

Knowledge, Attitude and Practice of Dental Students in Tehran regarding Hepatitis B, Hepatitis C, and HIV/AIDS

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Objectives Healthcare workers including dentists and dental students are at risk of transmission of blood-borne pathogens. Thus, it is imperative to assess their knowledge, attitude and practice regarding the infection control protocols.

Methods This cross-sectional study evaluated 164 dental students of Shahid Beheshti University using a self-administered questionnaire. The questionnaire consisted of socio-demographic, knowledge (n=15), attitude (n=27) and performance (n=8) questions regarding hepatitis B, hepatitis C and HIV/AIDS. Data were collected and analyzed using the Kruskal-Wallis and Mann-Whitney U test.

Results The mean score of knowledge, attitude and practice regarding hepatitis B, hepatitis C and HIV/AIDS was 18.66 (out of 30), 31.59 (out of 54) and 6.29 (out of 8), respectively. The students had low knowledge level about the routes of transmission, the standard infection control protocols, and infection treatment. They also had poor attitude towards treating the infected patients. There was no significant difference in knowledge, attitude and practice between different academic grades of dental students or males and females.

Conclusion The findings did not show satisfactory level of knowledge or attitude of Shahid Beheshti dental students regarding hepatitis B, hepatitis C and HIV/AIDS infections. Thus, more educational programs emphasizing on blood-borne infections are recommended.

Keywords Knowledge; Attitude; Work Performance; Dentists; Hepatitis B; Hepatitis C; HIV.

Introduction

Hepatitis B and hepatitis C infections are the most common severe liver diseases. All members of the society are naturally susceptible to these infections.^{1, 2} Although hepatitis B virus (HBV) is a vaccine-preventable disease, no safe and effective vaccine has been developed yet.³ The overall prevalence of hepatitis B is less than 1% in the world.^{4, 5} Another serious global issue is the human immunodeficiency virus (HIV) infection. About 36.7 million people were infected with HBV by the end of 2015. In Iran, this infection also has shown an increasing trend in the recent years.⁶

Medical and dental health care professionals are more vulnerable to these blood-borne infections.^{7, 8} Effective infection control protocols and sterilization procedures should be followed by all dental healthcare workers to prevent infection transmission. According to the WHO estimates, two million work-related injuries cause about 66,000 hepatitis B, 16,000 hepatitis C and 1000 HIV infections in 35 million healthcare workers each year.^{9, 10} Hepatitis B is highly infectious, and the risk of infection after needlestick exposure to infected patients is ~0.3% for HIV, 3% for hepatitis C and 6%-30% for hepatitis B.¹¹

Although some standardized guidelines have been presented by the WHO and the Center for Disease Control for universal precautions and post-exposure prophylaxis, only a small number of dentists and even dental colleges

adhere to these guidelines and strictly perform them in their clinical practice.^{12, 13}

Dental training plays a vital role in helping future dentists to acquire sufficient knowledge and attitude regarding the infection control measures. The training interventions should include the transmission mode, pathogenesis, prevention methods, and actions to be taken in response to virus contamination. Precise knowledge in this respect can decrease the risk of infection with blood-borne viruses. However, limited studies are available on the knowledge, attitude and practice towards HBV, HCV and HIV/AIDS infections in Iran. The aim of this study was to assess the knowledge, attitude and practice of dental students of Shahid Beheshti University of Medical Sciences regarding HBV, HCV and HIV/AIDS infections.

Materials and Methods

This cross-sectional study was conducted on 164 third to sixth academic year dental students of Shahid Beheshti Dental School, Tehran, Iran in March 2019.

Data regarding the demographic information of students as well as their knowledge, attitude and practice were collected using a questionnaire. The validity and reliability of the questionnaire have been previously confirmed.¹⁴⁻¹⁸ The purpose of the study was explained to the students. Informed consent was obtained from the participants and they were ensured about the confidentiality of their

information. The study method and the questionnaire were approved by the Ethics Committee of Kurdistan University of Medical Sciences (ethical code: IR.MUK.REC.1395.133).

