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Awareness of Dental Students Studying at Different Universities in Hepatitis B and Hepatitis C Infection Control

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Abstract

Background: This study aims to evaluate and compare the knowledge, attitudes, and behaviors of dental students from 2 different universities regarding hepatitis B virus (HBV) and hepatitis C virus (HCV) infection control through a questionnaire-based study.

Methods: A total of 242 fourth- and fifth-year dental students from 2 universities participated in this study. A 15-question survey assessing their knowledge, attitudes, and behaviors related to hepatitis B and C was administered. Data analysis was performed using SPSS 29, with statistical significance set at $P < .05$.

Results: It was observed that 65.7% (n=159) of the students participating in the study were female and 34.3% (n=83) were male. It was observed that 51.2% (n=124) of the students were in the fourth grade and 48.8% (n=118) were in the fifth grade. The scores of the fourth grade students studying at Kahramanmaraş Sütçü İmam University were found to be statistically significantly higher than the fifth grade students ($P=.001$). Fourth grade students from Kahramanmaraş Sütçü İmam University scored considerably lower on knowledge questions than did fourth grade students from Marmara University ($P=.044$). The scores of the fourth grade students from Kahramanmaraş Sütçü İmam University on the behavior questions were statistically significantly higher than those of the fourth grade students from Marmara University ($P=.012$).

Conclusion: The study indicates that while dental students have a high level of knowledge about hepatitis B and C, their attitudes and behaviors require further improvement. Ongoing education is essential to ensure compliance with infection control standards.

Keywords: Awareness, dental students, hepatitis B, hepatitis C

What is already known on this topic?

- *Hepatitis B and C viruses (HBV-HCV) are serious infectious diseases that can be transmitted through body fluids such as blood and salive.*
- *Dental students are among the healthcare workers at risk of occupational exposure to these infections during clinical practise.*

What this study adds on this topic?

- *This study provides a comparative analysis of HBV and HCV-related knowledge, attitude, and behavior levels among dental students from 2 different faculties.*
- *It demonstrates that fourth year students had significantly higher behavior scores than fifth year students, suggesting early clinical training may have a stronger impact on infection control behavior.*

INTRODUCTION

Hepatitis B and C are viral infections that affect the liver. Hepatitis B virus is a DNA virus that affects more than 350 million chronic carriers worldwide, while HCV, an RNA virus, affects about 130-170 million people.[1,2] Because both infections carry the risk of becoming chronic, they can lead to serious liver disorders, including cirrhosis and hepatocellular carcinoma, making their prevention very important for healthcare workers.[3,4]

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Hepatitis B and C infections pose significant occupational risks for dentists due to the high potential for blood-borne transmission in clinical settings.[5,6] In Türkiye, it is mandatory for healthcare workers and students to be screened for hepatitis B serology before starting work and to receive hepatitis B vaccination if anti-HBs is negative.[7] The increased risk of exposure for dental students when they begin their clinical training emphasizes the need for effective infection control measures.[8]

While hepatitis B can be prevented by vaccination, there is no vaccine for hepatitis C yet.[8] Therefore, prevention measures and early diagnosis are of great importance. To reduce the risks associated with these infections, dental students should follow standard preventive measures, including immunization, personal protective equipment, and strict hygiene protocols.[9,10] Furthermore, routine blood tests should be performed to monitor immune status and detect possible infections early.[8]

This study aims to evaluate the knowledge, attitudes, and behaviors of dental students regarding HBV and HCV infection control and to identify gaps in awareness and preventive practices.

