	219 (82.6)	26 (9.8)	20 (7.6)	4.951 (0.763)
K9	47 (71.2)	8 (12.1)	11 (16.7)	82 (80.4)	8 (7.8)	12 (11.8)	60 (90.9)	5 (7.6)	1 (1.5)	29 (80.5)	5 (13.9)	2 (5.6)	207 (78.1)	35 (13.2)	23 (8.7)	14.300 (0.074)
K10	43 (65.2)	9 (13.6)	14 (21.2)	72 (70.6)	8 (7.8)	22 (21.6)	44 (66.7)	11 (16.7)	11 (16.6)	23 (63.9)	7 (19.4)	6 (16.7)	170 (64.2)	56 (21.1)	39 (14.7)	11.471 (0.176)
K11	53 (80.3)	11 (16.7)	2 (3.0)	77 (75.5)	9 (8.8)	16 (15.7)	47 (71.2)	15 (22.7)	4 (6.1)	25 (69.4)	9 (25.0)	2 (5.6)	216 (81.5)	31 (11.7)	18 (6.8)	22.069 (0.005)
K12	35 (53.0)	17 (25.8)	14 (21.2)	55 (54.0)	18 (17.6)	29 (28.4)	27 (40.9)	25 (37.9)	14 (21.2)	17 (47.2)	14 (38.9)	5 (13.9)	161 (60.8)	51 (19.2)	53 (20.0)	21.139 (0.007)
K13	52 (78.7)	10 (15.2)	4 (6.1)	88 (86.3)	5 (4.9)	9 (8.8)	59 (89.4)	6 (9.1)	1 (1.5)	30 (83.3)	4 (11.1)	2 (5.6)	231 (87.2)	22 (8.3)	12 (4.5)	10.256 (0.248)
K14	14 (21.2)	30 (45.5)	22 (33.3)	25 (24.5)	19 (18.6)	58 (56.9)	14 (21.2)	16 (24.2)	36 (54.6)	5 (13.9)	15 (41.7)	16 (44.4)	44 (16.6)	81 (30.6)	140 (52.8)	20.638 (0.008)
K15	47 (71.2)	12 (18.2)	7 (10.6)	77 (75.5)	11 (10.8)	14 (13.7)	53 (80.3)	9 (13.6)	4 (6.1)	32 (88.9)	3 (8.3)	1 (2.8)	210 (79.3)	38 (14.3)	17 (6.4)	10.627 (0.224)
K16	50 (75.8)	9 (13.6)	7 (10.6)	75 (73.6)	14 (13.7)	13 (12.7)	58 (87.9)	6 (9.1)	2 (3.0)	32 (88.9)	3 (8.3)	1 (2.8)	212 (80.0)	42 (15.8)	11 (4.2)	16.522 (0.035)

(Contd...)

Table 3: *(Continued)*

Items	Year of study															χ^2 (*P*)
	Year 1			Year 2			Year 3			Year 4			Year 5			
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	
Knowledge																
K17	58 (87.9)	5 (7.6)	3 (4.5)	88 (86.3)	3 (2.9)	11 (10.8)	61 (92.4)	4 (6.1)	1 (1.5)	31 (86.1)	3 (8.3)	2 (5.6)	243 (91.7)	14 (5.3)	8 (3.0)	13.898 (0.084)
K18	54 (81.8)	5 (7.6)	7 (10.6)	85 (83.4)	4 (3.9)	13 (12.7)	58 (87.9)	7 (10.6)	1 (1.5)	31 (86.1)	3 (8.3)	2 (5.6)	243 (91.7)	15 (5.7)	7 (2.6)	22.706 (0.004)
Total	741 (62.4)	222 (18.7)	225 (18.9)	1244 (67.8)	205 (11.2)	387 (21)	842 (70.9)	185 (15.6)	161 (13.5)	442 (68.2)	115 (17.7)	91 (14.1)	3222 (66.3)	679 (14)	956 (19.7)	14.870 (0.154)
Attitude																
A1	23 (34.8)	12 (18.2)	31 (47.0)	57 (55.9)	12 (11.8)	33 (32.3)	34 (51.5)	10 (15.2)	22 (33.3)	21 (58.3)	6 (16.7)	9 (25.0)	87 (32.8)	44 (16.6)	134 (50.6)	26.729 (0.001)
A2	45 (68.2)	13 (19.7)	8 (12.1)	83 (81.4)	8 (7.8)	11 (10.8)	46 (69.7)	13 (19.7)	7 (10.6)	30 (83.3)	5 (13.9)	1 (2.8)	225 (84.9)	14 (5.3)	26 (9.8)	24.683 (0.002)
A3	35 (53.1)	23 (34.8)	8 (12.1)	50 (49.0)	30 (29.4)	22 (21.6)	35 (53.1)	23 (34.8)	8 (12.1)	23 (63.9)	8 (22.2)	5 (13.9)	134 (50.6)	84 (31.7)	47 (17.7)	6.302 (0.613)
A4	22 (33.3)	32 (48.5)	12 (18.2)	41 (40.2)	21 (20.6)	40 (39.2)	19 (28.8)	27 (40.9)	20 (30.3)	8 (22.2)	15 (41.7)	13 (36.1)	89 (33.6)	111 (41.9)	65 (24.5)	23.319 (0.003)
A5	30 (45.5)	27 (40.9)	9 (13.6)	57 (55.9)	25 (24.5)	20 (19.6)	29 (44.0)	21 (31.8)	16 (24.2)	14 (38.9)	12 (33.3)	10 (27.8)	106 (40.0)	98 (37.0)	61 (23.0)	12.062 (0.148)
Total	155 (47.0)	107 (32.4)	68 (20.6)	288 (56.5)	96 (18.8)	126 (24.7)	163 (49.4)	94 (28.5)	73 (22.1)	96 (53.3)	46 (25.6)	38 (21.1)	641 (48.4)	351 (26.5)	333 (25.1)	18.619 (0.153)

