

A Cross Sectional Study on Knowledge, Attitude and Practice of Hepatitis B Vaccination Among Medical Students in Malaysia

Lee Pei Shin^{*}, Edzell Swamy Appasamy, Roshanjit Singh Sandhu, Thriya Lekka Appalanaidu, Divyarn Jude Woodrow Samaratunga

Faculty of Medicine, Melaka Manipal Medical College (Manipal Academy of Higher Education), Melaka, Malaysia

Email address

pshin0617@gmail.com (L. P. Shin), edzell168@gmail.com (E. S. Appasamy), roshanjit@gmail.com (R. S. Sandhu), thriya.lekka95@gmail.com (T. L. Appalanaidu), samaratungadivyarn@gmail.com (D. J. W. Samaratunga) *Corresponding author

To cite this article

Lee Pei Shin, Edzell Swamy Appasamy, Roshanjit Singh Sandhu, Thriya Lekka Appalanaidu, Divyarn Jude Woodrow Samaratunga. A Cross Sectional Study on Knowledge, Attitude and Practice of Hepatitis B Vaccination Among Medical Students in Malaysias. *Open Science Journal of Clinical Medicine*. Vol. 7, No. 3, 2019, pp. 83-92.

Received: May 30, 2019; Accepted: August 28, 2019; Published: September 6, 2019

Abstract

Transmission of HBV commonly occurs through exposure to bodily fluids, therefore putting health care workers at a higher risk of becoming infected. It is important for the medical students to have a good knowledge, attitude and practice regarding Hepatitis B vaccination. A questionnaire based analytical cross sectional study was used to conduct the study of knowledge, attitude and practice of hepatitis B vaccination among the medical students of private medical college in Malaysia. Participants of this study comprised of 3rd and 4th academic year students who have enrolled for MBBS in private medical college in Malaysia. The sample size of this research is 171 students. The questionnaire consisted of 4 sections, which are demographic details, attitude and practice of Hepatitis B vaccination. For qualitative data such as gender, race and socioeconomic status are calculated by using frequency, percentage and mode. The hypothesis tested by applying the Unpaired t test, ANOVA and binary logistic regression, odds ratio and 95% CI were used to measure the associations. In this research, 95.91% of the students were vaccinated against Hepatitis B (HBV) and 74.85% of the students had full doses (3 doses) of HBV vaccine. 92.4% of the students had moderate to good attitude and knowledge regarding HB vaccination. There is no significant association between gender (P=0.565), ethnicity (P=0.135), socioeconomic status (P=0.593) and knowledge (P=0.066) with practice of HBV vaccination. Female has 3.69 attitudes percentage score higher than male with a significant association (P<0.001). Chinese has higher attitude mean score (mean=85.53%) compared with Indian (mean=82.42%), Malay (mean=73.79%) and other ethnicities (mean=83.28%), this has significant association (P=0.002). Lower (mean=64.81%) socioeconomic status also shows lower attitude mean score compared with upper class (mean=82.37%), upper middle class (mean=83.09%), lower middle class (mean=82.28%) and working class (mean=81.48%), this has significant association (P=0.001). There is significant association between attitude and knowledge of HBV vaccination (P=0.002), students with good attitude mean score were 1.09 more likely to have better practice of Hepatitis B vaccination. The medical students who were not completed the full doses of Hepatitis B vaccination requirement should be educated on the importance of hepatitis b vaccination. We recommend the future studies to collect responses from all academic years so that the study would be of higher significance.

Keywords

Knowledge, Attitude, Practice, Hepatitis B Vaccination, Medical Students, Survey

1. Introduction

Hepatitis B infection, caused by the Hepatitis B Virus

(HBV), is one the major cause of morbidity and mortality globally. [1] HBV, a member of the Hepadnaviridae family, is a small DNA virus with features similar to retroviruses. About 1 in 3 people are known to be infected with this

potentially life threatening virus that affects the liver, causing both acute and chronic liver diseases. An estimated 257 million people have HBV infection, with the highest prevalence in western pacific region (6.2%) and African region (6.1%). [2] The general population in Malaysia with HBV surface antigen positive have a prevalence of 1.5 9.8%. [3] In 2015, HBV infection has caused 887000 deaths, mostly due to developments of complications including chronic hepatitis, liver cirrhosis and hepatocellular carcinoma (HCC) which is the second leading cause of deaths due to cancer. [1, 4] Transmission of HBV commonly occurs through percutaneous or per mucosal exposure to infected blood, semen and other bodily fluids, therefore putting health care workers at a higher risk of becoming infected. [5] Acute infection of HBV can be either symptomatic or asymptomatic and usually resolves, but in 5 10% of the cases reported, HBV infection can progress to a chronic stage. [6]

Fortunately, transmission of HBV can be prevented by the Hepatitis B vaccine, which has been available for over 20 years now with an excellent record of safety and immunogenicity. [7] In 195 countries, 105 countries have introduced HBV vaccine into their immunization schedule. [8] The global coverage (2016) for HBV vaccine is 39%, the highest in western pacific (83%) and the lowest in African (10%). [9] The HBV vaccination coverage in Malaysia is 96.32%. [3] The importance of vaccination is particularly seen in health care workers, where direct interaction with patients occurs. Health care workers who are HBV carriers due to childhood infections or exposure prior to vaccination pose a potential risk for their patients. [10] Unfortunately, the World Health Organization has estimated that coverage of Hepatitis B vaccination among healthcare workers in low and middle income country is 18%-39% and 67%-79% in high income countries. [11] The incidence of healthcare workers exposed to blood borne pathogens every year was 5.9% for HBV, around 66,000 HBV infections occur in people working in healthcare system worldwide. [12]

There are other variables that must be factored in this study. Studies show that different gender also affect the level of attitude and knowledge of Hepatitis B vaccination [13, 14]. Then, ethnicity can also cause different result in attitude and knowledge regarding Hepatitis B vaccination [15]. Another variable is the socioeconomic status, which may be a reason affecting knowledge and attitude of Hepatitis B vaccination among medical students [15 18]. People who has higher level of knowledge and attitude regarding Hepatitis B vaccination can affect the practice of Hepatitis B vaccination [19, 20].

