Original Article

A Survey on Medical, Dental, and Pharmacy Students' Knowledge, Attitude, and Practice about Hepatitis B Infection in a Private Medical University of Malaysia

Dinesh Kumar Upadhyay[1], Yuvati Manirajan[2], Muhammad Zahid Iqbal[1], Neeraj Paliwal[3], Sonam Pandey[4]

[1]Unit of Clinical Pharmacy and Pharmacy Practice, Faculty of Pharmacy, AIMST University, Kedah, Malaysia

[2]Faculty of Pharmacy, AIMST University, Kedah, Malaysia

[3]Unit of Pharmaceutical Technology, Faculty of Pharmacy, AIMST University, Kedah, Malaysia

[4]Independent Researcher, Kedah, Malaysia

ABSTRACT

Objective: The present study aimed to assess the knowledge, attitude, and practice (KAP) of 3rd- and 4th-year medical, dental, and pharmacy students about hepatitis B (HB) infection at a private medical university, Malaysia. **Methods:** A cross-sectional, questionnaire-based study was conducted among 482 medical, dental, and pharmacy students of 3rd- and 4th-year degree program of Asian Institute of Medicine, Science and Technology University to assess their KAP about HB infection using 34 prevalidated questions by convenient sampling method. A questionnaire was administered to the students, and their responses were measured at "yes" and "no" scale. Students' responses were entered in SPSS version 22, and quantitative analysis was performed using descriptive statistics and nonparametric tests at $P < 0.05$. **Findings:** The medical, dental, and pharmacy students had good knowledge and practice with positive attitude about HB infection. Mann–Whitney *U*-test determined a significant difference in knowledge ($P < 0.001$) and practice ($P < 0.001$) scores between medical and pharmacy, attitude ($P < 0.001$) scores between medical and dental, and attitude ($P < 0.001$) and practice ($P < 0.001$) scores between pharmacy and dental students. Students' age was correlated with their attitude, practice, and KAP scores and family income with their knowledge, attitude, practice, and KAP scores. **Conclusion:** Although students' knowledge and practice were good with positive attitude, all the students did not participate in health education program, screening, and vaccination of hepatitis B virus (HBV) infection which makes them more vulnerable to occupational HBV infection. Hence, it is recommended to organize a regular health education program for the students on screening and vaccination against HBV to prevent its infection.

Keywords: *Attitude, hepatitis, knowledge, Malaysia, pharmacy, students*

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Introduction

Hepatitis B (HB) is one of the life-threatening viral infections caused by hepatitis B virus (HBV). Acute HB can be cured at immediate attention, whereas people with chronic HB may have a lifelong infection, severe complications, and even death.[1] HBV is mostly transmitted through body fluids, blood, sexual activity, blood transfusion, needlestick injury (NSI), sharing the needles, organ transplantation, and from infected mother to child.[2,3] About 257 million people were infected worldwide with HBV in 2015, and over 887,000 deaths have been reported due to cirrhosis and hepatocellular carcinoma.[2] In the Asia-Pacific region, India is the second-largest global pool of chronic HBV infection with the burden of 50 million cases of HB.[4] Malaysia reported an alarming increase in HB incidents from

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Address for correspondence:
Dr. Dinesh Kumar Upadhyay, E-mail: dinesh17dec@rediffmail.com

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2.26 to 12.65 per 100,000 population between 2010 and 2015, respectively,[5] with a greater number of deaths in 2014 due to HB compared to any other vaccine-preventable disease.[6]

A high prevalence of HBV infection has been reported among health-care workers compared to nonhealth-care workers.[7] Studies from Malaysia have reported a low knowledge and awareness about HB infection among the health-care professional students[8,9] and recommends for more extensive studies in various universities located in different regions of Malaysia to know the level of understanding of health-care professional students about HBV infection. Moreover, none of the Malaysian studies compared the knowledge, attitude, and practice (KAP) of medical, dental, and pharmacy students about HBV infection together. Hence, this study was conducted in a private medical university in Kedah state, Malaysia.