Knowledge question (K1-K18), attitude question (A1-A5), response from participants (1: Correct; 2: Do not know; 3: Incorrect). SD: Standard deviation, HBV: Hepatitis B virus, HCV: Hepatitis C virus, HDV: Hepatitis D virus, NEPI: Vietnam's National Expanded Program on Immunization

Table 4: Hepatitis B knowledge and attitude among pharmacy students by monthly expense (USD) ([*n*=535], *n*(%])

Items	Expenditure (USD)												χ^2 (*P*)
	<90			90–<130			130–<180			≥180			
	1	2	3	1	2	3	1	2	3	1	2	3	
Knowledge													
K1	42 (27.8)	21 (13.9)	88 (58.3)	70 (34.7)	32 (15.8)	100 (49.5)	33 (37.5)	11 (12.5)	44 (50.0)	37 (39.4)	9 (9.6)	48 (51.1)	6.232 (0.398)
K2	100 (66.2)	29 (19.2)	22 (14.6)	142 (70.3)	25 (12.4)	35 (17.3)	63 (71.6)	6 (6.8)	19 (21.6)	63 (67.0)	7 (7.4)	24 (25.5)	14.286 (0.027)
K3	77 (50.9)	33 (21.9)	41 (27.2)	117 (57.9)	26 (12.9)	59 (29.2)	54 (61.3)	13 (14.8)	21 (23.9)	62 (66.0)	13 (13.8)	19 (20.2)	9.560 (0.144)
K4	103 (68.2)	27 (17.9)	21 (13.9)	152 (75.2)	26 (12.9)	24 (11.9)	66 (75.0)	13 (14.8)	9 (10.2)	71 (75.5)	10 (10.6)	13 (13.8)	4.084 (0.665)
K5	56 (37.1)	32 (21.2)	63 (41.7)	98 (48.5)	38 (18.8)	66 (32.7)	35 (39.8)	13 (14.8)	40 (45.4)	38 (40.4)	16 (17.0)	40 (42.6)	7.986 (0.239)
K6	117 (78.2)	21 (13.9)	12 (7.9)	156 (77.2)	26 (12.9)	20 (9.9)	72 (81.8)	11 (12.5)	5 (5.7)	81 (86.2)	7 (7.4)	6 (6.4)	4.774 (0.573)
K7	71 (47.0)	40 (26.5)	40 (26.5)	110 (54.4)	45 (22.3)	47 (23.3)	54 (61.4)	14 (15.9)	20 (22.7)	58 (61.7)	20 (21.3)	16 (17.0)	8.305 (0.217)
K8	126 (83.4)	15 (9.9)	10 (6.7)	166 (82.2)	23 (11.4)	13 (6.4)	72 (81.8)	7 (8.0)	9 (10.2)	79 (84.0)	7 (7.4)	8 (8.5)	2.876 (0.824)
K9	125 (83.5)	15 (9.9)	10 (6.6)	151 (74.8)	35 (17.3)	16 (7.9)	70 (79.6)	6 (6.8)	12 (13.6)	79 (84.0)	5 (5.3)	10 (10.6)	15.776 (0.015)
K10	94 (62.3)	32 (21.2)	25 (16.5)	131 (64.9)	38 (18.8)	33 (16.3)	62 (70.5)	11 (12.5)	15 (17.0)	65 (69.1)	10 (10.6)	19 (20.2)	6.622 (0.357)
K11	126 (83.4)	19 (12.6)	6 (4.0)	153 (75.8)	35 (17.3)	14 (6.9)	70 (79.6)	9 (10.2)	9 (10.2)	69 (73.4)	12 (12.8)	13 (13.8)	11.814 (0.066)
K12	81 (53.6)	37 (24.5)	33 (21.9)	104 (51.5)	56 (27.7)	42 (20.8)	55 (62.5)	11 (12.5)	22 (25.0)	55 (58.5)	21 (22.3)	18 (19.1)	8.622 (0.196)
K13	132 (87.4)	11 (7.3)	8 (5.3)	172 (85.1)	21 (10.4)	9 (4.5)	73 (83.0)	9 (10.2)	6 (6.8)	83 (88.3)	6 (6.4)	5 (5.3)	2.673 (0.849)
K14	22 (14.6)	49 (32.5)	80 (52.9)	36 (17.8)	65 (32.2)	101 (50.0)	21 (23.9)	27 (30.7)	40 (45.4)	23 (24.5)	20 (21.3)	51 (54.3)	8.157 (0.227)
K15	118 (78.2)	29 (19.2)	4 (2.6)	162 (80.2)	29 (14.4)	11 (5.4)	64 (72.7)	10 (11.4)	14 (15.9)	75 (79.8)	5 (5.3)	14 (14.9)	28.501 (0.000)
K16	120 (79.4)	25 (16.6)	6 (4.0)	172 (85.1)	24 (11.9)	6 (3.0)	63 (71.6)	14 (15.9)	11 (12.5)	72 (76.6)	11 (11.7)	11 (11.7)	17.986 (0.006)

