



Dental Students' Perceptions on Patients with HIV or Hepatitis B Infection

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Authors' contributions

This work was carried out in collaboration between all authors. Authors PB and UB designed the study, wrote the protocol, and wrote the first draft of the manuscript. Author SZS performed the analysis, proof reading and revisions. Authors KH, AR and HS managed the literature searches performed the statistical analysis and helped in the first draft of the manuscript. All authors read and approved the final manuscript.

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ABSTRACT

Background: Dentists see many patients with undiagnosed or diagnosed HIV and Hepatitis B infection, posing threat to both doctor and patients. The aim of this study was to investigate dental students' knowledge, awareness and attitude towards HIV and Hepatitis B patients.

Methods: A self-administered questionnaire was given to 164 clinical dental students in Kuala Lumpur.

Findings: A significant percentage (49%) of the students did not know that HBV is transmitted via saliva. Female students were consistently more knowledgeable and had positive attitude towards such patients. Students had sufficient knowledge about the importance of double-gloving (69%). They displayed in consistent knowledge about the difference in infection potential of HBV and HIV. Most students (87.3%) were aware of the possibility of accidental exposure during recapping needles and spraying biological material but they were not aware about other accidental exposures. 87% students agreed

that they require more training to treat patients with HIV or HBV. 88.3% students considered all patients potentially infectious and agreed (80.3%) to treat such patients in future only under close clinical supervision. Fewer students agreed to voluntarily serve at an HIV or HBV specialist center (30.6%).

Conclusion: The level of knowledge and awareness of dental students about HIV and HBV was not sufficient, which renders them to danger of contracting infection while performing clinical procedures. Although a majority of the students had good knowledge, only few had professional attitudes about treating patients with HIV/HBV. Most were in favor of receiving more training to treat these patients efficiently.

Keywords: Dental students; HIV/HBV infection; hazard.

1. INTRODUCTION

Infection with human immunodeficiency virus (HIV) and hepatitis B virus (HBV), the etiological agents of AIDS and hepatitis B, have emerged as modern scourges of mankind. People with HIV are at high risk of oral health related problems. They require additional dental care than the average person due to their frail immune system and the antiretroviral drugs they take. The importance of good dental care in the management of HIV is mandatory. With the emergence of the AIDS epidemic in the 1980s, more stringent precautions were recommended by Centers for Disease Control and Prevention in the USA to effectively protect health care workers and public and prevent HIV transmission in health care settings. In 1988, the World Health Organization (WHO) recommended that all dentists should treat HIV-positive patients and stated that it is unethical and unlawful for a dentist or dental student to refuse treatment to HIV-positive patients [1]. Hepatitis B continues to be a major health problem in Malaysia and worldwide. As most of the infections are asymptomatic and subclinical, it is almost certain that cases of Hepatitis B are under-reported [2]. Medical and dental students and healthcare providers are more susceptible to these infections due to three factors the high prevalence of virus carriers in the general population, the high frequency of clinicians' exposure to blood and other body fluids and the high contagiousness of these viruses [3]. In 2008, WHO reported HBV is 50-100 times more infectious than HIV [1]. According to UNAIDS (2010) Global Report, there were about 50,000 people living with HIV in Malaysia [3]. A study in Malaysia reported that 15.1% of HIV-positive individuals attended dental clinic after the confirmation of their status [4]. According to the Malaysian Liver Foundation, there are 2.4 million Hepatitis B Virus (HBV) carriers in Malaysia, and they will continue to be the source of HBV infection [5]. Moreover, asymptomatic carriers visiting dental and medical clinics are the potential threats of infection to the clinician and students.

