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Assessment of Knowledge, Attitude and Preventive Practice regarding Hepatitis B Infection among Dental Students at Khyber College of Dentistry: A Cross-Sectional Study

Hafsa Rehman, Amna Amjad*, Tahira Hina Khalid, Samaviya Urfan

Under Graduate Students- Khyber College of Dentistry, *Corresponding Author

Background: Hepatitis B is a highly contagious disease with a high prevalence in developing countries like Pakistan. Dentists are at an increased risk of acquiring Hepatitis B Virus (HBV) infection due to the nature of their work and their lack of knowledge regarding proper cross-infection control.
Objective: To assess knowledge, attitude, and preventive practices regarding HBV infection among Dental Students (DS) at Khyber College of Dentistry (KCD) and to determine the vaccination status of DS against HBV.
Methods: A descriptive cross-sectional study was conducted at KCD from August 2023 to September 2023. A self-administered questionnaire was distributed among 177 students of all clinical years, i.e., 3rd year, 4th year, and interns, to collect data. Modified Bloom's cutoff was used to assess the level of KAP. The data was analyzed using SPSS version 25.
Results: Out of 152 subjects, 61 (40.1%) were male and 91 (59.9%) were female. The majority of the participants had adequate knowledge (57.9%), a positive attitude (74%), and a medium level of practice (67.8%) against HBV. However, only half (50%) of the participants had proper knowledge about post-exposure protocol, and the majority (62.5%) of the participants were not vaccinated against HBV.
Conclusion: Overall knowledge was adequate, attitude was found to be positive, and a medium level of preventive practice was observed against HBV infection. HBV vaccination programs must be made mandatory in dental institutes, as the majority of participants were not vaccinated against HBV despite the high risk.

Keywords: Hepatitis: Dentistry: Preventive Practice; Attitude: HBV

INTRODUCTION

The 10th largest cause of mortality globally is hepatitis B infection, which is a serious health risk (1). Public health professionals refer to hepatitis B as the "silent killer" and the "silent epidemic" because it can be fatal and is brought on by exposure to the Hepatitis B Virus (HBV), which can cause cirrhosis, liver cancer, or liver failure in those who are persistently infected (2) .

According to estimates from the World Health Organization, 2 billion people worldwide have HBV infection. The majority of body fluids, including blood, serum, saliva, serous exudates, semen, and vaginal fluid all may contain high concentrations of this virus. Unprotected sexual contact, blood transfusions, reuse of contaminated needles and syringes, and vertical transfer from mother to child during childbirth are among the possible transmission routes (2) .

Percutaneous and mucosal exposure to infectious blood or body fluids of a person with either acute or chronic Hepatitis B is the main method of transmission for the HBV (3,4). After a needle injury to a non-immune person, there is a 6% to 30% risk of contracting Hepatitis B, according to estimates (4). HBV is a DNA virus that is a member of the hepadnaviridae family. The virus has partly double-stranded DNA and the hepatitis B surface antigen, which is the primary diagnostic antigen for infection, surrounds its core antigen (5).

Students studying medicine, dentistry, and nursing are more susceptible to infectious diseases since they interact with patients and deal with blood transfusions, surgical equipment, and injections (1). During their training as health professionals, health care workers were observed to have the highest occupational risk of HBV infection, and the incidence of this virus among them has been estimated to be 2-4 times higher than that of the general population (2). By observing basic precautionary measures and getting vaccinated are the cornerstones of HBV transmission prevention. The use of personal protective equipment (gloves, gowns, goggles, and a cap) as well as practices like adequate sharps disposal and hand cleanliness are considered standard precautions (6).

Due to the increased risk of infection among dental students, it is crucial to prevent the spread of the Hepatitis B virus in dental practices. Dental students should be aware of the dangers associated

with performing dental treatments and take the necessary precautions to stop the spread of this illness by the aid of preventative measures to control the condition. Patients and dentists will be protected from unintentional transmission of this disease through dental education that places a specific emphasis on infection control procedures (7) .