(Contd...)

Table 4: *(Continued)*

Items	Expenditure (USD)												χ^2 (*P*)
	<90			90–<130			130–<180			≥180			
	1	2	3	1	2	3	1	2	3	1	2	3	
Knowledge													
K17	139 (92.0)	6 (4.0)	6 (4.0)	183 (90.6)	13 (6.4)	6 (3.0)	77 (87.5)	6 (6.8)	5 (5.7)	82 (87.2)	4 (4.3)	8 (8.5)	6.305 (0.390)
K18	131 (86.7)	11 (7.3)	9 (6.0)	180 (89.1)	15 (7.4)	7 (3.5)	79 (89.8)	4 (4.5)	5 (5.7)	81 (86.2)	4 (4.3)	9 (9.6)	6.123 (0.410)
Total	1780 (65.5)	452 (16.6)	484 (17.9)	2455 (69.2)	572 (16.1)	519 (14.7)	1083 (68.4)	195 (12.3)	306 (19.3)	1173 (69.3)	187 (11.1)	332 (19.6)	9.482 (0.311)
Attitude													
A1	53 (35.1)	24 (15.9)	74 (48.0)	84 (41.6)	35 (17.3)	83 (41.1)	39 (44.3)	11 (12.5)	38 (43.2)	46 (48.9)	14 (14.9)	34 (36.2)	6.335 (0.387)
A2	128 (83.8)	11 (7.3)	12 (7.9)	156 (77.2)	27 (13.4)	19 (9.4)	71 (80.7)	5 (5.7)	12 (13.6)	74 (78.8)	10 (10.6)	10 (10.6)	7.691 (0.262)
A3	83 (54.0)	44 (29.1)	24 (15.9)	91 (45.0)	81 (40.1)	30 (14.9)	49 (55.7)	22 (25.0)	17 (19.3)	54 (57.5)	21 (22.3)	19 (20.2)	13.136 (0.041)
A4	46 (29.5)	66 (43.7)	39 (25.8)	67 (33.1)	86 (42.6)	49 (24.3)	29 (33.0)	31 (35.2)	28 (31.8)	37 (39.3)	23 (24.5)	34 (36.2)	12.34 (0.055)
A5	67 (43.4)	47 (31.1)	37 (24.5)	86 (42.6)	73 (36.1)	43 (21.3)	45 (51.1)	29 (33.0)	14 (15.9)	38 (40.4)	34 (36.2)	22 (23.4)	4.220 (0.647)
Total	310 (51.3)	145 (24)	149 (24.7)	398 (49.3)	229 (28.3)	181 (22.4)	188 (53.4)	69 (19.6)	95 (27)	211 (56.1)	68 (18.1)	97 (25.8)	8.744 (0.278)

Knowledge question (K1-K18), Attitude question (A1-A5), Response from participants (1: Correct; 2: Do not know; 3: Incorrect). SD: Standard deviation, HBV: Hepatitis B virus, HCV: Hepatitis C virus, HDV: Hepatitis D virus, NEPI: Vietnam's National Expanded Program on Immunization. USD: US Dollar

did not know. Monthly expenditures of <90 USD or ≥180 USD did not affect significantly on knowledge (P = 0.311), attitudes were (P = 0.278). The resulting description of the knowledge and attitudes of the pharmacy students by expenses per month is in Table 4..

Each response was assessed good or poor knowledge, positive or negative attitude. The positive score is ≥3.50 (≥70%) and negative one is <3.50 (<70%). Overall, the respondents had negative attitudes toward hepatitis B, with the mean scores shown in Figure 1.

Considering the knowledge of hepatitis B in terms of demographic characteristics, males scored better than females (>3.50). However, females had better attitudes toward hepatitis B prevention than males, which is presented in Table 5.

DISCUSSION

The findings of the current study revealed impressive facts regarding the knowledge of pharmacy students and their attitude toward HBV. In addition, the study showed different recognition rates and attitude scores among pharmacy students in Dongnai province.

