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Knowledge, Attitude and Practice of Dental Students and Graduated Dentists Regarding Patients with Hepatitis B and C Infections in Islamabad and Rawalpindi, Pakistan

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ABSTRACT

Objective: Hepatitis B and C viruses (HBV, HCV) may cause potentially lethal liver infections. It is estimated that approximately 5 million people are affected by HBV while 10 million have HCV in Pakistan. This study aimed to assess the knowledge, attitude and practices of dental students and dentists towards Hepatitis B and C infected patients in their day-to-day practice.

Materials and Methods: A cross-sectional study design was used to distribute self-administered questionnaires to dental students, house officers, postgraduate residents and general dentists working in dental colleges across Rawalpindi and Islamabad (N = 357). The answers to the 18-item questionnaire were recorded in SPSS version 22. Chi-square test and independent t-test were applied. A value of $p < 0.05$ was considered statistically significant.

Results: The attitude, knowledge and practice between 'students' (third year and final year students) and 'graduated dentists' (house officers, postgraduate trainees and general dentists) were compared. It was found that both groups had a good attitude. The respondents did not perform optimally in the knowledge section however the responses between the two groups showed no significant statistical difference, they were mostly incorrect, nevertheless. The practice-based section also showed the inadequacy of the two groups.

Conclusion: The present study revealed that the participants had a good perception of attitude towards patients with hepatitis. However, the knowledge of our participants regarding the infection was suboptimal indicating the need to revise our undergraduate curriculum and approach to practice also needs to be improved demanding more emphasis on clinical teaching.

Keywords: Attitude, Dentist, Hepatitis, KAP Study, Knowledge, Practice

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INTRODUCTION

Hepatitis B and C viruses (HBV, HCV) cause potentially lethal liver infections. It is estimated that approximately 12 million people are affected by HBV/HCV in Pakistan.[1] Another study conducted in Punjab documented overall prevalence for HBV and HCV to be 8.4% and 42.7%, respectively.[2] These rates are aggressively increasing due to insufficient implementation of infection control protocols in the country; inadequate sterilization of medical instruments and equipment, infected needle injuries, use of unscreened blood.[3]

The occupational transmission of the infection is a serious concern in health care workers (HCWs), which includes dental practitioners and auxiliary staff.[3] There have been instances where dentists have refused treatment of infected individuals. A study from Saudi Arabia showed a negative attitude of dental students and interns towards the HBV patients.[4] Similarly, a study from Poland demonstrated that over 25% of dentists did not provide care to individuals infected with blood-borne pathogens.[5] Although the practice of denying treatment to infected individuals is common, it is unethical and prohibited by the Code of Ethics of the Pakistan Medical and Dental Council.[6]

To minimize cross-infection in dental clinics, preventive guidelines have been issued by professional health agencies, such as the Centers for Disease Control and Prevention (CDC). These guidelines encourage awareness of health care workers, vaccines, proper hand hygiene, gloves, masks, face and eye shields and proper sterilization and disinfection protocols.[7,8]

Despite the availability of universal protocols, only a few dentists incorporate them in their dental practice. There is limited literature available on the topic from Pakistan. A study conducted at CMH Lahore Medical College demonstrated that the knowledge of dental students was suboptimal about hepatitis. Over 60.3% of these students were uncomfortable treating infected patients because they felt inadequately trained to protect themselves.[9] Khurram et al conducted a study in 2020 showing that only 44% of participants had an adequate attitude towards hepatitis B infected patients.[10]

This study aims to assess the knowledge, and attitude of dental students, practising dentists in dental colleges of Islamabad and Rawalpindi towards HBV and HCV infections. The objective is to identify the deficiencies related to patient management in the training of dentists of the respective area.

