



## RESEARCH ARTICLE

**KNOWLEDGE, ATTITUDE AND PRACTICE OF DENTAL STUDENTS TOWARDS HEPATITIS B INFECTION IN ADEN UNIVERSITY, YEMEN**Mohamed Hasan Alsakaf<sup>1</sup>, Adel Jumaan Binsaad<sup>2,\*</sup><sup>1</sup> Department of Conservative Dentistry, Faculty of Dentistry, University of Aden; Mobile: +967 772434577<sup>2</sup> Department of Microbiology, Faculty of Medicine, University of Aden; Mobile: +967 714071428\*Corresponding author: Adel Jumaan Binsaad; E-mail: [adljman616@gmail.com](mailto:adljman616@gmail.com)

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**Abstract**

Hepatitis B virus (HBV) infection is a major worldwide public health issue. The risk of exposure to HBV among healthcare workers (HCWs) is a major concern, especially among students in health professions. This is a cross-sectional survey, aimed to assess the knowledge, attitude, and practices toward HBV infection among dental students, using an administered questionnaire containing 2 sections. The first section for demographic characteristics and the second section contained 15 questions on knowledge of HBV (7 questions), attitude (3 questions), and practices (5 Questions) of HBV infection. Dental students in the third, fourth, and fifth years of Aden University were included in the study. Descriptive statistics like frequencies and proportions were used to summarize the data. A total of 308 dental students participated in the study. Of these, 50.3% were males and 49.7% were females.

A total of 77.2% of the students knew about the transmission and prevention of HBV infection. More than 75.0% of participants had a positive attitude towards preventive measures against HBV infection, and 78.2% of participants agreed that the HBV vaccine can prevent HBV infection. Only 0.97% of students were vaccinated against HBV infection and 53.9% of students knew about the postexposure treatment against HBV infection. The overall knowledge regarding HBV infection was found to be adequate among dental students. Dental students are at high risk of exposure to HBV infection owing to the low HBV vaccination rate. Therefore, dental students should be vaccinated prior to their entry into professional practices.

**Keywords:** Hepatitis B virus, Practice, Knowledge, Vaccination, Dental students.**Introduction**

Hepatitis B virus (HBV) infection is a major global public health problem, which is caused by hepatitis B virus (HBV), that is classified as a DNA hepadnavirus [1]. According to the World Health Organization (WHO), about 240 million people worldwide are chronically infected with hepatitis B virus [2].

HBV is mainly transmitted by contact with contaminated blood and body fluids, and contaminated instruments, unprotected sexual intercourse, transfusion of contaminated blood and blood products, unsafe use of needles, from mother to her child at birth, close household contact, and among children in early childhood [3].

Healthcare workers and dental students, are part of the healthcare delivery system, so they are at higher risk of acquiring infection during their practice. In dental settings, HBV infection can be transmitted by contact with blood or saliva or gingival crevicular fluid of infected patients during dental procedures such as teeth extraction, surgical or non-surgical endodontics, gingivectomy, root planing, scaling and flossing, and intraligamentary injections [3, 4].

In developing countries, where the prevalence of HBV is high in general population, healthcare workers (HCWs) including dental professionals and students in health professions, who had not received HBV vaccine are three to four times, at greater risk of exposure to HBV infection than the general population [5, 6].

Previous studies have been demonstrated a clear gap of knowledge among students of health profession towards the risks of occupational exposure to HBV infection. For instance, a study conducted among dental students, showed that 28.4% of students knew about the postexposure treatment against HBV infection and about 58.8% students knew about the preventive measures against HBV infection [7]. In other study conducted among medical students, 57.85% of the students were had knowledge about vaccine dosage, transmission, and prevention of HBV infection [8].

Studies assessing the knowledge, attitude, practices towards HBV infection are needed to design public health policies and interventions to reduce the transmission of infections acquired by health personnel. Yemen is highly endemic with HBV, and the seroprevalence of HBV is high among general population and healthcare workers [9, 10], and a data regarding knowledge towards the occupational exposure to HBV among dental students is scarce. Therefore, the aim of this study was to assess the knowledge, attitude, and practice towards HBV infection among dental students in Aden University.

