

HEPATITIS B: KNOWLEDGE, AWARENESS, VACCINATION AND SEROLOGICAL STATUS OF VOCATIONAL SCHOOL OF HEALTH SERVICES STUDENTS AT A STATE UNIVERSITY IN TURKEY

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ABSTRACT

Aim. In this study, the aim is to evaluate the knowledge level about hepatitis B (HBV) of the students receiving education in vocational school of health services, who are a risky group for HBV infection, and to examine their awareness and immune status.

Material and methods. The data of this research was collected by a questionnaire prepared by the researcher. The sample in the study consisted of 537 (81.4%) students. The data were evaluated using the SPSS 16.0 package program. Frequency, percentage, Pearson chi-square and Fisher's exact test was used in the analysis of the data.

Outcomes and conclusions. It was determined that the students who participated in the research did not show sufficient sensitivity to get vaccinated against HBV and to know their serological status. It was also identified that they had a lack of knowledge and/or did not have clear information about the modes of transmission of HBV, its treatment, and that HBV may cause cirrhosis. The results of this research will guide students in the trainings to be given in order to raise their awareness on this subject and to ensure that they are immunized before they start working and have practical training in the field of healthcare.

Keywords: hepatitis B, students, knowledge, awareness, vaccination, serological status

INTRODUCTION

Hepatitis B (HBV) infection is one of the most common infections in the world and in our country. While the disease may be life-threatening in its acute phase, it may lead to serious complications such as chronic hepatitis, cirrhosis and hepatocellular carcinoma if it is not fully cured [1]. In epidemiological terms of HBV infection, Turkey is among moderate-risk countries and seroprevalence of HBV varies from region to region [2]. There are modes of transmission of HBV infection such as parenteral, perinatal, horizontal and sexual contact [3]. The most common modes of transmission of HBV infection among healthcare personnel are; percutaneous contact, such as needle used for patients accidentally sticking into

the hand, injury with cutting tools contaminated with infected blood, splashing of infected blood or body fluids on mucous membranes [4]. Protection from this pathogen transmitted with blood and body fluids is possible by preventing contact, vaccination and post-contact prophylaxis [5].

Students studying in the field of health services are under serious risk in terms of HBV infection both during their education and in their professional lives. These people, who are in close contact with the patients, can get the disease from the patients as well as infect patients themselves. They also play a significant role in informing the public about hepatitis. Therefore, they must have sufficient and accurate information about the disease in the first place.

AIM

This research was conducted to evaluate the knowledge of the students studying in the field of health services about HBV infection, and to determine their awareness and immune status.

MATERIAL AND METHODS

It is a descriptive research. The research population consisted of 660 students studying in the Vocational School of Health Services at a state university, in Turkey, in the 2018-2019 academic year, and the research sample consisted of 537 students (81.4%) who agreed to participate in the study and could be reached.

Written permission was obtained from the Vocational School of Health Services Directorate for the study and the students who agreed to participate in the study were asked to give verbal consent to the researcher. However, only volunteer students were included in the study and no student was forced to participate in the survey. Before beginning to collect research data, it was stated that the information obtained would be kept confidential by explaining the purpose of the research. Additionally, after the survey was completed, the questions of the students were answered and information about the subject was given. No student refused to participate in the research.

The data were obtained by applying the questionnaire prepared by the researcher in May 2019 in line with the principles defined for healthcare workers in the relevant literature and for protection from infections transmitted by blood and body fluids [6,7]. The questionnaire form was applied 20 minutes before the end of the lesson, with the permission of the relevant instructor. The questions were focused on the demographic characteristics, HBV infection history, vaccination and serological status, current knowledge and awareness of HBV.

The data obtained were evaluated by a SPSS (16.0) package program. In the statistical analyses, (f) represents frequency, (%) percentage. Chi-square (χ^2), and Fisher's exact Chi-square test procedures were applied in order to test the differences and $p < 0.05$ was accepted significant.