Several studies have focused on the immune status of HCWs

Table 5: The relationship between demographic characteristics, knowledge score, and attitude score by mean score comparison

Characteristics	Knowledge				Attitude			
	Male		Female		Male		Female	
	Mean±SD	MD (IQR [25–75])	Mean±SD	MD (IQR [25–75])	Mean±SD	MD (IQR [25–75])	Mean±SD	MD (IQR [25–75])
Year of study								
1st	3.39±0.48	3.39 (3.2–3.8)	3.54±0.33	3.56 (3.3–4.0)	3.4±0.48	3.39 (3.0–3.9)	3.48±0.46	3.40 (3.2–3.8)
2nd	3.43±0.27	3.39 (3.2–3.7)	3.38±0.32	3.44 (3.2–3.8)	3.38±0.59	3.40 (2.9–3.9)	3.31±0.60	3.40 (3.0–3.9)
3rd	3.57±0.24	3.67 (3.3–3.9)	3.54±0.36	3.56 (3.4–3.7)	3.18±0.49	3.20 (3.0–3.7)	3.64±0.41	3.67 (3.4–3.9)
4th	3.22±0.40	3.34 (2.8–3.5)	3.69±0.42	3.72 (3.5–4.0)	3.10±0.40	3.40 (2.9–2.1)	3.44±0.66	3.4 (3.2–3.7)
5th	3.60±0.41	3.67 (3.3–3.9)	3.50±0.40	3.50 (3.2–3.8)	3.43±0.53	3.40 (3.0–3.8)	3.47±0.55	3.4 (3.0–3.8)
Part-time job								
No	3.51±0.35	3.50 (3.2–3.8)	3.50±0.36	3.50 (3.2–3.8)	3.41±0.55	3.40 (3.0–3.8)	3.39±0.54	3.40 (3.0–3.8)
Yes	3.53±0.42	3.61 (3.2–3.9)	3.52±0.42	3.56 (3.3–3.9)	3.33±0.54	3.40 (3.0–3.8)	3.55±0.65	3.60 (3.2–4.0)
Locality								
Urban	3.53±0.38	3.61 (3.2–3.9)	3.52±0.37	3.56 (3.3–3.8)	3.36±0.53	3.40 (3.0–3.8)	3.44±0.56	3.40 (3.0–3.8)
Rural	3.46±0.35	3.42 (3.3–3.7)	3.43±0.38	3.47 (3.2–3.7)	3.51±0.53	3.60 (3.0–3.8)	3.38±0.57	3.40 (3.0–3.8)
Cohabitants								
Parents	3.59±0.41	3.67 (3.3–3.9)	3.52±0.37	3.56 (3.3–3.8)	3.45±0.54	3.60 (3.0–3.8)	3.38±0.53	3.40 (3.0–3.8)
Relatives	3.49±0.41	3.42 (3.2–3.7)	3.48±0.37	3.50 (3.2–3.8)	3.49±0.59	3.60 (3.0–3.8)	3.41±0.56	3.40 (3.0–8.8)
Friends	3.49±0.29	3.36 (3.3–3.8)	3.52±0.38	3.56 (3.3–3.9)	3.04±0.42	3.00 (2.8–3.5)	3.47±0.59	3.40 (3.2–4.0)
Alone	3.42±0.37	3.43 (3.2–3.7)	3.46±0.40	3.44 (3.2–3.8)	3.34±0.54	3.40 (3.0–3.8)	3.43±0.59	3.40 (3.0–4.0)
Others([a])	3.58±0.32	3.67 (3.2–3.9)	3.53±0.36	3.50 (3.3–4.1)	3.46±0.71	3.20 (3.0–3.8)	3.74±0.60	3.80 (3.4–4.2)
Monthly expense (USD)*								
<90	3.53±0.35	3.50 (3.2–3.8)	3.50±0.38	3.50 (3.3–3.8)	3.43±0.50	3.60 (3.0–4.0)	3.49±0.54	3.60 (3.2–4.0)
90–<130	3.49±0.35	3.56 (3.2–3.8)	3.51±0.38	3.50 (3.2–3.8)	3.20±0.57	3.20 (2.8–3.6)	3.47±0.55	3.40 (3.0–3.8)
130–<180	3.53±0.39	3.44 (3.2–3.9)	3.48±0.34	3.56 (3.2–3.8)	3.54±0.54	3.60 (3.0–4.2)	3.35±0.61	3.40 (2.9–3.8)
≥180	3.53±0.43	3.67 (3.2–3.9)	3.54±0.38	3.56 (3.4–3.8)	3.45±0.58	3.40 (3.2–3.8)	3.30±0.58	3.40 (3.0–3.6)
Do you think it is enough for your life								
Yes	3.51±0.38	3.56 (3.2–3.9)	3.50±0.38	3.50 (3.2–3.8)	3.32±0.55	3.40 (3.0–3.8)	3.42±0.57	3.40 (3.0–3.8)
No	3.52±0.36	3.56 (3.2–3.8)	3.53±0.36	3.56 (3.3–3.9)	3.53±0.51	3.60 (3.0–4.1)	3.44±0.54	3.40 (3.0–4.0)

(Contd...)

