



## ORIGINAL ARTICLE

## Assessment of Knowledge, Attitudes and Practices of Medical Students Regarding Hepatitis B Infection at a Private University of Medicine in Senegal

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### Abstract

**Context:** Senegal is among the most endemic countries for viral hepatitis B with 11% of chronic HBV carriers. Students in the health sector are among those most at risk. The objectives of this study were to determine the Knowledge, Attitudes and Practices (KAP) of students at a private university in Dakar regarding viral hepatitis B and to identify associated factors.

**Methodology:** A cross-sectional, descriptive, and analytical study has been conducted among students of the St Christopher Iba Mar Diop School from April 1 to 30, 2019. The questionnaire was self-administered. Chi<sup>2</sup> testing and logistic regression were used to identify factors associated with the level of knowledge, as well as attitudes and practices regarding viral hepatitis B. The data was analyzed using SPSS version 22 software.

**Results:** In total, we interviewed 317 students, which corresponds to a participation rate of 60.5%. The main sources of information were predominately training (85.9%) and the media (68.2%). Jaundice (85.9%), hepatomegaly (79.2%) and fever (78.5%) were the main clinical signs known to students. Blood and sexual transmission routes were cited by more than 80% of the respondents. However, 19.4% of students reported that hepatitis B could be transmitted by the fecal-oral route. People with multiple sexual partners (77.5%) and health workers (76.4%) were the most frequently cited at-risk groups. Incarceration as a risk factor was known by only 38.7% of respondents.

The complications of hepatitis B, namely cirrhosis (81.3%) and hepatocellular carcinoma (69.0%), were also known. The antivirals effective on HBV were not well known to students: Tenofovir (44.7%), entecavir (21.1%) and lamivudine (10.2%). Sixty-two percent (62%) of students said that all HBV patients should be systematically treated. Almost two thirds (65.5%) of students said that it took 3 doses for a complete immunization. More than half (55.6%) of the students had been screened for the hepatitis B virus and 61.3% reported having been vaccinated against it. Of the 284 students, 27% had a good level of knowledge while 32.4% had good practices and attitudes regarding hepatitis B. Factors associated with good knowledge of hepatitis B were level of education (second year of Master's degree and above) (ORa = 3.96 [2.11-7.41]) and the number of sources of information ( $\geq 2$ ) on hepatitis B (ORa = 2.03 [1.11-3.69]). The same factors were also related to good practices and attitudes.

**Conclusion:** The results of this survey administered to students in the health sciences are generally unsatisfactory. To improve the knowledge of students in the health sciences, we commend organizing awareness campaigns in addition to lectures about the hepatitis B and spreading key messages through social media networks and students' associations.

### Keywords

Hepatitis B, KAP survey, Students, Senegal



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## Introduction

Viral hepatitis B is a public health problem. The World Health Organization (WHO) estimates that 257 million people are living with the Hepatitis B virus and in 2015, 887,000 people died from it, mostly due to cirrhosis or liver cancer [1]. In May 2016, the World Health Assembly adopted the first global strategy to fight against viral hepatitis. It aims to reduce the number of new cases by 90%, and the number of deaths due to viral hepatitis by 65% by 2030 [1,2]. Hepatitis B (HBV) infection is highly endemic in sub-Saharan Africa with a high prevalence of HBsAg > 8%. In Senegal, 11% of people are chronic carriers of the hepatitis B virus. An effective vaccine against hepatitis B has been available since 1982. However, it was only introduced into Senegal's Expanded Program of Immunization (EPI) in 2005, and rendered mandatory for newborns in 2016 [3]. Viral hepatitis B is part of the group of occupational infectious diseases [4]. Health professionals and students in the health sciences are among those most at risk due to the possibility of transmission through the bloodstream during medical care. In the event of accidental exposure to blood fluids, the risk of HBV transmission is 30% which is 300 times higher than the risk of HIV transmission [5]. Students in the health sciences are trained from their 3<sup>rd</sup> year to their doctorate in the epidemiology, clinical practice, diagnosis and treatment of hepatitis B. These courses are offered in the form of lectures and tutorials and include instructions on how to deal with accidental exposure to blood fluids. In Senegal, hepatitis B screening and vaccination for students in the health sciences is recommended but not mandatory because it is their responsibility, and so is monitoring and treatment in the event of a positive result. This study aimed to assess knowledge, attitudes and practices on hepatitis B infection and to identify factors associated among students at Saint Christopher Iba Mar Diop Medical School in Dakar.