RESULTS

Demographic characteristics

As can be seen in Table 1, 34.3% of the students participating in the survey were studying at First and

Emergency Aid Program, 29.8% of them were studying at Medical Laboratory Techniques Program, 11.5% of them were studying at Elderly Care Program, 11.0% of them were studying at Medical Imaging Techniques Program, 5.0% of them were studying at Physiotherapy Program, 5.6% of them were studying at Anesthesia Program and 2.8% of them were receiving education on Oral and Dental Health Programs. More than half of the students (58.8%) were in the first grade and 41.2% of them were in the second grade. Among the students, 34.6% were male, 65.4% were female and 32.6% of these students were in the 17-18 age range, 54.6% of them were in the 19-20 age range and 12.8% of them were 21 and over. While 48.2% of the students participating in the survey were graduated from vocational health high schools, 51.8% graduated from other high schools. While 7.6% of the surveyed students were working in health institutions, 92.4% were not working. It was found that 26.8% of the 41 students working in the health institution worked for less than 6 months, 12.2% of them worked for 6-12 months, 39.0% of them worked for 1-3 years and 22.0% of them worked for more than 3 years.

TABLE 1. The demographic characteristics of the students participating in the research (n = 537).

Students characteristics	Variables	n	%
Enrolled program	First and Emergency Aid	184	34.3
	Medical Laboratory Techniques	160	29.8
	Elderly Care	62	11.5
	Medical Imaging Techniques	59	11.0
	Physiotherapy	27	5.0
	Anesthesia	30	5.6
	Oral and Dental Health	15	2.8
Gender	Female	351	65.4
	Male	186	34.6
Age range	17-18	175	32.6
	19-20	293	54.6
	21 and over	69	12.8
Grade	1st Grade	316	58.8
	2nd Grade	221	41.2
Type of high school graduated	Vocational Health High Schools	259	48.2
	Others	278	51.8
Working status in health institutions	Yes	41	7.6
	No	496	92.4
Duration of work	< 6 months	11	26.8
	6-12 months	5	12.2
	1-3 years	16	39.0
	> 3 years	9	22.0

HBV infection history

It was determined that 1.3% of the students were HBV patients, 0.4% were HBV carriers and continued receiving medical checkups, 9.9% did not know whether they had HBV or not, and 5.2% had an HBV history in their family (Table 2). It was found that 10.7% of the students with HBV in their family were diagnosed with HBV, 3.6% were carriers, 82.1% were not diagnosed with HBV and 3.6% did not know whether they were infected with HBV ($p < 0.05$). It was determined that 35.7% of the students with HBV in their family had an immune response and 64.3% did not know whether they were immune or not ($p < 0.05$). When family members who had HBV disease were questioned, it was found that 42.8% had this disease in their mother and/or father, 28.6% in their siblings, and 28.6% in other family members such as aunts and uncles (Table 2).

TABLE 2. The history of HBV infection among the students participating in the research

	Variables	n	%
Do you have HBV or have you been diagnosed with such a condition?	Yes	7	1.3
	No	475	88.4
	I'm the carrier, I'm in control	2	0.4
	I have no idea	53	9.9
Do you have HBV in your family?	Yes	28	5.2
	No	448	83.4
	I have no idea	61	11.4
If yes, which family members have HBV?	Mother, father	12	42.8
	Sibling	8	28.6
	Other (aunt, uncle)	8	28.6

HBV vaccination status and distribution of serological status

It was found that 32.6% of the students had their HBV serology checked, 50.8% did not have it checked, and 16.6% did not remember whether they had such a test. It was determined that 41% of the students had the HBV vaccine, 40.8% did not and 18.2% did not remember whether or not they were vaccinated (Table 3). It was confirmed that there was no statistically significant relationship between the gender of the students participating in the study and their vaccination status ($\chi^2=3.198$, $p = 0.202$). When the students' reasons for not having HBV vaccine were questioned, it was found that 33.8% of them did not know that there was HBV vaccine in preventing the disease, 26.9% neglected to be vaccinated, 13.7% were unaware of the importance and severity of the

disease, 3.2% feared vaccination, 1.9% forgot to be vaccinated and 20.5% were not vaccinated for other reasons. It was determined that 51.4% of those who had HBV vaccine received all doses of the vaccine, 10.5% did not receive all the doses, 2.3% are still vaccinated, and 35.8% did not remember whether they received all doses. However, it was confirmed that only 31.4% of the students had antibody titer measurements performed after vaccination to determine whether there was immunity or not, 36.8% did not and 31.8% did not remember having it performed (Table 3). It was found that there is a statistically significant relationship between HBV diagnosis and HBV surface antibody (anti-HBs) test status ($p < 0.05$). When the students were asked whether they had immune responses to HBV, it was found that 25% had an immune response, 0.2% did not, and 74.8% did not know whether there was an immune response (Table 3). It was determined that there is a statistically significant relationship between the HBV immunity of the students and their gender ($p < 0.05$). It was determined that there is a statistically significant relationship between HBV vaccination and immunity against HBV. It was determined that 40.9% of those who had HBV vaccine had an immune response against hepatitis B, and 59.1% of them did not know whether they were immune or not. 20.1% of those who did not have HBV vaccine before stated that they had an immune response against HBV.