MATERIALS AND METHODS

This cross-sectional study was designed to assess the knowledge, attitude and practice of dentists and dental students in teaching hospitals across Islamabad and Rawalpindi. Ethical approval was obtained from the Ethical Review Board at Riphah International University before the initiation of data collection [Ref. No. IIDC/IRC/2019/04/001]. This study was conducted for four months between June-September 2019. Consent to fill in the questionnaire was taken verbally from dental students and dentists working in the clinical departments of the dental colleges; Islamic International Dental College and Hospital (IIDH), Pakistan Institute of Medical Sciences (PIMS), Margalla Institute of Health Sciences (MIHS), Armed Forces Institute of Dentistry (AFID), Islamabad Medical and Dental College (IMDC), Rawal Institute of Health Sciences (RIHS) and HBS Medical and Dental College. Third and final year dental students, house officers, postgraduate trainees, and practising dentists

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were included in the sample. Dentists not in clinical practice, or reluctant in filling in the questionnaire were excluded. The sample size was calculated using the World Health Organization sample size calculator, which generated a sample size of 357. The participants were recruited through the convenience sampling technique.

A self-administered questionnaire was used as an evaluation tool. The questions were designed to assess the knowledge, attitude and practice. A total of 18 questions were included. The final draft of the questionnaire was pilot tested on a group of 10 dentists at variable phases of their careers. On their recommendation 7 questions were clarified, 2 questions were added, and the questionnaire was reformatted to choose the best option. Thus, the content of the questionnaire was validated. The reliability test Cronbach's alpha was also calculated to analyze the reliability of the items of the questionnaire. During sample collection, the objective of the research was explained to potential participants. The filled forms were then taken, and the data was entered on SPSS version 22.

Descriptive analysis was done for the age of the participants. Frequencies and percentages were calculated for gender and the responses of the participants to measure the extent of adequacy of the responses. Chi-square test was implemented on categorical variables of the questionnaire to compare the adequacy of knowledge, attitude and practice among the two sorted groups of participants which were students (third year and final year students) and graduated dentists (house officers, postgraduate trainees and general dentists). An Independent t-test was applied for certain questions regarding the transmission of both the infections as these questions contained continuous variables.

RESULTS

A total of 357 responses were recorded on the SPSS data sheet as per the calculated sample size. Out of these 357 participants, 91 (25.5%) were male while 263 (73.7%) were females. A mean age of 23.10±3.56 years was recorded. The minimum age of the participant was 19 while the maximum was 45 years.

Third-year dental students were the most responders in our study sample, they comprised 40.3% (n=144), while the fourth-year student was 29% (n=103) of the sample. House Officer/Internee were 13.8% (n=49), postgraduate trainees were 10% (n=36) and while the general dentists were 6.5% (n=23) of the sample population as shown in Figure 1.

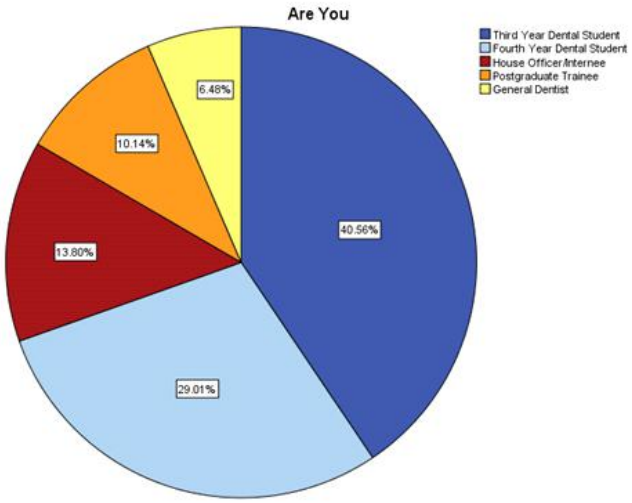

Figure 1: Distribution of the study participants

Participants were divided into two groups comprising 69.86% students (third year and final year students) and 30.14% graduated dentists (house officers, postgraduate trainees, and general dentists).

