



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

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ARTICLE INFO

Type: Original Article

Received: ۲۰۲۴/۰۹/۱۶

Accepted: ۲۰۲۴/۱۲/۱۰

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To cite this article: Amiri SH, Danish SM, Asghari SJ, Qadar Adel MQ. Knowledge and Awareness Regarding Hepatitis B among Medical Students in Kabul, Afghanistan: Cross-Sectional Study.

Afghanistan Journal of Infectious Diseases. ۲۰۲۰ Jan ۳(۱):۸۳-۹۰.

<https://doi.org/10.6۰۱۴۱/ajid.۸۱>

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 ۲۰۲۳. A Structured self-administered questionnaire were used regarding awareness about prevention, transmission, diagnosis, and treatment and vaccination availability for HBV.

Results: A total of ۲۰۰ students participated, comprising ۱۰۶ (۵۳,۰%) males and ۹۴ (۴۷,۰%) females, with an almost even distribution among the fields of study. ۶۳,۵% 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 (۱). Hepatitis B virus (HBV) infection is caused by a DNA virus with an incubation period of ۲۱-۱۲۰ days (۲). HBV infection is an occupational risk for medical students, midwifery, dentistry, and medical

technology students, especially in developing countries. HBV infection kills about ۱,۱ million people globally every year (۳). 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 (۴). Although there are five distinct types of viral hepatitis, chronic hepatitis B and C cause ۹۵% of hepatitis-related sickness and



untimely deaths. HBV is a serious global health concern, affecting ٢٩٦ million students worldwide in ٢٠١٩ and causing approximately ٨٢٠,٠٠٠ deaths that year (١). Moreover, HBV is considered a "silent disease" as infected persons are often asymptomatic carriers; hence, the further spread of the disease goes unnoticed (٥). HBV is a leading cause of acute liver failure, cirrhosis, hepatocellular carcinoma (primary liver cancer), and possibly even pancreatic cancer (٦), 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 (٧).

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 (٨, ٩). 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 (١٠, ١١). Afghanistan has the highest age-adjusted death rate due to HBV, with ٨٦٢ deaths or ٠,٣٧% of total deaths in ٢٠٢٠. Partly, this is because the HBV vaccine introduced into the routine immunization program in Afghanistan only in ٢٠٠٦ (١٢).

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 ٦٣% among households (١). In Ethiopia, the magnitude of poor knowledge about HBV infection was ٤٨% among health science students (١٣). And set global targets of achieving a ٩٠% reduction in new cases of HBV and hepatitis C, a ٦٥% reduction in deaths from HBV and hepatitis C, and treatment of ٨٠%

of students living with these infections (١٤). 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 ١st and ٢nd 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 ٢٠٢٣. 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 ۲۰۰ 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 ۱۶ 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 ۱۶ questions.

Data analysis

The collected data were analyzed using SPSS version ۲۴ 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 ۰.۰۵, a standard deviation of ۰.۵, and a precision of ۰.۰۵, a sample size of ۲۰۰ people was calculated to estimate the average knowledge about hepatitis B.

$$N = \frac{Z_{1-\frac{\alpha}{2}}^2 S^2}{d^2}$$

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 ۱. Total ۲۰۰ students ۱۰۶ (۵۳.۰%) were male, and ۹۴ (۴۷.۰%) were female. Most participants included ۱۳۹ (۶۹.۵%) medical students, ۳۹ (۱۹.۵%) medical technology, ۲۱ (۱۰.۵%) midwives, and ۱ (۰.۵%) dentistry.

The results of the personal characteristics of the participants

The overall average of the students received the HBV vaccine was ۱۴۹ (۷۳.۲%), of which ۳۰ (۱۷.۵%) of participants had received one dose of the vaccine, ۴۳ (۲۲.۵%) two doses, and ۷۶ (۳۳.۲%) 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 ١٧٩ (٨٩,٧٪) students was no, and the reason for this answer was high cost of testing ٧٦ (٣٩,٠٪) students, lack of

access to the laboratory ٤٨ (٢٤,١٪) students, and lack of awareness ٥٥ (٢٦,٥٪) students.

