

ORIGINAL ARTICLE

Awareness and Knowledge of Nurses towards Hepatitis B Virus Infection at a Tertiary Hospital in Selangor, Malaysia

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ABSTRACT

Hepatitis B is a well-recognized occupational risk for healthcare workers. This self-administered questionnaire study was designed to assess awareness and knowledge towards hepatitis B virus infection among 140 nurses at Serdang Hospital, Selangor, Malaysia from the period of 1st April to 30th September 2017. The response rate was 97.2% (n = 140/144). A total of 71.4% of participants showed adequate awareness of hepatitis B. Most participants had heard hepatitis B with the predominant sources receiving from friends, media and education. Majority of them did serology blood test of hepatitis B before. A total of 84.3% of participants were aware of vaccine available for hepatitis B, although 78.6% got vaccinated in the past. Antiviral treatment of hepatitis B was not well noticed by most of them. Education qualification determines the awareness of hepatitis B. Regarding the knowledge, 73.6% of participants showed poor knowledge of hepatitis B. Most participants understood that hepatitis B was caused by a virus infection and the organ most affected was the liver. Surprisingly, 77.9% of them failed to recognize that cancer could be caused by hepatitis B. Majority of participants were aware that transmission of hepatitis B could be mediated via sexual intercourse, as well as childbirth. Nevertheless, 14.3% of them believed that hepatitis B was able to spread by cough and sneeze. Older age, Chinese ethnicity, and having high educational qualification were factors leading to adequate knowledge of hepatitis B. Additional attention should be emphasized to strengthen knowledge towards hepatitis B among nurses and perhaps other healthcare workers in Malaysia.

INTRODUCTION

Hepatitis B is a viral infection that mainly attacks the liver and can cause both acute and chronic disease. The World Health Organization (WHO) estimated two billion individuals had been infected by hepatitis B. In Malaysia, the prevalence of chronic hepatitis B is about 5% among the population (Mohamed et al., 2004; Merican et al., 2000). The incidence rate of hepatitis B among Malaysians was reported at 14.52 per 100,000 population with a mortality rate of 0.21 in 2018 (Ministry of Health Malaysia, 2019). Chinese has the highest prevalence of disease (Qua & Goh, 2011; Sung, 1990). Vertical transmission is recognized as the major route of transmission. It is estimated that 2.4% of pregnant women in Malaysia are infected with hepatitis B. The hepatitis B vaccination programme for children was introduced by our health ministry in 1989, which successfully reduce the number of cases of infection among Malaysians. To achieve WHO – Glasgow Declaration on Viral Hepatitis Elimination (WHO, 2015) target by 2030, the Malaysian Ministry of Health is working together with multi-sectoral organizations to formulate a strategy to eliminate viral hepatitis in this region.

Most previous studies have studied only on patients with hepatitis B (Mohamed et al., 2012), residents at certain areas (Pathmanathan & Lakshmanan, 2014; Lim and Rashwan, 2003; Changmai et al, 2013), students (Ahmad et al., 2016), or dentists (Yaacob & Samaranayake, 1989) with regard to their awareness and knowledge (A&K) for hepatitis B infection. However, studies with nurses as participants is rather limited. The consensus in local literature revealed that A&K about hepatitis B was poor, and hepatitis B vaccination was inadequately covered in Malaysia (Mohamed et al., 2012; Pathmanathan & Lakshmanan, 2014; Lim & Rashwan, 2003; Changmai et al., 2013; Ahmad et al., 2016; Yaacob Samaranayake, 1989). Healthcare workers (HCWs) especially nurses are at high risk of contracting certain blood-borne diseases including hepatitis B. There

were also misperceptions by HCWs that patients with hepatitis B could be recognized by appearance, vaccination does not provide sufficient protection and no risk of cancer. This may have contributed to the unwillingness of HCWs to take extra precaution when they are attending patients. Besides this, hepatitis B virus was wrongly believed that it could be spread through activities such as cough or sneeze, which may cause some HCWs reluctance to serve patients with viral infections such as human immunodeficiency virus (HIV), hepatitis B virus (HBV) and hepatitis C virus (HCV) (Philip et al., 2014). This survey was developed to better understand the current level of A&K of nurses towards hepatitis B at a tertiary hospital in Selangor, Malaysia. It is hoped that by obtaining nurses' A&K about hepatitis B, we aimed to provide better HCWs-centered education, equipping them to better understand the disease and help them to prevent the spread of the disease.