This study, focusing mainly on private medical students in their 3rd and 4th academic year aims to find out the depth of knowledge, attitude and practice of Hepatitis B vaccination in these students. These students are chosen because they have no prior experience in the clinical scenario as they are recently introduced into clinical practice after 3 years of theoretical studies. Third and fourth year students have more lecture class compare with others which allow us to approach the students more conveniently, and also increase the response rate.

There are many researches done on the topic of Hepatitis B vaccination in Malaysia among health based students [20], international students, [21] and household [15]. However, there is very little study pertaining knowledge on Hepatitis B vaccination with attitude and practice of Hepatitis B vaccination. There is also limited study in Malaysia about the practice of Hepatitis B vaccination among medical students. This study would help in adding new aspects into the literature.

1.1. Research Questions

- 1. What is the prevalence of Hepatitis B vaccination among medical students?
- 2. Is there any association of gender, ethnicity, and socioeconomic status with knowledge of Hepatitis B vaccination among medical students?
- 3. Is there any association of gender, ethnicity, and socioeconomic status with attitude of Hepatitis B vaccination among medical students?
- 4. Is there any association of knowledge, attitude with practice of Hepatitis B vaccination among medical students?

1.2. Research Objectives

- 1. To find out the prevalence of Hepatitis B vaccination among medical students.
- To find out the association of gender, ethnicity, and socioeconomic status with knowledge of Hepatitis B vaccination among medical students.
- 3. To find out the association of gender, ethnicity, and socioeconomic status with attitude of Hepatitis B vaccination among medical students.
- 4. To find out the association of knowledge, attitude with practice of Hepatitis B vaccination among medical students.

1.3. Research Hypothesis

- 1. There is an association between gender, ethnicity, and socioeconomic status with knowledge of Hepatitis B vaccination among medical students.
- 2. There is an association between gender, ethnicity, and socioeconomic status with attitude of Hepatitis B vaccination among medical students.
- 3. There is an association between knowledge, attitude with practice of Hepatitis B vaccination among medical students.

2. Methodology

2.1. Study Design

The analytical cross sectional study design was used to assess the association between gender, ethnicity, socioeconomic status and knowledge, attitude, practice for Hepatitis B vaccination among medical students.

2.2. Study Place, Population and Time

The study was conducted in Melaka Manipal Medical College (MMMC), Muar, Johor, Malaysia campus.

There are three programs under Melaka Manipal Medical College, Malaysia, which are foundation in Science (FIS), Bachelor of Medicine and Bachelor of Surgery (MBBS) and Bachelor of Dental Surgery (BDS). There are approximately 800 students. There are 2 batches of FIS students, 5 batches of MBBS students and 3 batches of BDS students in this college. Third and fourth year medical students were chosen to be the study population.

The study was conducted for 6 weeks between the months of April to June 2019.

2.3. Sample Size

The sample size for this research was calculated using the formula given below

$$n = \frac{NZ_{1-\alpha/2}^{2} p (1-P)}{d^{2}(N-1) + Z_{1-\alpha/2}^{2} p (1-P)}$$

Where,

n=Sample size N=Sample population Z=1.96² p=Estimated proportion α =Constant, 0.05 Alpha (α) 0.05 Estimated proportion (p) 0.28 (28% students with vaccination) [13] Estimated error (d) 0.05

Population size (N) 270

Minimum sample size needed: 145

$$n = \frac{270 \times 1.96_{1-0.05/2}^{2} \times 0.28 (1 - 0.28)}{0.05^{2} (270 - 1) + 1.96_{1-0.05/2}^{2} \times 0.28 (1 - 0.28)}$$
$$n = 145$$

The maximum percentage of attrition allowed in this research was 15%.

To allow for non response, the final sample size was calculated using the formula below:

Non response:

$$n_{final} = \frac{n_{calculated}}{1 - non - response(\%)}$$

$$n_{final} = \frac{145}{1 - 0.15}$$

$$n_{final} = \frac{145}{0.85}$$

$$n_{final} = 170$$

The minimum sample size calculated was 145. The final calculation was done to include a non response rate of 15%

and the final sample size obtained for this study was 170 after rounding off.

3. Sampling

Non probablilty, purposive sampling method was used in this research. 3rd and 4th year medical students of MMMC, Malaysia campus was included in our study. A self administered questionnaire was distributed among the students.

Inclusion criteria include 3rd and 4th year medical students of MMMC, Malaysia campus who were present on the date of data collection, willing to participate and complete questionnaire submission.

The exclusion criteria for the research participation were, absence on the day of data collection, unwillingness to participate and incomplete questionnaire submission.

4. Data Collection Method

Data collection was based on self administered questionnaire adopted from previous studies. [13, 22, 23]

The Cronbachs alpha coefficient for knowledge was 0.200 and attitude was 0.531.

The questionnaire consisted of 4 sections. The First section encompassed demographic details such as gender, age, ethnicity, and socioeconomic status (upper class, upper middle class, lower middle class, working class, and lower/poor).

The Second section consisted of 12 questions on the knowledge of Hepatitis B vaccination. Three options were given for each question, which are yes, no and dont know. Questions with correct answer will be given 1 mark, questions with wrong or dont know answer will be given 0 mark. Total marks are added and categorized into good (80 100%), moderate (60 79%) and poor (0 59%) knowledge.

