



## Knowledge, attitude, and practice regarding hepatitis B infection among dental interns of a private dental college in Pune, India: A questionnaire study

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### Original Article

#### Abstract

**BACKGROUND AND AIM:** In a dental office, infections can be transmitted through several routes such as direct or indirect contact with blood, oral fluids, droplet spatter, aerosols, etc. Despite the introduction of various programs and strategies, misconceptions about the transmission of hepatitis B, prophylaxis, and vaccination remain widespread. Such lack of knowledge may create fear or discrimination toward dental management of hepatitis B positive patients; hence, it is essential to assess dental interns' understanding of the hepatitis B disease. This study was undertaken to evaluate the awareness regarding hepatitis B virus (HBV) infection amongst the interns of Dr. D. Y. Patil Dental College and Hospital, Pimpri, Pune, India.

**METHODS:** A cross-sectional survey was carried out on 84 interns using a self-administered questionnaire with questions regarding the knowledge, infection control measures, and post-exposure protocols of hepatitis B infection. The collected data were analyzed using SPSS software.

**RESULTS:** The mean age of the respondents was 22.42 years. About 17.86% of the respondents were men and 82.14% were women. 71.4% of the interns had moderate knowledge regarding hepatitis B. Only 44.04% of the interns were aware of the correct incubation period of the disease, whereas 57.14% of the interns were aware of the correct vaccination dosing schedule. About 17.86% of the interns were unaware that post-exposure prophylaxis was available for hepatitis B.

**CONCLUSION:** Although majority of the interns displayed moderate knowledge and good clinical practice behavior, vast improvements still need to be made with regard to the awareness of the disease itself as well as the responsibility of all dentists to prevent cross-contamination and to do no harm.

**KEYWORDS:** Knowledge; Attitude; Hepatitis B; Communicable Diseases; Infection Control; Cross-Sectional Studies

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Around 40 million carriers of hepatitis B are present in India, accounting for 10%-15% of the total carriers worldwide.<sup>1</sup> Estimations show that 14.4% of hospital workers all over the world are positive for hepatitis B.<sup>2</sup> In various studies, the prevalence of healthcare professionals infected with hepatitis B was 10 times higher than the general population.<sup>3</sup>

Dental professionals are at a high risk of exposure to hepatitis B virus (HBV) due to their various encounters with bodily fluids and the use and disposal of sharp instruments.<sup>4</sup> In a dental office, infections can be transmitted through several routes such as direct or indirect contact with blood, oral fluids, droplet spatter, aerosols, etc.<sup>5</sup> Moreover, as this virus remains viable for

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more than twenty-four hours under natural circumstances and for more than one week in plaster casts, there exists a significant possibility of HBV transmission in dental settings.<sup>6</sup> Despite the introduction of various programs and strategies, misconceptions about the transmission of hepatitis B, prophylaxis, and vaccination remain widespread. Such lack of knowledge may create fear or discrimination toward dental management of hepatitis B positive patients; hence, it is critical to evaluate dental interns' knowledge of the hepatitis B disease.

The incidence of HBV can be reduced by educating healthcare workers and students about its transmission and immunization.<sup>7</sup> Hence, this study aimed to evaluate the awareness regarding HBV infection amongst the interns at Dr. D. Y. Patil Dental College and Hospital in Pune, India, and to make them aware of the correct responses.

## Methods

A cross-sectional survey was conducted at Dr. D. Y. Patil Dental College and Hospital and Dr. D. Y. Patil Vidyapeeth (Deemed to be) University, Pimpri, Pune, from December 2019 to February 2020. The study design was approved by the Scientific Committee and the Ethics Committee of Dr. D. Y. Patil Vidyapeeth (Deemed to be) University.

A pre-tested, well-structured, and pre-validated questionnaire was obtained from a cross-sectional study done by Jain et al. in 2014.<sup>8</sup> In the mentioned study, the authors conducted a pilot study on 50 students to assess the feasibility and validity of the questionnaire. Prior to the commencement of the present study, it was attempted to determine the content and face validity of the questionnaire again through discussions with experts from the Department of Public Health Dentistry.