Capilouto, Weinstein, Hemenway and Cotton in 1992 reported that the annual cumulative risk of infection from routine treatment of patients whose seropositivity is undisclosed is 57 times greater from HBV than from HIV, and the risk of dying from HBV infection is 1.7 times greater than the risk of HIV infection. Dental practitioners are at high risk as all the oral procedures require working with high speed, sharp instruments, the restricted operating area limits viewing of the oral cavity and the environment is bathed in blood and saliva. While dental professionals are considered to be at "low" risk for contracting HIV/AIDS, they may have ten times greater risk of becoming chronic HBV carriers than the average citizen [6]. Owing to the alarmingly increase in spread of HIV and Hepatitis B in Malaysia, the present study aims to identify dental students' level of knowledge, awareness and attitude towards HIV and HBV patient

2. METHODS

The current study was approved by Medical Ethics Committee Faculty of Dentistry, University of Malaya. Study population consisted of clinical dental students, having clinical dental practices during their period of education in Kuala Lumpur. A self-administered questionnaire was applied with demographics, consisting of 32 pre-coded questions under three main sections: "knowledge assessment" (14-items), "awareness" (7-items) and "attitudes towards patients" (11-items). The response to these questions were rated on a 5 point Likerts scale with "1" being "Strongly Disagree", "2" being "Disagree", "3" being "neutral", "4" being "Agree" and "5" being "Strongly Agree". as described in the material and methods. During statistical analysis we combined the "strongly agree" and "agree" similarly combined "strongly disagree" and "disagree". Henceforth, mean and standard deviation were calculated."

The questionnaire was administered to the entire student during their class and was collected after an hour. The confidentiality of the respondents was maintained completely. The questionnaire form with less than 50% response was discarded.

Non-probability quota sampling technique was used for selecting survey participants and a total of n=164 (sample-size) surveys were collected from the dentistry students. The data was analyzed using SPSS 17 with descriptive analysis such as means, standard deviations, frequencies and percentages were calculated and reliability test was performed.

2.1 Reliability Test

In order to see if the survey instrument designed in this study is reliable, are liability test was performed. The reliability of a test refers to stability of measurement overtime. [7] Over all reliability (internal consistency) of the study exceeded the suggested level of 0.70 (Nunnally, 1978), which suggests that the measures were free from random error and thus reliability coefficients (Cronbach alpha) estimate the amount of systematic variance (Peter, 1979). Cronbach alpha value for variable 'knowledge assessment' was found to be at moderate level, Cronbach alpha value for variable 'awareness' was found to be at deemed acceptable and Cronbach alpha value for variable 'attitudes towards patients' was also close to the suggested leve1. The high alpha values indicated good internal consistency among the items (survey-questions), and the high alpha value for the overall scale indicated that convergent validity was met (Parasuraman et al., 1991). The results obtained in this study are therefore reliable as shown in Table 1 showing reliability of three components included in study.

Table 1. Reliability test

Variables	Cronbach alpha (α)
Knowledge assessment	0
Awareness	0
Attitudes towards patients	0

Overall Reliability: 0.82;p<0.05

3. FINDINGS

3.1 Demographics

Table 1.5 represents demographics of the respondents (clinical dental students) for this study. Majority of the respondents were females (78%). As for the age group, majority (95.7) of the students were in-between the age group of 21-30.

Table 1.5. Demographics (n=164)

Gender		
Female	128	78.0
Male	36	22.0
Total	164	100.0
Age		
21-30	158	96
31- 40	06	4

3.2 Students' Knowledge about HIV and HBV Patients Visiting Dental Clinic

This section of the study investigates the perceptions of clinical dental students on their 'knowledge assessment' for HIV/HBV patients. Table 2 demonstrates that respondents had relatively high perceptions cores (mean ≥ 4.0) regarding:

- Is it possible for a healthy looking person to be infected with AIDS/HBV virus?
- HIV can be passed on to a baby from HIV + mother.
- Vaccine can prevent HIV infection.
- Allpatientscomingtodentaloperatoryshouldbeconsideredpotentiallyinfectious.

Similarly, respondents had relatively high perception scores (mean ≤ 2.5) regarding:

- Hepatitis B is not transmitted infected blood or open sores.
- Hepatitis B is not transmitted by sharing razors or tooth brush.
- Can HIV be transmitted by shaking and or hugging?

HIV/Hepatitis B can be transmitted through contaminated water.

Vaccine can prevent Hepatitis B.