The Third section consisted 19 questions about the attitude toward Hepatitis B vaccination. Question 1 to 18 were given options yes, no and dont know. Answers with positive attitude will be given 3 mark, questions with answer dont know will be given 2 marks and answers with negative attitude will be given 1 mark. Total marks are added and categorized into good (80 100%), moderate (60 79%) and poor (0 59%) attitude. Question 19 asked about the ways to encourage students to get vaccinated, three options were given, which are organizing seminar, door to door campaign and media awareness program. On this question, participants can choose one or more answer according to their opinion.

The Fourth section consisted 6 questions about the practice of Hepatitis B vaccination. Question include vaccination status, history of screening for Hepatitis B, history of needle prick injury and history of unscreened blood transfusion were given options yes and no. Question regarding number of doses of Hepatitis B vaccine received was given options 1, 2, 3 and dont know. Question about vaccination status in the family member were given options father, mother, sibling and dont know. Each response is recorded.

5. Data Analysis

The data was collected via self administered questionnaires and then entered into Microsoft Excel. The data from Microsoft Excel was then analyzed by using Epi Info 7.2.2.16.

For qualitative data such as gender, race and socioeconomic status are calculated by using frequency, percentage and mode. Quantitative data such as knowledge and attitude are calculated by using mean, standard deviation and range.

Table 1. statistical test used for variables.

Association		
Independent Variables	Dependent Variable	Statistical test
Gender	Knowledge of Hepatitis	Unpaired t test
Ethnicity	B vaccination	ANOVA
Socioeconomic Status		Thursday to a
Gender Socioconomia Status	Attitude of Hepatitis B	Unpaired t test
Ethnicity	vaccination.	ANOVA
Attitude	Practice of Hepatitis B	Binary Logistic
Knowledge	vaccination.	Regression

Odds ratio is calculated in the study.

The level of association is 0.05.

6. Ethical Consideration

This study was reviewed and approved by the Research Ethics Committee, Faculty of Medicine, Melaka Manipal Medical College.

To ensure this study was ethically conducted throughout, the objectives of the study were clearly indicated to the participants on each questionnaire and they were given the reassurance that their participation is completely voluntary and they were free to refuse or withdraw their participation at any point.

The participants had given their written acceptance for participation in the research through a signed Informed Consent form. The participants information was kept confidential and used only for the purposes of the particular research. Their anonymity and privacy were well maintained.

7. Results

Table 2. Sociodemographic characteristics of medical students (n=171).

Variable	Frequency (%)
Gender	
Female	99 (57.89%)
Male	72 (42.11%)
Ethnicity	
Indian	79 (46.20%)
Chinese	46 (26.90%)
Malay	13 (7.60%)
Others	33 (19.30%)
Socioeconomic status	
Lower class	4 (2.34%)
Lower middle class	21 (12.28%)
Upper class	50 (29.24%)
Upper middle class	83 (48.54%)
Working class	13 (7.60%)

Table 3. Knowledge and Attitude towards Hepatitis B and its vaccination among medical students (n=171).

Variable	Frequency (%)
Knowledge	
Good	88 (51.46%)
Moderate	70 (40.94%)
Low	13 (7.60%)
Mean (standard deviation)	75.33 (13.10)
Min Max	27.27 100.00
Attitude	
Good	104 (60.82)
Moderate	63 (36.84)
Low	4 (2.34)
Mean (standard deviation)	82.23 (8.55)
Min Max	44.44 96.29

Table 2 shows the demographic characteristics of medical students in private medical college in Malaysia. A total of 200 questionnaires were distributed among 3rd year medical students, and a total of 171 responses were recorded (n=171). The number of female students are 99 (57.89%) and the number of male students are 72 (42.11%). Based on the findings, Indian students are comprised of 79 (46.20%), Chinese students at 46 (26.90%), Malay students at 13 (7.60%) and Others at 33 (19.30%). 83 (48.54%) of students belong to the Upper Middle Class, 50 (29.24%) to the Upper Class, 21 (12.28%) to the Lower Middle Class, 13 (7.60%) to the Working Class and 4 (2.34%) to Lower Class.

Table 3 shows knowledge and attitude towards Hepatitis B and its vaccination among medical students. Results show that 88 (51.46%) students have a good knowledge regarding Hepatitis B and its vaccination, 70 (40.94%) show a moderate knowledge and 13 (7.60%) show low knowledge. The mean score (standard deviation) for knowledge is 75.33 (13.10), with the maximum score being 100 and the minimum 27.27. In regard to attitude, 104 (60.82%) have a good attitude score, 63 (36.84%) students have a moderate score and 4 (2.34%) show a low attitude score. The mean (standard deviation) attitude score is 82.23 (8.55) with the maximum score being 96.29 and minimum 44.44.

Table 4 shows the correct responses on questions regarding knowledge on Hepatitis B. 133 (77.78%) students gave the correct response when asked whether HBV is hereditary. 136 (79.53%) responded correctly regarding the transmission of HBV by air and 147 (85.96%) correctly answered the question on the venereal transmission of HBV. 142 (83.04%) students gave the correct answer to the question Do people get HBV during birth?. 119 (69.59%) answered correctly when asked about the HBV transmission through sharing of spoons or bowls. 62 (36.26%) responded correctly when asked about the transmission of HBV through saliva. When asked about HBV transmission through sharing of toothbrush, 79 (46.20%) were correct. For the question Does HBV have signs, 141 (82.46%) gave the correct response and regarding HBV causing liver cancer, 152 (88.89%) answered with the correct answer, Yes. 152 (88.89%) answered correctly when asked If someone is infected with Hepatitis B but she/he look and feel healthy, do you think that person can spread Hepatitis B?. For the

question, Do people get HBV by holding hands with an infected person? 154 (90.06%) responded correctly.