Methods

A cross-sectional, questionnaire-based study was conducted among 482 medical, dental, and pharmacy students of third- and forth-year degree program of Asian Institute of Medicine, Science and Technology (AIMST) University located in Kedah state of Malaysia in the month of May 2019. The study was approved by AIMST University Human Ethics Committee (AUHEC) (Ref. No. AUHEC/FOP/2019/18). The study sample was calculated 450 students (medical: 200, dental: 110, and pharmacy: 140) using Raosoft sample size calculator at 95% confidence interval, 50% proportion, and 5% margin of error. The study excluded incomplete survey form, 1st- and 2nd-year students from three courses due to their less academic and clinical exposure at the beginning of the courses, and 5th-year medical and dental students due to their clinical posting in another hospital during the study period. Before conducting the study, written consent was taken from the students who showed their willingness to participate in the study, and the targeted sample (N = 450) was achieved by a convenient sampling method.

KAP questions related to HBV infection were developed after extensive literature review[8,10-13] covering the basic information such as causative pathogen, sign and symptoms, screening, risk factors, mode of transmission, complications, severity, treatment, prevention, and vaccination. A total of 34 questions were formulated and divided into three domains: knowledge (15 questions), attitude (12 questions), and practice (7 questions). These questions were measured at "yes" and "no" scale. Score 1 was given to "yes" response, whereas 0 for "no" response. (The final version of our questionnaire is provided in Supplementary File.) The minimum and maximum possible scores for individual domain can be 0–15 for knowledge, 0–12 for attitude, and 0–7 for practice questions, respectively. However, the total KAP scores can be 34. Students' KAP were classified based on Bloom's cutoff point into poor knowledge (mean scores ≤5/15), adequate knowledge (mean score >6–10/15), and good knowledge (mean scores >10–15/15); negative attitude (mean scores ≤6/12) and positive attitude (mean scores >6–12/12); and poor practice (mean scores ≤3/7) and good practice (mean scores >3–7/7), respectively. The overall KAP scores of the students were classified as good KAP (mean scores >17–34/34) and poor KAP (mean scores ≤17/34).

The face and content validity of the questionnaire was done by one community medicine doctor and two public health pharmacy experts. A pilot study was carried out with 10% of the students to determine the questionnaire suitability, and Cronbach's alpha test for reliability was calculated 0.83 for knowledge, 0.78 for attitude, and 0.76 for practice. A prevalidated questionnaire was distributed to the students, and their responses were taken within 30 min. Data were entered into SPSS version 22 (IBM Corp., Armonk, NY) and found skewed at Shapiro–Wilk test. Descriptive statistics were used for quantitative analysis. Mann–Whitney *U*-test compared the mean scores between the groups, whereas Spearman's rank-order correlation test established the association between categorical variables and continuous variables at a significant level of $P < 0.05$.

Results

The students' mean age was 22.78 ± 1.45. Females were more in numbers (334 [69.3%]). Most of the students (81%) were from urban areas and residing in hostels (76%). Chinese were greater in number (350 [72.6%]), followed by Indian (124 [25.7%]). About 55% of the students' family income ranged between RM 5000 and RM 10000 (1 USD = RM 4.18). The blood donation status of the students was almost in equal proportion (yes: 49.4% and never done before: 50.6%) with no experience of NSI among 80% of the students.

Knowledge of the students about HB infection was examined, and their responses were analyzed by descriptive statistics [Table 1].

Attitude of the students about HB infection was evaluated, and data were analyzed by descriptive statistics [Table 2].

Students' practice about HB infection was tested, and data were analyzed by descriptive statistics [Table 3].

Descriptive statistics determined students' good knowledge (mean scores >10/15), good practice (mean scores >3/7), and overall good KAP (mean scores >24/34)

Table 1: Students' response to knowledge questions (*N* = 482)