## Methods

This cross-sectional observational study was conducted among the students of Dental College at Aden University from October to December 2021. Aden University is located in Aden City, which is a seaport city in Yemen, located by the eastern approach to the Red Sea (the Gulf of Aden), some 170 kilometers (110 mi) east of Bab-El-Mandeb southern of Yemen within longitude 45°02'12" E and latitude 12°46'45" N [11]. The study population comprised undergraduate dental students from the third year, fourth year, and fifth year.

Verbal consent was obtained from each participant, and anonymity of the participants was maintained throughout the study. All the students who were present and who gave verbal consent were considered as the sample size for the study.

A pretested, administered structured questionnaire was used to collect information about demographic characteristics and the knowledge, attitude and practices of dental students towards HBV infection. The questionnaire was modified by experts from the department of Community Medicine and Public Health, Faculty of Medicine and Health Science, University of Aden. The questionnaire was also pretested, and a pilot testing was conducted among 10 students of Dental College to check its reliability, clarity, time required, acceptability, and missing data. Those students included in pilot testing were excluded from the study. The questionnaire included three questions for the demographic characteristics, seven questions for knowledge, three questions for attitude, and five

questions for practice of dental students regarding HBV infection. The participants were asked to answer each question with 'yes' or 'no' regarding knowledge-based and practice-based questions. Also, regarding attitude-based questions towards HBV infection the participants were asked whether they are agree or not agree. For each correct answer provided by the respondents a sum of one point were given. A scoring method was used to estimate the knowledge, attitude and practice of the respondents toward HBV infection. Regarding student's knowledge, good knowledge was considered if the study respondents answered 70 % or more of knowledge questions correctly, while poor knowledge where considered if the respondents answered less than 70 % of knowledge questions. Positive attitude where considered, if the respondents were answered correctly for 70 % or more of the attitude questions correctly, and negative attitude, if the respondents answered for less than 70 % of attitude questions. Finally, regarding practice toward HBV, good practice was considered if the study participants were answered 70 % or more of the practice questions correctly, and poor practice where considered if the participants answered less than 70 % of attitude questions. Malpractice was considered when the participants were unable to answer 70 % of practice items correctly [12].

### *Statistical analysis*

The Statistical Package for Social Sciences (SPSS) software version of 20 was used to enter, clean and analyse the data. Descriptive statistics like frequencies and proportions of knowledge, attitude, and practice related to HBV infection were used to summarize the data.

### *Ethical consideration*

The ethical committee of the Faculty of Medicine and Health Science and Faculty of Dentistry at Aden University was approved this research before initiation, and a permission was also granted by the dean of Faculty of Dentistry.

## Result

Out of 308 dental students participated in this study 155 (50.3%) were males and 153 (49.7%) were females. 235 (76.3%) in age group more than 22 years. Among 308 students, 89 were third-year students, 128 fourth-year students, and 91 were fifth-year students. Demographic characteristic of participants illustrated by Table 1.

**Table 1.** Demographic characteristics of participated dental students at University of Aden (n=308)

Characteristics	No.	(%)
<b>Sex</b>		
Male	155	50.3
Female	153	49.7
<b>Age group (years)</b>		
Less than 22	73	23.7
More than 22	235	76.3
<b>Study year</b>		
Third year	89	28.9
Fourth year	128	41.6
Fifth year	91	29.5

In this study, majority of the participants (7.1%) had adequate knowledge regarding mode of transmission and prevention of HBV infection. Of the dental students participated, 273 (88.6 %) reported that HBV can be transmitted through transfusion of infected blood and body fluids, 254 (82.5 %) believed that the disease can be transmitted by unsafe sex, and 287 (93.2 %) mentioned unsterilized or contaminated medical equipment such as syringes, needle and surgical instruments may act as a means for transmission of HBV infection, while 218 (70.8 %) knew that the disease can be transmitted by shaking hands with an infected person, and 266 (86.4%) were aware of HBV vaccine and knew that HBV vaccine is effective and safe. However, relatively a low proportion of 199 (64.6 %) of study participants mentioned that HBV can transmitted congenitally and only 166 (53.9 %) knew that HBV has a post-exposure prophylaxis (Table 2).