MATERIAL AND METHODS

A total of 242 (fourth n:124, fifth n:118) students studying at Kahramanmaraş Sütçü İmam University (KSU) Faculty of Dentistry and Marmara University Faculty of Dentistry were included in the study. Ethical approval for the study was obtained from the KSU Non-Interventional Clinical Research Ethics Committee on December 9, 2024 (Decision no: 04). Participation in the study was voluntary. The participants included in the study were asked to read and sign the informed consent form prepared in accordance with the Principles of the Declaration of Helsinki, indicating that they understood the purpose and content of the study and voluntarily participated in it. Students who did not want to complete the questionnaire were not included in the study. Participants were administered a questionnaire consisting of 15 questions about their knowledge, attitudes and behaviors regarding hepatitis B and hepatitis C viruses. In this questionnaire, students' knowledge and awareness levels were evaluated. The inclusion criterion was being a fourth or fifth-year student at KSU and Marmara University Faculty of Dentistry. The questionnaires were created and administered to the students electronically via Google Forms.

Survey

The questionnaire (Table 1) consists of 4 main sections:

1. "Socio-demographic status," including academic year and gender.
2. "Knowledge," consisting of 5 questions on students' knowledge of HBV and HCV infection.
3. "Attitudes" toward patients with HBV and HCV infection. Students rated a given statement on a 5-point scale: strongly disagree, disagree, somewhat agree, agree, and strongly agree.

Table 1. Questionnaire Applied to Students

Hepatitis B virus infection can be transmitted mainly through blood and blood products, but not through bodily secretions such as semen, sweat, saliva, vaginal secretions, and breast milk.				True	False
Anti-HBs indicates immunity against HBV.				True	False
Hepatitis B is an acute liver disease caused by the B virus that affects the liver.				True	False
Anti-HCV and HCV RNA tests are used to diagnose HCV infection.				True	False
Hepatitis C is mostly transmitted parenterally through blood transfusions and needles from IV drug users.				True	False
I have a moral responsibility to treat patients with HBV infection.	Absolutely agree	Agree	Partially agree	Disagree	Absolutely disagree
I will treat patients with HBV infection.	Absolutely agree	Agree	Partially agree	Disagree	Absolutely disagree
I can safely treat patients with HBV infection	Absolutely agree	Agree	Partially agree	Disagree	Absolutely disagree
I am worried about being infected with HBV by my patients.	Absolutely agree	Agree	Partially agree	Disagree	Absolutely disagree
Dentists have a right to know the HBV infection status of their patients.	Absolutely agree	Agree	Partially agree	Disagree	Absolutely disagree
I wear gloves before touching the patient.		Always	Mostly	Sometimes	Rare
I use a protective mask when treating the patient.		Always	Mostly	Sometimes	Rare
I use protective goggles when treating the patient.		Always	Mostly	Sometimes	Rare
I use protective shields when treating the patient.		Always	Mostly	Sometimes	Rare
I wear a cap when I treat the patient.		Always	Mostly	Sometimes	Rare

HBV, hepatitis B virus; HCV, hepatitis C virus; IV, intravenous.

4. Students' "behaviors" regarding assessing the use of personal protective equipment when treating a patient with HBV and HCV infection. Students rated on 4 scales regarding a given statement: always, mostly, occasionally, and rarely.

Survey Scoring

Firstly, the age, gender, and year of education of the students are included at the beginning of the questionnaire. Then, questions assessing students' levels of knowledge, behaviors, and attitudes related to HBV and HCV infections were included respectively. A total of 5 questions evaluating the level of knowledge consist of true and false options. For each question, 20 points were recorded for the correct answer and 0 points for the incorrect answer. Accordingly, the highest knowledge level score was determined to be 100.

There are a total of 5 questions evaluating attitude. This scale includes physicians' opinions about treating patients. The responses of strongly disagree, disagree, undecided, agree, and strongly agree are given 0, 1, 2, 3, and 4 points respectively. Accordingly, the highest attitude score can be 20.

There are a total of 5 questions evaluating behavior. The responses "rarely, sometimes, mostly, always" are given 0.1, 2, and 3 points respectively. Accordingly, the highest behavior score can be 15.