Current knowledge and awareness of students on HBV infection

27.4% of the students who participated in the survey stated that, they participated in a training program on HBV infection, 72.6% of them stated that they did not receive any training. It was determined that there is a statistically significant relationship between the students' working in a health institution and their education about HBV infection ($\chi^2=9.099$, $p = 0.000$). It was found that there is no statistically significant relationship between the education level of the students and their education status about HBV ($\chi^2=1.633$, $p = 0.201$). It has been determined that 99.5% of 390 people who have not received any training on HBV infection want to participate in a training program. It was confirmed that 86.2% of the students had knowledge about HBV disease or heard about it before. It was determined that there is a statistically significant relationship between having

TABLE 3. *HBV vaccination status and distribution of serological status of the students*

	Variables	n	%
Have you had HBV serology checked?	Yes	175	32.6
	No	273	50.8
	I have no idea	89	16.6
Have you had an HBV vaccine before?	Yes	220	41.0
	No	219	40.8
	I have no idea	98	18.2
If your answer is no; Why did you not get an HBV vaccine before?	Neglecting	59	26.9
	Forgetting	4	1.9
	Not knowing the severity / importance of the disease	30	13.7
		74	33.8
		7	3.2
	Not knowing that the disease has a vaccine	45	20.5
	Fear of vaccination Other reasons		
If your answer is yes; Have you received all doses of the vaccine?	Yes	113	51.4
	No	23	10.5
	Continues	5	2.3
	I do not remember	79	35.8
If your answer is yes; Have you had antibody titer measurement made to determine whether immunity has occurred after vaccination?	Yes	69	31.4
	No	81	36.8
	I have no idea	70	31.8
Do you have an immune response to HBV?	Yes	134	25.0
	No	1	0.2
	I have no idea	402	74.8

HBV patients in the family of students and their having heard of this disease before ($\chi^2=33.473$, $p = 0.001$). When the sources of information of the students who received information about HBV were questioned, they stated that they obtained information about HBV infection 48% via school or teachers, 27.6% healthcare workers, 7.4% internet, 6% books or brochures, 5.4% friends, 2.8% family, 2.6% radio or television and 0.2% via the printed media. Although 78.8% of the students knew that there is a vaccine against HBV disease, 21.2% of them did not (Table 4).

It was found that only 23.8% of the students answered correctly by saying 3 doses to the question of how many doses of HBV vaccine should be given, and 76.2% did not know how many doses of HBV vaccine should be given (Table 4).

67.3% of the students said they did not consider themselves at risk for HBV, 32% said they were at risk, and 0.7% said they did not know if they were at risk (Table 4). It was found that there was no statistically significant relationship between having HBV patients in the family and students seeing themselves in the risk group for HBV ($p = 0.158$).

It was found that 70.2% of the students have knowledge that HBV can also be transmitted from a healthy-looking person. It was determined that 57.2% of the students knew that a mother with HBV can transmit the virus to her child during childbirth. It was determined that 75.4% of the students knew that HBV can be transmitted by needles or other sharp objects. It was found that 70.6% of the students knew that HBV can be transmitted by splashing blood and saliva to the nose, eyes or mouth. It was determined that only 24.8% of the students knew that the disease would not be transmitted by sharing the kitchen utensils of a person with HBV. It was found that 45.1% of the students knew that the disease would not be transmitted by eating the meal cooked by a person with HBV (Table 4). It was determined that there is a statistically significant association between having HBV patients in the family and knowing the modes of transmission of HBV ($p < 0.05$).

It was confirmed that 27.6% of the students knew that HBV can cause cirrhosis. In addition, it was confirmed that 10.6% of the students stated that HBV would not cause cirrhosis, and 61.8% answered that they did not know (Table 4).

It was determined that only 17.9% of the students responded correctly by answering there is no definitive treatment for HBV disease, 47.7% stated that there is a treatment and 34.4% answered that they did not know (Table 4). A statistically significant relationship was found between having HBV patients in the family and knowing the definitive treatment of HBV disease ($\chi^2=27.350$, $p = 0.000$).