The questionnaire was mainly about HBV, HCV and HIV/AIDS infections, adopted from a previous study¹⁸ with minor modifications and included four major parts:

(I) Sociodemographic status including the academic year and gender

(II) Knowledge section consisted of 15 questions about the routes of transmission, treatments, preventions, and oral manifestations. All 15 questions had three possible responses: yes, no and I do not know.

(III) Attitude section consisted of 27 questions about the behavior and dental treatments of infected patients, healthcare workers and students. The questions in this section had three possible answers: agree, neutral and disagree.

4) Practice section consisted of eight yes/no questions regarding students' infection control, their vaccination status, precautionary methods, and treatments.

In Shahid Beheshti Dental School, students work in the clinics from the beginning of the third academic year. Since the questionnaire was mainly about the blood-borne infections, we selected our study population from Shahid Beheshti Dental School. About 180 questionnaires were administered among all selected dental students and 10 minutes of time was given to them to fill it out. The students that did not completely answer three or more questions were excluded from the study. At the end, 164 questionnaires were analyzed.

For knowledge and attitude questions, score 2 was allocated

to each correct answer, score 1 was allocated to "I do not know" or "neutral" answers and score 0 was allocated to incorrect answers. In the practice section, score 1 was allocated to each correct answer and score 0 was allocated to each incorrect answer. The scores ranged from 0-30 for knowledge, 0-54 for attitude, and 0-8 for the practice section.

The knowledge, attitude and practice levels of the students were categorized as "good" or "high" (more than 75% correct answers for each section), "fair" (50-75% correct answers for each section) and "poor" or "inadequate" (less than 50% correct answers for each section).¹⁹

Descriptive statistics including the percentage, mean and standard deviation (SD) of scores were calculated in each category by using SPSS version 22. The Mann Whitney U test and the Kruskal Wallis test were used to analyze the data.

Results

About 180 questionnaires were given to all dental students from third to sixth academic year with 10 minutes of time to answer. The students that did not completely answer three or more questions were excluded from the study. Finally, a total of 164 dental students of Shahid Beheshti Dental School were evaluated; 51.2% were females and 48.8% were males. Generally, 18.9% of students were in the third, 35.4% were in the fourth, 28% were in the fifth, and 17.7% were in the sixth academic year. The mean scores of knowledge, attitude, and practice regarding HBV, HCV and HIV/AIDS infections were 18.66 (out of 30), 31.59 (out of 54) and 6.29 (out of 8), respectively (Table 1).

Table 1- Mean scores of knowledge, attitude and practice regarding HBV, HCV and HIV/AIDS infections based on gender and academic year of students

Demographic characteristics	Knowledge	P value	Attitude	P value	Practice	P value
Gender	Mean ± SD	0.232	Mean ± SD	0.258	Mean ± SD	0.640
Male	18.99 ± 2.65		31.28 ± 3.83		6.11 ± 1.23	
Female	18.90 ± 2.57		31.88 ± 3.48		6.46 ± 1.18	
Academic Year		0.375		0.549		0.449
3 rd year	18.61 ± 2.45		31.87 ± 3.76		6.23 ± 1.14	
4 th year	18.21 ± 2.67		31.03 ± 3.57		6.14 ± 1.22	
5 th year	19.11 ± 2.61		31.72 ± 3.46		6.41 ± 1.24	
6 th year	18.90 ± 2.67		32.17 ± 4.05		6.48 ± 1.27	
Total	18.66 ± 2.62		31.59 ± 3.66		6.29 ± 1.21	

The majority of participants did not show high knowledge level about the HBV, HCV and HIV/AIDS. For example, only 3.65% had adequate knowledge about the special protocols regarding HIV infection control after a needlestick injury; which was the lowest in this section. Also, 11.58%, 21.95% and 14.63% of students had optimal awareness about the oral manifestations of HIV, HBV treatment and transmission by saliva, respectively; which were not high (Table 2).

According to Figure 1, the highest knowledge level was 22

and the lowest was 15. About 17.7% of the students had poor and 82.3% had fair knowledge level. No student had good knowledge level.

Also, the results did not indicate good positive attitudes (more than 75% correct answers) towards HBV, HCV and HIV/AIDS patients. For instance, all the students preferred to refer HIV positive patients to other dentists or special clinics and only 7.31% of them accepted to treat addicted patients in their private offices. About 82.31% of students had some concerns about the other patients' thoughts

regarding treating infected persons. Only 16.46% of students agreed to tell their patients if they were HIV+.