Statistical Analysis

SPSS 29 (IBM SPSS Corp.; Armonk, NY, USA) program was used for statistical analysis. Descriptive statistical methods (mean, SD, median, frequency, percentage, minimum, maximum) were used to evaluate the study data. The conformity of the quantitative data to normal distribution was tested by the Shapiro–Wilk test and graphical analysis. The Student's *t*-test was used for comparisons of quantitative variables with normal distribution between 2 groups, and Mann–Whitney *U* test was used for comparisons of quantitative variables without normal distribution between 2 groups. Statistical significance was accepted as $P < .05$.

RESULTS

The study was conducted between December 12, 2024, and December 15, 2024, with a total of 242 students, 50% (n=121) from KSU and 50% (n=121) from Marmara University. It was observed that 65.7% (n=159) of the students participating in the study were female and 34.3% (n=83) were male. It was observed that 51.2% (n=124) of the students were in the fourth grade and 48.8% (n=118) were in the fifth grade.

The scores of the students who participated in the study on the knowledge questions about HBV and HCV infection ranged between 20 and 100, with a mean of 89.17 ± 13.76. The scores on the attitude questions ranged between 8 and 20, with a mean of 15.83 ± 2.30, and the scores on the behavior questions ranged between 6 and 15, with a mean of 12.07 ± 2.06.

According to gender, students' knowledge, attitude, and behavior scores about HBV and HCV infection did not show a statistically significant difference ($P > .05$) (Table 2).

The knowledge and attitude scores of the students studying at KSU about HBV and HCV infection did not show a statistically significant difference according to their grades ($P > .05$). The behavioral scores of the fourth grade students studying at KSU were statistically significantly higher than the fifth grade students ($P = .001$). The knowledge, attitude, and behavior scores of the students studying at Marmara University about HBV and HCV infection did not show a statistically significant difference ($P > .05$) (Table 3).

The scores obtained from the knowledge questions by the fourth grade students from Marmara University were statistically significantly higher than the fourth grade students from KSU ($P = .044$). There was no statistically significant difference between the attitude scores of fourth grade students about HBV and HCV infection according to universities ($P > .05$). The scores of the fourth grade students from KSU on behavior questions were found to be statistically significantly higher than the fourth grade students from Marmara University

Table 2. Evaluation of Knowledge, Attitude, and Behavior Scores About Hepatitis B Virus and Hepatitis C Virus Infection by Gender

		Gender		Test Value
		Female (n=159)	Male (n=83)	*P*
Knowledge score	Mean ± SD	89.18 ± 13.07	89.16 ± 15.08	Z: −0.356
	Median (Min-Max)	100 (40-100)	100 (20-100)	[a]**.722**
Attitude score	Mean ± SD	15,84 ± 2,3	15.82 ± 2.31	t: 0.075
	Median (Min-Max)	16 (9-20)	16 (8-20)	[b]**.940**
Behavior score	Mean ± SD	12.26 ± 1.89	11.7 ± 2.32	t: 1.896
	Median (Min-Max)	12 (7-15)	12 (6-15)	[b]**.060**

[a]Mann–Whitney *U* test.
[b]Student's *t*-test.

Table 3. Evaluation of Knowledge, Attitude, and Behavior Scores About Hepatitis B Virus and Hepatitis C Virus Infection by Classes

			Grade		Test Value
			Fourth Grade (n=62)	Fifth Grade (n=59)	*P*
Kahramanmaraş Sütçü İmam University	Knowledge score	Mean ± SD	87.1 ± 12.6	90.51 ± 13.57	[a].081
	Attitude score	Mean ± SD	16.05 ± 2.33	16.17 ± 2.28	[b].773
	Behavior score	Mean ± SD	12.9 ± 2.01	11.42 ± 1.86	[b].001**
Marmara University	Knowledge score	Mean ± SD	90.97 ± 13.39	88.14 ± 15.37	[a].257
	Attitude score	Mean ± SD	15.5 ± 2.25	15.63 ± 2.34	[b].761
	Behavior score	Mean ± SD	11.98 ± 2.02	11.92 ± 2.1	[b].855

[a]Mann–Whitney *U* test.
[b]Student's *t*-test.
**$P < .01$.

