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## Knowledge, Attitude and Practice toward Prevention of Hepatitis B Virus Infection among Somalian Immigrant in the State of Selangor, Malaysia, and their HBV Infection Status

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### Abstract

**Background:** Hepatitis B virus (HBV) infection is a serious health problem that can lead to liver cirrhosis and cancer. Assessing the public knowledge, attitude, and practice towards HBV infection can be useful in planning public health policies in HBV management. **Objective:** The current study sought to determine the association between knowledge, attitude, and practice towards HBV infection with the HBV infection status of Somalian immigrants in Malaysia. **Method:** A cross-sectional study was conducted from September 2017 to April 2018 among Somalian immigrants in the state of Selangor, Malaysia. Data was collected using a validated, self-administered structured questionnaire. Their blood samples were collected for the detection of HBV DNA using nested PCR. Descriptive statistics and chi-square analysis were done to determine this association. **Result:** A total of 145 participants were recruited. The majority of participants were in the age group of 20-31 (84.1%), male (62.8%), single (52.4%), had an educational level of an undergraduate degree (70.3%), and unemployed (88.3%). The majority of the participants show good knowledge (82.8%) and attitude (78.6%) but generally poor practice (32.4%) towards HBV infection. The mean knowledge, attitude, and practice scores among them were  $16.9 \pm (4.89)$ ,  $9.20 \pm (2.94)$ , and  $9.39 \pm (2.93)$  respectively. The sociodemographic characteristic variables and KAP of HBV were not significantly associated. Selected samples collected from the participant tested negative for HBV DNA via nested PCR assay. **Conclusion:** Somalian immigrants in Malaysia have a good level of knowledge and attitude but a poor level of practice towards HBV infection. All participants were negative for HBV infection.

**Key Words:** Hepatitis B virus (HBV), Prevention, Somalian Immigrant, Infection Status, State of Selangor.

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## 1. Introduction

Hepatitis B virus (HBV) infection is one of the major public health issues worldwide. It is the most common and serious form of infection that can progress to chronic, lifelong infection of the liver (Kim et al. 2019). According to the World Health Organization (WHO), nearly 2 million people have been reported with evidence of ongoing or previous HBV infection globally. More than 2 million people, 350 million of them suffered from chronic, lifelong infection of the virus (Abdela et al. 2016).

HBV infection targeted the liver, leading to the development of a plethora of liver diseases ranging from acute hepatitis to chronic hepatitis, liver cirrhosis, and hepatocellular carcinoma. It is estimated that 15–40% of chronic HBV carriers were susceptible to develop liver cirrhosis and hepatocellular carcinoma. Consequently, one million people die each year as a result of HBV infection and its complications (Noubiap et al. 2015).

Attributed to the development of a vaccine against HBV, regions of developed nations such as North America, Northern, and Western Europe, and Australia have seen a significant reduction in the disease burden (Baig et al. 2015). These regions are considered as having low endemicity of HBV with prevalence ranging from 5 to 7% of the population and 0.5 to 2% of them are chronic carriers (Baig VN et al. 2015).

However, moderate endemic regions such as part of Eastern and Southern Europe, the Middle East, Japan, and part of South America with 10 to 60% prevalence and 2 to 7% chronic carriers, as well as high endemic regions such as South East Asia, China, sub-Saharan Africa and the Amazon Basin with 70 to 95% prevalence and more than 8% chronic carriers, still exists due to the lack of

enforcement and awareness towards the control of the disease (Coppola et al. 2015).

HBV can be transmitted through contact with infected bodily fluids that include blood, semen, and vaginal secretion (Sagnelli et al. 2014). Moreover, HBV can also be transmitted from infected mothers to their newborn babies and is believed to be a major contributor to the prevalence in high endemic regions (Adjei et al. 2016). In terms of practice, HBV is transmitted through unprotected sexual intercourse with an infected individual, sharing of needles and syringes either in health-care settings or among persons who inject drugs, or during medical, surgical, or dental procedures, or getting a tattoo, or shaving in the barbershop through the use of equipment that is contaminated with infected blood (Sagnelli et al. 2014).