By following the right vaccination procedures, hepatitis B infection can be avoided. All medical personnel are required to receive the hepatitis B vaccine as part of their work safety requirements and to wear personal protective equipment (PPE) (1) . To boost the formation of anti-HB antibodies, vaccination should be administered in three doses, with a month interval between the first and second dosage and a six-month interval between the first and third dose (8) . The vaccine is 95% effective in preventing infection and the development of chronic disease and liver cancer due to HBV (3) .

Hence, the primary objective of this study was to determine the level of knowledge, attitude and practice (KAP) regarding HBV infection and the secondary objective was to determine vaccination status of undergraduate dental students in an institution-based study.

MATERIAL & METHODS

A descriptive cross-sectional, questionnaire-based study was conducted from August 2023 to September 2023 in Khyber College of Dentistry (KCD), Peshawar, Pakistan. Ethical Approval for the study was obtained before conducting the study from the institutional research and ethical review board (IREB) of KCD vide letter number 44/ADR/KCD dated 03-08-2023.

Survey instrument: Based on existing literature, a close-ended self-structured questionnaire was prepared in English (3,5,9) .

The questionnaire consisted of four sections:

Section A: Sociodemographic characteristics including gender and year of study

***Section B*:** Consisted of 10 questions to assess the knowledge regarding HBV Infection. This section had a total score of 20 with a score of 2 points for right answer, 0 points for wrong answer and 1 point for an unsure response. A score of 16 or above signified good knowledge.

Section C: Consisted of 5 questions related to attitude towards HBV Infection with a total score of 10 points with the same point scheme as in section B. A score of 8 or more was indicated positive attitude.

Section D: Consisted of 7 questions about preventive measures taken against HBV Infection. This section had a total score of 13 points with right answer of 1 point and a wrong answer of 0 points score. A score of 10 or more was considered to indicate good preventive practice behavior.

To assess the level of KAP, modified Bloom's Cutoff was used where a score of 80-100% of correct responses meant a good KAP, a score of 50-79% was of a medium level KAP and a score less than 50% of the correct responses denoted poor KAP. Modified Bloom's cut off was adopted from Chand et al. knowledge ,attitude and practice study (10,11) .

The researcher carried out the data collection by distributing the questionnaires in the lecture halls and wards. Informed consent was also taken before the distribution of the questionnaires and the responses were kept anonymous by not collecting any identifying information of the participants.

Data Collection:

A total of 177 students were approached out of which 152 agreed to participate in the study, with a response rate of 85.8%. The sample size was calculated using OpenEpi software by taking margin of error 4% and 95% confidence interval. A convenience sampling method was used for the study. It is a type of non-probability sampling. The cross-sectional study was conducted among dental students of all clinical years i.e., third year, fourth-year students and House officers. First and second-year students as well as those with incomplete questionnaires were excluded from the study.

Pilot Study: A Pilot Study was conducted among 40 students to test the validity and reliability of the questionnaire. Validity was acceptable with Cronbach alpha values of 0.711(knowledge), 0.642 (Attitude) and 0.611 (preventive practices). Face validity by 8 public health specialties was also used to validate the questionnaire.

Statistical Analysis: IBMSPSS (Statistical Package for Social Studies version 24.0, Chicago II, and USA) was used for data entry and analysis. Descriptive statistics were used to report frequencies and proportions of categorical data. Continuous data was expressed as Mean and SD in case of normally distributed data and median and range was used for non-normally distributed data. The normality of continuous variables was checked using the Kolmogorov-Smirnov test. Kruskal-Wallis test and Mann-Whitney U were used for determining significant differences between groups. A Spearman Correlation coefficient was used to evaluate correlation between scales. A p value of less than 0.05 was considered statistically significant.

