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Knowledge, Awareness And Practice Towards Hepatitis B Infection Among Dental Students In The International University For Science And Technology, Syria

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Abstract

Background: Hepatitis B virus (HBV) is a severe health issue globally and poses a significant morbidity and mortality risk amongst carriers. Healthcare personnel, especially dentists, are at a higher occupational risk due to their direct contact with infected patients' blood. Transmission in the dental setting is most often the result of inadequate knowledge and deficient prevention practices.

Objective: The purpose of this study was to evaluate the level of knowledge, awareness, and practice (KAP) towards HBV, thus revealing misconceptions and misunderstandings that present obstacles to the delivery of quality dental care and possibly provide a baseline for future assessment of Hepatitis B awareness amongst dental students at the International University for Science and Technology (IUST) in Syria.

Materials and Methods: This cross-sectional KAP study used a standardized online-based questionnaire. Data were collected regarding basic knowledge of HBV, its transmission, and vaccination from 257 randomly sampled dental students across different academic years. Data were interpreted using descriptive and inferential analysis.

Results: Results expressing overall knowledge regarding HBV were satisfactory, with slightly higher percentages observed in the fourth and fifth academic years. 66.4% of students are well aware of the types of viral hepatitis. 70.69% know its correct modes of transmission. The majority,63.5%, recognize that it is a life-threatening disease, while 76.1% realize that it can be transmitted in the dental office. However, the results concerning vaccination status are less satisfactory; only 31.9% are vaccinated against HBV, but 85% are willing to take the vaccine. Finally, about 59.4% are interested in learning more about HBV, which reflects a generally positive attitude towards HBV.

Conclusion: The level of knowledge and awareness is borderline sufficient and should be improved by emphasizing continued education about the dangers and preventive safety measures regarding HBV through reinforcing the subject in the required syllabus. However, the overall percentage of vaccinated students proves that the practice aspect needs improvement and is an area of concern for the dental faculty. These findings suggest that dental students are at considerable risk of infection; therefore, action must be taken to prevent workplace exposure, including post-exposure prophylaxis, and providing accessible and compulsory vaccination coverage for all dental students at IUST is of utmost importance.

Keywords: Hepatitis B, Transmission, Vaccination, Dental Students, Awareness

Introduction

Viral Hepatitis is an infectious disease that causes inflammation of the liver and is generally classified into five main types: A, B, C, D, and E **[1]**. Hepatitis B Virus (HBV) is a common health problem worldwide and is known to be the most serious among the five types, given its high prevalence and the fact that it can progress into a chronic infection with life-threatening complications **[2]**. Moreover, HBV is considered a "silent disease" as infected persons are often asymptomatic carriers; hence, the further spread of the disease goes unnoticed **[3]**. According to the Centers for Disease Control and Prevention (CDC), as of 2022, HBV affects approximately 296 million people and contributes to an estimated 820,000 deaths every year **[4]**.

HBV is a leading cause of acute liver failure, cirrhosis, hepatocellular carcinoma (primary liver cancer), and possibly even pancreatic cancer **[5]**, all of which are severe, possibly fatal conditions. HBV belongs to a family of viruses known as the Hepadnaviridae family. It is a relatively small DNA virus that replicates by reverse transcription and thus integrates into the host genome **[6]**. 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 **[7]**.

HBV is a blood-borne, highly contagious virus that is easily spread through sexual contact, perinatally 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. **[8]**

Dentists, being a part of the health care sector, are in particular at a significantly high risk of infection as they are more susceptible to exposure to the virus because their job demands handling of blood-contaminated instruments where accidental injuries might occur; in addition, dentists often come into direct contact with infected blood or saliva **[9]**. When proper prevention protocols are not adopted within the dental office, the threat of infection affects dentists and their patients. HBV is a vaccine-preventable disease, and primary immunization is available from infancy, but those high-risk group individuals (such as dentists) may benefit from a booster shot **[10]**.

Dental students may be at severe risk of getting infected by HBV during the delivery of dental procedures, especially those who are in higher academic years (i.e., 4th and 5th years). However, little is known about dental students' knowledge of HBV infection in Syria as little data is available for review, and the existing literature published in this regard is limited.

Since occupational exposure is a critical means of HBV transmission, proper knowledge and attitude regarding HBV is essential to limit its transmission within the dental clinic. Because there is a need for more data on this matter in Syrian Universities, this study was carried out to investigate undergraduate dental students' level of knowledge regarding HBV infection to better gauge their awareness and concern about such infectious diseases in the dental clinic.