By adhering to universal precautions which include using protective barriers such as gloves, vaccination, appropriate sterilization of medical equipment, and proper hospital waste management system, the spread of HBV infection can be prevented. Also, HBV cannot be transmitted by holding hands, sharing food, kissing, hugging, coughing, sneezing, or breastfeeding (Sagnelli et al. 2014).

Assessment of knowledge, attitude, and practice (KAP) towards a certain health issue is a useful tool in planning public health policies. Strategies in disease management can be tailored to maximize results by taking into account the current KAP of the target population. It is a valuable and most frequently used study tool in health-seeking behavior research. The study collects information on what is known, believed, and done by the member of the population concerning a particular topic (Hamissi et al. 2014).

Knowledge is usually assessed to see how

far the community members knew regarding the biomedical concepts revolve around the topic of interest such as causes and symptoms of the disease. When the knowledge deviates from biomedical concepts, it is termed as “beliefs”. People’s beliefs, feelings, and values toward a particular object or phenomenon culminated into their attitude toward it (Hassan-kadle et al. 2018). Finally, the knowledge and attitude towards a disease influence their practices such as preventive measures towards a certain disease or lifestyle modification (Kim et al. 2019).

HBV can also spread via immigration, particularly within migrants from countries with a high HBV endemicity to those with a low HBV endemicity (Li et al. 2015). Like many other sub-Saharan African countries, Somalia also has high endemicity of HBV with evidence of current and past infection found in 18.9% to 29% of the population (Mansour-Ghanaei et al. 2013). On the other hand, Malaysia, despite being one of the countries located in a highly endemic region of South East Asia, has become one of the countries in Asia that have reduced the burden of HBV infection with a reported HBV prevalence of 5% (Mesfin and Kibret 2013). The current study aims to determine the association between knowledge, attitudes, and practices (KAP) towards HBV infection among Somalian immigrants in the state of Selangor, Malaysia, and their HBV infection status.

## **2. Methods**

### **Ethical Approval**

This research has been approved by the Ethics Committee of the Faculty of Engineering and Life Science UNISEL (J150056E).

### **Study Design**

Data on knowledge, attitude and practice toward HBV among Somalian immigrants in Malaysia and their sociodemographic characteristics were

assessed through validated, self-administered structured questionnaires (Nelson et al. 2017). HBV infection status of the participants was confirmed via detection of the HBV DNA in their blood (Rajamoorthy et al. 2019). Data were collected from September 2017 to April 2018.

### **Study Participants**

The study population was recruited from Somalian immigrants to Malaysia who reside in the state of Selangor, particularly the three different regions of Shah Alam, Serdang, and Gombak. Inclusion criteria include adults with Somalia citizenship in the state of Selangor that is older than 20 years old regardless of gender, employment, and social status. Somalian immigrants that have recurrent evidence of HBV infection, who are younger than 20 years old, that have citizenship other than Somalia, or not residing in Malaysia were excluded from the study.

### **Data Collection**

Data was collected by using a self-administered structured questionnaire that collects information about the sociodemographic characteristics of the participants and their KAP towards the prevention of HBV. Data were collected using a personal interview with the study population. The investigator gave a brief introduction to participants before filling the questionnaire. The face validity and the reliability of the questionnaire were evaluated by conducting a pilot study with approximately 5% of the sample size (10 people).

### **Blood Sample Collection**

To determine the HBV infection status among participants, their blood was tested for the presence of HBV DNA. Venipuncture was performed by the certified phlebotomist and 4 ml of blood was collected in a vacutainer tube together with age and gender data. All blood sample was centrifuged and the plasma was separated. All samples were stored at -80°C until analysis.