Statements	Medical (*n*=222)	Pharmacy (*n*=149)	Dental (*n*=111)	Total
Awareness of HB infection	218 (98.2)	145 (97.3)	109 (98.2)	472 (97.9)
Causative organism	215 (96.8)	139 (93.3)	110 (99.1)	464 (96.3)
Knowledge of HB antigen	213 (95.9)	137 (91.9)	108 (97.3)	458 (95)
HB is life-threatening infection	190 (85.6)	132 (88.6)	104 (93.7)	426 (88.4)
HB may develop other types of hepatitis infection	179 (80.6)	111 (74.5)	85 (76.6)	375 (77.8)
Complication of HB infection	192 (86.5)	123 (82.6)	98 (88.3)	413 (85.7)
Symptoms of HB infection	209 (94.1)	142 (95.3)	101 (91.0)	452 (93.8)
Unprotected sex, sharing of unsterilized syringe, needle, and surgical instruments can lead to HB infection	214 (96.4)	126 (84.6)	100 (90.1)	440 (91.3)
Contaminated blood and body fluids are one of the modes of transmission of HBV	212 (95.5)	135 (90.6)	105 (94.6)	452 (93.8)
HBV can spread from a mother to a child vertically	199 (89.6)	124 (83.2)	95 (85.6)	418 (86.7)
HB can be prevented if possible	210 (94.6)	132 (88.6)	104 (93.7)	446 (92.5)
HB infection can be prevented by a vaccine	211 (95)	140 (94)	104 (93.7)	455 (94.4)
Vaccination schedule for children	213 (95.9)	131 (87.9)	95 (85.6)	439 (91.1)
HBV vaccines and antibodies are given together to a newborn from HBsAg-positive mother	198 (89.2)	127 (85.2)	99 (89.2)	424 (88)
Route of administration of vaccine	204 (91.9)	123 (82.6)	86 (77.5)	413 (85.7)

Data are reported as Number (%) of participants. In this table, only "Yes" answers are shown for each statement. HB=Hepatitis B, HBV=HB virus, HBsAg=HB surface antigen

with positive attitude (mean scores >6/12) about HB infection [Table 4].

Mann–Whitney *U*-test determined a significant difference in knowledge ($P < 0.001$) and practice ($P < 0.001$) scores between medical and pharmacy, attitude ($P < 0.001$) scores between medical and dental, and attitude ($P < 0.001$) and practice ($P < 0.001$) scores between pharmacy and dental students [Table 5].

Spearman's rank-order correlation test was used to establish the correlation between students' demographic characteristics and their knowledge, attitude, practice, and KAP scores [Table 6].

Discussion

Most of the students from three courses showed a high degree of knowledge about HBV infection, causative organism, mode of transmission, symptoms, and considered HBV infection as life-threatening with greater emphasis on possibility to prevent HBV infection with proper vaccination.[1,8,12-15] However, the majority of the students knew that exposure to contaminated blood or body fluids, unprotected sex, sharing unsterilized contaminated syringes, needles, and surgical instruments are the risk factors for HBV infection.[1,13,16,17] A greater number of students were aware of HB antigen, HB vaccination schedule, route of administration for HB vaccine, and combined therapy of HBV vaccine and antibody to newborn delivered by hepatitis B surface antigen-positive mother. More than two-third of the students also knew that HB may develop other types of hepatitis infection and may cause liver cancer[1,12,18] [Table 1].

In contrast to the above findings, studies from different countries reported low knowledge and awareness about HBV infection among medical,[19] dental,[20] and pharmacy[21] students. However, studies from Ghana and India described moderate and fair knowledge about HBV infection among medical and pharmacy students, respectively.[22,23] A low level of knowledge and awareness among medical, dental, and pharmacy students might be due to their unstructured curriculum design and less exposure to tutorials and assignments related to infectious diseases on a regular basis. The overall mean knowledge scores of the students were found as good as previous studies[16,22-24] but higher than one Indian study[4] with a significant ($P < 0.001$) difference in the knowledge mean scores between medical and pharmacy students in the present study.[8] The difference in mean knowledge scores between medical and pharmacy students might be due to more in-depth discussion on infectious diseases with medical students during their lectures, tutorials, and clinical exposures compared to pharmacy students.

Students showed positivity on safety and effectiveness of HB vaccine,[1,13,14] compulsory vaccination,[25] reporting of NSIs, and patient's testing for HBV before receiving health-care services;[13,14] allow HBV-infected patients to work routinely;[15,26] and restrain them from sexual contacts,[1,12,26] but they were not in favor of isolating HBV-infected patients[1] and refraining to treat

Table 2: Students' response to attitude questions (*N* = 482)

