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Original Research

Knowledge, Attitude and Risk Perception towards Hepatitis B and Hepatitis C Infected Patients Among Dental Undergraduate Students in Dental Colleges in Maharashtra

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ABSTRACT:
Background: Hepatitis B and C pose significant occupational risks to dental professionals due to their blood-borne nature. Dental students, as future clinicians, must possess adequate knowledge and awareness to ensure safe practice and reduce stigma. **Aim:** To assess the knowledge, attitudes, and risk perceptions regarding hepatitis B and C among undergraduate dental students in Maharashtra, India. **Materials and Methods:** A cross-sectional survey was conducted among 308 dental undergraduate students across multiple colleges in Mumbai using a validated, self-administered questionnaire comprising 26 closed-ended items to evaluate five domains: sociodemographics, knowledge, attitude, risk perception, and self-assessment. Data were coded in Microsoft Excel 2010 and analyzed using SPSS version 22. Descriptive statistics were computed, and the Chi-square test was used to evaluate associations, with significance set at $p < 0.05$. **Results:** Most participants were female (75.9%) and aged 19–22 years (52.2%). Knowledge levels were generally satisfactory, with 94.8% identifying needle-stick injuries as a key transmission route and 91.5% aware of the availability of the hepatitis B vaccine. However, only 56.4% correctly recognized that no vaccine exists for hepatitis C. While 63.6% acknowledged a professional obligation to treat infected patients, 65.9% reported fear or hesitation. Risk perception was moderate, with 63.3% agreeing that all patients should be considered potentially infectious and 79.5% supporting mandatory workplace vaccination ($p < 0.05$). Notably, 91.5% expressed the need for additional training to enhance their competence in managing HBV/HCV-infected patients ($p < 0.05$). **Conclusion:** Dental undergraduates demonstrated good foundational knowledge, but notable gaps remain—particularly in understanding hepatitis C prevention and managing fear related to treating infected individuals. Strengthening infection control training and integrating hepatitis-related modules into the dental curriculum are recommended to enhance clinical safety and reduce stigma.
Keywords: Hepatitis B, Hepatitis C, Dental students, Knowledge, Attitude, Risk perception

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INTRODUCTION

Viral hepatitis has emerged as a major global health concern, with data from 187 countries underscoring its widespread burden. Hepatitis refers to liver inflammation caused by infectious viruses or non-infectious agents such as alcohol, toxins, medications, and autoimmune conditions. Among the five primary hepatitis viruses—hepatitis A (HAV), B (HBV), C (HCV), D (HDV), and E (HEV)—HBV and HCV are responsible for the majority of chronic infections and hepatitis-related mortality [1,2].

Despite the availability of effective vaccines and antiviral therapies, chronic HBV and HCV account for approximately 95% of hepatitis-related illnesses and premature deaths [3]. According to the World Health Organization (WHO), HBV ranks among the top ten causes of death globally, contributing to an estimated 500,000 to 1.2 million deaths annually due to complications such as cirrhosis and hepatocellular carcinoma [4,5], and in India itself, HBV prevalence ranges from 2% to 7%, making it a significant contributor to national morbidity and mortality [6].

Globally, over 304 million individuals are living with chronic HBV and HCV infections. Alarmingly, 86% of HBV and 64% of HCV cases remain undiagnosed, with only 3% and 20% of affected individuals, respectively, receiving appropriate treatment [7]. In 2022, chronic viral hepatitis B and C were responsible for approximately 1.3 million deaths—equivalent to nearly 3,500 deaths per day. Additionally, over 6,000 new infections occur daily [1]. Chronic HBV leads to liver disease in 15–20% of infected individuals, while 50% of HCV infections progress to chronicity, with 5–25% developing cirrhosis over 10–20 years [8].

HAV and HEV are primarily transmitted via the fecal-oral route and typically cause acute, self-limiting infections. In contrast, HBV and HCV are blood-borne pathogens transmitted through percutaneous or mucosal exposure to infected blood and bodily fluids [9]. These viruses pose a significant occupational hazard to healthcare professionals, including dental practitioners, due to the risk of transmission during clinical procedures [10–13].

Dental professionals are particularly vulnerable to blood-borne infections due to the nature of their work, which involves frequent exposure to saliva and blood. Despite adequate infection-control guidelines, inadequate knowledge and negative attitudes toward patients with HBV and HCV may compromise infection control practices and contribute to stigma. Therefore, assessing dental students' knowledge, attitudes, and risk perceptions is essential for designing targeted educational interventions and promoting safe clinical behaviors[14].Given the community-facing nature of dental practice, understanding students' preparedness is vital for infection control and stigma reduction.