Table 2. Students' knowledge about HIV and HBV patients

Statements	Percentage agreement	Mean (SD*)
1. Is it possible for a healthy looking person to be infected with AIDS/HBV virus?	96.0	4.28±(0.71)
2. Hepatitis B is transmitted via the infected's blood or open sores.	87.6	1.66±(0.92)
3. Hepatitis B is transmitted via saliva.	44.5	3.07±(1.42)
4. Hepatitis B is not transmitted by sharing razors or toothbrush.	72.7	2.05±(1.17)
5. HIV cannot be transmitted by shaking hand or hugging.	90	1.40±(0.72)
6. Double gloving can provide protection from HIV/HBV transmission.	68.36	3.77±(0.96)
7. HIV/Hepatitis B can be transmitted through contaminated water.	43.4	2.05±(1.11)
8. HIV can be passed on to a baby from HIV+ mother.	97	4.35±(0.79)
9. HIV can be passed on to an infant in breast milk.	58.53	3.45±(1.41)
10. Vaccine can prevent Hepatitis B.	83.6	4.05±(0.94)
11. Vaccine can prevent HIV infection.	24	1.71±(1.03)
12. HBV is more infectious than HIV.	47	3.27±(1.27)
13. All patients coming to dental operatory should be considered potentially infectious.	87	4.17±(0.71)
14. The oral manifestations associated with HIV includes diseases such as:		
a) Candida infection	93.06	
b) Aphthous Ulcer	65.26	
c) Hairy Leukoplakia	83.4	3.52±(0.93)
d) Kaposi's Sarcoma	76.2.	
e) Angular cheilitis	47.9	
f) Herpes	55.16	
g) Lymphoma	48.5	
h) Hyper Pigmentation	30.8	
i) Purpura	39.03	

*SD = Standard Deviation

3.3 Students' Awareness toward HIV/HBV Positive Patients Visiting Dental Clinic

This section of the study investigates the perceptions of clinical dental students on their 'awareness' regarding HIV/HBV patients. Table 3 demonstrates that respondents had relatively high perceptions cores (mean ≥ 4.0) regarding:

- Do you think HIV/ HBV + patients must inform the dentist of their status
- Do you think there is certain amount of undiagnosed HIV/HBV + patient that attend the dental clinics?
- If you have queries about HIV/HBV, from where do you get the information: 'Government health care workers (doctor/nurses)' and 'internet'
- In your opinion; in dentistry, the majority of accidents responsible for exposure to HIV/HBV/Other potential infections are: 'When recapping the needle' and 'spray of biological material like blood and saliva'.
- Do you think you need more training to improve your knowledge regarding these topics?

Similarly, respondents had relatively high perceptions core (mean ≤ 2.5) regarding only:

In your opinion; in dentistry, the majority of accidents responsible for exposure to HIV/HBV/Other potential infections are: 'While receiving the instruments from the store'

Table 3. Students' awareness towards HIV/HBV positive patients visiting dental clinic

Statement /Questions	Percentage agreement	Mean (SD*)
1. Do you think the existing syllabus is sufficient guide regarding HIV/HBV patient's treatment recommendations & management?	35.26	3.10±(0.94)
2. Do you think HIV/ HBV+ patients must inform the dentist of their status.	98.1	4.64±(0.66)
3. Do you think there is certain amount of undiagnosed HIV/HBV+ patient that attend the dental clinics?	94.4	4.22±(0.66)
4. If you have queries about HIV/HBV, from where do you get the information:		
a) Government health care workers (doctor/nurses)	88.83	4.02±(0.76)
b) Private health care workers (doctor/nurses)	80.96	3.53±(0.94)
c) Family and relatives	60.63	3.53±(0.94)
d) TV/Radio/News papers	76.20	3.70±(0.96)
e) Internet	95.06	4.20±(0.74)
f) Library	75.46	3.71±(0.98)

Table 3 Continued.....