The sample size was calculated using the formula given below:<sup>9</sup>

$$n = \frac{Z^2 P(1-P)}{d^2}$$

where n = sample size, Z = Z statistic for a level of confidence, P = expected prevalence or proportion (if the expected prevalence is 20%, then P = 0.2), and d = precision (if the precision is 5%, then d = 0.05).

Taking the prevalence from the study by Jain et al.,<sup>8</sup> the sample size for the present study was calculated to be 81 using the above formula.

At the time of the study, the total number of interns enrolled in the program was 110, from which 84 interns were willing to participate; hence, they were considered as the sample for the study.

**Data collection:** Before distribution of the survey, the value of the study was explained to the students and an informed consent was obtained from the participants. The information gathered was kept confidential.

The questionnaires were printed and distributed to the interns over a period of one week. The participants were approached in their respective departments in which they were posted at the time. The physical copies of the questionnaire were distributed and filled out under the observation of two operators. The participants were not allowed to confer with each other while answering. The copies of the questionnaire were collected by the two operators after 15 minutes and the responses were tabulated in an Excel sheet.

The questionnaire consisted of four parts. The first section contained general information like age, sex, immunization status, and previous attendance of Continuing Dental Education (CDE) programs. The second section included ten questions assessing the knowledge of interns. There were five questions in the third section which addressed the attitude towards hepatitis B-infected people. In the fourth section, four questions were posed to assess the practices followed during clinical work.

**Scoring system:** To assess the knowledge in the second section, a scoring system was developed according to the number of correct responses; the scores 1-4 were regarded as poor, 5-7 as moderate, and 8-10 as good.

The answers received for the third section (attitude) were rated on a three-point Likert scale: agree, uncertain, and disagree. To determine the individual’s overall attitude, a threshold of four positive responses out of five questions was considered as having positive attitude; otherwise, it was considered as negative attitude.

For the fourth section (behavior), the interns’ behavior was rated as ‘positive behavior’ or ‘negative behavior’ based on the responses to 4 questions. A score of 1-2 was regarded as ‘positive behavior’ and a score of 3-4 was regarded as ‘negative behavior’.

The data were analyzed using SPSS software (version 21, IBM Corporation, Armonk, NY, USA). A P-value < 0.05 was considered statistically significant and the correlation between the scores of knowledge and attitude was assessed using the Spearman’s rank correlation test.

### Results

A total of 84 interns completed the questionnaires. About 82.14% of the respondents were women and 17.85% were men. The mean age of the respondents was 22.42 years. More than half of the interns (73.8%) had not attended any CDE/Continuing Medical Education (CME) program on hepatitis B. Regarding vaccination status, 83.3% of the respondents reported to be immunized against HBV (Table 1).

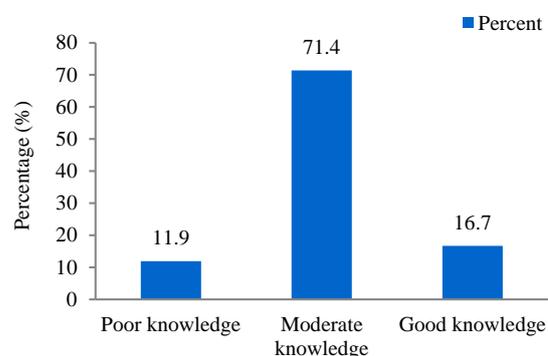
**Table 1.** Respondents’ characteristics (section A)

Variable	Value
Number (total number)	84 (110)
Response rate (%)	76.36
Gender [n (%)]	
Men	15 (17.86)
Women	69 (82.14)
Mean age (year)	22.42
CDE/CME attended [n (%)]	
Yes	22 (26.20)
No	62 (73.80)
Immunization status [n (%)]	
Immunized	70 (83.30)
Not immunized	14 (16.70)