Students had fairly positive attitude regarding HIV+ students and health care personnel overall (Table 3).

Table 2- Knowledge of dental students about HBV, HCV and HIV/AIDS infections

Statement	Yes % (n)	I do not know % (n)	No % (n)	Correct % (n)
1. Can hepatitis B/C be transmitted through kissing?	0% (0)	0% (0)	100% (164)	100% (164)
2. Can hepatitis B/C be transmitted through a common dental brush?	3.65% (6)	33.53% (55)	62.80% (103)	62.80% (103)
3. Can hepatitis B/C be transmitted through sexual contact?	100% (164)	0% (0)	0% (0)	100% (164)
4. Can hepatitis B/C be transmitted through saliva?	29.87% (49)	55.48% (91)	14.63% (24)	14.63% (24)
5. Is there a high transmission risk to marry a HBV infected person despite good prophylaxis?	31.70% (52)	42.68% (70)	25.60% (42)	25.60% (42)
6. Is there a high transmission risk for a baby who has a HBV infected mother despite good prophylaxis?	88.41% (145)	11.58% (19)	0% (0)	88.41% (145)
7. Is there a vaccine for HBV?	82.31% (135)	12.19% (20)	5.48% (9)	82.31% (135)
8. Is there a vaccine for HCV?	0% (0)	0% (0)	100% (164)	100% (164)
9. Do all hepatitis B patients need therapeutic interventions?	54.26% (89)	23.78% (39)	21.95% (36)	21.95% (36)
10. Is there any effective treatment for HCV?	0% (0)	18.90% (31)	81.09% (133)	81.09% (133)
11. Is there any treatment to prevent liver failure by hepatitis viruses?	31.70% (52)	27.43% (45)	40.85% (67)	31.70% (52)
12. Can red plaques or nodules be oral manifestations of AIDS?	11.58% (19)	76.82% (126)	11.58% (19)	11.58% (19)
13. Is the risk of AIDS infection 40-50% after a needlestick injury?	0% (0)	18.29% (30)	81.70% (134)	81.70% (134)
14. Is HBV more communicable than HIV?	95.73% (157)	4.23% (7)	0% (0)	95.73% (157)
15. Can we reduce the risk of HIV infection after a needlestick injury by special protocols?	3.65% (6)	15.24% (25)	81.09% (133)	3.65% (6)

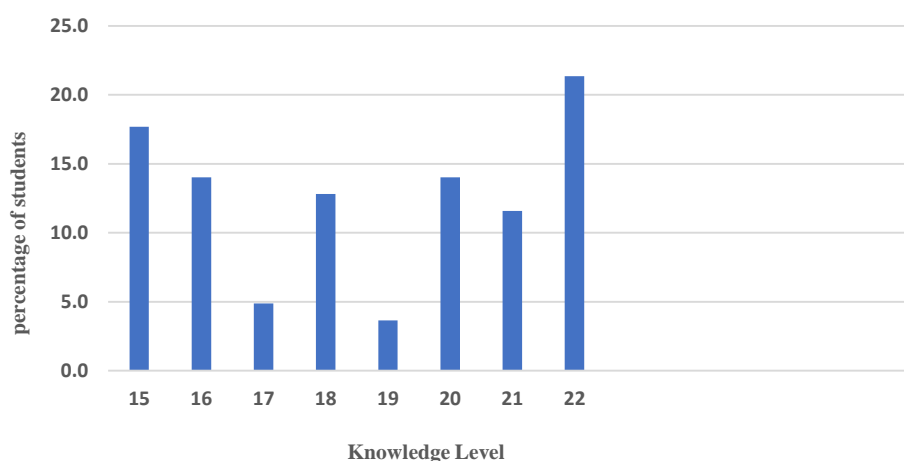


Figure 1- Knowledge levels of dental students (out of 30)

According to Figure 2, the highest attitude level was 39 and the lowest was 25. About 7.9% of the participants had poor, and 92.1% had fair attitude level. There was no good attitude level among students.