Table 4. Correct responses to questions on knowledge of Hepatitis B (n=171).

Items	Frequency (%)
Do people get HBV from genes (heredity)?[NO]	133 (77.78)
Do people get HBV through the air (coughing or staying in the same room)?[NO]	136 (79.53)
Do people get HBV from sexual relationships?[YES]	147 (85.96)
Do people get HBV during birth?[YES]	142 (83.04)
Do people get HBV by sharing spoons or bowls for food?[NO]	119 (69.59)
Do people get HBV by eating food that has been chewed by an infected person?[YES]	62 (36.26)
Do people get HBV by sharing a toothbrush with an infected person?[YES]	79 (46.20)
Does HBV have signs?[YES]	141 (82.46)
Does HBV cause liver cancer?[YES]	152 (88.89)
If someone is infected with hepatitis B but he or she look and feel healthy, do you think that person can spread hepatitis B?[YES]	152 (88.89)
Do people get HBV by holding hands with an infected person?[NO]	154 (90.06)

Table 5. Responses to questions on Attitude towards Hepatitis B and its vaccination among medical students (n=171).

	-	-	
ITEM	YES [Frequency	NO [Frequency	DONT KNOW
I I EW	(%)]	(%)]	[Frequency (%)]
Do you know if healthy people need Hepatitis B vaccination?	167 (97.66)	3 (1.75)	1 (0.58)
Do you know if you need a Hepatitis B vaccination at your age?	148 (86.55)	17 (9.94)	6 (3.51)
Would you be willing to be tested for Hepatitis B infection?	150 (87.72)	21 (12.28)	0
Should Hepatitis B patients be allowed to work routinely?	135 (78.95)	25 (14.62)	11 (6.43)
Should Hepatitis B patients be allowed to do strenuous exercise?	111 (64.91)	37 (21.64)	23 (13.45)
Should Hepatitis B patients be isolated?	35 (20.47)	126 (73.68)	10 (5.85)
Should Hepatitis B patients abandon sexual contact?	71 (41.52)	69 (40.35)	31 (18.13)
Vaccination prevents spread of infection to patients?	102 (59.65)	54 (31.58)	15 (8.77)
Hepatitis B is a serious disease?	143 (83.63)	22 (12.87)	6 (3.51)
Hepatitis vaccine is effective in preventing the disease?	147 (85.96)	15 (8.77)	9 (5.26)
The risk of death among vaccinated persons is reduced compared to the non vaccinated?	140 (81.87)	19 (11.11)	12 (7.02)
The Hepatitis B vaccine is available at my work place?	117 (68.42)	30 (17.54)	24 (14.04)
I am worried about Hepatitis B adverse effects?	48 (28.07)	100 (58.48)	23 (13.45)
I am afraid of infection from Hepatitis B vaccination?	39 (22.81)	119 (69.59)	13 (7.60)
Hepatitis B vaccine is not effective in disease protection?	31 (18.13)	123 (71.93)	17 (9.94)
I am not at high risk of contracting HBV?	58 (33.92)	88 (51.46)	25 (14.62)
Hepatitis B vaccine is not available?	29 (16.96)	134 (78.36)	8 (4.68)
I have limited contact with high risk group?	64 (37.43)	80 (46.78)	80 (46.78)

Table 5 shows the responses to questions on attitude towards Hepatitis B and its vaccination among medical students. When asked about the need for HBV vaccination among healthy people, 167 (97.66%) students answered Yes. 3 (1.75%) answered No and 1 (0.58%) answered Dont Know. Regarding HBV vaccination in their age 148 (86.55%) answered Yes. No was the response of 17 (9.94%) students and Dont Know was the answer of 6 (3.51%) students. To the question Would you be willing to be tested for Hepatitis B infection? 150 (87.72%) students answered Yes. No was the answer given by 21 (12.28%) students and Dont Know was the answer given by 11 (6.43%) students. To the question, Should Hepatitis B patients be allowed to work routinely? there were 135 (78.95%) Yes, 25 (14.62%) No and 11 (6.43%) Dont Know answers. For the question Should Hepatitis B patients be allowed to do strenuous exercise? 135 (78.95%) students answered Yes. 25 (14.62%) gave the answer No and Dont Know was the answer given by 23 (13.45%) students. When asked about the isolation of Hepatitis B patients 35 (20.47%) answered Yes and 126 (73.68%) answered No and answered Dont Know 10 (5.85%). To the question Should Hepatitis B patients abandon sexual contact? 71 (41.52%) answered Yes, 69 (40.35%) answered No and 31 (18.13%) answered Dont Know and for the question Vaccination prevents spread of infection to patients? 102 (59.65%) students answered with a Yes, No was given by 54 (31.58%) students as the answer and Dont Know was the answer of 15 (8.77%) students.