To assess knowledge, we calculated the percentages of the responses and used a chi-square test to distinguish between the two groups of participants. By evaluating the percentages, it was revealed that participants do not harbour adequate knowledge regarding the infections under study as only 19.35% of students and 23.36% of dentists had adequate knowledge about the hepatitis B and C infections. Despite inadequate knowledge, no significant difference in the responses of the two groups was noted except for the source of information for cross-infection as shown in Table 1.

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Table 1: Responses of dental students and graduated dentists for the knowledge section using chi-square test

No.	Questions		Students (Percentage)	Dentists (Percentage)	*p*-value
1	**How Hep B and C can be transmitted in the dental setup?**	**Only blood**	31.00	26.17	0.148
		Blood & saliva	67.74	69.16	
		Only saliva	0.04	0	
		Aerosols	0.04	2.80	
2	**Were you taught in detail and efficiently about the clinical aspects of Hep B and C at the undergrad level?**	**Yes**	75.00	66.36	0.095
		No	25.00	33.64	
3	**Do you think your knowledge about Hep B and C is adequate?**	**Yes**	19.35	23.36	0.069
		No	29.44	17.76	
		Fair	51.21	58.88	
4	**From where did you learn about the cross-infection protocols you follow in your practice?**	**Teacher**	77.41	60.74	**0.001**
		Senior	4.03	2.80	
		Friend	2.02	0.93	
		Internet	6.05	10.28	
		Books	10.48	17.76	

The majority of the participants, 16.5% mentioned that 90% of transmission of HBV takes place through blood while 13.5% of participants said that 20% transmission occurs through saliva. Similarly, the majority of the participants 14.9% were sure that 90% of the transmission of HCV occurs through blood and only 12.6% knew that 0% transmission happens through saliva in this case. By applying an independent t-test on the questions regarding the rate of transmission of HBV and HCV through blood and saliva, a statistically significant difference was seen between the students and the dentists in the transmission of HBV through blood (p=0.05). While the p-value for transmission of HBV through saliva was 0.121, the transmission of HCV through saliva was 0.539 and transmission of HCV through blood was 0.550 yielding a non-significant difference between students and dentists.

Attitude assessment was done through a series of questions. The first one asked if the dentist should deny treatment to a known infected individual if given an opportunity. The majority of the participants, 245 (69%) were in favour of treating infectious patients. In general, 162 (45%) participants were hesitant in treating HBV and HCV patients. 39.19% of students and 25.53% dentists said that their hesitation was stemmed from a fear of needle stick injuries. About 92% of our respondents said that they would continue treatment even if their longtime patient suffers from HBV or HCV, fortifying their duties as healthcare representatives. There were 304 (85%) respondents that recognized their ethical obligation to treat HBV and HCV infected patients. There were 225 (63%) participants that believed that an infected dentist should no longer practice. When the Chi-square test was applied to compare the attitude of students and dentists, the statistically significant difference was only revealed for hesitation in treating hepatitis patients with the students being more hesitant 50.40% as compared to the dentists 34.58% (p=0.006) as shown in Table 2.

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Table 2: Responses of dental students and graduated dentists for the attitude section using chi-square test

No.	Questions		Students (Percentage)	Dentists (Percentage)	*p*-value
1	**Do you think that dentists should have the opportunity to refuse to treat patients with HBV and HCV?**	**Yes**	27.02	18.69	0.154
		No	65.32	75.70	
		Don't Know	7.66	5.61	
2	**Do you hesitate in treating a patient with Hep B or C?**	**Yes**	50.40	34.58	**0.006**
		No	49.60	65.42	
3	**Why do you hesitate in providing treatment to Hep B and C patients?**	**Not confident about standard protocols**	14.19	25.53	0.117
		Fear of being infected	31.76	27.66	
		Needle prick injury	39.19	25.53	
		Anxious about transmission risk	7.43	4.26	
		Poor sterilization	6.08	14.89	
4	**If you found out that your longtime patient had HBV and HCV, would you stop treating him?**	**Yes**	6.85	12.15	0.100
		No	93.15	87.85	
5	**Are you ethically/ morally responsible to treat a Hep B-positive patient?**	**Yes**	86.29	84.11	0.503
		No	6.05	4.67	
		Don't Know	7.66	11.22	
6	**Do you think the health care professional who has become Hep B or C positive should be discouraged to practice dentistry?**	**Yes**	36.69	37.38	0.902
		No	63.31	62.62	