## Methodology

### Setting

Our study took place at the Saint Christopher Iba Mar Diop School of Medicine at El Hadj Ibrahima Niassé University (UEIN). It is a private higher education institution, which awards students the degree of State Doctor of Human Medicine, Pharmacy and Dentistry. It is located in Dakar, the capital of the Republic of Senegal. It was created in 2000 and has been part of the Private University of Marrakech (UPM) since 2014.

### Study design and sample

This was a cross-sectional, descriptive and analytical study. This KAP (Knowledge, Attitudes and Practices) survey was conducted from April 1 to 30, 2019. All students who were enrolled in medicine, pharma-

cy, or dentistry programs at the Master's level, and agreed to complete the questionnaire were included in the study. The recruitment process was therefore exhaustive. Students who were absent on the day of the survey did not participate. Of the 317 collection forms we excluded 33 and analyzed the results of the remaining 284 forms. Collection forms where more than 60% of the questions were not answered were considered incomplete and therefore excluded from analysis.

### Study procedure

In coordination with the course director, a 15-minute information session was organized for the students to discuss the context and objectives of the study. After obtaining consent, the forms were then distributed and retrieved after about 30 minutes during the same session. One month after the survey, a seminar on hepatitis B was organized for all students at the University.

### Questionnaires

An anonymous questionnaire was developed based on a literature review. The questionnaire consisted of 27 questions divided into the following 4 sections: sociodemographic information (age, sex, nationality, marital status, level of education), sources of information (media "radio, television, internet and press", training, other), knowledge about viral hepatitis B (definition, incubation period, clinical signs, transmission pathways, at-risk groups, serological markers, evolving modalities) and attitudes and practices regarding hepatitis B (students' hepatitis B screening and vaccination history, molecules effective on HBV, treatment indications, existence of the vaccine, and vaccination targets). The questionnaire was composed of close-ended questions that were either single or multiple-choice.

### Statistical analysis

In the descriptive analysis, the qualitative variables were described in numbers and percentages and the quantitative variables were described in terms of averages, standard deviation, range, mode and median. For the analytical component, a one-point score was attributed to each correct answer, and a zero value was attributed to false or missing answers. Regarding knowledge of hepatitis B, there were 10 questions with a total possible score of 32 points. For attitudes and practices, there were 11 questions with a total possible score of 21 points. We subdivided the students into two categories using a 70% cut-off: < 70% (Poor) and ≥ 70% Good).

- For knowledge: Good: ≥ 21 points and Bad: 21 < points

- For attitudes and practices: Good: ≥ 15 points and Bad: 15 points

During univariate analysis, we compared good knowledge regarding hepatitis B with other variables on the one hand, and on the other hand, good attitudes and practices regarding hepatitis B and other variables. For the multivariate analysis we used the logistic regression method. All variables whose p-value was  $\leq 0.25$  were selected to model good knowledge, attitudes and practices regarding hepatitis B. Odds ratios (OR) were reported with a 95%CI. A p value  $< 0.05$  was considered statistically significant in multivariable analysis. Data entry and analysis were done using SPSS version 22.

## Ethical considerations

The Head of the Medical University Saint Christopher Iba Mar Diop approved this survey. Student consent was obtained before the data collection form was completed. All data collected was rendered anonymous prior to analysis.

## Results

Out of a total of 525 students, 317 agreed to complete the survey and 284 forms were selected, which corresponds to a participation rate of 60.5%. The sex ratio was 0.70 in favor of women. The average age of

**Table 1:** Participant responses regarding knowledge, attitudes and practices related to Hepatitis B at a Private University of Medicine in Senegal, 2019 (N = 284).