Statements	Medical (*n*=222)	Pharmacy (*n*=149)	Dental (*n*=111)	Total
Getting of HBV infection	126 (56.8)	64 (43)	63 (56.8)	253 (52.5)
Safety and effectiveness of HB vaccine	215 (96.8)	138 (92.6)	105 (94.6)	458 (95)
HB vaccination	213 (95.9)	139 (93.3)	105 (94.6)	457 (94.8)
Restrain from sexual contacts for HB-infected patients	175 (78.8)	114 (76.5)	87 (78.4)	376 (78)
Diagnosis and treatment of HB infection are expensive	113 (50.9)	94 (63.1)	75 (67.6)	282 (58.5)
Refrain from treating HB-infected patients	65 (29.3)	55 (36.9)	56 (50.5)	176 (36.5)
Testing of patients for HBV before receiving health-care services	179 (80.6)	130 (87.2)	103 (92.8)	412 (85.5)
Reporting of Needlestick injury	213 (95.9)	137 (91.9)	101 (91)	451 (93.6)
HBV-infected patients should be allowed to work routinely	179 (80.6)	124 (83.2)	94 (84.7)	397 (82.4)
Isolation of HB patients	79 (35.6)	39 (26.2)	60 (54.1)	178 (36.9)
Need of patient's hospitalization for full duration of HB treatment	126 (56.8)	86 (57.7)	85 (76.6)	297 (61.6)
Hepatitis C-infected patients also need HB vaccination	144 (64.9)	89 (59.7)	88 (79.3)	321 (66.6)

Data are reported as Number (%) of participants. In this table, only "Yes" answers are shown for each statement. HB=Hepatitis B, HBV=HB virus

Table 3: Students' response to practice questions (*N*=482)

Statements	Response	Medical (*n*=222)	Pharmacy (*n*=149)	Dental (*n*=111)	Total
Screening for HB		168 (75.7)	95 (63.8)	88 (79.3)	351 (72.8)
Vaccination against HB	FV	165 (74.3)	102 (68.5)	74 (66.7)	341 (70.7)
	PV	42 (18.9)	30 (20.1)	18 (16.2)	90 (18.7)
	NV	15 (6.8)	17 (11.4)	19 (17.1)	51 (10.6)
Request for the use of new syringe		179 (80.6)	89 (59.7)	84 (75.7)	352 (73.0)
Screening of blood before transfusion		168 (75.7)	83 (55.7)	82 (73.9)	333 (69.1)
Participation in HB health education program		106 (47.7)	49 (32.9)	49 (44.1)	204 (42.3)
Investigation and treatment of HB		213 (95.9)	142 (95.3)	100 (90.1)	455 (94.4)
Do you avoid meeting HB patients?		30 (13.5)	26 (17.4)	36 (32.4)	92 (19.1)

Data are reported as Number (%) of participants. In this table, only "Yes" answers are shown for each statement. FV=Full vaccination, PV=Partial vaccination, NV=No vaccination, HB=Hepatitis B

HB-infected patients by health-care professionals.[1,12,14] Students believed that patients with hepatitis C should be vaccinated for HBV[1,26] and HBV-infected patients should be hospitalized for full duration of treatment.[1,26] About 58.5% of the students felt that the diagnosis and treatment of HB infection are expensive,[25] and slightly more than a half of the students thought that they can get HB infection.[14]

The students in the present study showed their positive attitude toward HBV infection as previous studies conducted in different countries[14,27,28] but opposite to another study reported the overall negative attitude of pharmacy students toward HB infection,[29] indicating that students' knowledge did not bring changes in their attitude toward HB infection. A significant difference in mean attitude scores between medical and dental ($P < 0.001$) and pharmacy and dental ($P < 0.001$) students recommends for appropriate corrective measures to minimize the differences in their attitude. A systematic review highlighted a high degree of NSIs among Pakistani dental health-care workers with underreporting of it due to lack of awareness regarding the reporting system.[30] Similarly, underreporting of NSIs by medical, dental, and pharmacy students was documented from various countries.[14,31-33] Moreover,

Table 4: Mean knowledge, attitude, practice, and KAP scores of the students about hepatitis B infection (*N*=482)

Group	Mean±SD			
	Knowledge score (out of 15)	Attitude score (out of 12)	Practice score (out of 7)	KAP score (out of 34)
Medical (*n*=222)	13.86±1.67	8.23±2.05	3.89±1.21	25.98±3.58
Pharmacy (*n*=149)	13.20±2.04	8.11±1.90	3.25±1.35	24.56±3.68
Dental (*n*=111)	13.58±1.92	8.42±2.01	3.71±1.33	25.71±3.72