The attitude of the participants towards HBV and HCV patients was very positive as the majority of them was willing to treat patients suffering from such infections. Out of 357 samples, 259 (72.5%) participants have treated a hepatitis patient knowingly. When the participants were asked if they scheduled hepatitis patients at the end of the day to prevent cross-infection, 203 respondents did not make such a distinction. Further questioning was presented regarding the clinical practices conducted which included the glove, mask and facial care regime and the sterilization cycles as shown in Table 3.

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Table 3: Overall trend of practices

No.	Practices	Percentage (%)
1	**Double Gloves**	89.9
2	**Single Layer of Gloves**	10.1
3	**Double Masks**	78.4
4	**Single Mask**	21.6
5	**Face Shield**	38.8
6	**Eyewear**	20.5
7	**Sterilization of instruments – Once**	32.6
8	**Sterilization of instruments – Twice**	67.4

Regarding the practices, the participants have inadequate knowledge as it is seen they have a misconception of using double gloves, double masks and double sterilization cycles and lack of wearing eye protection. While comparing the students and dentists through chi-square testing, a statistically significant difference was seen between students and dentists for knowingly treating hepatitis patients (p=0.001), giving last appointments to hepatitis patients (p=0.007) and wearing a face shield or eyewear (p=0.007) as shown in Table 4.

Table 4: Responses of dental students and graduated dentists for the practice section using chi-square test

No.	Questions		Students (Percentage)	Dentists (Percentage)	*p*-value
1	**Have you ever treated a Hep B positive patient knowingly?**	**Yes**	66.13	87.85	**0.001**
		No	33.87	12.15	
2	**Do you give last appointments to the Hep B or C patient to prevent the spread of the disease?**	**Yes**	38.21	53.77	**0.007**
		No	61.79	46.23	
3	**Do you wear**	**Double Gloves**	88.26	93.46	0.137
		Single gloves	11.74	6.54	
4	**Do you wear**	**Double Masks**	76.92	82.24	0.263
		Single Mask	23.08	17.76	
5	**Do you wear**	**Face Shield**	42.51	29.91	**0.007**
		Eye Wear	16.19	29.91	
		None	41.30	40.18	
6	**How many times do you sterilize the instruments after treating Hep B and C patients?**	**Once**	32.00	33.65	0.759
		Twice	68.00	66.35	

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DISCUSSION

South-East Asia has been regarded as one of the areas with a high prevalence (>8%) of HBV infection. Similarly, countries with the highest reported prevalence rates of HCV are located in Africa and Asia with the sero-prevalence of HCV in Pakistan reported to range from 2.4% to 6.5%. Health care workers are at increased risk of such blood-borne infections. Through needle stick injury there are 37-62% chances of HBV infection in recipient and 0-10% chances of developing HCV infection.[11,12]

Most of the participants in the present study were female, about 74%. This is not surprising as most of the dental students enrolled in the colleges are female as seen in the study that the ratio of women in dentistry in Pakistan has histrionically increased from 1:3 female to male dentists in the early 1990s to an astonishing turn around to 2:1 in 2017.[13]

An analysis of responses from the knowledge-based section revealed that most participants consider both blood and saliva to be the mode of transmission of HBV and HCV. We felt that the knowledge of our participants was deficient in this area because it has been established that infected blood is the primary route of transmission of HCV and HBV. Saliva only becomes a contributing factor if it contains visibly infected blood. This was proven by a US study that showed blood exposure accounted for 72.7% of HCV infections while blood containing saliva accounted for 3.4%.[14]