MATERIALS AND METHODS

Study Design

This study used an empirical questionnaire to assess the level of A&K of nurses towards hepatitis B. It was conducted at a tertiary level government hospital (Serdang Hospital), located at Selangor, Malaysia. This project got approval from the ethics committee of the Clinical Research Centre, Serdang Hospital before the commencement of the study (Research ID: 35854). Data was collected from 1st April to 30th September 2017.

The study recruited Malaysian staff nurses who were at least 21 years old. The questionnaires of this study were self-administered. Participation in this research was completely voluntary and the written consents were obtained prior to the interview. All the collected data were kept anonymous and confidential.

To avoid any discussion, which may affect the validity of the study findings, the questionnaires were completed in front of the investigator. Once the questionnaire was done, a hepatitis B knowledge pamphlet was provided to the participant as a part of education. The study's sample size was calculated at 80% power and above 95% confidence level at 140.

The questionnaire was developed based on existing literature and consensus. This English-language questionnaire consisted of three sections: section 1 consisted of demographic data (gender, age, ethnicity, academic qualifications either undergraduate level or diploma level, smoking/alcoholic status, marital status and family history of hepatitis B); section 2 composed of 12 questions assessing awareness with the option "YES/NO" and one question with sub-question; and section 3 with 12 questions on knowledge with the option "YES/NO" and two questions with sub-questions. A score of one was given if respondents answer correctly, whereas incorrect answers were given a score of zero. The scoring range of level of knowledge was 12 (largest) to zero (smallest). Based on a 75% cut-off point, a cut-off level of < 7 was considered as poor whereas ≥ 7 was considered as adequate awareness about hepatitis B (Questions 2 and 6 were not counted in the assessment). In terms of knowledge assessment, a cut-off level of < 9 was considered as poor whereas ≥ 9 was considered as adequate knowledge about hepatitis B. The application of cut-off point to determine the adequacy of awareness or knowledge regarding certain illness had been used in previous studies (Malaysia (Rajamoorthy

et al., 2019), Indonesia (Harapan et al., 2017), and Saudi Arabia (Almansour et al., 2017).

Results obtained were analysed using GraphPad Prism Version 8.00 for Windows, GraphPad Software, La Jolla California USA, www.graphpad.com. Chi-square test for trend was used to see whether there was an association between age and knowledge level. Paired *t*-test was employed to obtain the correlation between ethnicity and knowledge level. Fisher's exact test was carried out for categorical variables (e.g. gender and educational level). Categorical variables were expressed as numbers and percentages, and $p < 0.05$ was considered statistically significant. Descriptive statistics were also used to analyse certain data.

RESULTS

Characteristics of Socio-Demography

A total of 144 copies of questionnaire were distributed, and 140 copies were received, which showed the response rate of 97.2%. These 140 participants included 65.7% females and 34.3% males. Most of the participants were under 40 years old, with a mean age of 34.5 years. In terms of ethnicity, 64.3% of participants were Malay, followed by 17.1% Indian, 8.6% Chinese, and 10.0% others. A total of 85.7% of the participants had at least diploma qualification, with 14.3% of them with undergraduate qualification. A total of 72.9% of them denied a family history of hepatitis B. The details of demographic characteristics were shown in Table 1.

Table 1 Demographic characteristics of respondents (n = 140)

Age (years)	Frequency	Percentage (%)
21 – 30	66	47.1
31 – 40	56	40.0
41 – 50	18	12.9
Gender		
Male	48	34.3
Female	98	65.7
Ethnicity		
Malay	90	64.3
Chinese	12	8.6
Indian	24	17.1
Others	14	10.0
Education qualification		
Diploma level	120	85.7
Undergraduate level	20	14.3
Family history of hepatitis B		
Yes	12	8.5
No	102	72.9
Unsure	26	18.6
Total	140	100

Awareness of Respondents towards Hepatitis B

Majority of the participants were aware of hepatitis B, mainly from friends, mass media and education. Most of them had tested with hepatitis B serology blood test before. A total of 84.3% of participants had heard about the hepatitis B vaccine before, and they knew that a complete course of this vaccination was three doses. However, only 78.6% of the participants got vaccinated in the past and 27.1% realised the existing antiviral treatment specifically for hepatitis B. A total of 88.6% of the participants had experienced needle stick injury (NSI) before, and 58.6% admitted that they knew how to protect themselves from hepatitis B infection.

The details of the awareness of participants towards hepatitis B are reported in Table 2.