In the practice section, all students had good practice about the transmission risk of unprotected sexual contact. Most of

students (79.26%) stated that they had been vaccinated against HBV and 71.95% of the students had checked their antibody titration too. Only 44.51% of them had good practice with regard to treatments for HCV+ patients (Table 4).

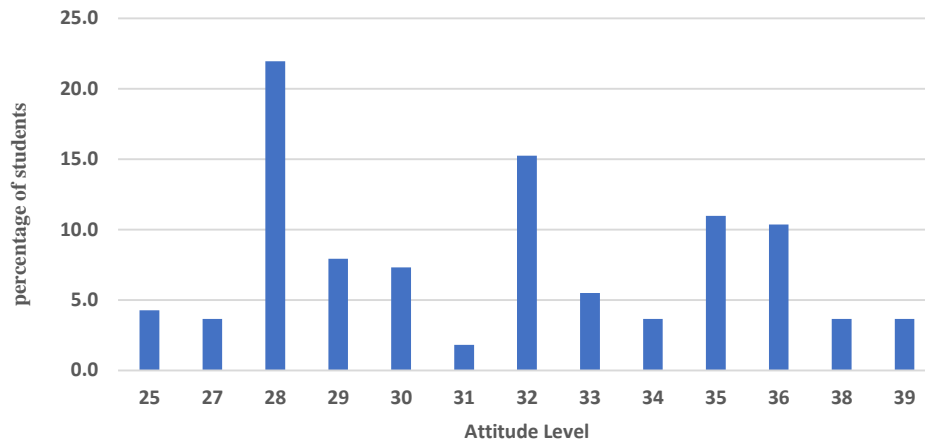


Figure 2- Attitude levels of dental students (out of 54).

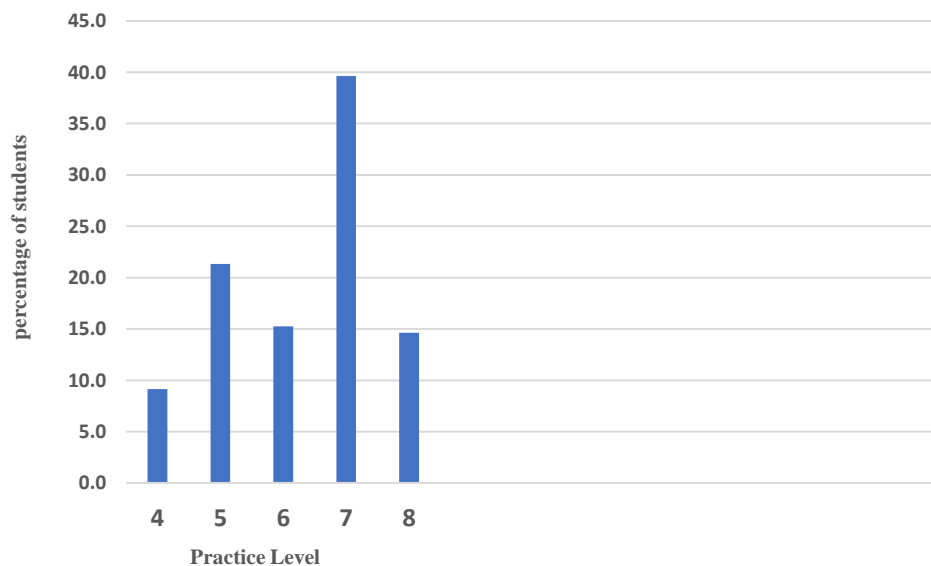
Table 3- Attitude of dental students towards HBV, HCV and HIV/AIDS infections