It was also found that 72.5% of our participants agreed that they were taught in detail and efficiently about the clinical aspects of HBV and HCV infection at the undergraduate level. Interesting enough, most participants said their knowledge concerning hepatitis was fair or not adequate, about 79%. For 72.5% teachers were the primary source of hepatitis knowledge. This is in accordance with a Croatian study which concluded that the level of knowledge about infectious diseases and routes of their transmission increases with each year of study. One of the conclusions of this study was also that the level of personal knowledge plays a very important role in forming these students' attitudes and risk perceptions regarding patients with HIV, HBV, and HCV.[15] A local study by Shamila et al showed that 62.5% of dental house officers were aware of hepatitis B infection and its transmission. 92.5% responded that without proper infection control measures hepatitis B infection can be acquired.[16] Similarly another study conducted in Islamabad concluded that 80% of the study participants had adequate knowledge about the risk factors for HBV, its mode of transmission and prevention strategies and 97.9% of the participants had a positive attitude towards following infection control guidelines.[17]

An analysis of the responses from the attitude section of the questionnaire revealed that most participants think dentists should not refuse treatment to HBV and HCV infected patients, while 24.4% of dentists disagreed. However, 85.2% of participants agreed that they were ethically and morally responsible for treating infected patients. Our results are similar to those yielded by a Polish study from 2017, in which 25% of respondents refused to help infected patients due to concerns about their health. In the same study, 45.4% of participants were hesitant in treating infected patients, primarily out of fear of needle stick injury.[5] The present study also reported that needle stick injury is the major concern of the participants while treating infectious patients. In a similar study conducted in Lahore by Ali A in 2017, 88.3% of dental students showed willingness towards treating HBV infected patients which is in accordance with our study.[9]

The practice-based section revealed that most participants wear double gloves and double masks while treating known infected patients. A majority also sterilized dental instruments twice. This is a misconception to wear double gloves and double masks as no such guidelines are available other than standard universal precautionary measures which state single gloves and single masks to be enough in all situations. While it is very promising, 40.6% of participants said they do not wear any eye protection. Eye protection is often overlooked, especially in dental teaching hospitals due to overwhelmingly large patient flow and difficulty in disinfecting units and instruments between every patient. In a study conducted in Central India in 2011; the use of face masks, gloves, eyewear, and protective clothing was practised by two students in a sample of 245.[18] In another investigation that stretched across 8 countries including Pakistan, it was pointed that only 58% of clinicians wore disposable exam gloves, and only 50% of practitioners practised standard precautions effectively.[19] About 92% of our participants

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would not stop treatment if they found out their long-term patient was diagnosed with HBV/HCV. Approximately 73% of participants had treated HBV positive patients knowingly. Since many dental students had not had the opportunity to treat an infected patient yet, their practice-based answers may be unreliable.

One of the limitations of this study was that we relied on self-administered questionnaires for information, such information is not always reliable. We also sampled dentists working in dental hospitals, teaching centres are bound to produce higher percentages. Similar studies in general practice dentists may yield different results. It is recommended to improve the knowledge and practices of the dental students at the undergraduate level so that more competent general dentists can serve our community.

CONCLUSION

The results of our study revealed a positive attitude in dental students and dentists about HBV and HCV infection working in dental hospitals. However, given the inadequate performance in the knowledge section and the practices section, additional steps should be taken to raise awareness in dental students and practising dentists about HBV/HCV. This includes arranging continuous learning workshops and awareness campaigns so dental healthcare workers in practice can benefit from the knowledge.

DISCLAIMER

None to declare.

CONFLICT OF INTEREST

There is no conflict of interest among the authors.

ETHICAL STATEMENT

The ethical approval is provided by the Ethical Review Board at Riphah International University Ref. No. IIDC/IRC/2019/04/001.

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AUTHORS CONTRIBUTION

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