Questions	Yes n (%)	No n (%)	Not Sure n (%)
Definition of viral hepatitis B infection	224 (78.9)	60 (21.1)	-
The average incubation period is 75 days	99 (34.9)	130 (45.8)	55 (19.4)
HBV infection symptoms			
<i>Jaundice</i>	244 (85.9)	3 (1.1)	37 (13.0)
<i>Hepatomegaly</i>	225 (79.2)	6 (2.1)	53 (18.7)
<i>Fever</i>	223 (78.5)	2 (0.7)	59 (20.8)
<i>Arthralgia</i>	59 (20.8)	54 (19.0)	171 (60.2)
<i>Asthenia</i>	191 (67.3)	7 (2.5)	86 (30.3)
Transmission route (s) for HBV			
<i>Sexual transmission</i>	228 (80.2)	56 (19.8)	
<i>Contaminated blood and bodily fluids</i>	245 (86.3)	39 (13.7)	
<i>Mother-to-child transmission</i>	188 (66.2)	96 (33.8)	
<i>Oro- fecal route</i>	55 (19.4)	229 (80.6)	
Groups most at risk of hepatitis B			
<i>People with multiple sexual partners</i>	220 (77.5)	10 (3.5)	54 (19.0)
<i>Healthcare workers</i>	217 (76.4)	11 (3.9)	56 (19.7)
<i>People who frequently require blood or blood products and dialysis patients</i>	187 (65.9)	15 (5.2)	82 (28.9)
<i>People detained in prisons</i>	110 (38.7)	35 (12.3)	139 (48.9)
<i>People who inject drugs</i>	177 (62.3)	25 (8.8)	82 (28.9)
<i>People with excessive alcohol consumption</i>	100 (35.2)	87 (30.6)	97 (34.2)
Possibility of screening asymptomatic hepatitis B?	243 (85.6)	14 (4.9)	27 (9.5)
Blood tests necessary for screening hepatitis B?			
<i>HBs Ag</i>	250 (88.0)	1 (0.4)	33 (11.6)
<i>Anti Hbs Ab</i>	143 (50.4)	41 (14.4)	100 (35.2)
<i>Transaminases</i>	138 (48.6)	37 (13.0)	109 (38.4)
<i>Viral load</i>	137 (48.2)	33 (11.6)	114 (40.2)
<i>Abdominal ultrasound</i>	57 (20.0)	81 (28.6)	146 (51.1)
Hepatitis B can lead to cirrhosis?	236 (83.1)	3 (1.1)	45 (15.8)
Hepatitis B is associated with an increased risk of liver cancer?	196 (69.0)	7 (2.5)	81 (28.5)
Is this disease curable?	202 (71.1)	46 (16.2)	36 (12.7)
There is a vaccine available against HBV?	270 (95.1)	1 (0.4)	13 (4.6)
The hepatitis B vaccine is safe and effective?	242 (85.2)	3 (1.1)	39 (13.7)
How many doses should you prescribe to protect a patient against hepatitis B? (3 doses)	186 (65.5)	98 (34.5)	

Can this drug be used to treat hepatitis B?			
<i>Tenofovir</i>	127 (44.7)	157 (55.3)	
<i>Interferon</i>	110 (38.7)	174 (61.3)	
<i>Entecavir</i>	60 (21.1)	224 (78.9)	
<i>Lamivudine</i>	29 (10.2)	255 (89.8)	
Did you prescribe a treatment for all the patients infected with hepatitis B?	175 (61.6)	75 (26.4)	34 (12.0)
Did you prescribe a vaccine for hepatitis B to pregnant woman?	108 (38.0)	44 (15.5)	132 (46.5)
Have you ever been screened for hepatitis B?	158 (55.6)	102 (35.9)	24 (8.4)
Have you been vaccinated for HBV?	174 (61.3)	52 (18.3)	58 (20.4)

**Table 2:** Factors associated with Medical students' knowledge of hepatitis B infection in a Private University of Medicine in Senegal, 2019 (N = 284).

Variables	Total	Good Knowledge n (%)	OR [IC95%]	p-value	ORa [IC95%]	p-value
<b>Department</b>				<b>0.001</b>		0.77
Pharmacy/Odontology	73	11 (15.1)	1		1	
Medicine	211	66 (31.3)	2.6 [1.3-5.2]		1.3 [0.6-2.9]	
<b>Level of education</b>				<b>&lt; 10<sup>-6</sup></b>		<b>&lt; 10<sup>-6</sup></b>
Master 1	160	25 (15.6)	1		1	
Master 2 and more	124	52 (41.9)	3.9 [2.3-6.8]		3.7 [1.9-6.9]	
<b>Sources of information</b>				<b>10<sup>-3</sup></b>		
< 2 sources	114	19 (16.7)	1		1	0.002
≥ 2 sources	170	58 (34.1)	2.6 [1.4-4.6]		2.7 [1.4-4.9]	
<b>Hepatitis B vaccination status</b>				0.19		0.18
No	110	25 (22.7)	1		1	
Yes	174	52 (29.9)	1.4 [0.8-2.5]		1.4 [0.8-2.5]	
<b>Age group (years)</b>						
≤ 23	149	39 (26.2)	1			
> 23	135	38 (28.1)	1.1 [0.6-1.9]			
<b>Sex</b>				0.37		
Female	167	42 (25.1)	1			
Male	117	35 (29.9)	1.3 [0.7-2.1]			
<b>Marital status</b>				0.31		
Not married	262	69 (26.3)	1			
Married	22	8 (36.4)	1.6 [0.6-4.0]			
<b>Screening of hepatitis B</b>				0.39		
No	126	31 (24.6)	1			
Yes	158	46 (29.1)	1.3 [0.7-2.1]			

