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Knowledge, Attitude and Practice of Hepatitis B Virus Infection among Dental Students and Interns in Saudi Arabia

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Abstract

Background: Hepatitis B virus (HBV) is a worldwide healthcare problem. Dental health care professionals are at a high risk of infection by HBV. The present study investigated the knowledge, attitude and practice of HBV infection among Saudi dental students and Interns in Saudi Arabia.

Material and Methods: This was a questionnaire-based cross-sectional study. A self-administered questionnaire consisting of questions on students' knowledge, attitudes, and practices regarding HBV was used. Data of 420 participants were analyzed using SPSS (Statistical Package for Social Studies) version 22.0.

Results: The response rate was 84%. Overall, the participants showed fair level of knowledge about HBV, with significant differences between final year students and the interns. Also, the subjects showed negative attitude toward HBV patients. The vast majority reported always wearing gloves (97.9%), gowns (92.1%), face masks (89.2%), disposable caps (87.1%) and protective eye wear (80.9%). The majority of participants (91.4%) had been vaccinated against HBV. However, only 41% completed the recommended 3 doses of the vaccine.

Conclusions: These unsatisfactory findings emphasize the necessity of continued education about HBV in order to improve knowledge, attitudes, and practices of dental students and Interns regarding HBV.

Key words: *HBV, Knowledge, Practice, Dental students, Interns.*

Introduction

HBV infection is a worldwide health care problem, especially in developing countries. It is one of the most common chronic viral infections that may infect the population. About 2 billion people are estimated to be infected and more than 350 million are chronic carriers of the virus (1). A wide spectrum of liver diseases can be caused by HBV infection, these diseases ranging from acute hepatitis to chronic hepatitis, liver cirrhosis, and hepatocellular carcinoma (2). HBV has several modes of transmission like through contact with infected blood or semen, from infected mothers to their neonates. In

addition, it can be transmitted through the use of unsafe injections, blood transfusion, or dialysis (1). Even though it is unethical and illegal to refuse treatment of HBV patients, some dentists may deter from treating HBV-positive patients (3).

Dental health care professionals including dental practitioners are at a high risk of infections by various microorganisms like HBV and HCV, herpes simplex virus, HIV, mumps, influenza, and rubella (4). This risk may be accentuated by accidental injuries during patient treatment (5), thus a culture of safety precaution and the infection control practice should be implemented among those students. This culture is the responsibility of dental schools in providing the adequate infection control measures, and training of dental students how protecting themselves and their patients, as well foundation of safe working conditions (6).

A number of studies (3,5-8) worldwide have evaluated the level of dentists' and dental students' knowledge, attitudes and behaviors regarding infection control guidelines and precautions and found unsatisfactory response and emphasized the need for further improvement of this kind of knowledge and practice. In Saudi Arabia data on HBV knowledge and attitudes of dental students are lacking. Therefore, this study was conducted to investigate the knowledge, attitudes and practices regarding HBV infection among dental students and Interns, in Riyadh, Saudi Arabia.

Material and Methods

This study, conducted in March 2017, consisted of a cross-sectional survey of final dental students and Interns. This survey was applied at four dental schools that were: Princess Nora university, Private Al-Qassim university, Riyadh dental college and Alfarabi college of dentistry. The study was approved by Alfarabi college Institutional Ethical Review Board.

The questionnaire was adapted from pretested questionnaires that have been used in some similar studies (7,8). Before distributing the questionnaire, a random sample of students (n=40) to ensure understandability and clarity of the questions.

This self-administered questionnaire consisted of 22-closed-ended questions divided into four parts. The first part screened the demographic profile of students including, age, gender, and academic level. The second part assessed the knowledge of those students regarding HBV infection and routes of transmission. The third part investigated the behavior and attitude towards HBV infection and infected patients. The last part examined the practices of students regarding protection measures against HBV as well as their HBV vaccination status.

Students were asked to fill out the anonymous self-administered questionnaire at the end of the lectures, or during the clinical sessions. Students who agreed to participate in the study, signed a consent form prior to answer the questionnaire.