Table 2 Awareness of respondents about hepatitis B (n = 140)

Questions	Response	Frequency	Percentage (%)
1. Have you heard of hepatitis B?	Yes	132	94.3
	No	8	5.7
2. How did you get to know about hepatitis B?	Friends	34	24.3
	Family	14	10.0
	Media	34	24.3
	Education	34	24.3
	Healthcare worker	24	17.1
3. Have you ever had a blood test for hepatitis B?	Yes	112	80.0
	No	28	20.0
4. Do you know anyone who has been tested for hepatitis B?	Yes	102	72.9
	No	38	27.1
5. Do you know how to check for hepatitis B?	Yes	58	41.4
	No	82	58.6
6. What are the usual symptoms of hepatitis B?	Fever	40	28.6
	Appetite loss	30	21.4
	Tea colour urine	28	20.0
	Nausea	14	10.0
	Yellow skin	28	20.0
7. Have you heard of the hepatitis B vaccine?	Yes	118	84.3
	No	22	15.7
8. Have you ever received hepatitis B vaccination?	Yes	110	78.6
	No	30	21.4
9. Do you know anyone who has been vaccinated for hepatitis B?	Yes	86	61.4
	No	54	38.6
10. Have you heard of medicine for hepatitis B?	Yes	38	27.1
	No	102	72.9
11. Have you ever been injected by non-disposable syringe and needle?	Yes	124	88.6
	No	16	11.4
12. Do you know how to protect yourself from hepatitis B?	Yes	82	58.6
	No	58	41.4

Out of the 140 participants, 100 (71.4%) showed adequate awareness of hepatitis B, whereas 40 (28.6%) were within the poor awareness range (Table 3).

Table 3 Level of awareness of respondents about hepatitis B (n = 140)

Awareness	Frequency	Percentage (%)
Poor awareness (scoring < 7)	40	28.6
Adequate awareness (scoring ≥ 7)	100	71.4

As seen in Table 4, only education qualification determines the awareness of hepatitis B among participants ($p < 0.0001$). The other factors including age group ($p = 0.8474$), gender ($p > 0.9999$), as well as ethnic group ($p = 0.4093$) showed no significant effect on the level of awareness.

Table 4 Demographic characteristics of respondents associated with awareness towards hepatitis B (n = 140)

Variables	Frequency, n (Percentage, %)	Adequate knowledge, adequate/poor	p-value
Age (years)			
21 – 30	66 (47.1)	50/16	$p = 0.8474$
31 – 40	56 (40.0)	35/21	
41 – 50	18 (12.9)	15/3	
Gender			
Male	48 (34.3)	34/14	$p > 0.9999$
Female	92 (65.7)	66/26	
Ethnicity			
Malay	90 (64.3)	60/30	$p > 0.9999$
Chinese	12 (8.6)	10/2	
Indian	24 (17.1)	19/5	
Others	14 (10.0)	11/3	
Education qualification			
Diploma level	120 (85.7)	81/39	$p < 0.0001****$
Undergraduate level	20 (14.3)	19/1	

**** $p < 0.001$

Knowledge of Respondents towards Hepatitis B

Majority of participants understood hepatitis B was caused by a virus infection, and the primary organ affected was liver. A total of 70.0% of the participants agreed that hepatitis B was not recognized by their appearance easily. On the other hand, 77.9% of participants failed to realize that hepatitis B could progress to cancer. About the mode of transmission, most of the participants acknowledged

that hepatitis B was able to spread through childbirth from mother to infant, as well as via sexual intercourse. Half of them recognized that hepatitis B could be transmitted through other routes including tattoos, body piercing, and sharing of toothbrush or razor with an infected patient. Surprisingly, 14.3% of participants claimed hepatitis B could be spread through common cold symptoms such as cough or sneeze. The summary of knowledge of participants towards hepatitis B was shown in Table 5.

Table 5 Knowledge of respondents about hepatitis B (*n* = 140)

Questions	Response	Frequency	Percentage (%)
1. Hepatitis B is a virus	Yes	110	78.6
	No	30	21.4
2. What is the major organ affected due to hepatitis B?	Heart	10	7.1
	Brain	6	4.3
	Liver	114	81.4
	Kidney	6	4.3
	Lungs	4	2.9
3. Can hepatitis B carriers be easily recognized by their appearance?	Yes	42	30.0
	No	98	70.0
4. Can hepatitis B cause cancer?	Yes	31	22.1
	No	109	77.9
5. Can hepatitis B spread through cough or sneeze?	Yes	20	14.3
	No	120	85.7
6. Can hepatitis B be transmitted through childbirth?	Yes	98	70.0
	No	42	30.0
7. Can hepatitis B be transmitted during sexual intercourse?	Yes	112	80.0
	No	28	20.0
8. Can hepatitis B be transmitted through sharing toothbrush and razor with others?	Yes	74	52.9
	No	66	47.1
9. Can hepatitis B be transmitted through tattoos and body piercing?	Yes	68	48.6
	No	72	51.4
10. Can hepatitis B be transmitted through hugs, kisses, and handshakes?	Yes	38	27.1
	No	102	72.9
11. Can hepatitis B be prevented by good hygiene?	Yes	38	27.1
	No	102	72.9
12. Do you know the number of shots in hepatitis B vaccination?	1×	6	4.3
	2×	22	15.7
	3×	100	71.4
	4×	12	8.6