($P = .012$). According to the universities, the knowledge, attitude, and behavior scores of fifth grade students about HBV and HCV infection did not show a statistically significant difference ($P > .05$) (Table 4).

DISSUSSION

Hepatitis B virus is a global health concern, and because it is spread by blood, dentistry is considered a high-risk occupation. Dental students and dentists can play a role in protecting against this infection and preventing the risk of transmission during dental treatments.[11,12] The increasing global prevalence of anti-HCV places additional demands on healthcare services and increases the likelihood that healthcare workers, including dentists and dental students, will provide care to individuals with HCV. Since HCV is transmitted through blood exposure, dental students are at higher risk for viral hepatitis infection during their internship due to lack of clinical experience.[13,14] The aim of this study was to compare the level of knowledge, attitudes and behaviors of fourth and fifth year dental students who have just started their clinical life about HBV and HCV infections, which are known to have a high risk of transmission. To the best of the authors' knowledge, no study in the literature has been found in which the HBV and HCV questionnaire used in this study was applied simultaneously to Turkish dental students in different faculties.

Considering that the education received in different academic years is a more reliable variable than the age of the participants, age assessment and statistics were not considered as a variable in this study to compare the level of knowledge, attitude, and behavior. When gender distribution was evaluated, no statistically significant difference was observed between the gender distributions of the groups. Similar to this study, Alavian et al[5] and Yılmaz et al[15] did not associate gender difference with HBV knowledge.

In 2014, a survey research study on Chinese dental interns was carried out by Li et al.[16] Taking into account the various academic years of dental students (Grades 5, 6, 7, and 8), it was discovered that knowledge scores generally declined unexpectedly as grades increased.[16] Alavian et al[5] conducted a questionnaire study in which they evaluated the knowledge of Iranian dental students about hepatitis B virus infection and control practices and applied the questionnaire to 142 dental students in the third and sixth grades. In some cases, it was noted that students in higher academic years showed less awareness.[5] From this situation, it can be concluded that students studying in upper grades have forgotten some basic information they have acquired from the courses that constitute the majority of the "knowledge" section of the questionnaire. In this study, fourth grades were found to be significantly higher than fifth grades in the behavior scores of dentistry students studying at Kahramanmaraş in patients with HBV and HCV. This finding emphasizes the necessity of continuous infection control education.

Yılmaz et al[15] conducted a questionnaire study in which the level of knowledge, attitudes and behaviors of fourth and fifth grade students in the faculty of dentistry about HBV infection

Table 4. Evaluation of Knowledge, Attitude, and Behavior Scores on Hepatitis B Virus and Hepatitis C Virus Infection by Universities

			University		Test Value
			Kahramanmaraş Sütçü İmam University	Marmara University	*P*
Fourth grade	Knowledge score	Mean ± SD	87.10 ± 12.6	90.97 ± 13.39	[a].044*
	Attitude score	Mean ± SD	16.05 ± 2.33	15.5 ± 2.25	[b].185
	Behavior score	Mean ± SD	12.9 ± 2.01	11.98 ± 2.02	[b].012*
Fifth grade	Knowledge score	Mean ± SD	90.51 ± 13.57	88.14 ± 15.37	[a].355
	Attitude score	Mean ± SD	16.17 ± 2.28	15.63 ± 2.34	[b].204
	Behavior score	Mean ± SD	11.42 ± 1.86	11.92 ± 2.1	[b].180

[a]Mann–Whitney *U* test,
[b]Student *t*-test
*$P < .05$.

were evaluated. A total of 314 students were surveyed. No statistically significant difference was observed between the knowledge level distributions of the fourth and fifth grade groups.[15] In this study, no statistically significant difference was found between the knowledge scores of fourth and fifth grade students in both universities. However, the knowledge scores of fourth grade students studying in Marmara were found to be statistically significantly higher than those of fourth grade students studying in Kahramanmaraş. In the study conducted by Yılmaz et al,[15] the mean attitude score of the fifth grade group was found to be statistically significantly higher than the fourth grade group. In this study, no statistically significant difference was found between the attitude scores across universities and between the fourth and fifth grades within universities. This may be due to the difference in the number and variety of questions evaluating attitudes toward HBV infection.