CDE: Continuing Dental Education; CME: Continuing Medical Education

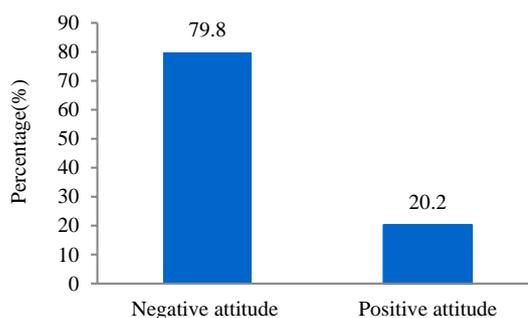
Overall, 71.4% of the participants showed

moderate knowledge (Figure 1) and 100% showed positive behavior (Figure 2).



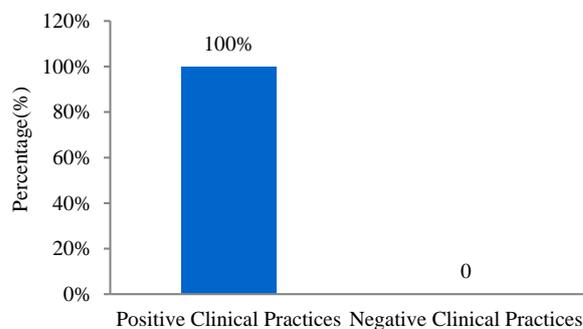
**Figure 1.** Percentage of participants having good, moderate, and poor knowledge scores

On the other hand, only 20.2% of the interns showed positive attitude (Figure 3).



**Figure 2.** Percentage of participants having overall positive and negative attitude scores

Table 2 shows the distribution of answers to each question in the second section of the questionnaire, which focuses on the knowledge of the interns.



**Figure 3.** Percentage of participants having positive and negative clinical practice scores

**Table 2.** Knowledge about hepatitis B (section B)

	Correct responses by students [n (%)]
Percutaneous transmission	74 (88.09)
Vertical transmission	59 (70.24)
Post-exposure prophylaxis	69 (82.14)
Infectivity	64 (76.19)
Endemicity	19 (22.62)
Immunization	48 (57.14)
Vaccine	79 (94.05)
Transmission	54 (64.28)
Clinical features	19 (22.62)
Incubation period	37 (44.04)
Average percentage of correct responses	62.14

Only 44.04% of the interns were aware of the correct incubation period, whereas only 22.62% of the interns were aware that the majority of the patients with hepatitis B infection remained asymptomatic.

The majority of the students (94.05%) were aware of the fact that hepatitis B could be prevented by the vaccine. Even though 70 students had received vaccination against hepatitis B, as a requirement of the institute, surprisingly only 57.14% of the interns were aware of the correct dosing schedule. About 70.24% of the interns were aware that hepatitis B could be transmitted via breast feeding and 88.09% of the interns had an understanding about the percutaneous transmissibility of the virus.

It is essential to take prompt action in case of accidental exposure to hepatitis B. Professionals need to be aware of the post-exposure prophylaxis regimen to be initiated

immediately. However, 17.86% of the interns were unaware that post-exposure prophylaxis was available for hepatitis B. It has been reported that HBV is 100 times more infectious than human immunodeficiency virus (HIV).<sup>10</sup> However, there was a lack of knowledge regarding the infectivity of the disease as 23.81% of the answers were incorrect.

The question from the survey most often answered incorrectly was concerning the endemicity of the disease. Out of 84 students, only 19 students knew that India was an intermediate endemicity zone. This is alarming since the carrier rate of hepatitis B in India is 2%-7% which represents a significant portion of the population.

Table 3 displays results of the third section of the survey, which focuses on the attitude of students toward patients with hepatitis B.

A total of 29 students were unwilling to work in the same environment as a patient with hepatitis and 27% of the interns believed infected patients should not be allowed to work in restaurants. This showed that there was a lacuna in knowledge regarding the transmission of the disease.