**Table 2.** Knowledge of participated dental students towards hepatitis B infection at University of Aden (n=308)

knowledge questions	Yes		No	
	N	(%)	N	(%)
HBV can be transmitted from a pregnant woman to her fetus	199	64.6	109	35.4
HBV can be transmitted by contaminated blood and body fluids	273	88.6	35	11.4
Hepatitis B transmitted by unsafe sex	254	82.5	54	17.5
HBV can be transmitted by unsterilized syringes, needles and surgical instruments	287	93.2	20	6.8
HBV spread by shaking hands with an infected person	218	70.8	10	29.2
Hepatitis B vaccine is effective and safe	266	86.4	42	13.6
HBV has post exposure prophylaxis	166	53.9	42	46.1

The attitudes of dental students towards HBV infection prevention are illustrated in Table 3. 241 (78.2 %) of the students were agreed that HBV vaccine can prevent HBV

infection, 256 (83.1%) were agreed that sterilization of medical instruments prevent transmission, and 236 (76.6%) acknowledged that the use of protective barriers like gloves, are important to prevent transmission of HBV infection.

**Table 3.** Attitudes of participated dental students towards hepatitis B prevention at University of Aden (n=308).

Attitude questions	Agree		Disagree	
	N	(%)	N	(%)
HBV vaccination could prevent transmission	241	78.2	67	21.8
Sterilization of instruments prevent transmission	256	83.1	52	16.9
Wearing of gloves is important to prevent transmission	236	76.6	72	23.4

According to practical measures for HBV prevention, out of the 308 participants, only 16 (5.2 %) had screened for HBV, 3 (0.97 %) students had vaccinated against HBV, and only 1 (0.32 %) of vaccinated students had completed the recommended three doses. Twenty-two (7.1%) of the respondents had a needle stick injury, and 188 (61.0%) of the participants had responded that they would report if they had needle stick injury. However, there were malpractice on prevention of HBV infection among the study participants (Table 4).

**Table 4.** Practices of participated dental students towards hepatitis B prevention at the University of Aden(n=308).

Practice questions	Yes		No	
	N	(%)	N	(%)
Have you ever screened for hepatitis B?	16	5.2	292	94.8
Have you got vaccine against HBV?	3	0.97	305	99.0
How many doses of HBV vaccine did you receive?				
One dose	2	0.6	306	-
Two doses	0	0	308	-
Three doses	1	0.3	307	-
Have you ever had a needlestick injury?	22	7.1	286	92.9
I always report for needlestick injury	188	61.0	120	39.0

## Discussion

In Yemen, the seroprevalence of HBsAg was estimated to be from 8-20%, and about 50% of general population are carriers of HBV-IgG. In addition, the HBsAg seroprevalence was estimated to be 9.9% among Yemeni healthcare workers[9, 10]. Dental students are part of the health care delivery system are at risk of acquisition of hepatitis B infection as other healthcare workers due to their direct contact with patients and contaminated instruments [3]. In addition, dental students are involved in many dental procedures such as teeth extraction, surgical or non-surgical endodontics, gingivectomy,

root planing, and intraligamentary injections that may exposed them to infected blood and saliva with HBV during their practice and work. Therefore, assessment of knowledge, attitude, and practice towards HBV infection is of great importance and informations obtained by such method are used to design proper preventive measures, especially among the students of medical profession and persons who may be in contact with patients.