Table 5: *(Continued)*

Characteristics	Knowledge				Attitude			
	Male		Female		Male		Female	
	Mean±SD	MD (IQR [25–75])	Mean±SD	MD (IQR [25–75])	Mean±SD	MD (IQR [25–75])	Mean±SD	MD (IQR [25–75])
Have you been immunized with HBV vaccine?								
Yes	3.53±0.38	3.56 (3.2–3.9)	3.53±0.39	1.50 (1.3–1.7)	3.41±0.58	3.40 (3.0–3.8)	3.52±0.58	1.80 (1.4–2.0)
No	3.49±0.37	3.50 (3.2–3.8)	3.46±0.35	1.44 (1.3–1.6)	3.30±0.49	3.40 (2.9–3.7)	3.25±0.53	1.80 (1.4–2.0)
Why don't you want to be vaccinated?								
Do not know where to get vaccinated	3.44±0.27	3.53 (3.3–3.7)	3.42±0.41	3.44 (3.2–3.8)	3.03±0.42	3.10 (2.7–3.6)	3.29±0.44	3.40 (3.0–3.7)
The vaccine is too expensive	3.43±0.67	3.34 (3.2–3.5)	3.49±0.31	3.67 (3.2–3.8)	3.25±0.82	3.25 (2.8–3.8)	3.42±0.40	3.40 (3.1–3.6)
Fear of side effects of the vaccine	3.23±0.49	3.17 (2.8–3.7)	3.39±0.29	3.36 (3.2–3.5)	3.16±0.75	3.60 (2.8–3.6)	3.32±0.59	3.40 (2.9–3.6)
Fear some needles	3.61±0.27	3.67 (3.4–3.9)	3.59±0.41	3.70 (3.4–4.0)	3.49±0.42	3.60 (3.2–3.6)	3.48±0.55	3.40 (3.0–3.8)
No fear of catching HBV	3.29±0.42	3.33 (3.0–3.6)	3.54±0.36	3.67 (3.2–3.8)	3.29±0.38	3.00 (2.7–3.9)	3.17±0.56	3.20 (2.8–3.4)
Others(ᵇ)	3.59±0.29	3.62 (3.2–3.9)	3.41±0.33	3.56 (3.2–3.8)	3.43±0.43	3.40 (3.2–3.8)	3.09±0.56	3.20 (2.8–3.6)
Do you intend to set vaccinated for HBV?								
Yes	3.47±0.33	3.44 (3.2–3.7)	3.44±0.36	3.50 (3.2–3.9)	3.21±0.43	3.40 (2.9–3.6)	3.24±0.54	3.40 (3.0–3.6)
No	3.52±0.43	3.70 (3.3–4.0)	3.53±0.35	3.56 (3.3–3.8)	3.45±0.58	3.60 (3.0–3.9)	3.32±0.48	3.40 (3.0–3.7)
The willingness to pay for vaccination (USD)*								
<15	3.35±0.37	3.33 (3.1–3.6)	3.49±0.32	3.56 (3.3–3.8)	3.20±0.48	3.20 (2.8–3.6)	3.36±0.51	3.40 (3.0–3.6)
15–<20	3.52±0.47	3.67 (3.3–3.8)	3.55±0.43	3.50 (3.2–3.9)	3.38±0.58	3.40 (3.0–3.6)	3.37±0.52	3.40 (3.0–3.8)
20–<30	3.69±0.23	3.67 (3.5–4.0)	3.33±0.31	3.47 (3.0–3.8)	3.55±0.42	3.60 (3.4–3.9)	3.07±0.49	3.20 (2.8–3.4)
≥30	3.57±0.36	3.78 (3.1–3.9)	3.45±0.45	3.81 (3.5–3.9)	3.13±0.47	2.00 (1.6–2.0)	2.77±0.88	2.80 (2.6–3.3)

SD: Standard deviation, Range: Min-Max, MD: Median, IQR: (Q1: 25th percentile, Q3: 75th percentile). (ᵃ): Dormitory or rented house, (ᵇ): Do not know HBV can be infected or do not like, *USD: US Dollar. HBV: Hepatitis B virus

with regard to hepatitis B, relatively few of them were dedicated to students in training for the health professions, although vaccination should precede exposure to the occupational risks of HBV infection. This study, which was conducted in a country possessing a high HBV prevalence rate, enabled the conducting of interviews in a total sample of 535 pharmacy students at a private university. It was shown that 37.4% of the male and 31.4% of the female students thought HBV transmission were caused through genes, with 31.4% of the female students thinking the same. In terms of year of study, the figures were 18.2% for the 1st-year students and 36.3% for the rest. Only a little over 30% of students knew that using tableware in common could not cause viral transmission. On the other hand, more than half of them were aware that HBV could be transmitted through blood, injection needles, and toothbrushes. In general, we concluded that pharmacy students were greatly aware of the symptoms and complications of hepatitis B (>70.0%). For instance, hepatitis B can lead to cirrhosis as well as liver cancer; moreover, alcohol abuse can intensify the processor can even lead to hepatitis C or D. In comparison, Noubiap *et al*. in Cameroon found an 83.2% level of good knowledge of the risk factors for HBV infection.[14] On the contrary, Shalaby *et al*. (2010) in Egypt at reported that interviewees had adequate knowledge of transmission, vaccination, and treatment of hepatitis B.[15] The report among medical in Pakistan showed fair level of knowledge toward hepatitis B and C among university students.[16,17] Mansour-Ghanaei *et al*. also concluded that the level of HCWs' HBV comprehension was average and the HBV knowledge of females was better than that of males.[12] In this study, a huge portion of the pharmacy students (>80%) knew that it is necessary to have an urgent cure for HBV and the vaccination method can beused to achieve the most effective results.