To the question Hepatitis B is a serious disease? the number of students who answered with a Yes was 143 (83.63%, 22 (12.87%) and 6 (3.51%) was given respectively for No and Dont Know. Regarding the question Hepatitis vaccine is effective in preventing the disease? a total number of 147 (85.96%) Yes were given whereas 15 (8.77%) No answers and 9 (5.26%) Dont Know were recorded. For the question The risk of death among vaccinated persons is reduced compared to the non vaccinated? there were 140 (81.87%) Yes and 19 (11.11%) No answers and 12 (7.02%) Dont Know answers. Regarding the question, The Hepatitis B vaccine is available at my work place? students responded with 117 (68.42%) Yes 30 (17.54%) No and 24 (14.04%) Dont Know. To the question I am worried about Hepatitis B adverse effects? students responded with a total number of 48 (28.07%) Yes, 100 (58.48%) No and 23 (13.45%) Dont Know. To the question I am afraid of infection from Hepatitis B vaccination? there were 39 (22.81%) Yes, 119 (69.59%) No and 13 (7.60%) Dont Know responses. I am worried about Hepatitis B adverse effects? was a question which got 48 (28.07%) Yes, 100 (58.48%) No and 23 (13.45%) Dont Know responses. Regarding the question I am afraid of infection from Hepatitis B vaccination? there were 39 (22.81%) Yes, 119 (69.59%) No and 13 (7.60%) Dont Know responses. To the question, Hepatitis B vaccine is not effective in disease protection? there were 31 (18.13%) Yes, 123 (71.93%) No and 17 (9.94%) Dont Know answers given. The question I am not at high risk of contracting HBV? was a question which got 58 (33.92%) Yes, 88 (51.46%) No and 25 (14.62%) Dont Know answers. Regarding the question Hepatitis B vaccine is not available? there were 29 (16.96%) Yes, 134 (78.36%) No and 8 (4.68%) Dont Know answers. To the question, I have limited contact with high risk group? there were 64 (37.43%) Yes, 80 (46.78%) No and 80 (46.78%) Dont Know answers.

ITEMSFrequency (%)Dont know74 (43.27)Have you ever had a needle prick injury?YesYes37 (21.64)No134 (78.36)Have you ever had unscreened blood transfusion?Yes1 (0.58)No170 (99.42)

^a=multiple answer is accepted.

Table 6 shows the response to questions on practice of Hepatitis B vaccination among medical students. Out of 171 students, 164 (95.91%) students are vaccinated against Hepatitis B and 7 (4.09%) students are unvaccinated. Among those who have been vaccinated, 128 (74.85%) have received 3 doses, 20 (11.70%) received 2 doses, 5 (2.92%) received a single dose and 11 (6.43%) dont know the number of doses taken. When asked if they have been screened for Hepatitis B, 91 (53.22%) answered Yes and 80 (46.78%) answered No. 76 (68.47%) students answered Father when asked Which family member have been vaccinated for Hepatitis B, 72 (42.11%) answered Mother, 80 (46.78%) answered Sibling and 74 (43.27%) dont know the vaccination status of their family members. For the question, Have you ever had a needle prick injury, 37 (21.64%) responded with yes and 134 (78.36%) responded with no. Only 1 (0.58%) had a history of unscreened blood transfusion and the rest 170 (99.42%) did not have a history of unscreened blood transfusion.

Table 6. Response to Questions on Practice of Hepatitis B Vaccination of medical students (n=171).

TTEMS	Frequency (%)		
Are you vaccinated for hepatitis B?			
Yes	164 (95.91)		
No	7 (4.09)		
How many doses?			
1	5 (2.92)		
2	20 (11.70)		
3	128 (74.85)		
Dont know	11 (6.43)		
Have you been screened for hepatitis B?			
Yes	91 (53.22)		
No	80 (46.78)		
Which of your family members have been vaccinated for Hep B? ^a			
Father	76 (68.47)		
Mother	72 (42.11)		
Sibling	80 (46.78)		

Table 7. Way for Medical Students to Get Encourage for Hepatitis B Vaccination. (n=171).

ITEMS	Frequency (%)
Organizing hepatitis seminars encourage students to get vaccinated? a	104 (60.82)
Door to door campaigning encourage students to get vaccinated? a	56 (32.75)
Media awareness programs encourage students to get vaccinated? a	112 (65.50)

^a=multiple answer is accepted.

Table 7 shows the response to the question Ways for medical students to get encouraged for Hepatitis B Vaccination. 104 (60.82%) answered organizing hepatitis seminars, 56 (32.75%) answered door to door campaigns and 112 (65.50%) answered media awareness programmes.

Therefore, majority of the students chose that media awareness programs to be more encouraging for vaccination followed by organizing hepatitis seminars and lowest for door to door campaigning.

Table 8. Binary Logistics Regression between Knowledge, Attitude and Practice for Hepatitis B Vaccination among medical students. (n=171).

Town	Practice of Hepatitis B Vaccination		
lerin	Odds Ratio (95% CI)	P Value	
Knowledge Percentage Score	0.95 (0.91 1.00)	0.0659	
Attitude Percentage Score	1.09 (1.03 1.15)	0.0015	

Table 9. Association between Gender, Ethnicity, Socioeconomic Status and Knowledge for Hepatitis B Vaccination of medical students (n=171).

Variable	Knowledge mean (SD)	Mean difference (95% CI)	t (df)/F (df1, df2)	P value
Gender ^b				
Female	74.84 (13.49)	1 170 (5 19 2 94)	0.59 (160)	0.565
Male	76.01 (12.61)	1.170 (3.18 2.84)	0.38 (109)	0.303
Ethnicity ^c				
Malay	67.13 (18.76)			
Chinese	75.88 (9.99)		1.87 (3,167)	0.135
Indian	75.95 (14.19)			

Variable	Knowledge mean (SD)	Mean difference (95% CI)	t (df)/F (df1, df2)	P value	
Others	76.31 (10.89)				
Socioeconomic ^c					
Lower	70.45 (4.55)				
Working Class	80.41 (14.77)				
Lower Middle Class	74.89 (17.23)		0.70 (4,166)	0.593	
Upper Middle Class	75.47 (10.69)				
Upper Class	74.36 (14.77)				

^b=Unpaired T test.

^c=ANOVA test.

Table 8 shows the binary logistics regression between knowledge, attitude and practice for Hepatitis B Vaccination among medical students. Knowledge percentage score has an odd ratio of 0.95 (0.91 1.00) and a P Value of 0.0659. The Attitude percentage score has an odd ratio of 1.09 (1.03 1.15) and a P Value of 0.0015. Based on the results, there is a significant association between attitude and practice of Hepatitis B vaccination but there is no significant association between knowledge and practice of Hepatitis B vaccination.

