

Knowledge, attitude and practices of cross infection control among Dental Students of Punjab Pakistan

MUHAMMAD WAHEED TAHIR¹, ASAD MAHMOOD², ANUM ABID³, MUHAMMAD SAAD ULLAH⁴, MUSTAFA SAJID⁵

ABSTRACT

Aim: To determine the knowledge, attitude and practices of cross infection control among dental students of Punjab Pakistan

Design: Cross- Sectional Survey

Period: August to September 2017

Setting: de'Montmorency College of Dentistry, Lahore, Lahore Medical and Dental College Lahore, Multan Medical and Dental College Multan.

Methods: A self-administered questionnaire consisting of question on cross infection control knowledge, attitude and practices was distributed among final year BDS students. The collected data was analyzed using SPSS software.

Results: A total 67 students participated in this study. 94% students know about universal precautions.55.2% agreed that these precautions are not applied in their college.74.6% students wash hands,98.5% change gloves and 49.3% change mask after every patient.83.6% students don't use protective eyewear , only 41.8% use protective plastic covering and 28.4% cover drawers after every patient.98.5% students use autoclave for sterilization of instruments.71.6% students are immunized against Hepatitis B.

Conclusion: We concluded that dental students in our study showed adequate knowledge and positive attitude but quite less satisfactory practice about infection control

Key words: infection control, dental students and dentistry

INTRODUCTION

Dentists, dental students and dental assistants are more prone to infections materials like body substances, dental supplies, aerosols and blood contaminations¹. Cross infections can be defined as the transmission of infection among patients and staff members within a clinical environment.² The dental clinical setup has a significant number of various microbes including HBV, HCV, HIV, HSV, and other viral and bacterial organisms which can transmit infection to patient and operating doctor^{3,4,5}. The mode of transmission of these microbes might be through blood contaminated sharp instruments, aerosols, droplet infections or splatters^{1,5}. The dentists are more prone to be infected by HBV and HCV⁶. In the dental office, percutaneous injury, blood contaminated mucous membrane contact and carrier

body fluids can transmit HIV. HBV, HCV and HIV risk of transmission in dental clinics were found to be 6-30%, 10% and 0.4% respectively^{7, 8}. Transmission of Hepatitis B and C through dental practices have also been identified in some studies conducted in Pakistan^{9, 10}.

Applying universal precautions can prevent cross infection. All the patients must be considered as infectious/carriers and universal precautions should be applied on all patients.

Infection control guidelines in developing countries have not be well established¹¹. Most of the Hospitals have no established infection control guidelines due to lack of awareness of the risks involved or absence of professionally trained staff. There are no documented guidelines for dental setup and dental hospitals in Pakistan. Pakistan Dental Association and Pakistan Medical and Dental Council have not published any guidelines for cross infection control.

The previous studies indicate inadequate knowledge and attitude among dentists towards cross infection control^{1,4,7,12-16}. The dental colleges act as a symbol of excellence for other dentists and dental community members. It is difficult and expensive to provide cross infection control to patients, dental students and dental faculty. To

¹Assistant Professor Oral & Maxillofacial Surgery, Allama Iqbal Medical College/Jinnah Hospital Lahore,

²Assistant Professor & Head, Department of Oral Biology, Lahore Medical and Dental College Lahore.

³MDS-Resident, KEMU/Mayo Hospital Lahore

⁴Assistant Professor, Department of Science of Dental Materials, Institute of Dentistry, CMH Medical College, Lahore.

⁵Assistant Professor, Department of Operative Dentistry. Multan Medical and Dental College Multan

Correspondence to Dr. Muhammad Waheed Tahir

Email: mwaheed76@gmail.com Tel: +92-3127307601,

establish infection control policies in the dental field, the dental students require more comprehensive knowledge and training. Dental students training can improve the cross infection control more effectively. Thus the aim of this study was to assess knowledge, attitude and practice of cross infection among final year dental students of three dental college of Punjab so that we can make necessary changes in cross infection training of dental students.