the students was 23.3 years  $\pm$  1.7 years. More than half (56.3%) of the respondents were in the 1<sup>st</sup> year of their Master's degree, a third in the 2<sup>nd</sup> year of their Master's degree (35.6%) and 8.1% were in the PhD program. They were predominantly in medicine (74.3%) then pharmacy (22.9%) and dentistry (2.8%).

### Knowledge of viral hepatitis B (Table 1)

Academic training (85.9%) and the media (68.2%) were the main sources of information on hepatitis B. The majority (78.9%) of respondents were familiar with the definition of hepatitis B. A third (34.9%) of the stu-

dents responded that the incubation period for hepatitis B was 75 days. Jaundice (85.9%), hepatomegaly (79.2%), fever (78.5%), and asthenia (67.3%) were the main signs known to students. More than half of the students failed to mention hives and arthralgia.

The modes of transmission of hepatitis B, namely via blood (86.3%), sexual intercourse (80.2%) and mother-to-child (66.2%), were well-known by our respondents. However, 19.4% of students reported that hepatitis B could be transmitted by the fecal-oral route. People with multiple sexual partners (77.5%), health workers (76.4%), and newborns of HBV-infected mothers

(66.9%) were the at-risk groups most frequently listed by students. Only one-third (35.2%) of respondents said that hepatitis B could be acute or chronic. According to 85.6% of students, asymptomatic hepatitis B can be detected and AgHbs (79.2%) was the primary screening test known to students. Most of the respondents were aware of the complications of hepatitis B, namely cirrhosis (81.3%) and hepatocellular carcinoma (69.0%).

### Attitudes at practices regarding hepatitis B (Table 1)

Out of all the students, 55.6% had been screened for the hepatitis B virus and 61.3% reported that they had been vaccinated against hepatitis B. The majority (71.1%) of students responded that it is possible to recover from hepatitis B if treated. Except for tenofovir (44.7%), other molecules were not well known to students: Interferon (38.7%), entecavir (21.1%) and lamivudine (10.2%). Two thirds of respondents (61.6%) wrongly stated that they would recommend systematic treatment for all patients infected with hepatitis B.

Nearly all (95.1%) students said that there is a vaccine against hepatitis B and that it is effective (85.2%). Moreover, 74.3% of students were aware that it is included in the Expanded Immunization Program. Two thirds (65.5%) said they would prescribe three doses for a full immunization. Two-thirds of respondents (62%) did not know if it is possible to vaccinate pregnant women, and 51.1% of them were unaware of whether it could lead to infertility or not.

### Factors associated to knowledge, attitudes and practices regarding hepatitis B (Table 2 and Table 3)

Overall, we found that students had a low level of knowledge. The mean knowledge score was  $18.5 \pm 5$  and the median was 19 [16-22]. Of the 284 students, 77 (27%) had good knowledge of hepatitis B (score  $\geq 21$ ). In multivariate analysis, the level of knowledge was higher among students in the second year of their Master's degrees (ORa: 3.7 [1.9-6.9]) and among those with at least two sources of information (ORa:

**Table 3:** Factors associated with Medical students' attitudes and practices regarding hepatitis B infection in a Private University of Medicine in Senegal, 2019, N (284).