Table 9 shows the association between gender, ethnicity, socioeconomic status and knowledge on Hepatitis B vaccination in medical students. Total number of respondents are 171. For Gender using unpaired T test, female have a knowledge mean of 74.84 (13.49) whereas male have a knowledge mean of 76.01 (12.61). This shows that male have

a 1.17 mean difference compared to female with a 95% confidence Interval of 5.18 to 2.84. T value is 0.58 (169) and the P value showed 0.565 which showed no significance between gender and knowledge. For ethnicity, knowledge mean for Malay, Chinese, Indian and Others are 67.13 (18.76), 75.88 (9.99), 75.95 (14.19), and 76.31 (10.89) respectively. The F value is 1.87 (3,167) and the P value is 0.135 indicating that ethnicity and knowledge on Hepatitis B has no significance. For the last variable, socioeconomic status, the mean for lower, working, lower middle, upper middle and upper class is 70.45 (4.55), 80.41 (14.77), 74.89 (17.23), 75.47 (10.69) and 74.36 (14.77) respectively. F value is 0.70 (4,166) and P value is 0.593. This shows socioeconomic status and knowledge of Hepatitis B vaccination have no significant association.

Table 10. Association between Gender, Ethnicity, Socioeconomic Status and Attitude on Hepatitis B Vaccination of medical students (n=171).

Variable	Attitude mean (SD)	Mean difference (95% CI)	t (df)/F (df1, df2)	P value
Gender ^b				
Female	83.78 (8.12)	2 60 (1 12 6 25)	2.84 (160)	0.005
Male	80.09 (8.73)	5.09 (1.15 0.25)	2.84 (109)	0.003
Ethnicity ^e				
Malay	73.79 (14.42)			
Chinese	83.53 (6.14)		5 10 (2 1(7)	0.002
Indian	82.42 (8.44)		5.10 (5,107)	0.002
Others	83.28 (7.16)			
Socioeconomic status ^c				
Lower	64.81 (23.08)			
Working Class	81.48 (9.26)			
Lower Middle Class	82.28 (9.49)		4.77 (4,166)	0.001
Upper Middle Class	83.09 (7.08)			
Upper Class	82.37 (7.30)			

^b=Unpaired T test.

^c=ANOVA test.

Table 10 shows the association between gender, ethnicity, socioeconomic status and attitude on Hepatitis B vaccination of medical students. Based on Gender, female have a mean attitude of 83.78 (8.12) and male have a mean attitude of 80.09 (8.73). The mean difference between female and male is 3.69 (1.13–6.25). The T value is 2.84 (169) and the P value is 0.005. This showed that there is a significant association between gender and attitude on Hepatitis B vaccination. In ethnicity, Malay, Chinese, Indian and Others have a mean attitude of 73.79 (14.42), 83.53 (6.14), 82.42 (8.44) and 93.28 (7.16) respectively. F value is 5.10 (3,167) and P value is 0.002. This indicates that there is a significant association between ethnicity and attitude of Hepatitis B vaccination.

Under socioeconomic status, lower, working class, lower middle class, upper middle class and upper class have a mean attitude of 64.81 (23.08), 81.48 (9.26), 82.28 (9.49), 83.09 (7.08) and 82.37 (7.30) respectively. The F value is 4.77 (4,166) and P value is 0.001. This showed significant association between socioeconomic status and attitude on Hepatitis B vaccination.

8. Discussion

Viral hepatitis B infection is considered as one of the major cause of morbidity and mortality globally due to its consequences such as chronic liver cirrhosis and hepatocellular carcinoma [1]. Transmission of Hepatitis B can be prevented by Hepatitis B vaccine, and it is particularly important in health care workers due to frequent interaction with patients. Our study aims to find out the association of gender, ethnicity, and socioeconomic status with knowledge and attitude of Hepatitis B vaccination among medical students. We also want to discover the association of knowledge and attitude with practice of Hepatitis B vaccination among medical students.

In the present study, 95.91% of the students were vaccinated against Hepatitis B (HBV) and 74.85% of the students had full doses (3 doses) of HBV vaccine. The result shows that nearly all students practiced HBV vaccination. According to a study among medical students in Pakistan, 79% of students were vaccinated against HBV and 70.6% of students complete 3 doses of HBV vaccine [13]. These results showed a different prevalence of HBV vaccination in different settings.

In our study, the majority of the students had moderate to good result in knowledge regarding HBV vaccination. This was in agreement with a study among undergraduate medical and non medical students in Muscat, and the study showed that the majority of the students in Muscat had some knowledge regarding HBV vaccination [24]. However, it was in contrast to a previous study among health based students in Malaysia, which showed that less than half of the students had adequate knowledge related to HBV vaccination [20]. Nevertheless, students in the present study had a few dilemmas regarding HBV vaccine. Majority of the students were confused about the possibility of people getting HBV by eating food that had been chewed by an infected person. This finding was not similar to the previous study. A study was done in Dunkwa On Offin [22] and Vietnamese American [24], and majority of their participants answered this question correctly. Majority of medical students in Malaysia made a mistake in question regarding the transmission of HBV by sharing toothbrush. This finding was not similar to a previous study in Dunkwa On Offin [22] and Vietnamese American [24], which showed that the majority of their participants answered this question correctly. This showed the lack of knowledge regarding the transmission of Hepatitis B infection by pre chewed food and sharing toothbrush in medical students.