Out of the 140 respondents, 37 (26.4%) showed adequate knowledge of hepatitis B, whereas 103 (73.6%) were within the poor knowledge range (Table 6).

Table 6 Level of knowledge of respondents about hepatitis B (*n* = 140)

Knowledge	Frequency	Percentage (%)
Poor knowledge (scoring < 9)	103	73.6
Adequate knowledge (scoring ≥ 9)	37	26.4

Table 7 summarized the associations between age, ethnicity, and education level with adequate knowledge of hepatitis B. It was observed a trend of increasing knowledge level with the increase of age ($p = 0.0013$). A significant different knowledge level was identified among different ethnicities ($p = 0.0153$). Educational level significantly impacted the adequate knowledge of hepatitis B ($p = 0.0001$). On the other hand, gender does not influence the knowledge level ($p > 0.9999$).

Table 7 Demographic characteristics of respondents associated with knowledge towards hepatitis B

Variables	Frequency, n (Percentage, %)	Adequate knowledge, adequate/poor	p-value
Age (years)			
21 – 30	66 (47.1)	9/57	0.0013***
31 – 40	56 (40.0)	20/36	
41 – 50	18 (12.9)	8/10	
Gender			
Male	48 (34.3)	12/36	> 0.9999
Female	92 (65.7)	25/67	
Ethnicity			
Malay	90 (64.3)	20/70	0.0153*
Chinese	12 (8.6)	8/4	
Indian	24 (17.1)	6/18	
Others	14 (10.0)	3/11	
Education qualification			
Diploma level	120 (85.7)	20/100	0.0001****
Undergraduate level	20 (14.3)	17/3	

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.005$; **** $p < 0.001$

DISCUSSION

To our best knowledge, this project was the first empirical questionnaire study assessing the A&K of the nursing staff about hepatitis B infection in Malaysia. Our findings demonstrated that the level of knowledge about hepatitis B was generally poor among nurses despite they had been educated about hepatitis B during their nursing school or hospital attachment. Our study had shown that 71.4% of participated nurses had adequate awareness of hepatitis B. However only 26.4% of them showed adequate knowledge of hepatitis B. This finding was in line with the findings from some previous studies. Ali et al. (2017) had reported that the majority of the 381 medical professionals in his study were aware of hepatitis B but lacked knowledge about hepatitis B infection. Besides this, a study conducted in Iran stated that less than half of 1,008 nurses from eight teaching hospitals had satisfactory knowledge about hepatitis B (Joukar et al., 2017).

The national immunization programme had been available in Malaysia since 1989 (Ministry of Health Malaysia, 1994). A total of 78.6% of nurses claimed that they were vaccinated before, however, there was no

proper documentation to record whether they had completed the full three doses course of the vaccination. Our study had shown that about half of the nurses know how to protect themselves from hepatitis B.

Most of the respondents in this study did not realise that hepatitis B is closely related to HCC. In fact, chronic hepatitis B is the major aetiology of hepatocellular carcinoma (HCC) in Malaysia (Goh et al., 2015). In patients with chronic hepatitis B, the chance of getting HCC was a hundred times higher than in non-infected person. As well-aware of the risk of hepatitis B to progress to HCC is crucial, allowing people to practise appropriate preventive measures.

Sufficient scientific understanding of HBV transmission is essential for medical staff. In the present study, the knowledge about the transmission of hepatitis B via sexual intercourse (80.0%), through childbirth (70.0%) was high. But transmission through sharing toothbrush and razor (52.9%), and tattoos, body piercing (48.6%) was low among nurses. Surprisingly, 14.3% of respondents claimed hepatitis B was able to spread through cough or sneeze.