Table ١: Demographic characteristics of participants (n=٢٠٠)

<i>Demographic Characteristics</i>		<i>Frequency (%)</i>
Gender	Male	١٠٦ (٥٣,٠)
	Female	٩٤ (٤٧,٠)
Age (yr)	٢٠-١٨ years	٢١ (١٠,٥)
	٢١-٢٣ years	١٠٦ (٥٣,٠)
	٢٤-٣٠ years	٧١ (٣٥,٥)
	٣١-٣٤ Years	٢ (١,٠)
Field of study	Medical Student	١٣٩ (٦٩,٥)
	Dentistry	١ (٠,٥)
	Midwifery	٢١ (١٠,٥)
	Medical Technology	٣٩ (١٩,٥)
Economic status	Poor	٣٣ (١٦,٥)
	Moderate	١٢٨ (٦٤,٠)
	Good	٣٩ (١٩,٥)

The average percentage of students trained to observe safety principles to prevent HBV was ١٧٦ (٨٨,٢٪) students. The overall percentage of the most sources of information for students about HBV was scientific training in the university theory training ٩٣ (٤٥,٦٪) students, hospital

٤١ (٢١,١٪) students, personal studies ٢٦ (١٣,٢٪) students, education through radio and television ١٢ (٦,٦٪) students, participated in the conferences ٦ (٣,٩٪) students, and conversation with colleagues ٢٢ (١٠,٦٪) students (Table ٢).

Table ٢: Individual characteristics of students of KNU, KMU, RIHE (n=٢٠٠).

<i>Individual characteristics Questions</i>	<i>Responses</i>	<i>KNU students N=١٥٠ N(%)</i>	<i>KMU students N=٥٦ N(%)</i>	<i>RIHE students N=٥٩ N(%)</i>	<i>Overall average N= ٢٠٠ N(%)</i>
Have been trained on safety principles to prevent hepatitis B? If the answer to the previous question is yes, what are your sources of information?	Yes	٧٣ (٨٥,٩)	٤٨ (٨٥,٧)	٥٥ (٩٣,٢)	١٧٦ (٨٨,٢)
	No	١٢ (١٤,١)	٨ (١٤,٣)	٤ (٦,٨)	٢٤ (١١,٨)
	Personal study	٩ (١٠,٦)	٤ (٧,١)	١٣ (٢٢,٠)	٢٦ (١٣,٢)
	Training in the hospital	١٣ (١٥,٣)	٧ (١٢,٥)	٢١ (٣٥,٦)	٤١ (٢١,١)
	Education through radio and television	٢ (٢,٤)	٣ (٥,٤)	٧ (١١,٩)	١٢ (٦,٦)
	Lecture at the University	٤٦ (٥٤,١)	٣٤ (٦٠,٧)	١٣ (٢٢,٠)	٩٣ (٤٥,٦)