Materials and Methods

A questionnaire was conducted using an online platform (Google Forms) shared amongst dental students at the International University for Science and Technology (IUST) for all five academic years. The form consisted of ten item multiple-choice questions each student had to fill anonymously. The first two questions were put in to obtain the demographic details of the study sample. Meticulous attention was put to ensure that the questions were as concise and straightforward as possible but, at the same time, offered an accurate understanding of the dental students' level of knowledge, attitude, and practice regarding HBV infection. Collected data were entered into a spreadsheet program and cross-analyzed using essential statistical functions to obtain quantitative results. As for the scoring system, students who correctly answered 60% of the questions were considered to have good knowledge and favorable attitudes and practices toward HBV. On the other hand, students who did not meet the cut-off score of 60% were considered to have inadequate knowledge and unfavorable attitudes and were concerned about HBV. No distinction was made between the different aspects of learning, awareness, and practice regarding scoring for the sake of simplicity, in addition to the overlap of these criteria between the items in this questionnaire.

Results

A total number of 257 students participated in the online questionnaire. The participants were (55.5%) males and (44.4%) females. As for academic years, they were mainly fourth-year students (45.5%), an almost equal distribution of fifth- (19.6%) and third-year students (18.4%), and the rest being second- (11%) and first-year dental students (5.5%)***. **Table (1)** summarizes the response distribution and the breakdown of maximum and minimum mean correct responses to each question regarding the academic year. Knowledge about HBV prevailed through answers to questions 1-5. The vast majority (66.4%) were well aware of the presence of five different types of viral hepatitis. In addition, 83.5% knew that hepatitis type C exists, which is a type of viral hepatitis that has similar modes of transmission and prevention to HBV but differs in that its kind is most likely to progress into a chronic infection, and no vaccine has yet been developed against it.

As to the correct modes of transmission of HBV where multiple answers may be selected, the more significant part chose the proper blood-borne routes as (70.69%) bloodborne through contaminated instruments, (31.8%) blood delivered through injectable drug abuse, (31.4%) bloodborne through sexual intercourse, and (21.6%) bloodborne perinatally at birth. Several students (19.2%) chose the oral-fecal route as a mode of transmission of HBV, which is a common misconception. (76.1%) realized that the dental office can be a source of transmission of HBV, and 63.5% recognized that HBV is a life-threatening disease.

In regards to the student's vaccination status against HBV, only (31.9%) were fully vaccinated. At the same time, the majority (85.5%) were willing to take the vaccine. About (6.3%) of students stated that vaccination is unnecessary if infection control procedures are followed.

Finally, the last item of the questionnaire reflects the attitude aspect of the research, where the majority (59.4%) of students were interested in learning more about HBV.

Using pivot tables for the cross-tabulation of data, answers to each item were correlated with the academic year of participants. As anticipated, the greater percentage of correct answers [A1] belonged to fifth-year dental students, and on the contrary, the lowest percentage of correct answers were from first-year participants. Minor differences that are not statistically significant have been noted between fourth- and fifth-year students.**

Table 1: Response distribution in regard to academic year -%. Correct answers are highlighted in bold.

Question	**Responses**	**Maximum correct (year wise)**	**Minimum correct (year wise)**
Knowledge-related			
Do you know that there are 5 types of Viral Hepatitis disease?	**66.4 (yes)** 29.7 (no) 3.9 (I don't know what viral hepatitis is)	78 (5^{th})	28 (1^{st})
Do you know that there is Hepatitis Virus type C?	**83.5 (yes)** 16.5 (no)	96 (5^{th})	21.43 (1^{st})
What do you know about the modes of transmission of HBV? **multiple answers may be selected*	**70.69 (blood borne through contaminated instruments).** **31.8 (blood borne through injectable drug abuse)** **31.4 (blood borne through sexual intercourse)** **21.6 (blood borne perinatally at birth)** 19.2 (fecal-oral route through contaminated foods). 9.8 (unsure about any of the above)	-	-
Can the dental office be a source of HBV Transmission	**76.1 (of course)** 12.2 (maybe) 5.9 (not at all). 5.9 (I don't know)	91.84 (5^{th})	14.29 (1^{st})
Is HBV disease life threatening?	**63.5 (yes)** 22.7 (no) 13.7 (I don't know)	73.28 (4^{th})	35.71 (1^{st})
Practice-related			
Are you vaccinated against HBV up to this date?	**31.9 (yes)** 37.4 (no) 15.7 (I don't know) 12.2 (I took the first dose and currently waiting for the second) 2.8 (I don't know that there is a vaccine against HBV)	66 (5^{th})	21.43 (1^{st})
If you knew that HBV poses a risk on the dentist, would you be interested in taking the vaccine?	**85.5 (of course)** 8.2 (not at all) 6.3 (vaccination is unnecessary if infection control procedures are followed)	100 (5^{th})	23.08 (1^{st})
Attitude-related			
Are you interested in obtaining more information about HBV?	**59.4 (yes)** 29.1 (yes but not anytime soon) 11.4 (no)	68.97 (4^{th})	14.29 (1^{st})