KAP=Knowledge, attitude, and practice, SD=Standard deviation

Table 5: Comparison of students' knowledge, attitude, and practice scores of hepatitis B infection (*N*=482)

Domain	Knowledge (out of 15)	Attitude (out of 12)	Practice (out of 7)
Group	Mean score	Mean score	Mean score
Medical (MED) (*n*=222)	13.86	8.23	3.89
Pharmacy (PH) (*n*=149)	13.20	8.11	3.25
Dental (DENT) (*n*=111)	13.58	8.42	3.71
MED versus PH (*P**)	0.001**	0.63	0.001**
MED versus DENT (*P**)	0.29	0.001**	0.57
PH versus DENT (*P**)	0.06	0.001**	0.001**

*Mann-Whitney *U*-test, **Significant at $P<0.05$ level (two-tailed)

Table 6: Correlation of students' KAP scores with their age, gender, family income, blood donation status and experience of needle stick injury (*N*=482)

Domains	Demographic characteristics									
	Age		Gender		Family income		Blood donation status		Experience of needlestick injury	
	r	*P**	*r*	*P**	*r*	*P**	*r*	*P**	*r*	*P**
K-scores	−0.06	0.15	0.01	0.76	0.09	0.046**	0.03	0.51	0.10	0.020**
A-scores	0.12	0.008**	−0.01	0.81	0.11	0.022**	−0.03	0.44	−0.05	0.23
P-scores	0.16	0.001**	−0.14	0.003**	0.09	0.048**	−0.13	0.004**	−0.14	0.002**
KAP-scores	0.09	0.031**	−0.04	0.33	0.14	0.002**	−0.06	0.18	−0.04	0.37

r=Correlation coefficient. *Spearman's rank-order correlation test, **Correlation was significant at <0.05 level (two-tailed).
KAP=Knowledge, attitude, and practice

one study highlighted their medical students not in favor of hospitalizing the HBV-infected patient for full duration of treatment.[26]

The overall mean practice scores of the students were good.[20,32] Mostly students were agreed for further investigation and treatment upon HBV diagnosis, and two-third of them had HBV screening which was higher than the Pakistani (49.4%) and Ethiopian (39.4%) studies.[26,32] Students believed that one should request for new syringe before use[8] and screening of blood before transfusion.[34] Students also denied for avoiding meeting with HB patients which was higher than one Malaysian study.[8] Less than two-third of the students received full vaccination against HBV that was higher than the studies conducted in Saudi Arabia[11] and Pakistan.[35] However, more than a half of the students never participated in HB health education program.[8] Furthermore, students' knowledge, attitude, practice, and KAP scores were correlated with their age, gender, family income, experience of NSI, and blood donation status which was comparable with the previous studies conducted in Malaysia[36] and Pakistan.[37]

Although all the students had good knowledge and practice with positive attitude about HBV infection, their full obligations toward attending health education program, screening, and vaccination of HBV were not commendable. Hence, they are continuously at higher risk of occupational HBV infection. The study recommends regular health education program highlighting more on occupational risk of HBV infection, screening, and vaccination. The institution should have HBV testing, vaccination, and postexposure prophylaxis facilities under the occupational health department. Moreover, the Ministry of Health should have a strict policy against vaccination and instruct the institutions to get the vaccination certificate from the students at the time of their admission and encouraged the nonvaccinated students for HBV vaccination.

The study findings cannot be generalized as it was restricted to one private university of Kedah state. Self-reporting from the students might have caused underreporting or overreporting of HBV infection. The study was conducted at different timings for three courses increasing the probability of questionnaire

outflow among the students that might have affected the study outcomes.

Authors' Contribution

Dinesh Kumar Upadhyay conceptualized the research study, synthesized, analyzed, and interpreted data and wrote the manuscript. Yuvati Manirajan helped in designing the study, analysis of the data, and manuscript writing. Muhammad Zahid Iqbal helped in collecting the data and assisted in data analysis. Neeraj Paliwal and Sonam Pandey critically reviewed, revised, and edited the manuscript. All authors read and approved the final version of the manuscript for the publication.

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Conflicts of interest

There are no conflicts of interest.

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