METHODOLOGY

This descriptive cross sectional study was conducted on final year BDS students of three dental colleges which are de'Montmorency College of dentistry Lahore, Lahore medical and Dental college Lahore, Multan medical and dental college Multan. A total of 67 students from these colleges willingly participate in this study. We use a self-administered questionnaire reproduced from a pretested questionnaire that has been applied in similar studies^{1,7,15}. The validity of the questionnaire was assessed by doing pilot study of random sample of students. A informed consent was taken from the participants and informed that their response would be anonymous and treated confidentially.

The questionnaire consisted of 18 closed ended questions related to student's knowledge, attitude and practice about cross infection control practices, sterilization and asepsis, methods of personal protection, Hepatitis B vaccination, attitude toward dental treatment of hepatitis infected patients. Results obtained from the students were analyzed by using SPSS version 20.

RESULTS

Table 1:

Question	Yes	No
Q1: Do you know about the universal precautions to prevent cross infection?	63(94%)	4 (6%)
Q2: Are these precautions being applied in your college?	30(44.8%)	37 (55.2%)
Q3: Do you know about WHO guidelines on Hand washing?	48(71.6%)	19 (28.4%)
Q4: Do you perform hand washing after every patient?	50(74.6%)	17 (25.4%)
Q5: Do you change gloves after every patient?	66(98.5%)	01 (1.5%)
Q6: Do you change mask after every patient?	33(49.3%)	34 (50.7%)
Q7: Do you use eye shield during dental procedures?	11(16.4%)	56 (83.6%)
Q8: Do you cover your light with plastic and change it after every patient?	28(41.8%)	39 (58.2%)
Q9: Do you cover the handle of the drawers with plastic cover?	19(28.4%)	48 (71.6%)
Q10: Do you know the proper protocol to wear and remove the surgical gloves?	58(86.6%)	09 (13.4%)
Q11: Do you use disposable needle to give local anesthesia?	64(95.5%)	03 (4.5%)
Q12: Do you perform pre-sterilization cleaning of your instruments?	55(82.1%)	12 (17.9%)
Q13: Do you decontaminate your instruments before sterilization?	49(73.1%)	18 (26.9%)
Q14: Do you heat sterilize all of your instruments including hand piece & burs between pts?	55(82.1%)	12 (17.9%)
Q15: Do you take history about Hepatitis B, C and HIV from every patient?	66(98.5%)	01 (1.5%)
Q16: Are you immunized against Hepatitis B?	48(71.6%)	19 (28.4%)
Q17: Do you and your assistant use proper universal precautions to treat Hepatitis Infected Pts?	56(83.6%)	11 (16.4%)
Q18: Do you disinfect your operatory after treating Hepatitis infected patient?	46 (68.7%)	21 (31.3%)

The questionnaire was completed by 67 final year students from three colleges in which 29 students were from Multan Medical and Dental College, 20 from de'Montmorency College of Dentistry Lahore and 18 students were from Lahore Medical and Dental College Lahore. The mean age of the students in the study was 22.63±1.027 years (figure 1). There were 42(62.7%) females and 25 (37.3%) were male students in this study. 94% students know about universal precautions. 55.2% students agreed that these universal precautions were not applied in their colleges. 90% of student s of de'Montmorency College of dentistry students reported In this study that these universal precautions were applied in their college (Fig. 2). 71.6% students know about World health organization hand washing guidelines and 74.6% students wash their hands after every patient. 98.5% change gloves and 49.3% change masks after every patient. Only 16.4% use protective eye shield during dental procedures while 83.6% don't use it. Protective plastic covering for dental light, drawers were used by 41.8% and 28.4% students respectively. 86.6% students knew the proper technique for wearing and removing surgical gloves.95.5% students use disposable needle for local anesthesia injection. 82.1 % students clean, 73.1% decontaminate their instruments before sterilization. 98.5% students autoclave their instruments including hand piece and burs between the patients. 71.6% students took history about hepatitis B, C and HIV form every patient. 71.6% students were immunized against Hepatitis B. 83.6% students use universal precautions for hepatitis infected patients. 68.7% students disinfect the operatory after treating Hepatitis infected patients. The overall result was shown in Table 1.