DISCUSSIONS

Hepatitis B virus is basically transmitted parenterally, by percutaneous and mucosal contact with infected blood and fluids, by transmission from the carrier mother to the infant (vertical transmission), and by sexual intercourse with the infected person [8]. In addition to these transmission modes, HBV transmission also occurs in the same dwelling and in close living conditions (horizontal transmission). Common living conditions are thought to cause transmission, especially in family members of HBV carriers, where other modes of transmission are not involved [9]. Since the virus can survive outside the human body for more than seven days, infected toothbrushes and razors can also be a source of transmission [10]. It was confirmed that 5.2% of the students had an HBV

TABLE 4. Current knowledge and awareness of students on HBV infection

	Variables	n	%
Have you had any previous training on HBV infection?	Yes	147	27.4
	No	390	72.6
If your answer is no; Would you like to receive training on HBV infection?	Yes	388	99.5
	No	2	0.5
Do you know about or have you heard about HBV before?	Yes	463	86.2
	No	74	13.8
Which of the following is the source of your information about HBV disease?	Books, brochures, etc.	28	6.0
	Schools and teachers	222	48.0
	Health workers	128	27.6
	Family	13	2.8
	Radio, television, etc.	12	2.6
	Friends	25	5.4
	Print media	1	0.2
Internet	34	7.4	
Did you know that there is a vaccine against HBV disease?	Yes	423	78.8
	No	114	21.2
How many doses of HBV vaccine should be taken?	3	128	23.8
	4	2	0.4
	I have no idea	407	75.8
Do you see yourself in the risk group in terms of HBV?	Yes	172	32.0
	No	361	67.3
	I have no idea	4	0.7
Can HBV be transmitted from a healthy-looking person?	Yes	377	70.2
	No	26	4.8
	I have no idea	134	25.0
Is HBV transmitted during childbirth?	Yes	307	57.2
	No	22	4.1
	I have no idea	208	38.7
Is HBV transmitted by needles or other sharp objects?	Yes	405	75.4
	No	8	1.5
	I have no idea	124	23.1
Does HBV disease cause cirrhosis?	Yes	148	27.6
	No	57	10.6
	I have no idea	332	61.8
Is there an exact treatment for HBV disease?	Yes	256	47.7
	No	96	17.9
	I have no idea	185	34.4
Can HBV be transmitted through splashes of blood and saliva to the nose, eyes or mouth?	Yes	379	70.6
	No	25	4.7
	I have no idea	133	24.7
Does sharing kitchen utensils of a person with HBV cause transmission of the disease?	Yes	187	34.8
	No	133	24.8
	I have no idea	217	40.4
Does eating the meal cooked by a person with HBV cause transmission of the disease?	Yes	79	14.7
	No	242	45.1
	I have no idea	216	40.2

history in their family. It was determined that 10.7% of the students with HBV in their family were diagnosed with HBV, 3.6% were carriers, 82.1% were not diagnosed with HBV and 3.6% did not know if they were infected with HBV ($p < 0.05$). It can be said that domestic transmission was low in the group participating in the study. It was found that 35.7% of the students with HBV in their family had an immune response, while 64.3% did not know whether they were immune ($p < 0.05$). When family members who had HBV were questioned, it was found that 42.8%

had this disease in their mother and/or father, 28.6% in their siblings, and 28.6% in other family members such as aunts and uncles. In another study, the presence of hepatitis B in family members was questioned and it was detected primarily in mothers (44.1%) among family members. Again, in the same study, this rate was reported as 13.7% in siblings [11].

72.6% of the students who participated in the study pointed out that they had not received any training on HBV infection previously and 99.5% of

the students who had not received any training stated that they would like to be trained on HBV infection. In the study conducted by Çetin et al. 73.3% of the participants in the questionnaire said that would like to receive training on the subject [12]. It was determined that there is no statistically significant correlation between the education level of the students and whether or not they had received a training on HBV ($\chi^2=1.633$, $p = 0.201$). On the other hand, 70.6% of the first grade students and 75.6% of the second grade students remarked that they had not received any training on HBV infection. While 48% of the students who were trained on HBV infection stated that they had obtained information on hepatitis at school and 2.6% said they had received through the radio and television broadcasts. In a similar study conducted among university students, 54.8% of the participants had not received any information or training on HBV infection, and when the sources of information of the participants receiving training were questioned, it was reported that 21.6% of the students had received it at school, and 10.2% through the radio and television [13]. What is remarkable here is that the rate of those who acquired information on hepatitis by way of the radio and television is very low. This rate may be said to be even lower among average citizens. Therefore, it would not be wrong to conclude that the media must give more coverage to this issue and students and the general public must be given more information.