The result of this study showed that overall knowledge regarding mode of transmission and prevention of HBV was good (77.2%). Most of participants knew that exposure to infected blood or body fluid, unsafe sexual contacts, exposure to unsterilized or contaminated medical equipment, and shaking hands with an infected person are risk factors for HBV infection. Also, in the current study, majority of dental students were knew that HBV vaccine is effective, safe, and protective. This finding was in line with the previous studies that reported a good knowledge of the study participants on HBV infection [13, 14]. On the other hand, this finding was higher than that reported in different countries [7, 15, 16, 17]. However, the result of this study was lower than that reported by different studies [6, 18]. The level of knowledge towards HBV among different populations and students of medical profession varies in different countries. These variations may be attributed to the difference in resource allotment, knowledge, perception, sufficiency of the educational programs, vaccination status [19, 20], occupation, educational degree, age and gender [21]. In Yemen, there is lack of school-based health education for students. The good knowledge toward HBV transmission and prevention showed by the participated dental students in this study, may be attributed to the awareness created by students when they enter the professional dental courses during the clinical study years [22], as they are students of the third, fourth, and fifth year. However, there is a need to improve the health education system and create more awareness toward HBV infection and other bloodborne infections.

On the other hand, in the current study, a low proportion (64.6%) of study participants knew that HBV can be transmitted congenitally; from mother to her child and only 53.9% knew that HBV has a post-exposure prophylaxis (PEP). The poor knowledge identified by this study in regard with the mode of transmission of HBV and post-exposure prophylaxis may be related to the lack of awareness about HBV occupational safety measure, that is recommend for those who had been exposed to HBV. Thus, this emphasizes the need for more health education about preventive measures and dental students should be familiarized with the principles of post exposure management in order to prevent HBV infection transmission [1, 23]. Similar finding was reported by several studies that investigated the knowledge about principles of infection control among students of different medical profession [24, 25].

In this study, the overall attitude of the dental students under study towards hepatitis B prevention was positive. More than 70.0% of the participated dental students were agreed that HBV vaccine, sterilization of medical instruments, and the use of protective barriers like gloves, are important to prevent transmission of HBV infection. Healthcare institutions should be provided with protective equipment such as gloves, safety cabinets, goggles, and eye washers in sufficient quantities in order to reduce the effects of occupational exposure to bloodborne infections including HBV infection [23]. This result was in agreement with other studies from Ethiopia and Saudi Arabia conducted among students of medicine and health sciences [12, 26].

Regarding practice towards HBV prevention, although most of the study participants had good knowledge and positive attitude on the HBV infection and its prevention, the result of current study showed malpractice towards hepatitis B prevention. Only 5.2 % had screened for HBV. The reasons for not screening of 94.8% of participants for the hepatitis B virus is might be attributed to lack of resources and feeling of low-risk status [3]. However, this finding was agreed with previous study, in which only 4.9% of participants were screened [12], and disagreed with other study, in which 49.6% had been screened for HBV infection [27].

In the current study, only 3 (0.97%) of students had vaccinated against HBV, and only one (0.3%) of vaccinated students had completed the recommended three doses. In contrast to this study, high HBV vaccination rate was reported among medical students in Pakistan, where 70.6% were completed the three doses of HBV vaccination and 79% were received at least one dose of the vaccine for hepatitis B [28], and in Ghana, among undergraduate public health students, where 30.5% of students completed the vaccination and 44.2% had received at least one dose of HBV vaccine [27]. The reason of low rate of HBV vaccination found among dental students in this study might be due to that the national immunization programmes against HBV for infants and high risk groups was introduced in 2000 and HBV vaccination is not routinely provided to students of medical profession in Yemen. In addition, the reason of not being vaccinated may be due to lack of knowledge about the vaccine, high coast of the vaccine, fear of acquiring hepatitis B from the vaccine, and doubt of the efficacy of the vaccine [3]. Moreover, this could be attributed to lack of awareness about occupational protective measures such as vaccination against HBV, post-exposure prophylaxis, training and adopting safer working practices. [1]. Therefore, there is a needs for improvement knowledge of vaccination and PEP against HBV, and more strategies should be implemented to prevent the risk of exposure among groups at risk including dental students.