### Nested Polymerase Chain Reaction

The presence of HBV DNA in participants' blood was detected using nested polymerase chain reaction (PCR). Nested PCR is a technique that utilized two sets of primers to amplify low occurring DNA sequences. DNA from the samples was

extracted using a QIAamp DNA Blood Mini Kit (QIAGEN GmbH, Hilden, Germany). Two different sets of primers (S1 and nested S2) were used to target the HBV DNA as shown in Table 1. The presence of amplified product was assessed with agarose gel electrophoresis.

Table 1. Primers used for amplification of HBV infection.

Primer Name	Sequence (5'-3')
S1 forward	TCCTGCTGGTGGCTCCAG
S1 reverse	CGTTGACATACTTTCCAATCAA
Nested S2 forward	ACCCTGYRCCGAACATGGA
Nested S2 reverse	CAACTCCCAATTACATARCCCA

### Data Analysis

Data analysis was checked for comprehension and reliability. Data was entered and analyzed using IBM SPSS software version 21.0. The findings were presented as numbers and percentages for categorical data. For quantitative data, the findings were presented as mean and standard deviation. The relationship between the variables was determined using descriptive statistics. A Chi-square test was used to determine the effect of different factors on the event of HBV infection. The chi-square result with a p-value less than 0.05 was considered statistically significant and while more than 0.05 was considered to be insignificant.

### Results

#### Sociodemographic Characteristics

A total of 145 questionnaires were distributed and 145 were received with a response rate of 100%. The gender distribution was 91 (62.8%) males and 54 (37.2%) females. The mean age of the study participants was 21.2 (0.44) years old. Most participants were in the 21 to 30 years old age group, 122 (84.1%). In terms of marital status, there were 76 (52.4%) singles, 52 (35.9%) married individuals, and 17 (11.7%) divorcees. Regarding educational level, 11 (7.6%) individuals had up to secondary level education, 102 (70.3%) individuals had an undergraduate degree, and 32 (22.1%) individuals had a postgraduate degree. The majority of the participants were students, hence, 128 (88.3%) of them identified themselves as unemployed. The sociodemographic characteristics of the Somalian immigrants in Malaysia are shown in Table 2.

Table 2. Sociodemographic characteristics among Somalian immigrants in the state of Selangor, Malaysia.

Variable	Group	Frequency (n)	Percent (%)
Age (21.2 ± 0.44)	< 20	4	2.8
	21-30	122	84.1
	31-40	17	11.7
	> 41	2	1.4
Gender	Male	91	62.8
	Female	54	37.2
Marital status	Single	76	52.4
	Married	52	35.9
	Divorced	17	11.7
Education level	Up to Secondary	11	7.6
	Undergraduate degree	102	70.3
	Postgraduate degree	32	22.1
Working status	Employed	17	11.7
	Unemployed	128	88.3

**Assessment of Knowledge towards Hepatitis B**

The participant's knowledge on HBV infection, etiology, transmission, and vaccination was evaluated with 24 questions related to public knowledge on HBV infection. Scoring of more than 12 was considered to be an indicator of good knowledge on HBV infection. Among the

participants, 120 (82.8%) showed good knowledge regarding HBV in general as well as its etiology, transmission, and vaccination. The mean knowledge score among the participants was 16.9 (4.88). Table 3 illustrates the participant's knowledge of different aspects of HBV infection.

Table 3. Level of knowledge on HBV infection among Somalian immigrants in the state of Selangor, Malaysia.