It is a well-known fact that HBV infection risk is ten times higher for healthcare workers compared to the control groups [14]. However, in this study, 67.3% of the students stated that they did not consider themselves to be in the risk group for HBV, 32% stated that they were in the risk group and 0.7% said that they did not know whether they were in the risk group. One of the measures which may be taken to reduce the risk is to check the immune status of healthcare workers against HBV and immunize those susceptible to infection by inoculation. However, it was seen that the students who took part in the study did not know about the importance of vaccination for prevention against HBV. Because only 41% of the students had been vaccinated against HBV; 40.8% of them had not been vaccinated in spite of all the risks. It was found out that 51.4% of those who had been vaccinated had received all doses of the vaccine, while 35.8% did not remember whether they had been given all doses or not. It was determined that

there is a statistically significant correlation between the immunity rate and gender ($p < 0.05$). It was found out that 23.9% of those with an immune response to HBV were men and 76.1% were women. However, in another study conducted, it was reported that there is no association between anti-HBs seropositivity and gender [15]. It was determined that there is a statistically significant correlation between receiving HBV vaccination and immunity against HBV ($p < 0.05$). It was determined that 40.9% of those who had had HBV vaccine had an immune response against hepatitis B, and 59.1% did not know whether they were immune to HBV or not. 20.1% of those who had not had HBV vaccine before stated that they had an immune response against HBV. However, 68.6% of those who had had their vaccines did not know about their anti-HBs status. Vaccinated healthcare staff must be tested in order to check the formation of anti-HBs antibodies 1 to 2 months after the completion of three doses of vaccine. There is no need for booster doses or monitoring of antibody titers once an anti-HBs level of 10 mIU/ml is achieved after three doses of vaccine are administered [16]. In this study, it was found out that only 31.4% of the students had antibody titer measurements performed after vaccination to determine whether there was immunity or not, and only 25% knew that they had an immune response. Similarly, in the study conducted by Tomruk et al., it was reported that 28.4% of those who had had a HBV vaccine had the vaccine checked serologically [17]. Checking whether an antibody response has occurred or not is very important to ensure that people who do not have an antibody response behave more cautiously. School boards and/or infection committees should make it compulsory for students studying healthcare to receive all doses before they start their applied training and practice; in addition, anti-HBs titers must be measured in order to determine whether or not an immune response has developed. In a study conducted by Uzun et al. in order to evaluate the immunization status, awareness and attitude as regards HBV of 222 research assistants actively working in a faculty of medicine the HBV vaccination rate was found to be 68.4%, and it was reported that the research assistants were not sensitive enough about being vaccinated against HBV and were indifferent to finding out whether they were immune or not [18]. In other studies in Turkey, anti-HBs positivity among healthcare workers were reported as 87.5% [19] and 92.4% [20].

However, in this study, it was seen that the rate of those who declared that they had an immune response against HBV was quite low (25%), and most of the students who participated in the study did not show awareness for vaccination against HBV and were not anxious to find out about their immune response status. When the answers to the question whether they have had HBV vaccines by students studying healthcare at another vocational school of higher education were evaluated, it was reported that 39.60% of the participants answered “yes”, 36.50% answered “no”, and 24% answered “I don’t know”, which are similar to the results obtained in our study [21]. Especially for healthcare workers and students, who comprise higher risk groups, carrying out screening tests for HBV and awareness of seropositivity as well as immunization for prevention are all of importance. In this respect, it is of great importance that healthcare professionals and students are screened for seropositivity intermittently and those who are seronegative for HBV be included in the vaccination program and the employees be trained on this. Especially, anti-HBs titers of those who stated that they had already been vaccinated should be checked at an appropriate time after vaccination.