Out of 84 dental interns, 26 believed that patients with hepatitis B should be treated in separate clinics. This attitude is baseless since patients may be unaware of being infected themselves. Furthermore, 55 interns were extremely worried about being infected with hepatitis B. However, 94% of the interns agreed that dentists should be ethically obligated to treat patients infected with hepatitis B.

**Table 3.** Attitude of students toward hepatitis B infected-patients (section C)

Sr. No.		Responses of students [n (%)]		
		Positive	Uncertain	Negative
1	Whether they would work in the same environment as a hepatitis B-infected person	39 (46.4)	16 (19.0)	29 (34.5)
2	Whether hepatitis B-infected people should be allowed to work in restaurants	50 (59.5)	7 (8.3)	27 (32.1)
3	Whether dentists are ethically obliged to treat patients with hepatitis B	79 (94.0)	3 (3.5)	0 (0)
4	Whether patients with hepatitis B should be treated in separate clinics	49 (58.3)	9 (10.7)	26 (31.0)
5	The extent of worry they feel toward getting infected by hepatitis B	Low [2 (2.3)]	Moderate [25 (29.7)]	Strong [55 (65.4)]
	Average percentage of positive behavior	64.7		

Table 4 displays the results of the fourth section of the survey based on clinical practice behavior.

**Table 4.** Clinical practice behavior (section D)

		Prudent responses by students [n (%)]
1	Usage of gloves	82 (97.0)
2	Change of gloves after each patient	84 (100)
3	Usage of face masks	84 (100)
4	Method of sterilization	83 (98.8)

Almost all of the interns (97%) reported that they wore gloves while performing oral examinations and treatment, and all of them stated that they changed gloves after each patient. Moreover, all interns used face masks during all dental procedures. The majority of the interns (98.8%) believed that steam under pressure (autoclave) was the recommended method of sterilization.

There was no significant correlation between knowledge and attitude scores and between knowledge score and CDE attendance (Table 5).

## Discussion

HBV is 50-100 times more infectious than HIV and is a major occupational risk for physicians and surgeons and leads to serious public health problems.<sup>11</sup> The infection caused by HBV could progressively lead to liver cirrhosis and cancer, posing an imminent threat to life.<sup>12</sup> Since the transmission of hepatitis B through saliva and gingival crevicular fluid (GCF) has been confirmed by various studies,<sup>13</sup> dental professionals are at risk of contracting this viral disease.

Whenever an operator accidentally experiences a needle prick injury, the first fear that comes to mind is being infected by

HIV. However, the risk of contracting HBV after a percutaneous injury ranges from 10% to 30%,<sup>14</sup> while the risk of HIV transmission has been estimated to be approximately 0.3%.<sup>15</sup> Because of this reason, a thorough knowledge about the prevention, transmission, and endemicity of HBV is of crucial value to all dentists. Therefore, this study aimed to assess the knowledge, attitude, and practice of dental interns regarding the hepatitis infection. It was found that the majority of the participants exhibited moderate knowledge score (71.4%) and negative attitude. However, the reported clinical practice behavior was good.

In the present study, there was a significantly larger number of women as compared to men due to the larger number of female students in dentistry. This was in line with the previous studies.<sup>8</sup> The percentage of immunized participants in the present study was 83.3% which was much higher as compared to a study by Kumar et al.<sup>16</sup> This higher percentage could be attributed to the fact that regular vaccination drives are conducted by the institution.

Compared to a study conducted by Jain et al.<sup>8</sup> on dental interns in Mumbai, India, where 43.56% of the participants had attended a CDE/CME program on hepatitis B, only 26.2% of the interns had attended a CDE/CME program on hepatitis B in the present survey. This low attendance could have various reasons such as availability of such programs and the participants' personal interest and motivation.

Regarding the level of knowledge of hepatitis B disease, the average percentage of correct responses was 62.14%. Considering the recency of their undergraduate study, the knowledge exhibited was fair.