Aim of the Study

This study aims to assess the knowledge, attitude, and risk perceptions regarding HBV and HCV infections among undergraduate dental students in Maharashtra, India.

MATERIALS AND METHODS

Study Design and Setting

This observational cross-sectional study was conducted across multiple dental colleges in Maharashtra, India and targeted dental undergraduates enrolled in first year, second year, third year, final year, and internship programs.

Study Population and Sampling

A convenience sampling method was adopted, wherein all students eligible for and present during data collection period were approached and invited to participate. A total of 308 valid responses were obtained and included in the final analysis.

Inclusion criteria

- BDS students enrolled in the first year, second year, third year, final year, or internship;
- those willing to participate and provide consent.

Exclusion criteria

- students who declined participation;
- questionnaires that were incomplete or left blank.

Questionnaire development and validation

A structured, self-administered English questionnaire comprising 26 closed-ended items was used to collect data. The questionnaire was developed based on existing literature and expert input, and was divided into five sections:

Part 1: Sociodemographic details (age, gender, year of study)

Part 2: Knowledge regarding causes, transmission routes, and prevention of HBV and HCV

Part 3: Attitudes toward patients infected with HBV and HCV

Part 4: Risk perception associated with treating hepatitis-infected patients

Part 5: Self-reflection and self-evaluation of personal beliefs and clinical preparedness.

The questionnaire was validated by senior faculty members from Periodontology, Oral Surgery, and Orthodontics. Minor revisions in wording and sequence were incorporated based on their feedback to improve clarity and relevance.

Data Collection

The questionnaire was administered as a self-completed survey, provided either electronically via Google Forms or as printed copies distributed during scheduled teaching sessions, depending on logistical feasibility. The first page included a brief study description and an informed consent statement, and only students who provided consent proceeded to complete the questionnaire.

Ethical Considerations

Participation was voluntary, and confidentiality of responses was maintained throughout the study.