RESULTS

A total of 152 students filled up the questionnaire. Out of 152 participants, 91(59.9 %) were females and 61(40.1%) were males. Among the study group, 82 students were from 3rd year BDS, 56 from 4th year BDS and 14 house officers. (**Table 1**).

Table 1: **Sociodemographic characteristics of participants**

	No. of students	% of Students
Year of Study		
3rd year	83	54.6
4th Year	55	36.19
Interns	14	9.21
Gender		
Female	91	59.9
Male	61	40.1
Total	152	100

Knowledge of HBV Infection: Knowledge regarding HBV infection was assessed by 10 questions that were scored in the range of 1 to 20. Participants with scores above 10 (49%) were considered to have adequate knowledge whereas those having knowledge above 16 (79%) were considered to have good knowledge. Out of 152 participants, 57.9% had adequate knowledge whereas 37.5% had good knowledge but still only 50% of the participants had proper knowledge about post exposure prophylaxis protocol. Only 4.6% of the participants were found to have poor knowledge regarding HBV infection. The overall median knowledge score was 16. There was no statistically significant difference between the mean rank scores of knowledge among 3rd year, 4th year and Final year students and also between male and female (p> 0.05) (**Table *2***).

Table 2: Difference in knowledge, attitude and practice among different study groups and genders

	Knowledge (Mean Ranks)	p value	**Attitude** (Mean Ranks)	p value	**Preventive Practices** (Mean Ranks)	p value	**Test Applied**
Year of Study							
3rd Year	71.01	0.285	70.46	0.019	62.83	0.001	Kruskal-Wallis Test
4th Year	82.89		79.40		87.12		
Interns	78.18		100.89		115.82		
Gender							
Male	73.19	0.518	74.15	0.539	71.83	0.278	Mann Whitney U test
Female	77.85		78.08		79.63		

Attitude towards HBV Infection: The median attitude score of the participants towards treatment of HBV infected patients was 10. Out of 152 participants, 22.4% had acceptable attitude, majority of the participants i.e. 74.30% had positive attitude towards treating HBV infected patients and 3.3% had unacceptable or poor attitude. A statistically significant difference (p<0.05) was found among the mean rank scores of participants of different education levels with house officers having

comparatively higher mean rank score than to 3rd and 4th year students but no significant difference was found for gender (**Table *2***).

Preventive Practice against HBV Infection: The overall median score for preventive practice was 8. Majority (67.8%) of the participants observed medium level of preventive practice, 14.4% had a good and 17.8% had poor preventive practice behaviors against HBV infected patients. A statistically significant difference ($p<0.05$) was found among participants of different education levels. House officers had the highest preventive practice mean rank score compared to 3rd year and 4th year students. As in the case of knowledge and attitude, no statistically significant difference was found between mean rank scores of males and female (Table 2). One alarming observation was that only 37.5% of the participants were vaccinated against HBV despite high risk.

Correlation Analysis: There was a statistically significant correlation of knowledge with both attitude and practice. Knowledge had a weak positive correlation with attitude (r=0.286, P=0.001) and practice (r=0.238, P=0.003). Also, a statistically significant but weak correlation was found between attitude and practice (r=0.285, P=0.001) (**Table *3***).

Table 3: Correlation of Knowledge, Attitude and Preventive Practice

	r-Pearson	p value
Knowledge vs Attitude	0.286	0.001
Knowledge vs Preventive Practice	0.238	0.003
Attitude vs Preventive Practice	0.285	0.001

DISCUSSION

The main aim if this study was to assess knowledge, attitude and preventive practice (KAP) of dental students regarding hepatitis B infection and to compare them across different academic

levels and genders. We used a cross-sectional survey with a self-administered questionnaire to collect data from 152 dental students at a public dental college in Pakistan

Our study found that the overall KAP of dental students regarding Hepatitis B infection was satisfactory with adequate knowledge, a positive attitude and medium level of preventive practice. In our study, a significant percentage showed adequate knowledge however, improvements are needed in some areas. The level of knowledge obtained in this study was is in accordance with other studies conducted in Saudi Arabia, Ghana, and Pakistan (9,12,13) .Furthermore, 95.4 % of the participants agreed that dentists are more susceptible to Hepatitis B virus due to the nature of their profession. This shows a high level of awareness and concern among dental students about occupational risk of hepatitis B infection.