No	Items	Yes	No
		N (%)	N (%)
1.	Have you ever heard of a disease termed Hepatitis B?	86 (59.3)	59 (40.7)
2.	Do you know what is Hepatitis B infection?	81 (55.9)	64 (44.1)
3.	Do you know the causes of Hepatitis B?	100 (69.0)	45 (31.0)
4.	Can Hepatitis B virus infections result in chronic hepatitis and liver cancer?	125 (86.2)	20 (13.8)
5.	Can Hepatitis B affect liver function?	127 (87.6)	18 (12.4)
6.	Can Hepatitis B affect any age group?	96 (66.2)	49 (33.8)
7.	Can Hepatitis B be transmitted by un-sterilized syringes, and surgical instruments?	116 (80.0)	29 (20.0)
8.	Can Hepatitis B be transmitted by using blades of the barber/ear and nose piercing?	115 (79.3)	30 (20.7)
9.	Can Hepatitis B be transmitted from mother to child?	110 (75.9)	35 (24.1)
10.	Can Hepatitis B be transmitted by contaminated water/food prepared by a person suffering from these infections?	47 (32.4)	98 (67.6)
11.	Is Hepatitis B virus transmission hereditary?	61 (42.1)	84 (57.9)
12.	The early symptoms of Hepatitis B are the same as cold and flu (runny nose and cough)	57 (39.3)	88 (60.7)
13.	Do you know the treatment for Hepatitis B virus infection?	67 (46.2)	78 (53.8)
14.	Can Hepatitis B be self-cured by the body?	77 (53.1)	68 (46.9)
15.	Is vaccination available for Hepatitis B?	122 (84.1)	23 (15.9)
16.	Do you recommend vaccination against Hepatitis B among your family members?	126 (86.9)	19 (13.1)
17.	Are you vaccinated against Hepatitis B?	121 (83.4)	24 (16.6)
18.	Are you aware of the appropriate intervals of the Hepatitis B vaccination?	128 (88.3)	17 (11.7)
19.	Do you know the precautionary measures to be taken against Hepatitis B in your routine practice?	115 (79.3)	30 (20.7)
20.	Are you aware of the risk of exposure to Hepatitis B at the dentist?	114 (78.6)	31 (21.4)
21.	Do you know the symptoms of Hepatitis B infection?	123 (84.8)	22 (15.2)
22.	Does HBV spread by casual contact such as handshaking?	76 (52.4)	69 (47.6)
23.	Do you know the mode of disease transmission?	129 (89.0)	16 (11.0)
	- Sexual intercourse	37 (25.5)	-
	- Blood transfusion	76 (52.4)	-
	- Infection needle	32 (22.1)	-
24.	What are the methods of prevention of the hepatitis B virus?		
	- Avoid unprotected sex	61 (42.1)	-
	- Vaccination	39 (26.9)	-
	- Material sterilization	20 (13.8)	-
	- Avoid diagnosed HBV patients	15 (10.3)	-
	- Proper disposal of sharps	2 (1.4)	-
	- Avoid needle stick injury	5 (3.4)	-
	- Avoid food that is not well cooked	3 (2.1)	-

**Assessment of Attitude towards Hepatitis B**

The participant's attitude towards HBV transmission, prevention, vaccination, and consequences was evaluated with 15 questions related to public perception towards HBV infection. Scoring of more than 7 was considered to be an indicator of a good attitude towards HBV

infection. Among the participants, 114 (78.6%) showed a good attitude towards HBV transmission, prevention, vaccination, and consequences. The mean attitude score among the participants was 9.2 (2.94). Table 4 illustrates the participant's attitudes towards different aspects of HBV infection.

Table 4. Level of attitude towards HBV infection among Somalian immigrants in the state of Selangor, Malaysia.