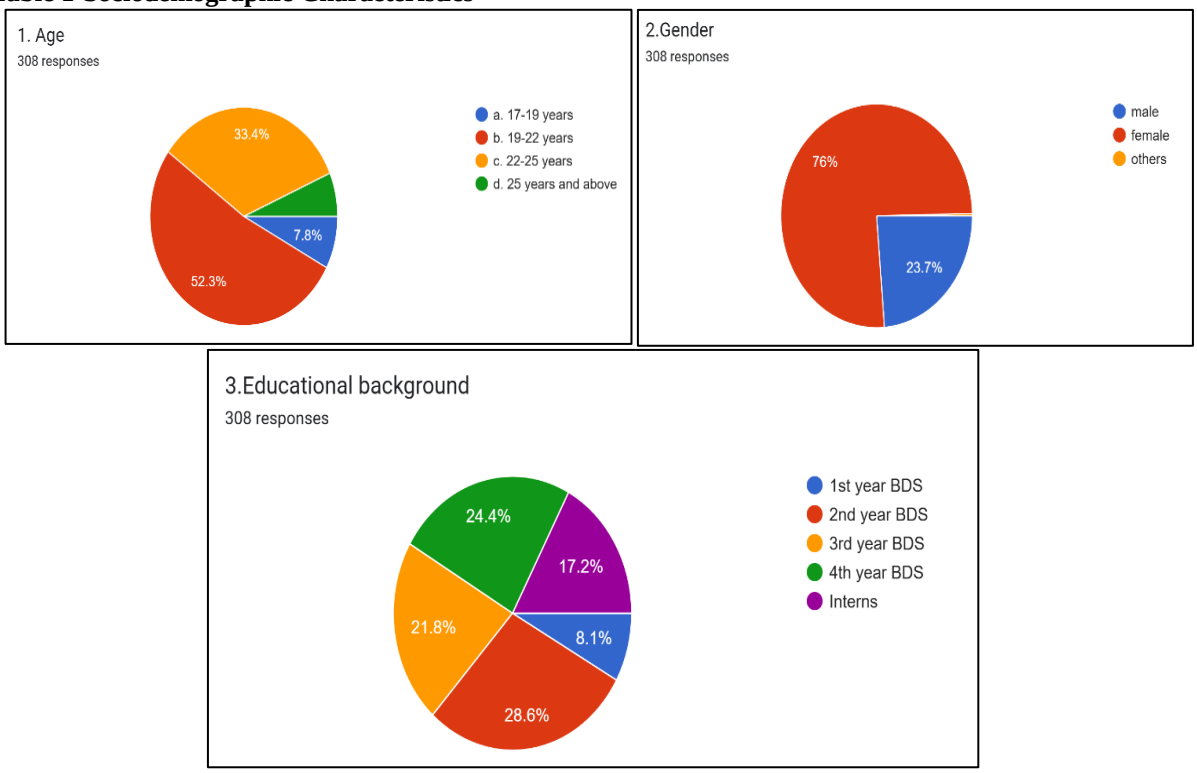
Data Analysis

Collected responses were entered in Microsoft Office Excel 2010, checked for completeness and consistency and were analysed using SPSS software (version 22). Descriptive statistics, including frequencies and percentages, were generated for qualitative variables. The significance level was set at

p < 0.05, and the Chi-square test was applied to compare associations between study parameters.

RESULTS

Table 1-Sociodemographic Characteristics



Sociodemographic Characteristics – Table 1 shows a total of 308 undergraduate dental students participated in the study. The majority were aged between 19–22 years (52.2%), followed by 22–25 years (33.4%). Female participants constituted 75.9% of the sample, while males accounted for 23.7%. Distribution across academic levels showed the highest representation from second-year students (28.5%), followed by fourth-year students (24.3%) and third-year students (21.7%).

Table 2-Knowledge of HBV and HCV

	Yes n/N (%)	**P value**
1.Have you ever heard about viral hepatitis disease?	**277/308 (89.9%)**	**p=0.004***
2.Can HBV/HCV be spread through social contact? (e g. Shaking hands, sharing food, sneezing)	**110/308 (35.7%)**	**p=0.218 (NS)**
3.Can a needle prick injury transmit HBV/HCV infection?	**292/308 (94.8%)**	**p=0.002***
4.Can aerosols produced from a dental handpiece be a vehicle for transmission of HBV/HCV?	**239/308 (77.5%)**	**p=0.026***
5.Is hepatitis C vaccine available?	**174/308 (56.4%)**	**p=0.873 (NS)**
6. Is hepatitis B vaccine available?	**282/308 (91.5%)**	**p=0.003***
7. Do you know that HBV/HCV infection can also cause death if left untreated?	**281/308 (91.2%)**	**p=0.003***

*NS – Not significant; *p<0.05 – significant

Knowledge of HBV and HCV-Table 2 shows most participants (89.9%) were aware of viral hepatitis. High awareness was observed regarding transmission through needle-stick injuries (94.8%) and availability of the hepatitis B vaccine (91.5%). However, only 56.4% were aware that no vaccine exists for hepatitis C. Significant

associations ($p < 0.05$) were found for knowledge of transmission via aerosols, availability of HBV vaccine, and fatality risk of untreated infections.

Table 3-Attitudes Toward HBV/HCV-Infected Patients

	Agreement Level n/N (%)	P value
1.Irrespective of the infection status, dentists have a professional obligation to treat patients with HBV/ HCV	**196/308 (63.6%)**	**p=0.561 (NS)**
2. The fear among dentists toward patients with hepatitis can be a hindrance in providing optimum dental care to those patients.	**203/308 (65.9%)**	**p=0.422 (NS)**
3. The dental instruments that have been used to treat HBV/HCV patients should be sterilized separately	**240/308 (77.9%)**	**p=0.011***
4. HBV and HCV is a serious public health problem and should not be underestimated.	**250/308 (81.1%)**	**p=0.008***

*NS – Not significant; *p<0.05 – significant

In table 3 regarding Attitudes Toward HBV/HCV-Infected Patients; While 63.6% agreed that dentists have a professional obligation to treat infected patients, 65.9% acknowledged that fear may hinder optimal care. A significant proportion (81.1%) recognized HBV/HCV as serious public health concerns. Notably, 77.9% supported separate sterilization of instruments used on infected patients ($p = 0.011$).