SPSS (Statistical Package for Social Studies) version 22.0 (IBM Corporation, Chicago, IL, USA) was used for data entry and analysis. Descriptive statistics including frequencies and proportions were performed. Chi-squared test was used to assess statistical significance, with a p-value < 0.05 was considered statistically significant.

Results

The response rate was 84% (420 out of 450). Female students represented about 66.2% of the sample. The sample comprised an almost equal distribution of interns (53.5%) and final year dental students (46.7%). Almost two thirds of the sample were from private dental schools (Table 1).

Table (2) shows proportions of "correct" responses to the knowledge items. Overall, correct responses varied greatly from 21% - 92.1%, with significant differences between interns and final year students. The vast majority knew that HBV can be transmitted from patient to patient (89.5%), that HBV can be transmitted through dental treatment (90.7%) and that the HBV vaccine is safe (92.1%). On the other hand, only less than quarter of the subjects knew about HBV sensitivity to low temperature, dryness and ultraviolet rays (21%), and that HBV is not less transmissible than Human Immunodeficiency Virus (HIV) (26%). Overall, final year students were significantly more knowledgeable than intern (p<0.05). Regarding gender, there were significant differences between males and females in most of the answered knowledge items. For example, significantly more females answered correctly some HBV knowledge items than their male counterparts: transmission of HBV through saliva (50.9% vs. 26.1%), transmission from dentists to patients (71.6% vs. 59.9%), transmission from patient to patient (91.4% vs. 85.9%) and transmissibility of HBV in comparison to HIV (29.9% vs. 18.3%). On the other hand, significantly more males were more knowledgeable than females regarding infection capacity of HBV outside the body (33.1% vs. 19.8%) and the ability of HBV to survive on unsterilized surfaces (85.9% vs. 76.3%).

Regarding the possible modes for HBV transmission (Table 3), the correct answers ranged between 13.3% and 98.1% with no significant differences between final year students and the interns except in one item related to the possibility of HBV transmission through saliva, in which the final year students answered better than interns (17.3% vs. 15.6%). With reference to gender, there was also no significant differences between males and females except in two items; the first one is related to the possibility of HBV transmission through sexual route, favoring males over females (76.3% vs. 69.7%). The other one is the transmissibility of HBV through saliva, favoring females over males (18.3% vs. 15.5%).

Table 1: Demographic Distribution (Gender& Academic level).

	Frequency	Percent	Total
Male	142	33.8	420 / 100
Female	278	66.2	
Final Year	196	46.7	420 / 100
Internship	224	53.3	

Table 2: Knowledge regarding Hepatitis B Virus Infection - %.

	Question	Gender			Academic level			
		Male	Female	*P*-value	Final year	Interns	*P*-value	Total
1	Trans. through saliva	26.1	50.9	0.000*	49.5	36.3	0.014*	42.5
2	Trans. Dentist to patient	59.9	71.6	0.011*	57.5	60.7	0.003*	67.6
3	Trans. Patient to patient	85.9	91.4	0.046*	83.7	44.8	0.000*	89.5
4	Dentist at high risk of HBV inf.	81.7	78.8	0.431	89.8	71	0.000*	79.8
5	Trans. Through dental treatment.	94.4	88.8	0.133	90.8	90.6	0.01*	90.7
6	HBV less trans. Than HIV	18.3	29.9	0.004*	32.1	20.5	0.01*	26.0
7	HBV sensitive to low temp., dryness, & UV rays	24.6	19.1	0.075	15.8	25.4	0.008*	21.0
8	HBV resistant to alcohol	48.6	46.4	0.078	54.1	41.1	0.021*	47.1
9	HBV not infectious outside body	33.1	19.8	0.007*	23.0	25.4	0.560	24.3
10	HBV survival on unsterilized surface	85.9	76.3	0.002*	77.0	81.7	0.498	79.5
11	HBV vaccine safety	92.3	92.1	0.257	90.8	93.3	0.499	92.1
12	HBV incubation period	29.6	28.8	0.461	33.2	25.4	0.004*	29.0

* means statistically significant.

