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Knowledge and Awareness Regarding Hepatitis B among Medical Students in Kabul, Afghanistan: Cross-Sectional Study

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ABSTRACT

Background: Hepatitis B virus (HBV) impose a major public health problem with an increased risk of occupational exposure among unvaccinated health care workers. We aimed to determine the level of knowledge and awareness of medical, midwifery, dentistry and medical technology students regarding hepatitis B virus and vaccination in Kabul, Afghanistan.

Methods: This descriptive cross-sectional study was conducted in three medical institutions and universities using a convenient sampling in Afghanistan in 2023. A Structured self-administered questionnaire were used regarding awareness about prevention, transmission, diagnosis, and treatment and vaccination availability for HBV.

Results: A total of 200 students participated, comprising 106 (53.0%) males and 94 (47.0%) females, with an almost even distribution among the fields of study. 63.5% of participants had correct knowledge regarding prevention, transmission antigen and antibody, treatment of HBV.

Conclusion: The findings indicate a concerning gap in vaccination coverage and knowledge dissemination among medical students. Enhancing educational programs and implementing comprehensive vaccination initiatives are essential to improve awareness and safety practices related to hepatitis B infection. Future longitudinal studies are needed to evaluate the impact of academic interventions on students' knowledge and vaccination rates.

Keywords: Viral hepatitis B, Knowledge, Prevention

Introduction

Hepatitis is an inflammation of the liver tissue. Heavy alcohol use, toxins, some medications, and certain medical conditions can cause hepatitis. However, hepatitis is often caused by a virus (1). Hepatitis B virus (HBV) infection is caused by a DNA virus with an incubation period of 21-135 days (2). HBV infection is an occupational risk for medical students, midwifery, dentistry, and medical technology students, especially in developing countries. HBV infection kills about 1.1 million people globally every year (3). There are five types of hepatitis (A, B, C, D, E), besides the types of non-classified or non-obvious links with this disease, such as hepatitis virus G 2(4). Although there are five distinct types of viral hepatitis, chronic hepatitis B and C cause 95% of hepatitis-related sickness and

untimely deaths. HBV is a serious global health concern, affecting 296 million students worldwide in 2019 and causing approximately 820,000 deaths that year (1). Moreover, HBV is considered a "silent disease" as infected persons are often asymptomatic carriers; hence, the further spread of the disease goes unnoticed (5). HBV is a leading cause of acute liver failure, cirrhosis, hepatocellular carcinoma (primary liver cancer), and possibly even pancreatic cancer (6), all of which are severe, possibly fatal conditions. HBV belongs to a family of viruses known as the Hepadnaviridae family. A relatively small DNA virus replicates by reverse transcription and thus integrates into the host genome (7).

The pathophysiology of HBV infections is that the virus alters the antigen structure on the host cell, to which the body responds with a self-mediated immune response, which destroys liver hepatocytes (8, 9). HBV is a blood-borne, highly contagious virus easily spread through sexual contact, prenatally during childbirth, contaminated blood transfusions, unsafe use of needles and syringes, or any direct contact with infected blood through cuts in the skin and mucous membrane (10, 11). Afghanistan has the highest age-adjusted death rate due to HBV, with 863 deaths or 0.37% of total deaths in 2020. Partly, this is because the HBV vaccine introduced into the routine immunization program in Afghanistan only in 2006 (12).

Regarding the knowledge, attitude, and practice (KAP) toward hepatitis infection, the magnitude of poor knowledge, unfavorable attitude, and poor practice are existing public health problems. In Malaysia, the magnitude of poor knowledge of HBV was 63% among households (1). In Ethiopia, the magnitude of poor knowledge about HBV infection was 48% among health science students (13). And set global targets of achieving a 90% reduction in new cases of HBV and hepatitis C, a 65% reduction in deaths from HBV and hepatitis C, and treatment of 80% of students living with these infections (14). To achieve all of these goals, accurate public awareness is very vital and that is why KAP studies are so important for ensuring adequate preventive measures in the community. Though studies were conducted in different parts of the world, we have noticed gaps in the literature regarding population, implications, and setting variances, even though investigations were done in various parts of the world.