It is estimated that 2.1 million of healthcare workers expose to sharp injuries contaminated with HBV every year [29], and the risk of transmission of HBV following needle stick injury is between 6% to 30% in HCWs who were not vaccinated or not completely vaccinated and those who did not receive post-exposure prophylaxis following NSI [30]. In developing countries, HCWs are at higher risk of exposure to HBV infection due to high HBV endemicity and most of them are not vaccinated [30]. In the current study, 22 (7.1%) of the participants had exposed to needle stick injury, and only 188 (61%) of the participants had readiness to report if they had needle stick injury. The rate of needle stick injury reported in this study was lower than 40% reported by Al-Dabbas *et al*, from Palestine [31], and 55.9% reported by Noubiap *et al*, from Cameroon [32]. The reason for this findings may be lack of reporting system which is very important for policies and interventions on occupational health exposure of healthcare workers. In Yemen, due to absent of reporting system on needlestick injuries, the number of NSI is underestimated. Therefore, it is important to motivate dental students to report NSIs in order to get the treatment, prophylaxis and advising.

## Conclusion

The overall knowledge regarding HBV disease was found to be adequate among dental students. The result of study showed that dental students are at high risk of exposure to HBV infection during their practice owing to low HBV vaccination rate. Therefore, we recommend that dental students should be vaccinated prior to their entry into professional practices.

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## Source of Support:

Nil.

## Conflict of Interest:

None declared.

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## المعرفة والمواقف والممارسات تجاه عدوى التهاب الكبد البائي بين طلاب كلية الأسنان في جامعة عدن، اليمن

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### المُلخَص

يعتبر التهاب الكبد الفيروسي البائي مشكلة صحية عالمية ويشكل خطر التعرض لفيروس الكبد البائي قلق رئيسي بين اوساط العاملين في المجال الصحي، وخصوصا بين طلاب المهن الصحية. وقد هدفت هذه الدراسة الاستقصائية المستعرضة الى تقييم معرفة ومواقف وممارسات طلاب كلية الأسنان تجاه التهاب الكبد الفيروسي البائي وذلك باستخدام استبيان ذاتي يحتوي على قسمين. القسم الأول يتضمن معلومات حول الصفات الديموغرافية للمشاركين والقسم الثاني يتضمن 15 سؤالاً لتقييم المعرفة (7 أسئلة) والمواقف (3 أسئلة) والممارسات (5 أسئلة) بما يخص عدوى التهاب الكبد الفيروسي البائي. وقد شملت الدراسة طلاب كلية الأسنان بجامعة عدن من المستوى الثالث والرابع والخامس. تم استخدام الأحصاء الوصفي مثل التكرار والنسب لعرض البيانات. وقد بلغ إجمالي عدد المشاركين في الدراسة 308 طالب وطالبة، وقد بلغت نسبة المشاركة لدى الذكور 50,3% ولدى الإناث 49,7%. وكان لدى 77,2% من الطلاب معرفة حول طرق انتقال والوقاية من العدوى بالتهاب الكبد الفيروسي البائي. وكان لدى أكثر من 75% من المشاركين مواقف ايجابية تجاه الإجراءات الوقائية المستخدمة ضد عدوى التهاب الكبد الفيروسي البائي. وكان 78,2% من المشاركين موافقين بأن اللقاح يمكن ان يمنع الإصابة بفيروس التهاب الكبد الفيروسي البائي. وقد كانت نسبة الطلاب الملحقين ضد العدوى بالتهاب الكبد الفيروسي البائي 0,97% فقط، بينما كان 53,9% من الطلاب يعلمون حول علاج ما بعد التعرض لفيروس الكبد الفيروسي البائي. بصورة أجمالية كانت معرفة طلاب الأسنان حول عدوى التهاب الكبد الفيروسي البائي مقبولة. ونظرا لأنخفاض نسبة التلقيح بين طلاب الأسنان فأنهم معرضون لخطر الإصابة بفيروس الكبد الفيروسي البائي. لذلك يجب تلقيح طلاب الأسنان قبل مزاولتهم للعمل المهني.

**الكلمات المفتاحية:** التهاب الكبد الفيروسي البائي، الممارسة، المعرفة، التلقيح، طلاب الأسنان.

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