Undoubtedly HCW is always at the risk of HBV infection due to the occupational exposure to blood. Some local studies have shown that the incidence of NSIs still happened among HCWs (Lekhraj et al., 2010; Santhna et al., 2007). This was shown in our study as well, that up to 88.6% of the respondents had experienced NSI before. Medical staff for sure have been educated the transmission risk of blood-borne diseases such as hepatitis B, hepatitis C and HIV. Perhaps the reason for the high rate of NSI among HCW was carelessness because of heavy load at hospitals or clinics as mentioned by Shahzad et al. (2013).

Most of the respondents did not realise that hepatitis B could be prevented by keeping good hygiene. Ensuring good hygiene and avoiding contact with contaminated objects or body fluids can protect against infection with hepatitis B.

Older age was a strong indicator of better knowledge towards hepatitis B. The older the nurse was, the longer they had serviced in the hospital, the more chances they had exposed to the educations, and the more likely they had more knowledge about the disease.

The impact of higher education level on better A&K of hepatitis B had been observed in our study. hepatitis B is a complicated disease with variations. As nurses or HCWs, they have more opportunities to expose to different medical resources and to gain more information during facing the patients. However, nurses with undergraduate education level have better A&K if compared with those with diploma level. This is proven that individuals with a higher education level can achieve a better understanding of this disease. Comparatively, the association between high educational level with better HBV knowledge had been reported among residents at Puchong, Malaysia (Pathmanathan & Lakshmanan, 2014), Selangor state, Malaysia (Rajamoorthy et al., 2019), and patients with chronic hepatitis B in Singapore (Wai et al., 2005).

Being Chinese, nurses had better knowledge about hepatitis B. Our finding is coherent with a telephone-interview study involving 1,013 Asian communities in British Columbia (BC), that Chinese ethnicity had been recognized as a positive predictor of having adequate knowledge of hepatitis B (Yau et al., 2016). In Malaysia, hepatitis B was more common among Chinese. Hepatitis B was the predominant aetiology for liver cirrhosis among Chinese (58.8%), however, it was a less dominant aetiology for other ethnicities (Qua & Goh, 2011). The relatively high prevalence of Hepatitis B among Chinese Malaysians may explain their better knowledge of hepatitis B.

This study contributes to the scanty literature on hepatitis B in Malaysia. Few limitations could be identified. The sample size of this study was relatively small, and only one hospital was recruited. Consequently, the findings may not well represent the true A&K situation of all nurses across Malaysia. To improve this, the future study will aim to include a wider range of hospitals to cover a full range of ethnicity, age group, and gender. Furthermore, the nurses' working experience and if any exposure working in the area related to hepatology disciplines/ infection control should be studied as well. Besides, data recording might be inaccurate because some questions in this study were dependent on the respondents' ability to recall.

The results draw attention to the operational issue of clinical care, as well as the ability of professionals dealing with the possible spread of hepatitis B. Although many efforts had been tried in controlling hepatitis B spreading in Malaysia, further improvement can be considered. Prevention of hepatitis B transmission is entirely achievable, and it is treatable with existing medicines.

Various guidelines including Guideline on Blood-borne Viral Infections by Malaysian Medical Council (MMC) in 2011 (Ministry of Health Malaysia, 2011), and the Guidelines

for Oral Healthcare Practitioners Infected with Blood-borne Viruses, by Ministry of Health (MOH), Malaysia, in 2014 (Ministry of Health Malaysia, 2014) were established. HCWs are equipped with personal protective equipment (PPE) that include disposable gloves, surgical masks, and gowns in their clinical setting. The hepatitis B immunization programme was launched in 1989, followed by post-immunization screening which was promoted in 2006. The Sharps Injury Surveillance Programme was initiated for the notification and management of HCWs who suffered NSI at the workplace. If all the HCWs are well-educated about hepatitis B related health issues following the guidelines listed above, the spread of hepatitis B among HCWs could be better controlled. It is advised to launch nationwide awareness programmes, and campaigns among HCWs more frequently to raise their A&K status. Last but not the least, hepatitis B vaccination should be offered to all HCWs to maintain an adequate preventive level of the disease.

CONCLUSION

Overall, the staff nurses had an adequate level of awareness but an insufficient level of knowledge towards hepatitis B infection. HCWs are responsible for providing proper education as well as management of HBV infection. But HCWs are exposed to blood and they are known to have a higher risk of acquiring NSI. The lack of knowledge towards hepatitis B revealed the need for ongoing training of HCWs involved in the diagnosis and management of the disease.

CONFLICT OF INTEREST

The authors declare that they have no conflicting interests in publishing this article and there are no competing financial interests of the institutions or authors.

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