Having enough knowledge and a proper attitude towards these infections are cornerstones of preventing their spread. Health staff and medical students have the most important role in preventing the disease by improving the disease knowledge among them and the patients because medical students are in close contact with hepatitis patients during their study period and afterward. Because medical students who consist future health staff face, the threat of percutaneous injuries with the consequent risk of contracting blood-borne infections such as HBV and C viruses their general knowledge and attitude about viral hepatitis and its transmission and prevention can stop the spread of this disease in hospitals and society.

We aimed to determine the level of KAP of medical, midwifery, dentistry and medical technology students regarding HBV and vaccination in Kabul, Afghanistan.

Materials and Methods

This descriptive cross-sectional, institutional-based study was conducted among medical students, midwife, medical technology students, and dentistry students in the 1st and 2nd years of Khatam-Al-Nabieen University (KNU), Razi Institute of Higher Education (RIHE), and Kabul University of Medical Science" Abu Ali Ibn Sina" (KMUS) from October 2023 to December 2023. Permission to survey these different medical colleges was obtained

through the proper channel. This method allows for the selection of participants based on their availability and willingness to participate, which can facilitate the efficient collection of information, although it may limit the generalizability of the findings.

Students were approached in their lecture halls, and verbal consent was obtained. A pre-formed, pre-tested questionnaire was distributed, collected after it had been completed. It contained questions regarding awareness about prevention and transmission, diagnosis, and treatment of HBV. In addition, it also contained the vaccination status of HBV, students' awareness regarding post-exposure prevention, and their observations during clinical rotations.

The statistical population included 200 students in delinquent fields.

Data collection

The data collection tool was through a self-administered questionnaire, part of which was set using previous studies and part by the researcher. Just as every measurement tool must be evaluated, so does the questionnaire. Its Effectiveness should not be a problem; it should be evaluated. The questionnaire consisted of three parts. The first part includes demographics and individual characteristics: age, sex, level of education, history of vaccination, economic status, and level of literacy of the father etc. The second part of questions related to awareness about the HBV (prevalence, clinical symptoms, complications, ways of transmission, treatment, disease prevention, etc.) included 16 questions. The third part included questions related to the application of safety principles regarding HBV vaccination history and compliance with safety principles to prevent this disease. This section included 16 questions.

Data analysis

The collected data were analyzed using SPSS version 24 software (IBM Corp., Armonk, NY, USA) and statistical tests. Distribution of demographic results and survey results with descriptive characteristics are reported. To determine the level of awareness, one point was given for each correct answer and zero points for incorrect or unclear answers. However, missing values were excluded for demographics.

Sample Size

The following formula was used to calculate the sample size. Considering an alpha error of 5%, a standard deviation of 0.5, and a precision of 5%, a sample size of 200 people was calculated to estimate the average knowledge about hepatitis B.

$$N = \frac{Z^2_{1-\frac{a}{2}}\, S^2}{d^2}$$

Ethical considerations

The study was approved by the Institutional Research and Ethics Committee of KNU, KMUS, RIHE, conducted after obtaining necessary informed consent from the students. All the participants were voluntary. The obtained information was completely confidential. It was mentioned in the questionnaire itself that was not necessary to write the name or family name.

Results

Socio-demographic properties of the all participating in the research are presented in Table 1. Total 200 students 106 (53.0%) were male, and 94 (47.0%) were female. Most participants included 139 (69.5%) medical students, 39 (19.5%) medical technology, 21 (10.5%) midwives, and 1 (0.5%) dentistry.