When the reasons for not having HBV vaccine were questioned, it was determined that 33.8% of the participants did not know that there was a HBV vaccine for the prevention of the disease, 26.9% neglected it, 13.7% were not aware of the importance and seriousness of the disease, 3.2% were afraid to be vaccinated, 1.9% forgot to be vaccinated and 20.5% of them were not vaccinated owing to other reasons. However, it was seen that these results were not compatible with those obtained in similar studies conducted in our country, and the reasons for not being vaccinated declared by most of the students were reported to be negligence and lack of opportunity [17,22]. In a study on university students conducted by Şahin et al., it was reported that 35.6% of the students had not received an HBV vaccine. It was reported that the reasons for students not being vaccinated were negligence (58.3%), not being aware of the seriousness of HBV infection (20.2%), not knowing that there was a vaccine for the prevention of the disease (13.9%), and fear of vaccination (7.6%) [13].

The known and most common form of transmission for viral hepatitis is coming into contact with infected blood and blood products. The risk is proportional to the degree and duration of one’s direct

contact with blood and body fluids. Therefore, students who run the risk of being exposed to blood and other body fluids are under constant risk of viral hepatitis infections during their clinical practice owing to their insufficient medical experience [23]. When infected saliva gets into one’s mucosa, although it may be very low, it is accepted that there is a possibility of being infected [4]. In this study, it was observed that 70.2% of the students were aware of the possibility of HBV transmission from a seemingly healthy person. It was determined that 70.6% of them knew that HBV can be transmitted by blood and saliva splashes in the nose, eyes or mouth, and 75.4% by needle stick or cutting oneself with other sharp objects. On the other hand, it was found that the percentage of the students who declared that the disease would not be transmitted by sharing the food and beverage containers used by a person with HBV and eating food cooked by a person with HBV was lower in our study group (24% and 45.1% respectively). The rate of those who do not know that a mother with HBV can transmit the virus to her baby at birth was found to be 42.8%. In another study, 75.7% of the students said that HBV was transmitted by birth, 94.1% by blood and 28.6% by personal belongings [24]. Similarly, in this study, too, it was seen that they had insufficient knowledge, especially about contamination with personal belongings. In a study on protection from HBV and transmission routes the disease conducted by Göktalay et al. on 392 students studying at a medical faculty, a healthcare school and a vocational school of healthcare services, it was seen that students’ awareness of HBV was not sufficient [25]. Both in this study and in other studies, it was found that the most known transmission way of HBV among students was through blood. Fewer students knew about other ways of transmission [26]. Training should be encouraged on other modes of transmission of HBV other than blood.

HBV infection is one of the important health concerns as it may lead to fulminant hepatitis in the acute phase or acute exacerbation periods, chronic hepatitis, liver cirrhosis and liver cancer – [27]. In this study, the percentage of those who know that HBV may cause cirrhosis was found to be 27.6%. Similar results were found in studies conducted on higher school of healthcare and high school students [25,28]. In the study by Çetin et al., the question whether or not it might cause cirrhosis was answered 100% correctly [12].

HBV infection, the importance of which is increasing in the world and Turkey, still does not have an effective treatment and the current treatments are rather costly. Therefore, preventing HBV infection must be given primacy. The most effective way of preventing HBV is to gain active immunity against it through vaccination [29]. It was observed that only 17.9% of the students gave the correct answer that there is no definitive treatment for HBV disease, 47.7% stated that it had a treatment and 34.4% answered “I don’t know”. In the study conducted by Savaşer et al., it was observed that the percentage of those who gave correct answers to this question (11.6%) was similar [28].

This study had several limitations. The research was done on Vocational School of Health Services students of a state university in Turkey. So, these findings cannot be generalised. Students who agreed to participate were included in the study. The most important limitation of the study is that most of the data on immunity status are on students’ statements.

CONCLUSIONS

As a result, in this study, the subjects that the students knew the least as regards HBV were that it

would not be transmitted by sharing food and beverage containers used by HBV positive people, there was no definitive treatment and the disease could cause cirrhosis. In order to raise the awareness of students on HBV, it is essential that HBV be given a wide coverage, modes of transmission and preventive measures be taught in addition to the curriculum; and after graduation, in-service training programs and refresher training be offered, publications on hepatitis be raised, more coverage on the issue be given in the visual media, and all students be actively immunized before they come into contact with patients, which will help to protect the health of healthcare workers as well as public health. To that end, it may be suggested that screening and vaccination become a routine at schools where healthcare professionals are trained, and keeping a record to ensure that all students carry out the necessary checks before clinical practice.

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