5. In your opinion; in dentistry, the majority of accidents responsible for exposure to HIV/HBV/ Other potential infections are:		
a) When recapping the needle	90.2	4.18±(0.76)
b) Spray of biological material like blood and saliva	86.3	4.08±(0.72)
c) Washing the instrument	56.1	3.52±(0.99)
d) While sending the instruments for sterilization	31.13	3.01±(1.10)
e) While receiving the instruments from the store	14.2	2.42±(1.13)
f) Clinical waste/rubbish management	69.3	3.68±(0.97)
6. Do you think in the polyclinic you are well-prepared for treating the patients with infectious diseases?	45.6	3.25±(1.04)
7. Do you think you need more training to improve your knowledge regarding these topics?	85.4	4.02±(0.88)

*SD = Standard Deviation

3.4 Students' Attitudes towards HIV/HBV Positive Patients Visiting Dental Clinic

This section of the study investigates the perceptions of clinical dental students on their attitudes towards patients with HIV/HBV. Table 4 demonstrates that respondents had relatively high perceptions cores (mean ≥ 4.0) regarding:

- Supporting HIV/AIDS patients improves community health.
- I will treat HIV/Hepatitis B+ patients.
- Do you think educating the patient can prevent the spread of AIDS/Hepatitis?

Similarly, respondents had relatively high perceptions core (mean ≤ 2.5) regarding only:

- Do you think HIV/HBV patients should be isolated in quarantine?
- I will treat HIV/Hepatitis B+ patients.
- Do you think educating the patient can prevent the spread of AIDS/Hepatitis?

Table 4. Student attitude towards HIV/HBV positive patients visiting dental clinic

Statement /Questions	Percentage mean (SD*) agreement	
1. Supporting HIV/AIDS patients improves community health.	85.9	4.07±(0.67)
2. HIV/AIDS patients should be treated at a separate ward	58.4	3.51±(1.03)
3. I am morally responsible to treat HIV/AIDS patients	69.2	3.76±(0.82)
4. Do you think HIV/HBV+ is a social stigma	49.1	3.37±(1.11)
5. If you are aware about the HIV/HBV infection status of the patient, will you be comfortable treating such patient in your practice	22.4	2.95±(1.04)
6. Do you think treating HIV/Hepatitis B+ patients with close clinical supervision would give you more confidence in treating such patients in future	80.76	3.93±(0.74)
7. I will treat HIV/Hepatitis B+ patients.	81.2	4.03±(0.80)
8. Do you think disclosure of HIV/ HBV+ status is geared towards cross infection prevention	60.7	3.59±(1.21)
9. Would you volunteer to provide services to AIDS/Hepatitis B specialist centre?	32.9	3.11±(1.04)
10. Do you think educating the patient can prevent the spread of AIDS/Hepatitis	90.7	4.27±(0.90)

*SD = Standard Deviation

4. DISCUSSION

Our results show that students' knowledge regarding mode of transmission and contagiousness of HBV was not adequate. However, students generally presented adequate level of knowledge related to prevention of HIV and HBV infection by double gloving.

All clinical students batches generally answered correctly that it is possible for a healthy-looking person to be HIV/HBV positive (mean = 4.28). The most unsatisfactory revelation was that barely half of the study population knew that HBV is transmitted via saliva (Mean = 3.07). A study by Capilouto, Weinstein, Hemenway & Cotton in 1992 also found that dentists are less concerned about becoming infected with infectious hepatitis, and are less frightened to treat patients with this disease [8]. This could be due to the lack of knowledge of the potential infection by HBV, also reported by Petersen *et al.* in 1976 that HBV surface antigen was detected in gingival swab, saliva, and oral lesion exudates samples from children.[9] HBV surface antigen also was found in swab samples of surfaces frequently touched or in contact with oral cavity. Thus, clinical year dental students must know that HBV is readily transmitted via saliva as they encounter patients' each day, and frequently get exposed to saliva and blood-bathed environment in oral cavity.

There was a consistent agreement among all year students regarding statements "patients must inform the dentist of their HIV/HBV positive status" (mean= 4.64) and "certain amount of undiagnosed HIV/HBV patients attending dental clinic (mean =4.22) However, almost all the students were not adequately aware about the accidental exposures to these viruses in the clinic.

In attitude comparison, even though maximum students displayed higher positive attitude towards treating these patients (mean = 4.03) but very less percentage of students were willing to serve at HIV and HBV specialist centres (mean =3.11)

Although, students are willing to treat these patients confidently under close clinical supervision, (mean= 3.93) it's very important for them to be aware of potential accidental exposures that in clinical dental practice clearly indicate deficiency in their awareness and attitude towards this group of patients.

In gender comparison females displayed higher level of knowledge compared to males. Awareness level about accidental exposures in clinic of both males and females were similar. However, females displayed higher positive attitude and felt more confident in treating these patients. In line, with a study done by Tibdewal H et al. in 2009 [10].