**Table 5.** Correlation between different variables

Variables	Correlation coefficient	P
CDE program attendance on knowledge	0.047	0.670
Immunization status on knowledge	0.042	0.704
Knowledge on fear of getting infected	-0.016	0.883
Knowledge on attitude	-0.154	0.162

CDE: Continuing Dental Education

The incubation period of the disease was correctly stated by 44.04% of the interns and this percentage was higher as compared to a study by Pandharbale et al.<sup>11</sup>

It was found that 22.62% of the interns were aware that there were no prominent clinical features for hepatitis B in majority of the cases, which is lower compared to a study by Pandharbale et al.,<sup>11</sup> where only 46% of the undergraduate (UG) students were aware. In our study, 64.28% were aware of all the modes of transmission, which was lower when compared with the students in the study (83.55%) by Nagpal and Hegde.<sup>17</sup>

The majority of the interns (94.05%) were aware that hepatitis could be prevented with the aid of vaccine, which is a higher rate compared to that of a study by Tripathi et al.<sup>18</sup> on dental students in Bareilly, India, in which only 78.4% of the respondents answered this question correctly.

Moreover, 57.14% of the interns were aware of the immunization schedule for hepatitis B which is in line with a study conducted by Nagpal and Hegde.<sup>17</sup> on dental students in Mysuru, India (63.8%).

This study revealed that 22.6% of the students knew that India was an intermediate endemicity zone for hepatitis B infection, while 76.19% of the participants were aware that HBV was more infectious than HIV. This percentage is higher than the results of a study by Mahesh et al.<sup>7</sup> in Chennai, India, in which only 54.7% of the participants were aware of the higher infectivity of HBV.

Moreover, 82.14% of the interns were aware that post-exposure prophylaxis was available for hepatitis B, which is much higher (32%) than that reported in the study by Jain et al.<sup>8</sup>

Regarding the attitude of dental students toward hepatitis B-infected patients, 64.7% of the participants displayed positive attitude and 94% of them agreed that they had a moral duty to treat hepatitis B-infected patients.

An average percentage of 98.95% was calculated for the clinical practice behavior. One reason for the disparity in the various

sections of the survey could be that the protocols implemented by the institution were enforced on the students by the supervisors irrespective of the knowledge and attitude of the dental students. The high percentage of interns who received immunization (83.3%) can be attributed to the immunization camps held by the institution. Based on this survey, it can be inferred that there is a lack of understanding about the various aspects of hepatitis B infection.

Universal precautions include proper hand washing and the use of personal protective equipment such as gloves, face mask, head cap, gown, and face shield to reduce mucocutaneous exposures. Percutaneous transmission can be limited by following the scoop technique for recapping needles and the recommended protocol for sharps disposal. Indirect transmission of HBV can also occur through the dental instruments; hence, students need to receive training on the sterilization and disinfection of patient-care items. The dental students also need to be adequately immunized and their antibody titers against hepatitis B should be checked regularly.

Although the above-mentioned protocol is implemented by the institution, students need to have an understanding of infectious diseases and their transmission, so that they become motivated to continue to implement these protocols during their independent practice.

At the end of the study, the interns were given the correct responses by the operators and their misunderstanding regarding the virus was cleared up. The importance of universal precautions was emphasized. Those students who were not immunized were immediately referred for vaccination.

This study was conducted with certain limitations. First, only a single study population was considered, due to which a comparison could not be made. Moreover, since the percentage of the study population was skewed in favor of women (82.14%), the effect of gender on the variables of the survey could not be considered. Besides, due to the

nonrandom sampling, the results cannot necessarily be applied to the rest of dental students in India. However, the results of the study can be used as a baseline for enhancing the knowledge about infection control by conducting dental education programs.

### Conclusion

Although the majority of the interns in this study showed moderate knowledge and good clinical practice behavior, major improvements still need to be made with regard to the awareness of the disease itself as well as the

responsibility of all dentists to prevent cross-contamination and to do no harm. The findings of the present study highlight the necessity of motivating students with respect to infection control and education.

### Conflict of Interests

Authors have no conflict of interests.

### Acknowledgments

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