Table (4) describe the attitude of the students towards patients with HBV. Overall the attitude of the participants was unsatisfactory and showed a negative attitude toward HBV infected patients. Females, significantly showed better attitude towards HBV patients than males. Also, final year students showed better attitude than their counterpart interns.

Table (5) shows students' use of personal protective equipment. The vast majority reported always wearing gloves (97.9%), gowns (92.1%), face masks (89.2%), disposable caps (87.1%) and protective eye wear (80.9), with no significant differences according to gender or the academic year. Significantly more females reported always wearing disposable caps than male students (93.7% vs. 83.8%).

Table (6) shows the vaccination status of the participants. Vaccination was reported by almost 91.4% of the participants, with a significant difference between males and females (88.6% vs. 93.9%). Out of the vaccinated participants, only 41% completed the recommended 3 doses of vaccination with significant difference according to the academic level ($p < 0.05$). No correlation was found between number of doses and gender.

Table 3: Knowledge regarding Hepatitis B Virus Modes of Transmission – %.

	Modes of transmission	Correct Response	Gender			Academic level			
			Male	Female	*P*-value	Final year	Interns	*P*-value	Total
1	NSI	Agree	99.4	97.5	0.331	96.4	99.6	0.051	98.1
2	Blood	Agree	99.3	96.8	0.219	96.4	98.7	0.267	97.6
3	From mothers to infants	Agree	83.8	73.7	0.064	80.6	74.1	0.132	77.1
4	Sexual route	Agree	69.7	76.3	0.000*	78.1	70.5	0.550	74.0
5	Sharing toilets	Disagree	19	19.8	0.112	16.8	21.9	0.272	19.5
6	Hugging	Disagree	43.7	43.5	0.083	43.9	43.3	0.652	43.6
7	Sneezing & coughing	Disagree	35.2	27.4	0.092	28.6	31.4	0.108	30.1
8	saliva	Disagree	18.3	15.5	0.008*	17.3	15.6	0.008*	16.4
9	Breast milk	Disagree	12.7	13.7	0.835	11.7	14.7	0.617	13.3
10	Drinking from same cup	Disagree	16.2	16.2	1.000	15.3	17	0.268	16.2

* means statistically significant.

Discussion

HBV infection is one of the most significant vocational infection that may face dental professionals, as they are frequently exposed to blood, saliva, and even suffer needle stick injuries (9,10). Accordingly, in order to reduce or prevent the transmission of such microorganisms to dental health workers, a strict adherence to infection control guidelines should be applied. This study was conducted to assess the level of knowledge, attitudes, and practice among dental students and interns regarding HBV infection at 4 dental schools in Saudi Arabia. Overall, dental students in the present study showed poor attitude and fair level of knowledge regarding HBV infected persons. These results were also reported in other studies (7).

Based on the results of this study, we can deduce that Saudi dental students have a fairly unsatisfied level of knowledge regarding HBV infection (only 6 out of 12 items with correct response rave above 50%). This is in an agreement with some other studies that showed limitation in knowledge among health care workers regarding HBV infection and its occupational risk (8,11-14).

In a study conducted by Alavian *et al.* (15), about 81.7% and 98.6% of the participants knew about the possibility of HBV transmission through saliva and from dentist to patient respectively, while in our study the figures were much lower (42.5% and 67.6% respectively. Interestingly, the vast majority of our participants believed that HBV vaccine is safe and effective for all ages (92.1%). This finding is very close to the finding (95.1%) (8) among Saudi dentists in Al Jouf province in . This may reflect the significance of continuous medical education programs in improving the health behaviors among dental health care workers.