Our results yielded that dental students had a positive attitude toward treating hepatitis B patients which was in accordance to studies conducted by Asad et al (14) and Nutt et al (15) .On the contrary, other studies revealed poor attitude (9,16).A positive attitude proves to improve the doctor-patient relationship and also helps in a smooth treatment flow. In a comparative study done ,dental students had a positive attitude towards hepatitis B patients compared to medical and nursing students (14) .

The preventive practice level was medium despite a positive attitude where only 14.5 % of the participants had good preventive level practice and comparatively interns had better preventive practice which can be obvious due to their work experience level and more clinical practice. Our results also showed that 92.8 % of the students examined patient blood reports for contagious infections before treatment.

According to CDC guidelines, healthcare workers are instructed to follow proper Personal Protective equipment protocol (PPE) while treating hepatitis B patients which includes face mask, double gloves, protective eyewear/eye shields and surgical mask. While in this study surgical gowns and protective eyewear were the least used PPE by dental students during treatments, double gloves were the most common form of PPE.

The findings of the present study indicated a low level of vaccination status. Only 37.5 % of the students were vaccinated against all three doses of HBV virus which is alarming compared to studies done in other parts of Pakistan where a higher percentage of vaccination status was recorded (13) .Immunization against Hepatitis B is recommended for all adults over the age of 18 years who are at a high risk against hepatitis B infection by the Advisory Committee on Immunization Practices (ACIP) (17). There was a big gap between the vaccination knowledge and vaccination practice where 86.2 % of students knew vaccination is a step toward preventing hepatitis B infection .A high rate of HBV vaccination was recorded in studies conducted in developed countries in North America and Middle East (18,19) This discrepancy can be due to the availability of free immunization programs by the governments.

The findings reveal several important insights that have implications for both the dental education curriculum and public health initiatives in Pakistan .They suggest that dental students have a positive attitude towards treating hepatitis B patients , which is essential for providing quality care and reducing stigma and discrimination against infected patients .However ,they also reveal a low level of vaccination status among dental students which poses a serious threat to their health and safety .Therefore it is recommended that dental colleges should implement mandatory vaccination programs for all dental students and staff ,as well as provide regular screening and counseling services for hepatitis B infection .

Based on these results, it is recommended that future research should explore the factors that influence KAP among dental students regarding hepatitis B infection using longitudinal or experimental study designs. It is suggested that dental colleges should collaborate with public health authorities to implement effective educational interventions and policies to improve knowledge, attitude and preventive practice among dental students regarding hepatitis B infection

However, this study also had some limitations that need to be considered when interpreting and applying the results .First, the study's cross-sectional design does not allow us to establish causal relationship between KAP and hepatitis B infection .Second, the self-administered questionnaire may introduce social desirability bias or recall bias among the participants .Third ,the sample size and selection may limit the representativeness and generalizability of the results to other dental

students .Fourth , the questionnaire did not measure some important factors that may influence KAP such as peer influences , cultural beliefs and personal experiences .These limitation may affect the accuracy or applicability of our findings and recommendations .

CONCLUSION

In conclusion, this research underscores the importance of awareness, vaccination, and proper practices in preventing Hepatitis B transmission. It emphasizes the need for targeted education and training for dental students to ensure their safety and the well-being of patients. This study also highlights the gap between policies and their proper implementation as vaccination against HBV is mandatory for dental and medical students but still very few participants were vaccinated against HBV. By improving knowledge, attitude, and preventive practices, healthcare professionals can contribute to the reduction of Hepatitis B's impact on public health.

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