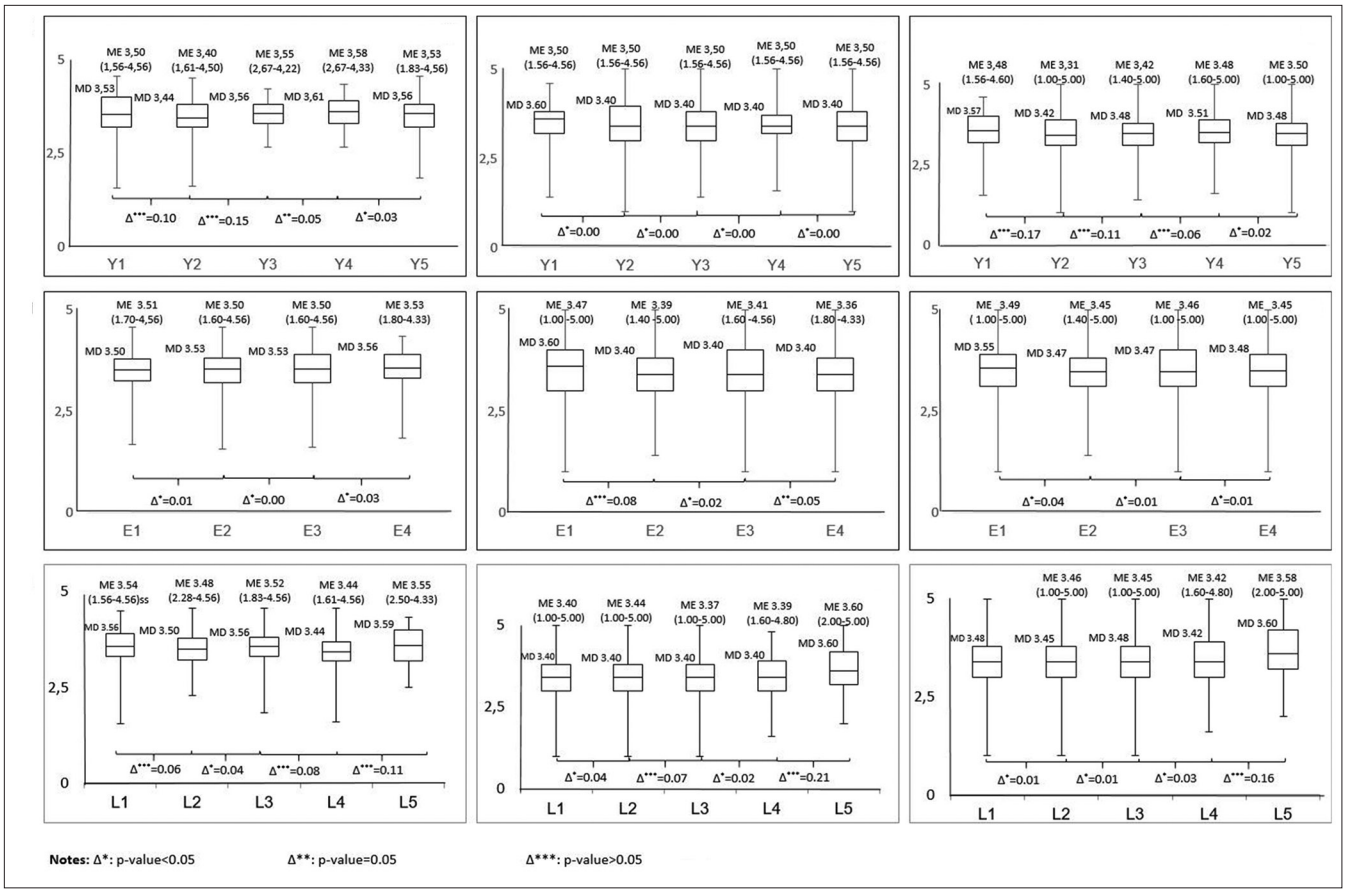

Figure 1: Description of knowledge and attitude score sub-group by (1) year of study, (2) monthly expense, (3) cohabitants. (a) Knowledge score, (b) attitude score, (c) total score. Δ*: P<0.05, Δ**: P=0.05, Δ***: P<0.05

Although the results reveal good knowledge about hepatitis B, there was the negative attitude (<70.0%) toward vaccination against that the overall attitudes toward HBV prevention was positive among less than one in two participants.[18] In research in Iran, Karimi-Sari *et al*. found that pharmacy students (54.0%) had a greater intention of getting vaccinated for HBV than others (20.9%).[19]

With regard to HBV vaccination, the WHO recommends that it be done worldwide, but especially in developing countries, including Vietnam. Vietnam is one of the nations both participating in and developing a project called "*Vietnam's National Expanded Program on Immunization,*" which is based on the WHO's global policies for immunization and establishment of the goal of providing universal immunization to all children by 1990 (PATH, 2014).