Table 4-Risk Perception (Agreement level)

	Agreement Level n/N (%)	P value
1.All patients should be considered potentially HBV/HCV infected	**195/308 (63.3%)**	**p=0.781 (NS)**
2.A clinician or a dentist who is HBV/HCV positive should not treat a healthy non hepatitis patient.	**113/308 (36.6%)**	**p=0.461 (NS)**
3. Standard personal protective equipment (PPE kit-gloves, mask, glasses, headcap etc) provides sufficient safety against accidental transmission of HBV/HCV infection.	**214/308 (69.4%)**	**p=0.214 (NS)**
4.HBV vaccine should be given to dentist and dental students as part of work place safety.	**245/308 (79.5%)**	**p=0.047***

*NS – Not significant; *p<0.05 – significant

Approximately 63.3% believed all patients should be considered potentially infected. While 69.4% felt standard PPE provides sufficient protection, only 36.6% agreed that HBV/HCV-positive clinicians should refrain from treating healthy patients. A significant association was found regarding the need for HBV vaccination as part of workplace safety ($p = 0.047$).(Table 4)

Part 5-Self-Evaluation

	Yes n/N (%)	P value
1.Do you feel competent to treat patients infected with HBV/HCV?	**221/308 (71.7%)**	**p=0.137 (NS)**
2.Do you think there is a need for further theoretical and practical education on the dental treatment of patients with HBV/HCV?	**282/308 (91.5%)**	**p=0.011***
3.I would be hesitant to continue dental treatment of my long term patient if he/she became infected with HBV/HCV ".	**149/308 (48.3%)**	**p = 0.241 (NS)**

*NS – Not significant; *p<0.05 – significant

When it came to self-evaluation (Table 5), most students (71.7%) felt competent to treat HBV/HCV-infected patients, yet 91.5% expressed a need for further theoretical and practical education ($p = 0.011$). Nearly half (48.3%) admitted hesitancy in continuing treatment for long-term patients who became infected.

DISCUSSION

This study assessed the knowledge, attitudes, and risk perceptions of clinical dental students in Maharashtra regarding hepatitis B and C infections. The findings reveal a generally high level of awareness about transmission routes and vaccine availability, yet notable gaps persist in understanding hepatitis C prevention and in attitudes toward infected patients.

The majority of participants correctly identified needle-stick injuries as a major transmission route and were aware of the availability of the hepatitis B vaccine. However, only 56.4% recognized that no vaccine exists for hepatitis C, indicating a critical gap

in knowledge that could affect clinical decision-making. Similar findings have been reported in previous studies among dental students in India and Southeast Asia, where knowledge about hepatitis C remains comparatively lower than hepatitis B [6,10].

Attitudinal responses revealed a tension between professional responsibility and perceived risk. While 63.6% of students agreed that dentists have an obligation to treat HBV/HCV-infected patients, 65.9% admitted that fear may compromise care. This highlights the need for structured sensitization and training programs that address both ethical obligations and emotional responses. Studies by McCarthy et al. and Rajamoorthy et al. have similarly emphasized the role of stigma and fear in shaping clinical attitudes [11,14].

Risk perception was high, with 63.3% of students believing that all patients should be considered potentially infected. Although this reflects a cautious approach, it also underscores the importance of universal precautions and consistent use of personal protective equipment (PPE). The finding that only 36.6% supported HBV/HCV-positive clinicians treating healthy patients suggests lingering misconceptions and stigma, which could be addressed through curriculum reform and peer-led workshops.

Self-evaluation responses were encouraging, with 71.7% of students expressing confidence in treating infected patients. However, the overwhelming majority (91.5%) indicated a need for further theoretical and practical education. This aligns with global recommendations advocating for enhanced infection control training in undergraduate dental curricula [1,7].

Therefore, enhancing the curriculum with focused modules on blood-borne pathogens, stigma reduction, and ethical care responsibilities, coupled with the incorporation of simulation-based training such as role-playing and clinical scenarios to strengthen competence and confidence, along with institutional policies mandating HBV vaccination and regular updates on infection-control protocols, can collectively improve students' attitudes and preparedness, ultimately contributing to safer community dental practices and reducing the risk of disease transmission.

Limitations

This study was limited to dental colleges in Maharashtra and may not reflect perceptions in other regions. Additionally, the use of self-reported data may introduce social desirability bias, and the convenience sampling approach may limit the generalizability of the findings.

CONCLUSION

Dental undergraduate students in Maharashtra show satisfactory knowledge of HBV/HCV, however, significant gaps remain in their understanding of hepatitis C prevention and in their attitudes toward infected patients. The presence of fear and stigma, despite professional awareness, underscores the need for targeted educational interventions.

Strengthening infection control training, promoting universal precautions, and integrating ethical and psychosocial dimensions into the dental curriculum are essential to prepare future practitioners for safe and compassionate care and addressing these gaps through curriculum reform and sensitization efforts will be critical in shaping a clinically competent and ethically grounded dental workforce.

Conflict of Interest

The authors declare no conflict of interest related to this study.

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