The results of the personal characteristics of the participants

The overall average of the students received the HBV vaccine was 149 (73.2%), of which 35(17.5%) of participants had received one dose of the vaccine, 43(22.5%) two doses, and 71(33.2%) of three doses of vaccine. In response to the

question: Have you done the antibody measurement after the vaccination to measure the level of immunity? The answer of the majority of 179(89.7%) students was no, and the reason for this answer was high cost of testing 76(39.0%) students, lack of access to the laboratory 48(24.1%) students, and lack of awareness 55(26.5%) students.

Table 1: Demographic characteristics of participants (n=200)

Demographic Characteristics		***Frequency (%)***
Gender	Male	106 (53.0)
	Female	94 (47.0)
Age (yr)	20–18 years	21 (10.5)
	21-23 years	106 (53.0)
	24-30 years	71 (35.5)
	31-34 Years	2 (1.0)
Field of study	Medical Student	139 (69.5)
	Dentistry	1 (0.5)
	Midwifery	21 (10.5)
	Medical Technology	39 (19.5)
Economic status	Poor	33 (16.5)
	Moderate	128 (64.0)
	Good	39 (19.5)

The average percentage of students trained to observe safety principles to prevent HBV was 176 (88.2%) students. The overall percentage of the most sources of information for students about HBV was scientific training in the university theory training 93(45.6%) students, hospital 41(21.1%) students, personal studies 26(13.2%) students, education through radio and television 12(6.6%) students, participated in the conferences 6(2.9%) students, and conversation with colleagues 22(10.6%) students (Table 2).

Table 2: Individual characteristics of students of KNU, KMU, RIHE (n=200).

Individual characteristics Questions	***Responses***	***KNU students N=85 N(%)***	***KMU students N=56 N(%)***	***RIHE students N=59 N(%)***	***Overall average N= 200 N(%)***
Have been trained on safety principles to prevent hepatitis B?	Yes	73 (85.9)	48 (85.7)	55 (93.2)	176 (88.2)
	No	12 (14.1)	8 (14.3)	4 (6.8)	24 (11.8)
If the answer to the previous question is yes, what are your sources of information?	Personal study	9 (10.6)	4 (7.1)	13 (22.0)	26 (13.2)
	Training in the hospital	13 (15.3)	7 (12.5)	21 (35.6)	41 (21.1)
	Education through radio and television	2 (2.4)	3 (5.4)	7 (11.9)	12 (6.6)
	Lecture at the University	46 (54.1)	34 (60.7)	13 (22.0)	93 (45.6)

	Participation in scientific conferences	3 (3.5)	1 (1.8)	2 (3.4)	6 (2.9)
	Conversation with colleagues	12(14.1)	7 (12.5)	3 (5.1)	22 (10.6)
Have you been vaccinated against hepatitis B?	Yes	66 (77.6)	34 (58.9)	49 (83.0)	149 (73.2)
	No	19 (22.4)	22 (41.1)	10 (17.0)	51 (26.8)
How many vaccinations have you received?	One dose	15 (17.6)	10 (17.9)	10 (17.0)	35 (17.5)
	Two doses	12 (14.1)	11 (19.6)	20 (33.9)	43 (22.5)
	Three doses	39 (45.9)	13 (21.4)	19 (32.1)	71 (33.2)
Have you done an antibody measurement after vaccination to measure the level of immunity?	Yes	10 (11.8)	5 (8.9)	6 (10.2)	21 (10.3)
	No	75 (88.2)	51 (91.1)	53 (89.8)	179 (89.7)
If your answer is no, can you tell me the reason?	High cost of testing	27 (31.8)	26 (46.3)	23 (39.0)	76(39.0)
	Lack of access to the laboratory	19 (22.4)	8 (14.3)	21 (35.5)	48 (24.1)
	lack of awareness	29(34.0)	17 (30.3)	9 (15.2)	55 (26.5)

Knowledge regarding transmission, prevention, and treatment of HBV

63.5% of participants had correct knowledge regarding prevention, transmission antigen and anti-body, treatment of HBV.

Among the participants, 57 (62.28%) were students of KNU, 39 (69.46%) were students of KMUS, and 32 (53.7%) students of RIHE (Table 3).