No	Items	Yes	No
		N (%)	N (%)
1.	Do you think you can get Hepatitis B?	102 (70.3)	43 (29.7)
2.	Would you share a meal with an infected person?	103 (71.0)	42 (29.0)
3.	Should an infected person be terminated from school/work?	101 (69.7)	44 (30.3)
4.	Is vaccination against Hepatitis B necessary?	107 (73.8)	38 (26.2)
5.	Have you ever thought you could get Hepatitis B?	82 (56.6)	63 (43.4)
6.	Should Hepatitis B patients be allowed to work routinely?	75 (51.7)	70 (48.3)
7.	Should Hepatitis B patients be isolated?	116 (80.0)	29 (20.0)
8.	Is education effective in improving the knowledge on Hepatitis B?	108 (74.5)	37 (25.5)
9.	How do you deal with Hepatitis B patients?	-	-
	- I avoided dealing with them	83 (57.2)	-
	- I deal with them cautiously	32 (22.1)	-
	- I deal with them normally	30 (20.7)	-
10.	What will be your reaction when you found that you have Hepatitis B?	-	-
	- Fear	39 (26.9)	-
	- Shame	15 (10.3)	-
	- Surprise	13 (9.0)	-
	- Sadness	78 (53.8)	-
11.	Who will you talk to about your illness?	-	-
	- Physician	54 (37.2)	-
	- Spouse	5 (3.4)	-
	- Parents	32 (22.1)	-
	- Child	20 (13.8)	-
	- Others relatives	4 (2.8)	-
	- Friends	4 (2.8)	-
	- No one	26 (17.9)	-
12.	What will you do if you think that you have symptoms of Hepatitis B?	-	-
	- Self-treatment	67 (46.2)	-
	- Going to a health facility	51 (35.2)	-
	- Going to a homeopath	3 (2.1)	-
	- Going to a traditional healer	24 (16.6)	-
13.	When you have symptoms of Hepatitis B, at what stage will you come to the health facility?	-	-
	- After self-treatment fails	24 (16.6)	-
	- Three to four weeks after the appearance of symptoms	34 (23.4)	-
	- As soon as I realized the symptoms of HBV	45 (31.0)	-
	- Will not see a physician at all	42 (29.0)	-
14.	How expensive do you think the diagnosis and treatment of Hepatitis B is?	-	-
	- Free	34 (23.4)	-
	- Reasonable	10 (6.9)	-
	- Somewhat expensive	17 (11.7)	-
	- Expensive	19 (13.1)	-
	- Do not know	65 (44.8)	-
15.	What will worry you the most after you are diagnosed with Hepatitis B?	-	-
	- Fear of death	66 (45.5)	-
	- Fear that the disease spread to a family member	35 (24.1)	-
	- The treatment cost	13 (9.0)	-
	- Isolation from society	31 (21.4)	-

**Assessment of Practice towards Hepatitis B**

The participant's practice towards HBV screening, prevention, and vaccination was evaluated with 16 questions related to the public action in terms of controlling HBV infection. Scoring of more than 8 was considered to be an indicator of good practice

towards HBV infection. Among the participants, only 47 (32.4%) showed good practice towards HBV screening, prevention, and vaccination, tabulated in Table 5. The mean practice score among the participants was 9.4 (2.93).

Table 5. Level of practice towards HBV infection among Somalian immigrants in the state of Selangor, Malaysia.

No	Items	Yes	No
		N (%)	N (%)
1.	Have you done the screening for Hepatitis B?	89 (61.4)	56 (38.6)
2.	Have you got yourself vaccinated against Hepatitis B	74 (51.0)	71 (49.0)
3.	Do you ask for the screening of blood before transfusion?	101 (69.7)	44 (30.3)
4.	Do you ask for a new syringe before use?	82 (56.6)	63 (43.4)
5.	Do you ask your barber to change the blade/or for safety equipment for ear and nose piercing?	104 (71.7)	41 (28.3)
6.	Do you share food/utensils/water etc. with others?	70 (48.3)	75 (51.7)
7.	Do you avoid meeting people?	59 (40.7)	86 (59.3)
8.	Will you continue and complete the treatment for the infection?	102 (70.3)	43 (29.7)
9.	Have you ever participated in a health education program related to Hepatitis B?	96 (66.2)	49 (33.8)
10.	Have you had any injuries or wound while working?	89 (61.4)	56 (38.6)
11.	Have you been subjected to Hepatitis B examination?	97 (66.9)	48 (33.1)
12.	Have you ever accidentally splashed blood or body fluids in your mouth, eyes, and nose?	38 (26.2)	107 (73.8)
13.	Have you been subjected to premedical examination on appointment?	94 (64.8)	51 (35.2)
14.	Is there a periodical medical examination? If yes, how frequent?	99 (68.3)	46 (31.7)
	- Every one to two months	49 (33.8)	-
	- Every three to six months	34 (23.4)	-
	- Once a year	36 (24.8)	-
	- Do not response	26 (17.9)	-
15.	Have you received a full dose of vaccination against Hepatitis B?	55 (37.9)	90 (62.1)
16.	How many doses of Hepatitis B vaccine did you receive?	-	-
	- One dose	24 (16.6)	-
	- Two doses	33 (22.8)	-
	- Three doses	55 (37.9)	-
	- Do not know	33 (22.8)	-