Statement	Agree % (n)	Neutral % (n)	Disagree % (n)	Correct % (n)
1. I will treat HIV ⁺ patients.	12.19% (20)	39.63% (65)	48.17% (79)	12.19% (20)
2. Patients will not come to my clinic if they know I treat AIDS patients; despite complete sterilization.	82.31% (135)	10.97% (18)	6.70% (11)	6.70% (11)
3. You are very concerned about getting AIDS infection through patients.	9.75% (16)	62.80% (103)	27.43% (45)	27.43% (45)
4. HIV ⁺ patients' treatment can reduce my career satisfaction.	25.00% (41)	20.12% (33)	54.87% (90)	54.87% (90)
5. HIV ⁺ patients' treatment is a professional duty of dentists.	23.78% (39)	64.63% (106)	11.58% (19)	23.78% (39)
6. There should be a special center for dental treatment of AIDS patients.	96.34% (158)	3.65% (6)	0% (0)	0% (0)
7. I prefer not to treat suspicious patients with high risk sexual contact.	34.75% (57)	41.46% (68)	23.78% (39)	23.78% (39)
8. I prefer not to treat addicted patients.	42.68% (70)	50.00% (82)	7.31% (12)	7.31% (12)
9. We should set a penalty for HIV ⁺ patients that do not disclose their infection.	10.36% (17)	25.00% (41)	64.63% (106)	64.63% (106)
10. Dentists' behavior affects patients' honesty about their infection.	72.56% (119)	19.51% (32)	7.92% (13)	72.56% (119)
11. dentists' behavior affects the anxiety of HIV ⁺ patients.	64.63% (106)	31.09% (51)	4.28% (7)	64.63% (106)
12. Talking about HIV with people can improve social awareness.	88.41% (145)	11.58% (19)	0% (0)	88.41% (145)
13. There is no problem if a HIV ⁺ assistant works in my clinic.	15.24% (25)	59.75% (98)	25.00% (41)	15.24% (25)
14. There is no problem if a HIV ⁺ secretary works in my clinic.	86.58% (142)	13.41% (22)	0% (0)	86.58% (142)
15. There is no problem if a HIV ⁺ cleaning person works in my clinic.	34.75% (57)	45.12% (74)	20.12% (33)	34.75% (57)
16. I prefer to refer a HIV infected patient.	100% (164)	0% (0)	0% (0)	0% (0)
17. I prefer to refer suspicious HIV/AIDS patients.	34.75% (57)	45.12% (74)	20.12% (33)	34.75% (57)
18. A HIV ⁺ person from health care workers can treat me.	53.04% (87)	43.29% (71)	3.65% (6)	53.04% (87)
19. A HIV ⁺ person from health care workers can only perform noninvasive treatments for me.	31.70% (52)	37.80% (62)	30.48% (50)	30.48% (50)
20. Health care workers should periodically test for HIV.	14.02% (23)	20.73% (34)	65.24% (107)	14.02% (23)
21. A HIV ⁺ student should be banned from working in a clinic.	0% (0)	13.41% (22)	86.58% (142)	86.58% (142)

22. I will inform my patients if I have HIV.	16.46% (27)	44.51% (73)	39.02% (64)	16.46% (27)
23. If I know my dentist has HIV, I will not go to his/her clinic anymore; despite complete sterilization and infection control.	0% (0)	23.17% (38)	76.82% (126)	76.82% (126)
24. If I know my dentist treat HIV ⁺ patients, I will not go to his/her clinic anymore despite complete sterilization and infection control.	0% (0)	17.68% (29)	82.31% (135)	82.31% (135)
25. Health care workers can refuse to treat HIV ⁺ patients.	7.92% (13)	45.12% (74)	46.95% (77)	46.95% (77)
26. In dental works, we should assume all patients have HIV or hepatitis.	88.41% (145)	11.58% (19)	0% (0)	88.41% (145)
27. Complete Infection control for hepatitis can make enough protection for AIDS as well.	64.63% (106)	29.87% (49)	5.48% (9)	64.63% (106)

Table 4. Practice of dental students regarding HBV, HCV and HIV/AIDS infections

Statement	Yes % (n)	I do not know % (n)	No % (n)
1. I will avoid kissing a person who has HBV or HCV.	0% (0)	100% (164)	100% (164)
2. I may use a common dental brush with a person who has HBV or HCV.	54.43% (86)	47.56% (78)	47.56% (78)
3. I will warn a HBV infected person regarding unprotected sexual contact.	100% (164)	0% (0)	100% (164)
4. I will warn a HBV infected woman regarding pregnancy.	15.24% (25)	84.75% (139)	84.75% (139)
5. Do you get all 3 series of HBV vaccination?	79.26% (130)	20.73% (34)	79.26% (130)
6. Did you ever check antibody titration after vaccination?	71.95% (118)	28.04% (46)	71.95% (118)
7. Do you advise pharmaceutical therapy to all HBV infected cases?	34.14% (56)	65.85% (108)	65.85% (108)
8. Do you advise pharmaceutical therapy to all HCV infected cases?	55.48% (91)	44.51% (73)	44.51% (73)

**Figure 3-** Practice levels of dental students (out of 8)

Based on Figure 3, the practice levels ranged from 4 to 8. About 45.7% of the students had fair and 54.3% had good practice level. There was no poor practice level in general.