In our study, we found that the majority of the students had moderate to good attitude regarding HB vaccination. This finding was the same as the study done among health based students in a public university in Malaysia. They also found that the majority of students had a good attitude toward HBV vaccination. [20]

In this study, students with a higher mean score of knowledge were less likely to have a better practice of HBV vaccination. However, the result was not significant. This may be due to the less number of unvaccinated students in the sample. In contrast to the result, one of the research project in Pakistan found that school based health programs had been the most successful approach to reduce the risk of vaccine preventable disease and increase the vaccination rate among students and school employees [20]. Then, our study showed that students with higher attitude mean score were significantly more likely to have HBV vaccination. The result was in agreement with a cross sectional research done in Malaysia health based students. They also found that there was a significant association between knowledge and attitude of Hepatitis B vaccination. [21]

In our study showed that male had a higher score of knowledge regarding HBV vaccination compare with female, but there was no significant association. This was different from the study among medical students in Pakistan show that female had higher knowledge regarding Hepatitis B vaccination [14]. The study showed that other ethnicity had higher marks compare with Chinese, Malay and Indian, but it was not significant. In a community based cross sectional survey done in Malaysia households, they found that Malay had better knowledge regarding Hepatitis B vaccination [16]. In a community based cross sectional survey in Malaysia showed that higher SES was one of the reasons for having good knowledge towards Hepatitis B vaccination. [16] Nevertheless, present research showed that there was no significant between ethnicity and knowledge about HBV vaccination. Working class showed the best level of knowledge compare with others, which was the total opposite result to the previous study [16].

With respect to gender, men had been found to be passive in engage in health related details. On the other hand, women were more motivated in seeking health related information [15]. In the present study showed that female had a higher attitude mean score towards Hepatitis B vaccination compare with male, and the result was significant. This has the same result as the study among medical students in Pakistan, they found that female has a better attitude regarding Hepatitis B vaccination [14]. Ethnicity had an influence on how we view the world and the common social practices. Malaysia is a country with a multi cultural background, people with different practice has different practice. A part of the people will choose to believe their traditional medicine rather than vaccination, so ethnicity can be a variable in affecting the knowledge of vaccination. Our study showed that Chinese had a higher attitude mean score regarding Hepatitis B vaccination compared with other ethnicity and the finding is significant. This result was the same as the community based cross sectional survey done in Malaysia households, they found that Chinese has better attitude regarding Hepatitis B vaccination [16]. Another variable is the socioeconomic status (SES) of the students. SES was defined as a measure of ones combined economic and social status. [17] SES made differences in 3 major determinants including health care, health behaviour and environmental exposure. [18] In the present study showed that lower class had a lower attitude mean score toward Hepatitis B vaccination compare to others. This finding was in line with a study among households in Malaysia, they also showed that participants with a low family income had a poor attitude of Hepatitis B vaccination [15].

In our study, we managed to get a response rate of 85.5%,

however, we had a few limitations in our study. This study was only done with semester 6 and 7 students (academic year 3). We did not manage to get the responses of semester 8, 9 and 10 students because during this 6 week period the students had clinical posting and exams, therefore it would have been difficult to approach and receive their responses. Adding to this limitation, we only managed to get responses from our own institute and not others because we had a very short period to complete the research project, therefore we cannot generalize our finding to other parts of Malaysia and the rest of the world.

In this study, there were a reasonable amount of medical students who were unvaccinated or have not completed the full doses of Hepatitis B vaccination requirement. Therefore medical students should be educated on the importance of hepatitis B vaccination and also the importance of completion of all 3 doses as Hepatitis B is a serious disease which can lead to a variety of problems. Moreover, this study showed that a majority of students had poor responses in 2 questions regarding the ways of hepatitis B transmission by pre chewed food and sharing toothbrush. Hence, medical students should be well versed in hepatitis B transmission as they will be entering the health care profession, throughout this research we have realized that the study population taken was less and was not extensive. We recommend future studies to collect responses from all academic years so that we can understand their knowledge and attitude regarding Hepatitis B vaccination. Secondly, it would be better if we included responses from other health care institutes to explore and also encourage better knowledge, attitude and practice of Hepatitis B vaccination.

9. Conclusion

In conclusion, this study shows 95.91% of the students were vaccinated against Hepatitis B (HBV) and 74.85% of the students had full doses (3 doses) of HBV vaccine. Most of the students had moderate to good attitude and knowledge regarding HB vaccination. There is no significant association between gender, ethnicity, socioeconomic status and knowledge with practice of HBV vaccination. There is significant association between gender (p<0.005), ethnicity (P=0.002) and socioeconomic status (P=0.001) with attitude of HBV vaccination. Female has 3.69 attitudes percentage score higher than male with a significant association (P<0.001). Chinese has higher attitude mean score (mean=85.53%) compared with Indian (mean=82.42%), Malay (mean=73.79%) and other ethnicities (mean=83.28%), this has significant association (P=0.002). Lower (mean=64.81%) socioeconomic status also shows lower attitude mean score compared with upper class (mean=82.37%), upper middle class (mean=83.09%), lower class (mean=82.28%) and middle working class (mean=81.48%), this has significant association (P=0.001). There is significant association between attitude and knowledge of HBV vaccination (P=0.002), students with good attitude mean score were 1.09 more likely to have better practice of Hepatitis B vaccination.

Acknowledgements

We wish to express our sincere gratitude to Professor Dr Adinegara Lufti Abbas, Professor Dr Htoo Htoo Kyaw Soe, and Associate Professor Dr. Sujata Khobragade from the Department of Community Medicine of Melaka Manipal Medical College for guiding us throughout the duration of the study in making our study a success. Furthermore, we would like to thank the Research Ethics Committee for approving our study and for allowing us to embark this research project. We would also like to extend our gratitude to all the participants of this study.