Fig.1: Histogram:

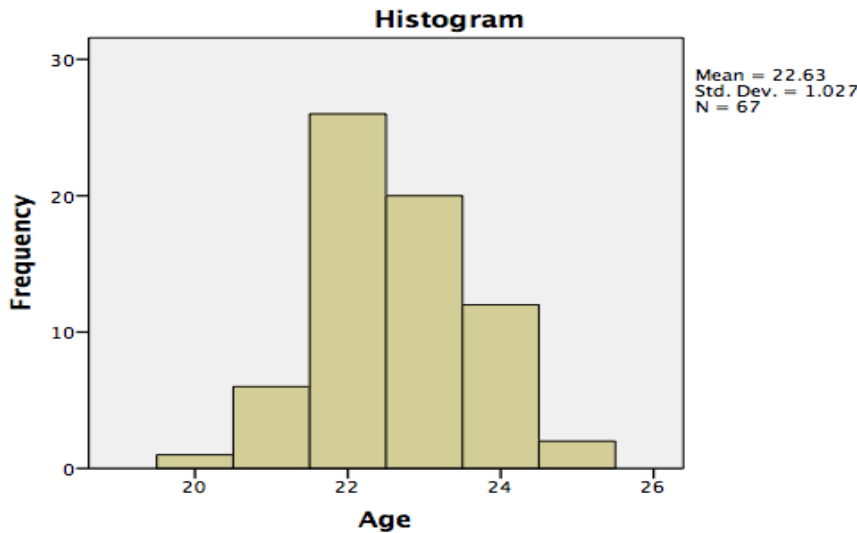
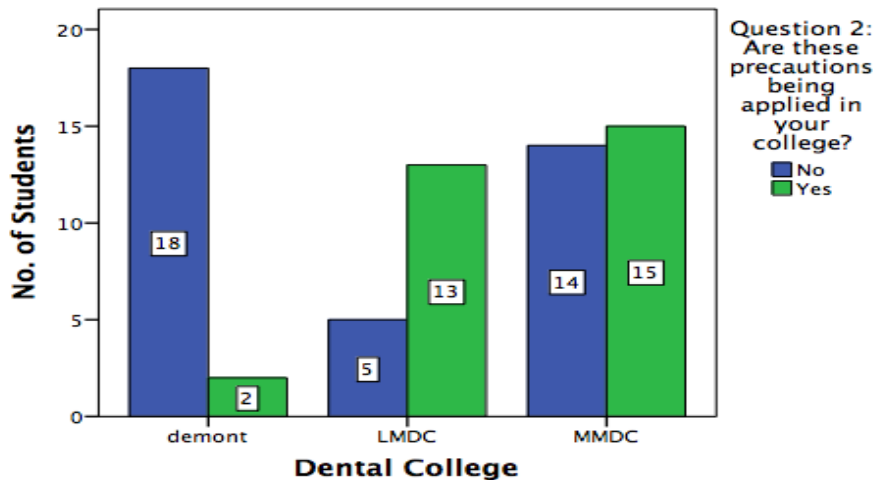


Fig. 2:



DISCUSSION

Dentists, dental students and dental care professionals are at significant risk of infections by blood borne viral and bacterial pathogens and more prone to exposed to blood, saliva and may suffer from percutaneous injury^{17,18}. The major key to prevention and reduction of transmission of infection to dental students and dental assistants lie in rigid compliance to cross infection control practice. This study reports the overall knowledge, attitude and practice regarding infection control among final year students of three dental colleges of Punjab. This is the first study conducted in Punjab Pakistan which investigate cross infection control among dental students. The overall knowledge of dental students in

this was good. 94 % students knows about the universal precautions. Similar results found in a Turkish and an Indian study^{1,19}. The implementation of these universal precautions was lacking in these colleges. 90% of deMotmorency College of dentistry final year students think that these are not applied in their college which is the only public sector college in this study. The reason might be due to lack of established institutional guidelines for cross infection control. This result is in contrast to a Saudi study in which 97% students think that dental school is responsible for implementation of the infection control recommendation and 96.1% are willing to practice same infection control policy in the future which is used in their college¹⁶.

Hand washing is the single most important factor for prevention and control of health care related infection. WHO published guidelines for hand hygiene²⁰. 71.6% students of this study know about them. The compliance with hand washing in this study was inappropriate as only 74.6% students wash their hands after every patient. This findings is consistent with earlier studies conducted by Al-Maweri et al, De Amorim-FInzi et al, Rehman et al and Kramar et al^{16,21,22,23}. The compliance in this study is poor as compared to Mohiuddin S et al study which was conducted on dental practitioners of Karachi Pakistan²⁴.