Discussion

Based on the results, the mean scores of knowledge,

attitude, and practice regarding HBV, HCV and HIV/AIDS infections were 18.66 (out of 30), 31.59 (out of 54) and 6.29 (out of 8), respectively. There was no significant difference in knowledge, attitude and practice levels between different academic grades of dental students or between males and females ($P > 0.05$). The findings also showed that the knowledge, attitude and practice scores of different grades

were not high. In another study in Iran, there was no significant relationship between knowledge and practice among dentists.⁶ However, it was in contrast to some other studies.^{18, 19}

The mean knowledge score in this study (18.66 out of 30) was not high. Students had poor knowledge level specially about ways of transmission, HBV treatments, and the infection control protocol for the needle stick injury. For example, most students did not know that in case of needle stick injury to HCV patients, the first step is to wash the wound area well with soap and water. Also, in case of needle stick injury to HBV, anti-HBs test should be performed to ensure if the patient is a carrier or not, and immunoglobulin and vaccines should be injected to the exposed individuals who are not vaccinated or have inadequate anti-HBs level.²⁰

A study on dental students of Mashhad University, Iran showed that the awareness of third academic year students was better because they had passed the infection control course in this grade.¹⁹ Similarly, infection control courses in Shahid Beheshti Dental School are limited to preclinical stage (fourth and fifth semesters) and this essential information is not reviewed or repeated in higher academic grades. Another study in China showed that knowledge scores unexpectedly decreased in higher grades and it was inferred that graduate students had forgotten some basic knowledge obtained from classes.¹⁹

In the current study, we easily noticed the lack of good attitude towards the infected patients. All the students preferred to refer HIV+ patients to other dentists or clinics. It was also revealed that the fear of infection transmission and losing other patients due to treating infected patients, play a significant role in rejection of HIV/AIDS patients by dentists. Askarian et al.¹⁵ argued that despite the acceptance of treatment of HIV/AIDS patients by dentists, a moderate to extremely high fear and anxiety of HIV transmission to themselves or other patients was observed among dentists. Fortunately, most students (88.41%) presumed their patients to be infected with HIV or HBV before dental treatments. The WHO also recommends to assume all patients as infected for any dental treatment and all dentists should implement complete sterilization protocols.²¹

According to Eguchi et al.²² higher level of knowledge may decrease individuals' negative attitude towards HBV, HCV

and HIV/AIDS infections. Therefore, the inappropriate attitude level in the present study can be related to poor knowledge of dental students.

Based on the practice results, we can conclude that Shahid Beheshti dental students have fair to good practice level regarding HBV, HCV and HIV/AIDS patients.

About 79.26% of students claimed to be vaccinated for HBV; which was lower than another study on 149 dental students of Mashhad Dental School, Iran (89.9%).¹⁸ Fortunately, 71.95% of the students who had suspicion about the efficacy of their previous vaccination, had been recommended by dentistry school's protocols to check their antibody titration before the third year.

Differences between the educational curricula and cultures in different dental schools may explain the differences in the results. A study in the United Kingdom indicated that age and type of dental practice were significantly associated with treatment practice and attitude of dentists regarding HIV/AIDS patients.²³

Reviewing infection control principles in higher academic grades can improve knowledge level of dental students regarding HBV, HCV and HIV/AIDS. The students in clinics should be encouraged to work on infected patients according to the standard infection control protocols under the supervision of their mentors to gain better attitude and practice.

This study had a limited number of participants and the results cannot be generalized to all dental students.

Conclusion

The findings showed no significant difference in knowledge, attitude and practice levels between different academic groups of dental students or between males and females. Also, the knowledge, attitude and practice levels of different grades were not satisfying. Thus, more educational programs regarding blood-borne infections, infection control, safety recommendations, and standard precautionary protocols are recommended.

Conflict of Interest

None Declared ■

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