**Association of Sociodemographic Characteristics and KAP Scores**

The relationship between the sociodemographic characteristics among the participants and the outcome of their knowledge, attitude, and practice

towards HBV infection scores were determined using descriptive statistics and the Chi-square test. Sociodemographic characteristics were found to not affect the KAP scores as depicted in Table 6.

Table 6. Sociodemographic characteristics among Somalian immigrants in the state of Selangor, Malaysia.

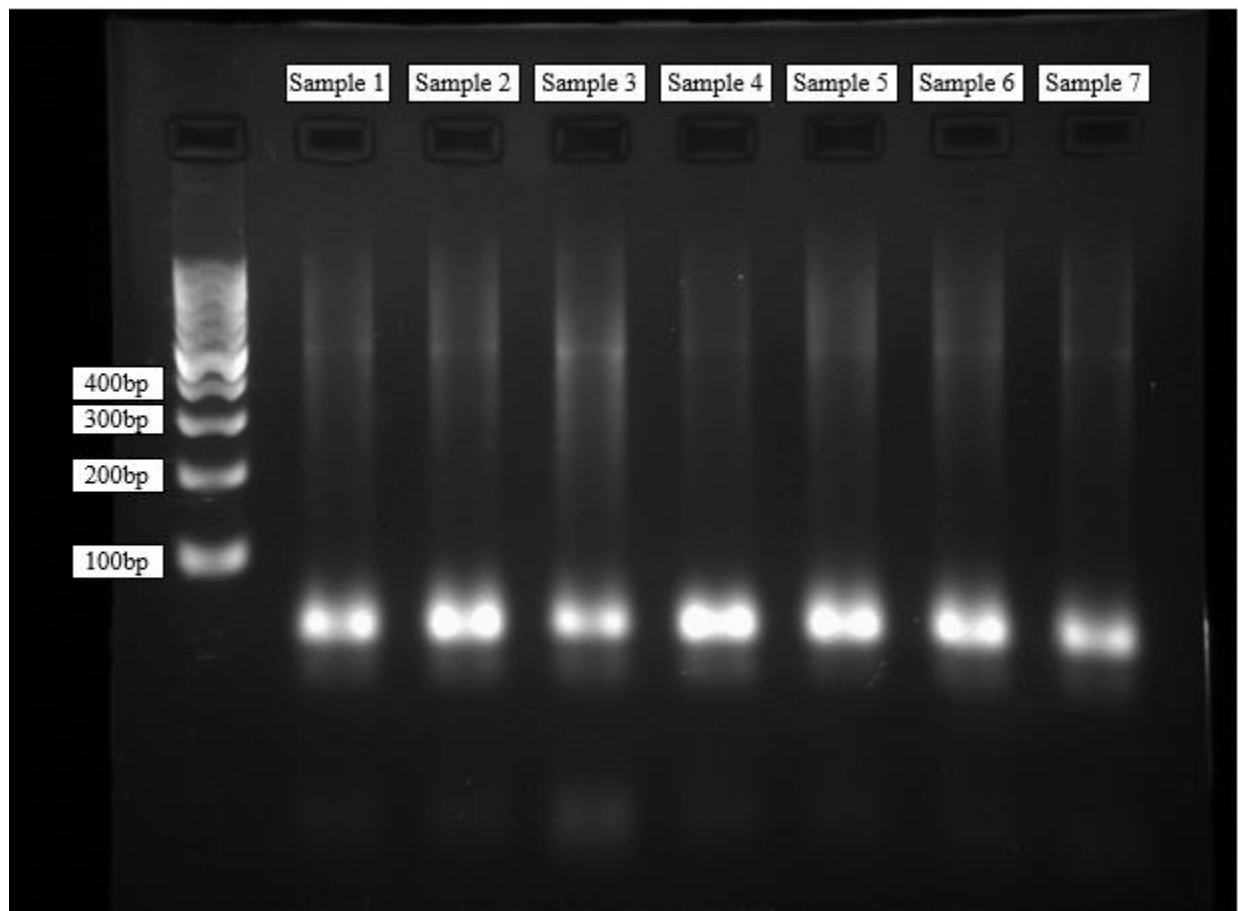
Description	N (%)	Good Knowledge	P-value	Good Attitude	P-value	Good Practice	P-value
<b>Age</b>							
< 20	4 (2.8)	3 (75.0)	0.899	3 (75.0)	0.639	0 (0.0)	0.388
21-30	122 (84.1)	101 (82.8)		94 (77.0)		41 (33.6)	
31-40	17 (11.7)	14 (82.4)		15 (88.2)		6 (35.3)	
> 41	2 (1.4)	2 (100.0)		2 (100.0)		0 (0.0)	
<b>Gender</b>							
Male	91 (62.8)	76 (83.5)	0.754	75 (82.4)	0.148	30 (33.0)	0.853
Female	54 (37.2)	44 (81.5)		39 (72.2)		17 (31.5)	
<b>Marital status</b>							
Single	76 (52.4)	58 (76.3)	0.085	56 (73.7)	0.159	30 (39.5)	0.145
Married	52 (35.9)	46 (88.5)		42 (80.8)		12 (23.1)	
Divorced	17 (11.7)	16 (94.1)		16 (94.1)		5 (29.4)	
<b>Education level</b>							
Up to Secondary	11 (7.6)	9 (81.8)	0.723	7 (63.6)	0.204	4 (36.4)	0.174
Undergraduate Degree	102 (70.3)	83 (81.4)		84 (82.4)		37 (36.3)	
Postgraduate Degree	32 (22.1)	28 (87.5)		23 (71.9)		6 (18.8)	
<b>Working status</b>							
Employed	17 (11.7)	16 (94.1)	0.187	13 (76.5)	0.818	6 (35.3)	0.787
Unemployed	128 (88.3)	104 (81.3)		101 (78.9)		41 (32.0)	