Table 3: Knowledge score about hepatitis B in participants

Group	***N***	***Mean ± Sd***
KNU students	85	10.718±3.209
KMU students	56	11.089±3.192
RIHE students	59	8.61±2.213
Gender		
Male	106	10.038±3.177
Female	94	10.383±3.041
Total	200	10.200±3.111

Discussion

However, incidence of HBV infection could be brought down by giving proper education regarding its transmission and immunization of all medical student with HBV vaccine. The level of knowledge regarding HBV was (63.5%). There is no formal university-based health education in our country, which might be the important reason of lower knowledge of hepatitis B among all medical students. Similar level of knowledge was found in the medical student of Dehli (15, 16). However, the medical final year students are more knowledgeable as compared to students of Bangladesh and that of Vietnam (17).

Scientific knowledge regarding HBV transmission is very essential for all medical students in every field. They can take proper protection during their clinical posting as the HBV is 50 times easier to transmit than HIV (18). It is common information and many students have concluded that compared to other healthcare workers, medical students were more at risk of exposure to risk factors of HBV and especially per-cutaneous injuries (19).

In the present study, the overall average of the students who had received the HBV vaccine was 148 (74.0%) students. However, our finding is higher than a study

from Pakistan, where (60%)(20), from Nepal (60.8%), and another study from Pakistan where (42.2%), and Nigeria where (47.7%), reported to have been vaccinated respectively (21, 22). Among the total students, 71(33.2%) of participants who received three doses of vaccine were fully vaccinated (3 or more doses). This is similar to the study from Saudi Arabia (23), where 38% had received all three doses, and much higher than 2% completed all three doses according to a finding from Ethiopia (24). However, a study in Nepal showed a higher percentage 83.7% of students completing full doses (25). This warrants a need to look into the vaccination status of students before going into clinical years to ensure high vaccination rates during their clinical training. Among the non-vaccinated participants (In response to the question: Have you done the antibody measurement after the vaccination to measure the level of immunity? The answer of the majority of 179(89.7%) students was no.

The main reasons for non-vaccination were no vaccination program offered 26.8%. The result is lower than other studies from Nepal (26), and Nigeria (25), that showed a lack of vaccination programs 37% and 43.2%, lack of opportunity 57.4% respectively as the major reasons for non-vaccination (25). These findings sufficiently shed light on the urgent necessity to implement vaccination programs for medical students. However, the high cost of vaccines was stated as the major reason for non-vaccination among health science students from Uganda (27).

This study has several limitations that should be considered when interpreting the results. Firstly, the cross-sectional design restricts the ability to infer causality between knowledge levels and vaccination awareness. Secondly, the convenience sampling method may introduce selection bias, potentially limiting the representativeness of the sample and the generalizability of the findings to the broader population of medical students in Afghanistan. Moreover, reliance on self-reported questionnaires may lead to response bias, as participants might overestimate their knowledge or awareness of HBV. The study's focus on only three institutions further constrains the generalizability of the results, suggesting that future research should encompass a larger and more diverse sample across multiple medical schools. Lastly, the study's findings point to the necessity for longitudinal research to evaluate the effectiveness of educational interventions over time, as this study only provides a snapshot of current knowledge levels. Future studies should aim to assess the impact of academic programs on improving knowledge and vaccination rates among medical students.

Conclusion

Overall, the average awareness of all participants in this study was 63.5%, among medical, Midwifery, and medical technology students regarding the HBV virus. It can be utilized effectively to motivate students to vaccinate against the HBV virus and adapt different safety precaution measures to reduce occupational risk in the future. A longitudinal study is needed to observe the actual improvement in knowledge regarding HBV after an academic year among students, which is the limitation of our study. Future efforts should prioritize the integration of HBV awareness into medical education curricula to ensure that healthcare professionals are well-equipped to combat this persistent public health threat.

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Conflict of Interest

The authors declare that there is no conflict of interests.

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