The current study sought to evaluate HBV awareness and attitudes toward HBV vaccination among pharmacy students at Lac Hong University. It also sought to encourage collaboration with government counterparts and instill confidence in health workers to provide vaccination services, including counseling to pregnant mothers regarding vaccination. The goal is to improve access to care and increase the rate of on-time hepatitis B birth-dose vaccination. The study had certain limitations, as it could not be generalized due to the cross-sectional self-reported nature of the study, as well as the small sample size and limited area in which it was conducted. Improving students' awareness of and perspective toward HBV is really important. Moreover, being knowledgeable about hepatitis B and vaccination against it at school is probably essential. Pharmacists are considered to be extremely knowledgeable and experienced in the field of vaccines. It can be seen that the immunization guidelines of HCWs and pharmacists are considered as the most important because of the rising awareness and changing attitudes of people toward vaccination. Forthcoming studies could assess the knowledge and attitudes of practicing community pharmacists.

CONCLUSION

The current study has identified the relationship among attitudes toward HBV prevention. The study sought to evaluate knowledge of HBV and attitudes toward HBV vaccination among pharmacy students at Lac Hong University, and the result of the study reveals crucial findings for the pharmaceutical industry. A program to educate people, especially pharmacy students, is necessary. The study found that female students have a better attitude than their male counterparts, but there is no difference in awareness between

Table 6: Distribution shown by mean, median, range, and interquartile range of knowledge and attitude score subgroup by year of study, cohabitants and monthly expense (USD)

Characteristics	Total score (n)															
	Knowledge					Attitude					Total					
	Mean±SD	Range	MD	25th	75th	Mean±SD	Range	MD	25th	75th	Mean	Range	SD	MD	25th	75th
Year of study																
1st	3.50±0.38	1.40–4.60	3.53	3.2	3.8	3.46±0.53	1.40–4.60	3.60	3.2	3.8	3.48	1.56–4.60	0.11	3.57	3.2	4.0
2nd	3.40±0.31	1.00–5.00	3.44	3.2	3.9	3.22±0.59	1.00–5.00	3.40	3.0	4.0	3.31	1.00–5.00	0.20	3.42	3.1	3.9
3rd	3.55±0.33	1.40–5.00	3.56	3.3	3.8	3.29±0.54	1.40–5.00	3.40	3.0	3.8	3.42	1.40–5.00	0.15	3.48	3.1	3.8
4th	3.58±0.41	1.60–5.00	3.61	3.3	3.7	3.37±0.61	1.60–5.00	3.40	3.2	3.7	3.48	1.60–5.00	0.14	3.51	3.2	3.9
5th	3.53±0.40	1.00–5.00	3.56	3.2	3.8	3.46±0.55	1.00–5.00	3.40	3.0	3.8	3.50	1.00–5.00	0.11	3.48	3.1	3.8
Cohabitants																
Parents	3.54±0.38	1.56–4.50	3.56	3.3	3.9	3.40±0.53	1.00–5.00	3.40	3.0	3.8	3.47	1.00–5.00	0.11	3.48	3.1	3.9
Relatives	3.48±0.39	2.28–4.56	3.50	3.2	3.8	3.44±0.57	1.00–5.00	3.40	3.0	3.8	3.46	1.00–5.00	0.13	3.45	3.1	3.8
Friends	3.52±0.36	1.83–4.56	3.56	3.3	3.8	3.37±0.55	1.00–5.00	3.40	3.0	3.8	3.45	1.00–5.00	0.13	3.48	3.1	3.8
Alone	3.44±0.39	1.61–4.56	3.44	3.2	3.7	3.39±0.57	1.60–4.80	3.40	3.0	3.9	3.42	1.60–4.80	0.13	3.42	3.1	3.9
Others[a]	3.55±0.34	2.50–4.33	3.59	3.2	4.0	3.60±0.64	2.00–5.00	3.60	3.2	4.2	3.58	2.00–5.00	0.21	3.60	3.2	4.2
Monthly expense (USD)*																
<90	3.51±0.37	1.67–4.56	3.50	3.3	3.8	3.47±0.53	1.00–5.00	3.47	3.0	4.0	3.49	1.00–5.00	0.11	3.55	3.1	3.9
90–<130	3.50±0.38	1.56–4.56	3.53	3.2	3.8	3.39±0.55	1.40–5.00	3.39	3.0	3.8	3.45	1.40–5.00	0.12	3.47	3.1	3.8
130–<180	3.50±0.36	1.61–4.56	3.53	3.2	3.9	3.41±0.58	1.00–5.00	3.41	3.0	4.0	3.46	1.00–5.00	0.16	3.47	3.1	4.0
≥180	3.53±0.40	1.83–4.33	3.56	3.3	3.9	3.36±0.58	1.00–5.00	3.36	3.0	3.8	3.45	1.00–5.00	0.13	3.48	3.1	3.9

SD: Standard deviation, Range: Min-Max, MD: Median, IQR: (Q1: 25th percentile; Q3: 75th percentile), *USD = US Dollar

the two groups. However, it is essential that enhancement of the knowledge and attitudes of pharmacy students relating to HBV infection be added to the learning process, with an up-to-date program. On the other hand, it is also essential to disseminate information to students and the public, especially by sharing HBV information with one's friends and family members. In addition, it is necessary to conduct a health education campaign aimed at the general public to disseminate proper attitudes toward a self-care educational program.