References

- E. J. Aspinall G. Hawkins A. Fraser S. J. Hutchinson D. Goldberg. Hepatitis B prevention, diagnosis, treatment and care: a review. Occupational Medicine, Volume 61, Issue 8, Oxford Academic, December 2011, Pages 531–540.
- [2] World Health Organization [Internet]. Hepatitis B. 18 July 2018. Available from: https://www.who.int/news room/fact sheets/detail/hepatitis b.
- [3] Ruksana Raihan. Hepatitis in Malaysia: Past, Present, and Future. 2016 Jul 9. 6 (1): 52–55. PubMed PMCID: PMC5578560. PubMed PMID: 29201726.
- Hepatitis B Foundation [Internet]. What Is Hepatitis B? [Cited 2019 May 18]. Available from: https://wayback.archiveit.org/org350/20190414183852/https://www.nlm.nih.gov/bsd/uniform requirements.html#electronic.
- [5] Salisbury D, Ramsay M, Noakes K., Immunisation Against Infectious Disease, 2006 London Department of Health publication.
- [6] Liang TJ. Hepatitis B: the virus and disease. 2009 May; 49 (5 Suppl): S13 21. PubMed PMID: 19399811. PubMed PMCID: PMC2809016.
- [7] Daniel Shouval, Hepatitis B vaccines, Journal of Hepatology 39 (2003) S70 S76.
- [8] World Health Organization [Internet]. Immunization coverage. 16 July 2018. Available from: https://www.who.int/newsroom/factsheets/detail/immunizatio n coverage.
- [9] Leora R. Feldstein, Stephanie Mariat, Marta Gacic Dobo, Mamadou S. Diallo, Laura M. Conklin, and Aaron S. Wallace. Global Routine Vaccination Coverage, 2016. 2017 Nov 17; 66 (45): 1252–1255. PubMed PMCID: PMC5726243. PubMed PMID: 29145357.
- [10] Ristinen E, Mamtani R. Ethics of transmission of hepatitis B virus by health care workers. Lancet 1998; 352: 1381–1383.
- [11] Prüss Üstün A, Rapiti E, Hutin Y. Estimation of the global burden of disease attributable to contaminated sharps injuries among health care workers. Am J Ind Med 2005; 48: 482–90.
- [12] Varsha Singhal, Dhrubajyoti Bora, and Sarman Singh, Hepatitis B in Health Care Workers: Indian Scenario, 2009 Jul Dec; 1 (2): 41–48, PMCID: PMC3167966, PMID: 21938248.

- [13] Khan N1, Ahmed SM, Khalid MM, Siddiqui SH, 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, J Pak Med Assoc. 2010 Jun; 60 (6): 450 5, PMID: 20527642.
- [14] Stefan Ek, Gender differences in health information behaviour: a Finnish population based survey, Oxford academia, Health Promotion International, Volume 30, Issue 3, September 2015, Pages 736–745, https://doi.org/10.1093/heapro/dat063, available from: https://academic.oup.com/heapro/article/30/3/736/620016.
- [15] Yogambigai Rajamoorthy, corresponding, Niazlin Mohd Taib, Subramaniam Munusamy, Samsul Anwar, Abram Luther Wagner, Mudatsir, Knowledge and awareness of hepatitis B among households in Malaysia: a community based cross sectional survey, 2019 Jan 10. doi: 10.1186/s1288901863758, PMCID: PMC6327400, PMID: 30630464.
- [16] Elizabeth H. Baker, Socioeconomic Status, Definition, Wiley Online Library. Available from: https://onlinelibrary.wiley.com/doi/abs/10.1002/97811184108 68.wbehibs395.
- [17] Nancy E. Adler, Katherine Newman, Socioeconomic Disparities In Health: Pathways And Policies, health affairs vol. 21, no. 2: the determinants of health, april 2002, https://doi.org/10.1377/hlthaff.21.2.60.
- [18] Rajamoorthy Y, Radam A, Taib NM, Rahim KA, Munusamy S, Wagner AL, et al. (2019) Willingness to pay for hepatitis B vaccination in Selangor, Malaysia: A cross sectional household survey. PLoS ONE 14 (4): e0215125. https://doi.org/10.1371/journal.pone.0215125.

- [19] m. Riccò, l. Vezzosi, g. Gualerzi, and c. Signorelli, Knowledge, attitudes and practices (KAP) towards vaccinations in the school settings: an explorative survey, 2017 Dec; 58 (4): E266–E278, PMCID: PMC5912794, PMID: 29707657.
- [20] Siti Nurafifah Binti Sheikh Zainal Abidin, Nor Azlina A Rahman, Mainul Haque, Knowledge and attitudes of health based students in a public university in Malaysia on hepatitis B infection, Cukurova Med J 2019; 44 (1): 160–168, DOI: 10.17826/cumj.449400.
- [21] Abdulrahman Ahmad, Lye Munn Sann, Hejar Abdul Rahman, Factors associated with knowledge, attitude and practice related to hepatitis B and C among international students of Universiti Putra Malaysia, BMC Public Health, December 2016, 16: 611.
- [22] Desmond Aroke, Benjamin Momo Kadia, Ephesians Nkwetta Anutebeh, Awareness and Vaccine Coverage of Hepatitis B among Cameroonian Medical Students, BioMed Research International Volume 2018, Article ID 3673289, 6 pages, https://doi.org/10.1155/2018/3673289.
- [23] Kwame Y Boakye, assessing the knowledge and perception on hepatitis b among senior high school (shs) students in dunkwa on offin, Academia, available from https://www.academia.edu/10127035/ASSESSING_THE_KN OWLEDGE_AND_PERCEPTION_ON_HEPATITIS_B_AM ONG_SENIOR_HIGH_SCHOOL_SHS_STUDENTS_IN_D UNKWA ON OFFIN.
- [24] Victoria M. Taylor, Hepatitis B Awareness, Testing, And Knowledge Among Vietnamese American Men And Women, J Community Health. 2005 Dec; 30 (6): 477–490. doi: 10.1007/s10900 00572823.