In reference to the knowledge about modes of HBV transmission, only 4 items out of 10 got a response above 50%, demonstrating an inadequate level of knowledge, especially among controversial items such as transmission of HBV through saliva, breast milk, sneezing or coughing of an infected person. This could be attributed to the controversy in these points and the absence of concrete evidence (8,16,17). Of the participants, only 19.5% knew that sharing toilets with an infected person could not transmit HBV. This finding is contradicted with results of Al-Hazmi study (61%) (8).

Regarding the statements on the attitude assessment, unfortunately only a small proportion of the participants were inclined to choose "agree" or "strongly agree" which actually reflect unsatisfactory or negative attitude toward HBV infected people. Interestingly, the obtained data showed better significant attitudes of females compared to males, which was in agreement with some other studies in this subject (6,15). This may be accounted to the fact that females are more concerned with infection control guidelines comparing to males (18). On the other hand, the results were contrary to the expectation whe-

Table 4: Attitude toward Hepatitis B Virus Infection - %.

	Attitude statement	Distribution/Gender			Distribution/ Academic level		
		Males	Females	*p*-value	Final Year	Internship	*p*-value
1	**"I have moral responsibility to treat patients with HBV infection**			0.000*			0.000*
	Agree/strongly agree	28.2	49.6		52.6	33.5	
	Neutral	12.0	12.6		15.3	9.8	
	Disagree/strongly disagree	59.8	37.8		32.1	56.7	
2	**"I will treat patients with HBV infection"**			0.000*			0.000*
	Agree/strongly agree	27.5	50.4		52.6	33.9	
	Neutral	7.0	8.6		10.2	6.3	
	Disagree/strongly disagree	65.5	41		37.3	59.8	
3	**"I can safely treat patients with HBV infection"**			0.000*			0.004*
	Agree/strongly agree	26	45.6		45.4	33.5	
	Neutral	7.8	13.7		15.3	8.5	
	Disagree/strongly disagree	66.2	40.7		84.7	49.3	
4	**"I will let dentists treating patients with HBV treat my teeth"**			0.021*			0.052
	Agree/strongly agree	21.1	32.7		31.1	26.8	
	Neutral	11.3	15.5		17.3	11.2	
	Disagree/strongly disagree	67.6	51.8		51.5	62.1	
5	**"Dentists have rights to know their patient's HBV infection status"**			0.000*			0.002*
	Agree/strongly agree	34.5	65.8		56.1	54.5	
	Neutral	5.7	7.9		11.2	3.6	
	Disagree/strongly disagree	59.8	26.3		32.6	42	
6	**"I am worry about being infected with HBV by my patients"**			0.000*			0.000*
	Agree/strongly agree	26.7	48.2		44.4	37.9	
	Neutral	9.2	13.7		16.3	8.5	
	Disagree/strongly disagree	64.1	38.1		39.3	53.6	

* means statistically significant.

re final year students showed significant better attitudes than interns in all statements of attitudes. This finding is in agreement with study conducted by Li *et al.* (7) among Chinese dental interns, and contrary to some other studies (6,15). This may be ascribed to that dental interns are more likely exposed to high risk factors of HBV infection like blood and saliva, making them less willing to deal with HBV patients.

In respect to the use of personal protective equipment, the response was adequate and in agreement with some previous studies in this subject (6,7,18,19). In other hand the reported use of protective barriers in this study was higher than in a previous study in Yemen (5) (face masks 89.8% vs 53.8%, and eyewear 80.9% vs 14%). This adequate utilization of protective barriers among the participants in this study may reveal the good practice and habits cultivated once admitted to the dental school.

The finding of the present study indicated a high rate of HBV vaccination. About 91.4% of the participants were vaccinated against HBV, which could be ascribed to the fact that HBV vaccination is obligatory requirement by the dental and medical schools in Saudi Arabia. This rate is comparable to that reported by other studies in UAE (98.8%), Brazil (90.8%) and Canada (100%) and Saudi Arabia (90%) (6,18-20). However, this rate is higher than that reported in other studies reported in Yemen (70.7%)

Table 5: Student's use of Personal Protective Equipment - %.