	Participation in scientific conferences	۳ (۳,۰)	۱ (۱,۸)	۲ (۳,۴)	۶ (۲,۹)
	Conversation with colleagues	۱۲ (۱۴,۱)	۷ (۱۲,۰)	۳ (۰,۱)	۲۲ (۱۰,۶)
Have you been vaccinated against hepatitis B?	Yes	۶۶ (۷۷,۶)	۳۴ (۰۸,۹)	۴۹ (۸۳,۰)	۱۴۹ (۷۳,۲)
	No	۱۹ (۲۲,۴)	۲۲ (۴۱,۱)	۱۰ (۱۷,۰)	۰۱ (۲۶,۸)
How many vaccinations have you received?	One dose	۱۰ (۱۷,۶)	۱۰ (۱۷,۹)	۱۰ (۱۷,۰)	۳۰ (۱۷,۰)
	Two doses	۱۲ (۱۴,۱)	۱۱ (۱۹,۶)	۲۰ (۳۳,۹)	۴۳ (۲۲,۰)
	Three doses	۳۹ (۴۰,۹)	۱۳ (۲۱,۴)	۱۹ (۳۲,۱)	۷۱ (۳۳,۲)
Have you done an antibody measurement after vaccination to measure the level of immunity?	Yes	۱۰ (۱۱,۸)	۰ (۸,۹)	۶ (۱۰,۲)	۲۱ (۱۰,۳)
	No	۷۰ (۸۸,۲)	۰۱ (۹۱,۱)	۰۳ (۸۹,۸)	۱۷۹ (۸۹,۷)
If your answer is no, can you tell me the reason?	High cost of testing	۲۷ (۳۱,۸)	۲۶ (۴۶,۳)	۲۳ (۳۹,۰)	۷۶ (۳۹,۰)
	Lack of access to the laboratory	۱۹ (۲۲,۴)	۸ (۱۴,۳)	۲۱ (۳۰,۰)	۴۸ (۲۴,۱)
	lack of awareness	۲۹ (۳۴,۰)	۱۷ (۳۰,۳)	۹ (۱۰,۲)	۰۰ (۲۶,۰)

Knowledge regarding transmission, prevention, and treatment of HBV

۶۳,۰% of participants had correct knowledge regarding prevention, transmission antigen and anti-body, treatment of HBV.

Among the participants, ۰۷ (۶۲,۲۸%) were students of KNU, ۳۹ (۶۹,۴۶%) were students of KMUS, and ۳۲ (۰۳,۷%) students of RIHE (Table ۳).

Table ۳: Knowledge score about hepatitis B in participants

Group	N	Mean $\pm$ Sd
KNU students	۸۰	۱۰,۷۱۸ $\pm$ ۳,۲۰۹
KMU students	۰۶	۱۱,۰۸۹ $\pm$ ۳,۱۹۲
RIHE students	۰۹	۸,۶۱ $\pm$ ۲,۲۱۳
Gender		
Male	۱۰۶	۱۰,۰۳۸ $\pm$ ۳,۱۷۷
Female	۹۴	۱۰,۳۸۳ $\pm$ ۳,۰۴۱
Total	۲۰۰	۱۰,۲۰۰ $\pm$ ۳,۱۱۱

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 (۶۳,۰%). 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 (۱۰, ۱۶). However, the medical final year students are more knowledgeable as compared to students of Bangladesh and that of Vietnam (۱۷).

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 ۰۰ times easier to transmit than HIV (۱۸). 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 (۱۹).

In the present study, the overall average of the students who had received the HBV vaccine was ۱۴۸ (۷۴,۰%) students. However, our finding is higher than a study

from Pakistan, where (٦٠٪)(٢٠), from Nepal (٦٠,٨٪), and another study from Pakistan where (٤٢,٢٪), and Nigeria where (٤٧,٧٪), reported to have been vaccinated respectively (٢١, ٢٢). Among the total students, ٧١(٣٣,٢٪) of participants who received three doses of vaccine were fully vaccinated (٣ or more doses). This is similar to the study from Saudi Arabia (٢٣), where ٣٨٪ had received all three doses, and much higher than ٢٪ completed all three doses according to a finding from Ethiopia (٢٤). However, a study in Nepal showed a higher percentage ٨٣,٧٪ of students completing full doses (٢٥). 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 ١٧٩(٨٩,٧٪) students was no.

The main reasons for non-vaccination were no vaccination program offered ٢٦,٨٪. The result is lower than other studies from Nepal (٢٦), and Nigeria (٢٥), that showed a lack of vaccination programs ٣٧٪ and ٤٣,٢٪, lack of opportunity ٥٧,٤٪ respectively as the major reasons for non-vaccination (٢٥). 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 (٢٧). 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 ٦٣,٥٪, 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.

Acknowledgments

The authors are very grateful to the students who participated in the study and KNU, KMU, and RIHE University for ethical clearance of the study. No financial source was received for this study.

Conflict of Interest

The authors declare that there is no conflict of interests.

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