ACKNOWLEDGMENT

The authors are indebted to the participants who joined in this study for their time and generosity.

REFERENCES

1. World Health Organization. Hepatitis B 2017. Geneva: WHO; 2017. Available from: http://www.who.int/mediacentre/factsheets/fs204/en. [Last accessed on 2017 Dec 15].
2. Taylor VM, Choe JH, Yasui Y, Li L, Burke N, Jackson JC. Hepatitis B awareness, testing, and knowledge among vietnamese American men and women. J Community Health 2005;30:477-90.
3. World Health Organization. We can. I can. Stop Hepatitis-Stop Liver Cancer. Geneva: WHO; 2018. Available from: http://www.who.int/hepatitis/news-events/world-cancer-day/en/. [Last accessed on 2017 Dec 15].
4. Program for Appropriate Technology in Health; 2012 Available from: http://www.path.org/publications/detail.php?i=1928. [Last accessed on 2017 Dec 15]
5. WHO, UNICEF, UNFPA, Division TWBatUNP. Trends in Maternal Mortality: 1990 to 2013. Geneva: WHO; 2014.
6. Di Bisceglie AM, Rustgi VK, Hoofnagle JH, Dusheiko GM, Lotze MT. Hepatocellular carcinoma. Ann Intern Med 1988;108:390-401.
7. Merican I, Guan R, Amarapuka D, Alexander M, Chutaputti A, Chien R, et al. Chronic hepatitis B virus infection in Asian countries. J Gastroenterol Hepatol 2000;15:1356-61.
8. Pathoumthong K, Khampanisong P, Quet F, Latthaphasavang V, Souvong V, Buisson Y. Vaccination status, knowledge and awareness towards hepatitis B among students of health professions in Vientiane, Lao PDR. Vaccine 2014;32:4993-9.
9. World Health Organization. Guidlines on Hepatitis B and C Testing. Geneva: World Health Organization; 2017.
10. Hadler SC. Hepatitis B virus infection and health care workers. Vaccine 1990;8:S24-S8.
11. Fariba G, Abolfazl M, Narges M. A survey of the students' knowledge about hepatitis in Shiraz University of Medical Sciences. Hepatitis Monthly 2006;2006:59-62.
12. Mansour-Ghanaei R, Joukar F, Souti F, Atrkar-Roushan Z. Knowledge and attitude of medical science students toward hepatitis B and C infections. Int J Clin Exp Med 2013;6:197.
13. General Statistics Office of Vietnam. Statistical Handbook of Vietnam 2014. General Statistics Office of Vietnam; 2014. Available from: http://www.gso.gov.vn/default.aspx?tabid=512&idmid=5&ItemID=14277.
14. Noubiap JJ, Nansseu JR, Kengne KK, Ndoula ST, Agyingi LA. Occupational exposure to blood, hepatitis B vaccine knowledge and uptake among medical students in Cameroon. BMC Med Educ 2013;13:148.
15. Shalaby S, Kabbash IA, El Saleet G, Mansour N, Omar A, El Nawawy A. Hepatitis B and C viral infection: Prevalence, knowledge, attitude and practice among barbers and clients in Gharbia governorate, Egypt. East Mediterr Health J 2010;16:10-7.
16. Khan N, Ahmed Sm Fau - Khalid MM, Khalid Mm Fau - Siddiqui SH, Siddiqui Sh Fau - Merchant AA, Merchant AA. Effect of gender and age on the knowledge, attitude and practice regarding hepatitis B and C and vaccination status of hepatitis B among medical students of Karachi, Pakistan. 2010;6:30-82.
17. Okonkwo UC, Ngim OE, Osim H, Inyama MA, Kooffreh-Ada M, Esu E, et al. Knowledge of hepatitis B virus infection among traders. Niger J Clin Pract 2017;20:415.
18. Abdela A, Woldu B, Haile K, Mathewos B, Deressa T. Assessment of knowledge, attitudes and practices toward prevention of hepatitis B virus infection among students of medicine and health sciences in Northwest Ethiopia. BMC Res Notes 2016;9:410.
19. Karimi-Sari H, Bayatpoor ME, Aftabi Khotbesara M, Ebrahimi MS, Sattari Z, Sattari P, et al. Knowledge, attitude, and practice of Iranian health sciences students regarding hepatitis B and C virus infections: A national survey. Am J Inf Control 2017;45:e135-e41.

Source of Support: Nil. **Conflict of Interest:** None declared.