	Equipment Gender/ Academic level	Always	Mostly	Sometimes	Rarely	Never	*p*-value
1	**Gloves**						
	Males	97.9	1.4	0.0	0.7	0.0	0.312
	Females	97.8	1.1	1.1	0.0	0.0	
	Final year	96.4	2.6	0.5	0.0	0.5	0.068
	Internship	99.1	0.0	0.9	0.0	0.0	
	Total	97.9	1.2	0.7	0.0	0.2	
2	**Protective eye wear**						
	Males	83.1	4.2	9.2	2.1	1.4	0.233
	Females	79.7	9.8	7.6	2.5	0.4	
	Final year	77.4	10.3	8.7	2.6	1.0	0.435
	Internship	83.9	5.8	7.6	2.2	0.4	
	Total	80.9	7.9	8.1	2.4	0.7	
3	**Face masks**						
	Males	92.2	0.0	5.7	0.7	1.4	0.058
	Females	87.7	4.7	4.0	2.5	1.1	
	Final year	87.2	4.1	4.1	2.1	2.6	0.124
	Internship	91.0	2.2	4.9	1.8	0.0	
	Total	89.2	3.1	4.5	1.9	1.2	
4	**Disposable caps**						
	Males	93.7	2.1	1.4	2.1	0.7	0.038*
	Females	83.8	7.2	5.8	1.8	1.4	
	Final year	86.2	5.1	5.1	1.5	2.0	0.527
	Internship	87.9	5.8	3.6	2.2	0.4	
	Total	87.1	5.5	4.3	1.9	1.2	
5	**Gowns**						
	Males	89.4	7.0	1.4	1.4	0.7	0.449
	Females	93.5	4.0	1.8	0.4	0.4	
	Final year	91.3	5.6	2.0	0.0	1.0	0.239
	Internship	92.8	4.5	1.3	1.3	0.0	
	Total	92.1	5.0	1.7	0.7	0.5	

* means statistically significant.

Table 6: HBV Vaccination – %.

	Modes of transmission	Correct Response	Gender			Academic level			
			Male	Female	*P*-value	Final year	Interns	*P*-value	Total
1	Vaccination status?	Yes	86.6	93.9	0.012*	89.3	93.3	0.146	91.4
		No	13.4	6.1		10.7	6.7		8.6
2	No. of administered doses	3 doses	37.4	42.7	0.457	36	45.2	0.014*	41
		< 3 doses	62.6	57.3		64	54.8		59

* means statistically significant.

and India (38%) (5,21). This study observed that females administered the vaccine were more than males with significance. This finding is in agreement with some studies conducted in Brazil and Yemen (5,18), and could be attributed to the recognized concern of females toward the preventive measures in general (18).

Unfortunately, out of 91.4% of vaccinated participants, only 41% had received the recommended 3 doses of vaccination. This result is much lower than that reported in some other studies by Alavian *et al.* (15), Kramer *et al.* (22) and De Souza *et al.* (18) in which this rate was more than 80%.

Conclusions

The unsatisfactory findings from this study emphasize the necessity of continued education about HBV in order to improve knowledge, attitudes, and practices of dental students and Interns regarding HBV.