4.1 Knowledge among Students

All the clinical students' reflected appropriate knowledge regarding double gloving as a potential protection from HIV/ HBV transmission (Mean=3.77).

Generally, dental students have either moderate or high level of knowledge especially in terms of HIV, but somewhat lacking when it comes to HBV's mode of transmission and infectivity (Table 2). Sadeghi and Hakimi in 2009 reported that mean of Iranian dental students' knowledge about HIV/AIDS patients was excellent, but this knowledge was not significantly associated with the willingness to treat HIV/AIDS patients [11]. If dental students are not confident of their knowledge about HIV/AIDS patient management, they do not properly prepare themselves to treat these patients. The above finding reflects students' false sense of security due to availability of HBV vaccine while there is no vaccine available to prevent HIV.

4.2 Awareness among Students

Based on table 2 all students relatively agreed that there is a certain amount of undiagnosed HIV/HBV patients attending dental clinic (Mean = 4.22). Maximum students agreed that clinical waste/rubbish management can expose them to accidental exposure to HIV/HBV infection. Although, significant proportion of the students were not aware that sending and receiving instruments for sterilization can expose them to risk of HIV/HBV infection in dental clinic (Mean = 2.42). All the students should be aware of existing risk of infection during the disposal of the clinical waste, as that might contain infected human tissue, blood and other body fluids.

According to Table 3, more than half of the population (Mean = 3.10) conferred that the existing curriculum is not the sufficient guide and more training is required to enhance their skill for managing HIV/HBV patients in dental surgery. This reflects that students are interested to augment their knowledge about treating patients with HIV/HBV. The current finding is consistent with study by Nasir, Astrom, David and Ali's in 2008 where about half of the Sudanese dental students confirmed a high need for further education about topics related to HIV and AIDS [12]. These findings are consistent with Institute of Medicine report that supports the goals of the Surgeon General's Report on Oral Health and illustrates the receptiveness to change indeed the existing curriculum in dental education [13].

4.3 Attitude of Students

Table 4 reflects that majority of dental students considered all dental patients as potentially infectious. (Mean = 0.17) This might be due to more clinical experience of the final year students compared to their juniors. This finding is consistent with Brailoet al's study where Croatian senior dental students in University of Zagreb Admore professional attitudes and were significantly more positive about dentists' professional obligation to treat patients who are HIV-positive than were junior students (14). As shown in Table 4, most students (mean =3.76) believed that it is the moral duty for a dentist to treat an HIV/HBV patient. On the contrary, findings also reveal that a very low percentage of students (mean = 3.11) are willing to volunteer at HIV/HBV specialist centers. Only about half the final year students (mean = 3.59) agreed that disclosure of HIV/HBV status of dental patients can help to prevent cross-infection. This shows that there are a number of final year students who are having conflicting attitudes towards HIV/HBV patients. Although, disclosure may be difficult, It is important to consider the benefits of sharing HIV/AIDS status with al health care providers [15]. Disclosure of status can help dentists to take preventive measures and be more cautious to prevent the spread of HIV infection, thus taking greater care of the HIV patients. Almost all the students agreed that educating the patients can prevent the spread of HIV/HBV infection.[16] In a study by Brailo V et al. [17] senior students also expressed significantly higher willingness to treat intravenous drug users and patients with hepatitis.

5. CONCLUSION

The level of knowledge of dental students about HIV/HBV was generally acceptable. However, their awareness with regards to HBV and its mode of transmission was not adequate. Considering the students willingness to treat the HIV/HBV positive patients, it was not satisfactory. It is necessary that students be well informed about these infectious diseases and should develop necessary safe practical skills and positive attitude towards treating these patients. In order to prepare future dentists, well equipped with knowledge and positive attitude towards treatment of such patients, health education programme is suggested in future to improve their awareness to prevent injuries and to assess the knowledge of universal precaution and their risk perception about these infections. Specific programme module focusing on the oral health management of immunocompromised patients is recommended, that enables dental operators to provide comprehensive treatment to these patients. The findings of this study should also be extended to other medical and dental schools in Malaysia.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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