Variables	Total	Good Attitudes and practices (%)	OR [IC95%]	p-value	ORa [IC95%]	p-value
<b>Department</b>				< 10 <sup>-6</sup>		0.67
Pharmacy/Odontology	73	13 (17.8)	1		1	
Medicine	211	79 (37.4)	2.8 [1.4-5.3]		1.1 [0.6-2.2]	
<b>Level of education</b>				< 10 <sup>-6</sup>		<b>0.04</b>
Master 1	160	37 (23.1)	1		1	
Master 2 and more	124	55 (44.3)	2.6 [1.6-4.4]		2.4 [1.1-5.4]	
<b>Sources of information</b>				0.07		0.50
< 2 sources	114	30 (26.3)	1		1	
$\geq 2$ sources	170	62 (36.5)	1.7 [1.0-2.5]		1.2 [0.6-2.2]	
<b>Hepatitis B vaccination status</b>				0.08		0.09
No	110	29 (26.4)	1		1	
Yes	174	63 (36.2)	1.6 [0.9-2.7]		1.7 [0.9-3.0]	
<b>Age group (years)</b>				0.06		
$\leq 23$	149	41 (27.5)	1		1	<b>0.02</b>
> 23	135	51 (37.8)	1.6 [1.0-2.6]		1.9 [1.1-3.6]	
<b>Good Knowledge</b>				< 10 <sup>-6</sup>		< 10 <sup>-6</sup>
No	207	42 (20.3)	1		1	
Yes	77	50 (64.9)	7.3 [4.1-13.0]		6.2 [3.3-11.5]	
<b>Sex</b>				0.62		
Female	167	56 (33.5)	1			
Male	117	36 (30.8)	0.9 [0.5-1.5]			
<b>Marital status</b>				0.31		
Not married	262	87 (33.2)	1			
Married	22	5 (22.7)	0.6 [0.2-1.6]			
<b>Screening of hepatitis B</b>				0.47		
No	126	38 (30.2)	1			
Yes	158	54 (34.2)	1.2 [0.7-2.0]			



2.7 [1.4-4.9]). As for attitudes and practices regarding hepatitis B, the average score was  $12.2 \pm 4$  and the median was 13 [10-15]. One third (32.4%) of students had good attitudes and practices regarding hepatitis B (score  $\geq 15$ ). In multivariate analysis, factors associated with good practices and attitudes regarding hepatitis B were age  $> 23$  years (ORa : 1.9 [1.1-3.6]), "medicine" as field of study (ORa : 2.4 [1.1-5.4]) and a good level of knowledge (ORa : 6.2 [3.3-11.5]).

## Discussion

The evaluation of students' knowledge of viral hepatitis B found that the definition, main clinical signs, modes of transmission and complications were known by more than two thirds of the respondents. The media (68.2%) was the second most important source of information after lectures (85.9%). These results are similar to those of 91.9% of students surveyed at the University of Lomé (Togo) by Bagny [6] who had also acquired knowledge about hepatitis B through these means, although they were not students in health sciences. The expansion, accessibility and breadth of new information and communication technologies (ICTs) explain these facts. We must, however, ensure that the information provided is reliable. Despite the various sources of information on hepatitis B found among our respondents, the level of knowledge was low, with a score of  $< 21$  in 73% of cases. Indeed, only 34.9% of students had correctly answered the question regarding the incubation period. This result is significantly lower than that reported by Kumar in India (80.1%) [7]. According to the literature [8,9], the main transmission routes of HBV (blood: 86.3%; sexual intercourse: 80.2%; mother-to-child: 66.2%) were identified by our participants. However, 19.4% of students reported that HBV could be transmitted by the fecal-oral route. This result is also reported in other studies conducted in Cameroon 27% [10] and Ghana: 40.5% [11]. This false information may be related to the fact that the fecal-oral transmission is possible for other hepatitis viruses, including HAV and HEV. Our study found that most students were aware of the groups most at risk of HBV: people with multiple sexual partners (77.5%), healthcare workers (76.4%), newborns from infected mothers (66.9%). However, 35.2% of the respondents wrongly considered people with excessive alcohol consumption to be at risk. Alcohol intake accelerates the progression of liver disease in patients with chronic viral hepatitis B and C. On the other hand, incarceration is a risk factor for HBV infection due to the presence of promoting factors such as promiscuity, substance abuse and homosexuality. This was not well known to the majority of students, as only 38.7% of them considered detainees as a high-risk group. The multicenter study conducted in Lomé and Dakar among detainees found a high prevalence of hepatitis

B of 12.5% [12].