References

1. Trépo C, Chan HLLok A. Hepatitis B virus infection. The Lancet. 2014;384:2053-63.
2. Hollinger FB Liang TJ. Hepatitis B virus. Fields virology. 2001;4:2971-3036.
3. Khosravanifard B, Rakhshan V, Najafi-Salehi LSherafat S. Tehran dentists' knowledge and attitudes towards hepatitis B and their willingness to treat simulated hepatitis B positive patients. East Mediterr Health J. 2014;20:498-507.
4. Smith AJ, Cameron SO, Bagg JKennedy D. Management of needlestick injuries in general dental practice. Br Dent J. 2001;190:645-50.
5. Halboub ES, Al-Maweri SA, Al-Jamaei AA, Tarakji BAl-Soneidar WA. Knowledge, attitudes, and practice of infection control among dental students at Sana'a University, Yemen. Journal of International Oral Health. 2015;7:15.
6. Al-Maweri SA, Tarakji B, Shugaa-Addin B, Al-Shamiri HM, Alaizari NAAlMasri O. Infection control: Knowledge and compliance among Saudi undergraduate dental students. GMS Hyg Infect Control. 2015;10:Doc10.
7. Li X, Kang H, Wang S, Deng Z, Yang T, Jia Y, et al. Knowledge, attitude, and behavior of hepatitis B virus infection among chinese dental interns. Hepat Mon. 2015;15:e25079.
8. Al-Hazmi AH. Knowledge, attitudes and practice of dentists concerning the occupational risks of hepatitis B virus in Al Jouf Province, Saudi Arabia. Niger J Clin Pract. 2015;18:276-81.
9. Su J, Deng XHSun Z. A 10-year survey of compliance with recommended procedures for infection control by dentists in Beijing. Int Dent J. 2012;62:148-53.
10. Mutters NT, Hagele U, Hagenfeld D, Hellwig EFrank U. Compliance with infection control practices in an university hospital dental clinic. GMS Hyg Infect Control. 2014;9:Doc18.
11. Kabir A, Tabatabaei SV, Khaleghi S, Agah S, Faghihi Kashani AH, Moghimi M, et al. Knowledge, attitudes and practice of Iranian medical specialists regarding hepatitis B and C. Hepat Mon. 2010;10:176-82.
12. Di Giuseppe G, Nobile CG, Marinelli PAngelillo IF. A survey of knowledge, attitudes, and behavior of Italian dentists toward immunization. Vaccine. 2007;25:1669-75.
13. Kesieme EB, Uwakwe K, Irekpita E, Dongo A, Bwala KJAlegbeleye BJ. Knowledge of Hepatitis B Vaccine among Operating Room Personnel in Nigeria and Their Vaccination Status. Hepat Res Treat. 2011;2011:157089.
14. Sukriti, Pati NT, Sethi A, Agrawal K, Agrawal K, Kumar GT, et al. Low levels of awareness, vaccine coverage, and the need for boosters among health care workers in tertiary care hospitals in India. J Gastroenterol Hepatol. 2008;23:1710-5.
15. Alavian SM, Mahboobi N, Mahboobi N, Savadrudbari MM, Azar PSDaneshvar S. Iranian dental students' knowledge of hepatitis B virus infection and its control practices. J Dent Educ. 2011;75:1627-34.
16. Abedi F, Madani H, Asadi ANejatizadeh A. Significance of blood-related high-risk behaviors and horizontal transmission of hepatitis B virus in Iran. Arch Virol. 2011;156:629-35.
17. Singhal V, Bora DSingh S. Hepatitis B in health care workers: Indian scenario. J Lab Physicians. 2009;1:41-8.
18. de Souza RA, Namen FM, Galan J, Jr., Vieira CSedano HO. Infection control measures among senior dental students in Rio de Janeiro State, Brazil. J Public Health Dent. 2006;66:282-4.
19. Rahman B, Abraham SB, Alsalami AM, Alkhaja FENajem SI. Attitudes and practices of infection control among senior dental students at college of dentistry, university of Sharjah in the United Arab Emirates. Eur J Dent. 2013;7:S15-9.
20. McCarthy GM Britton JE. A Survey of Final-Year Dental, Medical and Nursing Students: Occupational Injuries and Infection Control. J Can Dent Assoc. 2000;66:561.
21. Singh A, Purohit BM, Bhambal A, Saxena S, Singh AGupta A. Knowledge, attitudes, and practice regarding infection control measures among dental students in Central India. J Dent Educ. 2011;75:421-7.
22. Kramer A, Meyer G, Ertzinger S, Kietz K, Schrader OMartiny H. Multi-centre study on the implementation of selected hygiene measures in 331 dental surgeries. Hyg Med. 2008;33:64-73.

Conflicts of interest

All authors declare there is no competing interest related to the study.