### **HBV Infection Status**

All the participants included in this study were known to be free of HBV infection. Molecular analysis for the presence of occult HBV infection was done via PCR detection of HBV DNA. Successful amplification of the HBV DNA will produce a 350 base pair product that can be seen in the agarose gel electrophoresis. All samples were

tested negative for HBV DNA. None of the samples demonstrated successful amplification of the 350 base pair HBV DNA PCR product as shown in Figure 1. Hence, the association between knowledge, attitudes, and practices towards HBV infection among Somalian immigrants in the state of Selangor, Malaysia, and their HBV infection status could not be evaluated.

Figure 1. PCR Product of HBV DNA Nested PCR.



## **Discussion**

The existence of vaccines against HBV infection, since 1982, has led to the low prevalence of HBV infection in many developed countries (Siraj, Fareed, and Mahajan 2016). However, the prevalence of HBV infection is still high in sub-Saharan Africa and southeast Asia due to the lack of awareness and action taken towards controlling the disease (Terrault et al. 2018).

Malaysia, a country located in South East Asia, is one of the few countries in Asia that has a low prevalence of HBV infection (Elbur et al. 2017). Considering the potential of HBV transmission via immigration, particularly within migrants from countries with a high HBV endemicity to those with a low HBV endemicity, the Malaysian government requires a mandatory health screening for all travelers within the first five days of arrival in Malaysia. This mandatory screening also applies to the Somalian immigrants, whose home country has reported prevalence of 18.9% to 29% of the population (Mansour-Ghanaei et al. 2013).