In the study of Yılmaz et al,[15] no statistically significant difference was observed between the mean behavior scores of fourth and fifth grade students and behavior scores according to the questions. In this study, the behavior scores of fourth grade students at Kahramanmaraş were found to be significantly higher than fifth grade students. In addition, behavior scores among fourth graders were significantly higher in Kahramanmaraş than at Marmara University. This may indicate that as students progress through their clinical training, their focus shifts from theoretical knowledge to practical skills, leading to a decrease in retention of infection control knowledge. Further research is needed to determine whether curriculum adjustments or periodic refresher courses can address this problem.

Al-Shamiri et al[17] applied a questionnaire consisting of questions about knowledge, attitudes, and practices related to HBV to 420 students studying in 4 different faculties in Saudi Arabia. According to the results of this questionnaire, it was reported that dental students showed a poor attitude and a moderate level of knowledge about people infected with HBV. Regarding the use of personal protective equipment, the response was adequate.[17] This adequate use of protective barriers among the participants in this study may reveal good practices and habits acquired after admission to dental school. The scores of the students who participated in this study on the knowledge questions about HBV and HCV infection were found to be 89.17 ± 13.76 on average out of 100, 15.83 ± 2.30 on average out of 20 on the attitude questions, and 12.07 ± 2.06 on average out of 15 on the behavior questions. According to these results, the knowledge, attitude, and behavior scores of the dental students who participated in this study can be evaluated as medium-sufficient.

Souza et al[13] evaluated the level of knowledge, attitudes, and behaviors of dental students regarding HCV infection with a questionnaire consisting of 62 questions. A total of 340 dental students from 2 public universities in Brazil participated in the study. The results showed that Brazilian dental students in their final year had significantly better knowledge about hepatitis C compared to first-year students. The mean knowledge score of the participants was found to be acceptable.[13]

Homolak et al[18] conducted a questionnaire study testing the level of knowledge of hepatitis B and hepatitis C among dental students. Of the 206 students who participated in the study, 90 were preclinical and 116 were clinical students. The overall level of knowledge about HBV and HCV was found to be poor, with mean scores of 61.90% and 51.35%, respectively. Statistical analysis revealed that students enrolled in the first year had significantly lower knowledge of HBV compared to students enrolled in all other years. There was no statistically significant difference in HBV knowledge between male and female students. In this study, there was no significant difference in knowledge levels between fourth and fifth year students. The mean knowledge score was 89.17%. It is believed that this may be due to the different number of questions included in the questionnaire. In this study, no significant difference was observed between genders.

This survey study among students from different institutions reveals differences in knowledge, attitudes and behaviors. Differences in curriculum structure and infection control education may explain these differences. Although knowledge scores are generally high, behavior, and attitude scores indicate a need for reinforcement of appropriate infection control practices.

Limitations

- Small sample size and limited generalizability.
- Unequal gender distribution.
- Limited number of survey items.
- A more robust academic approach would include a sampling method covering multiple universities across the country.
- Additionally, the study methodology does not provide detailed information on the validity and reliability of the survey, despite the fact that it is a previously implemented survey.

CONCLUSION

The high level of awareness concerning HBV and HCV among dental students was impacted by their academic year and university. Although this study found that dentistry students have appropriate knowledge regarding HBV and HCV infection, significant gaps were identified. This emphasizes the significance of ongoing HBV and HCV education in this population in order to avoid HBV and HCV infection, as well as discrimination and prejudice toward HBV and HCV patients.

Data Availability Statement: The data that support the findings of this study are available on request from the corresponding author.

Ethics Committee Approval: Ethics committee approval was received for this study from the ethics committee of Kahramanmaraş Sütçü İmam University (Date: 09.12.2024; Approval No.: 04).

Informed Consent: Written informed consent was obtained from participants who participated in this study.

Peer-review: Externally peer-reviewed.

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