As for hepatitis B screening, 88% of students knew that HBsAg was the main serological marker to look for. However, it should be noted that some recommendations suggest that HBsAg, and antibodies HBs and HBcAc [13] should be tested simultaneously during screening. This strategy certainly has the advantage of determining the exact immune status of the person in a single step, but it is expensive, which is why sequential screening starting with the search for HBsAg is adopted in our countries. Contrary to the claims of nearly half of the students, the measuring transaminases and viral load are not part of the screening methods but rather of the evaluation of the disease's evolution.

Regarding attitudes and practices, 55.6% of students had been screened for HBV and 61.3% of them were vaccinated. These rates could be attributed to the many blood donation and HBV vaccination campaigns carried out at the school. This percentage of vaccinated students is significantly higher than those reported by Ansa in Accra among health workers (53.4%) [14] and by Bagny [6] in Togo among nurses (51.3%). To improve students' hepatitis B screening and vaccination, we recommended that they be made mandatory and available free of charge to students in the health sciences.

For children, their immunization against HBV is ensured because the vaccine is included in the Expanded Immunization Program, as stated by 74.3% of our respondents. However, 62% of respondents were unaware of the possibility of vaccinating pregnant women. The same observation was made in a KAP survey conducted in Senegal where only 11% of doctors knew that it was possible to vaccinate a pregnant woman against HBV [12], and 48% stated that it could cause infertility. In light of these results, it is important to emphasize in the curriculum that the hepatitis B vaccine is safe for pregnant women, and that there is no possibility of mother-to-child transmission if vaccination is done during pregnancy. Regarding curative treatment, two thirds (61.6%) of respondents wrongly stated that all patients infected with hepatitis B virus should be systematically treated. This result is different from that found in a study conducted in Iran [15] in which 62.2% of dental surgery students rightly believed the opposite. Indeed, the prescription of treatment obeys very specific guidelines that are outlined in the WHO [16] and EASL [17] recommendations. On the therapeutic level, several antivirals are effective on HBV. Tenofovir is now the top recommended molecule, and nearly half (44.7%) of the students had listed it. In contrast, interferon (38.7%), entecavir (21.1%) and lamivudine (10.2%) were not well known to the respondents. This is probably due to the fact that interferon is very expensive and is most often reserved for

the treatment of HBV/HIV co-infections. Entecavir is not available in our countries and lamivudine is now rarely used in monotherapy due to high frequency of resistance. The rate of lamivudine resistance is 23% after 12 months of therapy and in up to 80% after 5 years of treatment [18].

In our study, we also sought factors associated not only with good knowledge but also with attitudes and practices. Overall the level was low. Of the 284 students, 27% had good knowledge of hepatitis B (score  $\geq 21$ ) and only one third (32.4%) of students had good attitudes and practices regarding hepatitis B (score  $\geq 15$ ). We were unable to find a link between gender, age, marital status and level of knowledge. Similar results have been reported by Abdela in Ethiopia [19] and Al Wutayd in Saudi Arabia [20]. However, other authors have reported a higher level of knowledge among students over 25 years of age in Laos [21] and among men in Cameroon [8]. We also did not find any variation in levels of knowledge between the different fields of study. Li in China found that dental interns had better knowledge (score: 8.79 versus 5.94,  $p < 10^{-6}$ ) and practices than medical interns (score: 29.89 versus 27.3  $p < 10^{-6}$ ), but the latter had a better attitude regarding hepatitis B (score: 20.55 versus 19.62  $p = 0.032$ ) [22]. According to the literature [8,22], the level of education has a positive impact on knowledge, attitudes and practices regarding hepatitis B. Students in the second and subsequent years of their Master's degrees had a higher level of knowledge and better practices and attitudes. In addition, we found that students with good knowledge had six times more positive attitudes and practices regarding hepatitis B. This highlights the critical need to improve their level of knowledge which impacts their attitudes and practices as future health professionals playing an important role in the treatment and prevention of hepatitis B.

## Conclusion

Overall, the results of this KAP survey on hepatitis B found that less than one-third of students had a good level of knowledge and good attitudes and practices regarding hepatitis B. The level of education and the number of information sources were the determining factors. Students' knowledge must be reinforced especially on diagnostic methods and therapeutic aspects. We recommended organizing awareness campaigns on hepatitis B in addition to lectures, and spreading key messages through social media and students' associations.

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