Discussion

Of the numerous occupational infections that can be transmitted within a dental setting, HBV is plausibly one of the most important, given its highly contagious and life-threatening nature. While the prevalence of HBV varies between one country and another, in Syria alone, data from the Syrian Ministry of Health in 2004 shows that the overall prevalence of HBV is 5.62%. **[12]**. Although markedly less than the worldwide prevalence of 10.5%, it is still important to acknowledge that HBV transmission is a scenario that can be encountered by any dentist anywhere in the world at any point in their career, which is why it is necessary to take steps against HBV. Moreover, there is a global consensus that healthcare workers esp, especially dentists, are prone to infection because they are at a higher risk of sustaining needle stick injuries and far more exposed to infected blood and saliva **[13]**. This increased transmission risk is why it is vitally important to reinforce continued education and enact infection control protocols and universal precautions to limit transmission of HBV within the dental office. This has to begin during dental school and will be implemented later in a dentist's

career. **[14]** This study aims to shed light on HBV among students at IUST. It is important to note here that the two final years of dental school are predominantly focused on professional clinical training and thus are the ones where students come into close contact with patients and may contract or transmit the virus.

The decision to use an online-based form was due to two main reasons; the first was more accessible and more widespread access to obtain the largest possible study population, including dental students from all academic years at IUST. The second reason is overcoming the two-week COVID-19 lockdown restriction when the research was conducted.

The results of this study showed that the knowledge attitude and practice among dental students at IUST is only borderline acceptable. After calculating the mean score (average percentage) of correct answers was only 63%. A score breakdown of the questionnaire items showed that most Students recognize the different types of viral hepatitis (66.4%). Its modes of transmission (70.6%), its life-threatening nature (63.5%), and the fact that they may play a role in the communication of this disease throughout their practice (76.1%). There is a positive correlation where the higher the anticipated risk, the higher the precautions taken **[15]**. Proper knowledge of these aspects of HBV can help recognize the disease early and decrease its transmission rate.

Similarly, a more significant part of students are willing to learn more about HBV (88.6%), which shows a positive attitude concerning HBV. However, what happens to be lacking is the practice aspect of this study, specifically vaccination, given that only a fraction of the students reported being fully vaccinated against HBV with all three dosages (31.9%). **Figure (2)** further illustrates students' vaccination status per their academic year. The results obtained were alarming. 37.4% of students reported not being vaccinated, most of them being fourth-year students, while 12.2% received only the first dose.

Vaccination should ideally be followed as a cornerstone infection control strategy within the university's dental clinic. It is necessary to emphasize here that immunization is superior to infection control as a preventive measure for HBV transmission **[16]**. That is because the innate host immune system is the first line of defense against HBV.

In comparison to a similar study carried out at the Syrian Private University, another dental school in Damascus, Syria, the results reported seem to be comparable, with the majority of students demonstrating only an average level of knowledge of blood-borne pathogens, including HBV. **[17]** The overall difference showing that fifth- and fourth-year students were significantly more knowledgeable can be attributed to the fact that courses which cover the topics the of transmissible diseases do not begin until the fourth- to fifth year of dental school. These similar findings might lead us to claim the shortcomings in Syrian dental schools when it comes to the delivery of subjects concerned with virology and blood-borne pathogens that directly affect dentists.