The current study sought to evaluate knowledge, attitude, and practice towards HBV infection among Somalian immigrants in Malaysia and their relationships to the HBV infection status of the Somalian immigrants. Results of the study showed an overall good level of knowledge and attitude of the participants toward HBV infection. However, a poor level of practice towards HBV infection was detected among the participants. Nevertheless, all participants were devoid of molecular evidence of HBV infection. Moreover, participant's sociodemographic characteristics also shown no association with their KAP.

Numerous studies had been done in the past to assess the level of KAP towards HBV infection in a variety of populations, mainly healthcare professionals (Haq et al. 2013). In terms of knowledge and attitude, many of the population studied demonstrates a fair level of

understanding and perception towards the disease. However, vaccination compliance has been continuously identified as a gap in practice in many of these studies. In the current study, Somalian immigrants demonstrated a similar pattern, where they have good knowledge and attitude but poor practice.

A high level of knowledge on the biomedical concepts revolving around HBV was expected in the healthcare professional's population. This typically translates to a good attitude towards the disease. Studies focusing on the dentist, physician, healthcare workers, medical students, and dental students, (Haq et al. 2013) all revealed a fair level of knowledge and attitude towards HBV. In non-clinical university students, a study conducted among students of Fayoum University, Egypt, revealed that three-quarters of the participants had a satisfactory level of knowledge and attitude towards HBV (Zampino et al. 2015), (Vahdat et al. 2014), (Wang 2009), WHO, 2018, WHO, 2019.

In the current study, 82.8% out of the 145 participants, demonstrated a good level of knowledge towards HBV. Good knowledge was apparent among the participants because a majority (88.3%) of them were students who had prior knowledge about the infection. The mean knowledge score for the complete cross-sectional study was 16.9 (4.88). A good level of knowledge is indicated by a score of 12. As expected, the level of attitude follows the level of knowledge with 78.6% of participants showed a good attitude towards HBV. The mean attitude score for the complete cross-sectional study was 9.2 (2.94). A good level of attitude is indicated by the score of 7.

A sufficient level of knowledge and a good attitude towards a certain disease can lead to good practice in disease prevention and control (Kim H et al. 2019). However, many KAP studies in HBV has shown a relatively poor level of practice despite a good level of knowledge and attitude towards it. When inspected

deeper, vaccination compliance was identified as the recurrent gap in the practice of dentists (Elbur et al. 2017), physicians, healthcare workers, medical students, and dental students. The unavailability of the vaccine in a developing country such as Ethiopia has contributed to the low vaccination practice among study populations.

In the current study, only 32.4% of the participants demonstrated a good level of practice towards HBV. More than half of the population (62.1%) did not receive the recommended three doses of the HBV vaccine. However, the mean knowledge score for the complete cross-sectional study indicated a good practice with a score of 9.4 (2.93), slightly higher than the cut-off score of 8.

In terms of HBV infection status, all study participants were found to be devoid of traces of HBV DNA in their blood. Nested PCR is a method that utilized two sets of primers to amplify low occurring DNA sequences. This method has been proven to be able to detect occult HBV infection in 4% of the 1000 HBV negative Iranian (Raihan R et al. 2019). The negative result in Somalian immigrants in Malaysia suggests a positive correlation between good KAP and the HBV infection status among Somalian immigrants in Malaysia.

Although the finding may not be representative of the entire Somalian immigrants in Malaysia, the current study demonstrates a gap regarding practice on prevention of HBV among Somalian immigrants in the state of Selangor. This study can serve as a reference to urging the Somalian Ministry of Health to prioritize the awareness and education on the HBV prevention measures, particularly its vaccination program. This highlights the need to make the appropriate HBV vaccine freely available in the health centers along with educating the public, especially pregnant mothers, on the importance of vaccination against HBV.

## **Conclusion**

Knowledge and attitude towards HBV infection among Somalian immigrants in Malaysia were acceptable but their practice towards HBV infection was poor. Nevertheless, all of the participants were devoid of molecular evidence of HBV infection, suggesting a positive correlation between good KAP and the HBV infection status among Somalian immigrants in Malaysia.

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## **Conflict of interest**

The authors have no conflicts of interest to disclose.

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