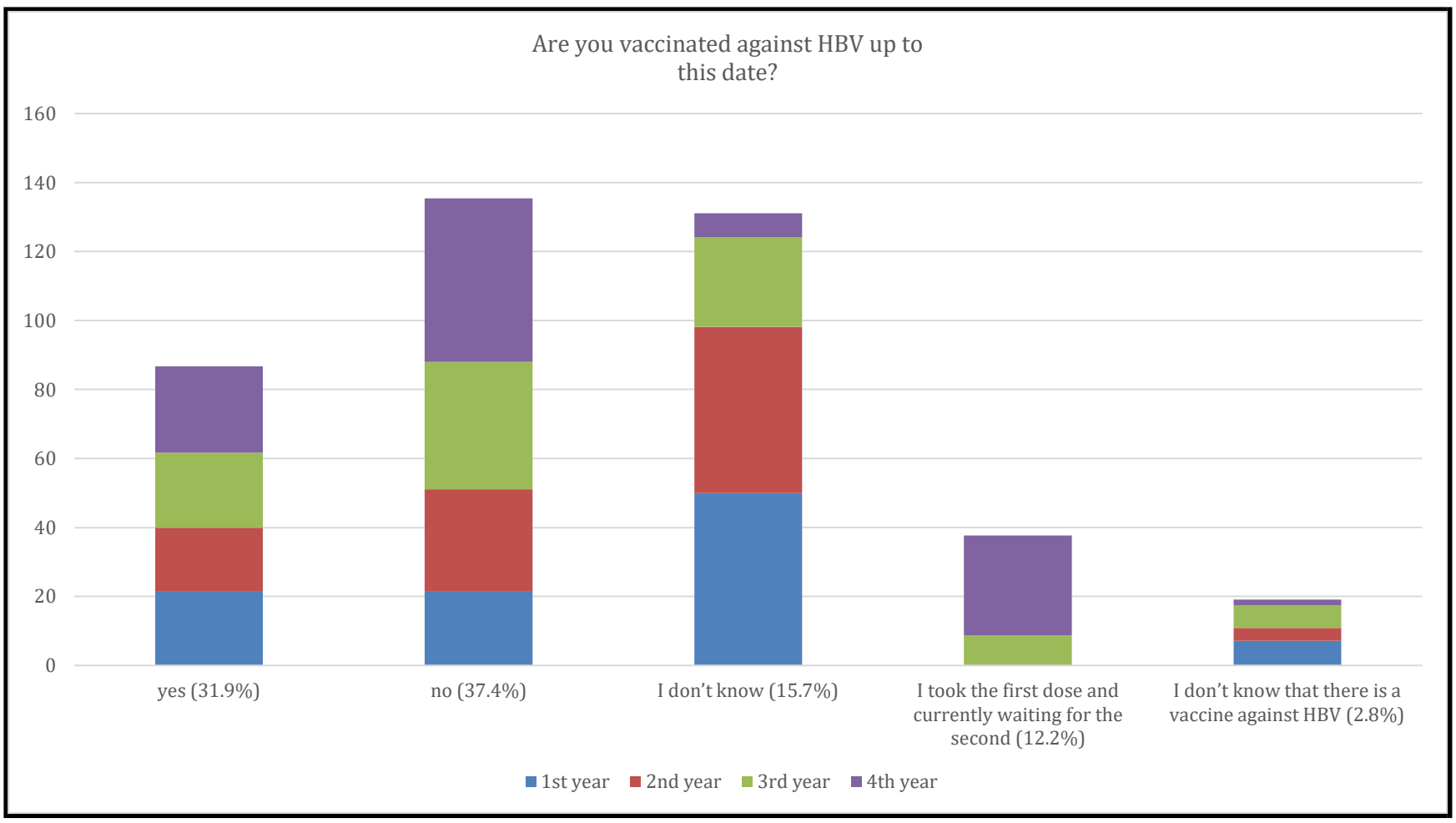

Figure 2: Vaccination status of IUST as per academic year.

Conclusion

After the data collected was analyzed, the results may be interpreted as indicators of how well dental students at IUST understand HBV, its transmission, risk, and prevention. Knowledge about these elements of the Hepatitis virus is essential for every dental student and practitioner to implement in their clinics. Results showed that the level of understanding regarding HBV is acceptable but must be improved upon, especially during the first years of dental school. These findings highlight the necessity of adopting a more thorough

theoretical and practical curriculum when it comes to viral Hepatitis through conducting regular infection control workshops, seminars, and posters hung in the university's dental clinics and halls as reminders about HBV prevention protocols. However, Regarding the unsatisfactory findings about the students' vaccination status, action must be taken to provide free and mandatory vaccination to students before their clinical years. Moreover, it is as essential to develop and reinforce a positive attitude around transmissible diseases by motivating students early on to read and do their research to learn more about viral Hepatitis as a means of continued education to adhere to infection control protocols and consequently limit the transmission of HBV and other blood-borne pathogens within the dental clinic.

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