Changing gloves after every patient is the second most important factor of cross infection control after hand hygiene. 98.5% students in this study change gloves after every patient which is quite satisfactory. This result is in consistent with Al-Rabeah et al, Al-Maweri et al and Mohiuddin S et al study^{7,16,24}. The proper technique of wearing and removing gloves is as important as the change of gloves after every patient. Furthermore, inappropriate use of glove could lead to the spread of microorganism and potentially put the care giver at increased risk as studied by Burke et al²⁵. 86.6% students have the knowledge of proper protocol of wearing and removing surgical gloves which is quite satisfactory.

Changing mask after every patient is lacking in this study. Only 49.3% students change mask after every patient. This result is consistent with Al-Rabeah et al study in which 54.2% dentists change mask⁷. This study compliance is low as compared to Yuzbsigh et al (96.3%), Al-Maweri et al (90.2%)^{1,16}. The compliance is high as compared to Saheeb et al study in which only 19.5% dental practitioners wear face mask during patient examination¹³. The protective eye wear use prevent the health care provider from generated aerosols and blood splashes during the procedure. Very poor compliance is seen in this study and only 16.4% use protective eye wear. This unsatisfactory result is not peculiar to Pakistan as many other studies found similar findings^{7,13}. Yüzbasioğlu E et al found 96.3% study individual use protective eye wearing in their study¹. The poor usage of eyewear and facemask may show low level of understanding among dental students about the possibility of disease transmission via blood and aerosols. Dental students should be reinforced to use facemask and eye wear to decrease the risk of airborne infection transmission.

The use of sterile covering is also lacking in this study. 41.8% students change dental light cover and 28.4% change drawer handle cover after every patient. Similar results found in Turkish and Pakistani study^{1,15}. The danger of transmitting blood borne

viruses to patient by the reuse of needle, syringe and local anesthetic agent cannot be over-emphasized. 95.5% students use disposable needle for local anesthesia.

Many authors in their studies have stressed on the hazard of cross infection by the use of dental instruments²⁶. Dental instruments must be cleaned and decontaminated before sterilization. 82.1% clean while 73.1% decontaminate the instruments before sterilization. Dental students should be guided in this regard.

According to this study 82.1% student autoclave all their instruments including hand piece and burs between the patients. Morris et al showed that 94% dentists in Kuwait used autoclave to sterilize handpiece¹¹. Our study results are satisfactory as compared to Asfand Ali Khan study conducted in Karachi where he found only 47.5% dentists autoclave hand piece daily¹⁵. Reason may be due to the perception of dentist that frequent autoclaving may lead to malfunctioning of the hand piece²⁶. Other reasons include single hand piece and due to burden of patients it may be difficult to find out time for autoclaving hand piece daily¹⁵. Hepatitis B and Hepatitis C virus infection in health care workers were found to be 6-30% and 10% respectively⁸.

The prevalence of Hepatitis B carrier state in Pakistan is estimated to be 3-5%²⁷. This means that dentists, dental students and dental assistants are at high risk of exposure to Hepatitis B antigen²⁷. 98.5% students took history about Hepatitis B, C and HIV from every patient which is satisfactory. 71.6% students are immunized against Hepatitis B in this study. Similar results found in Khan et al and Mohiuddin et al study^{15,24}. But Immunization status of dentists in England (97%) and Jordan (95%) was found to be much high^{28,29}. Reason of less immunization in dental students may be due to lack awareness campaigns and mandatory immunization at the time of admission for dental students.

83.6% students use proper universal precautions to treat Hepatitis Infected patients while 68.7% students disinfect the operatory after treating these patients. Although positive attitude was found in students regarding treatment of Hepatitis infected patients which is in accordance with previous studies^{22,30}. This positive attitude among dental students to treat hepatitis infected patients will further reinforce by giving more theoretical and practical knowledge about hepatitis and cross infection.

Despite Multicenter study and adequate response of the students, there are few limitations of this study. One limitation (drawback) of this study was that the responses were subjective rather than objective. Close ended questionnaire further limit the study because it cannot assess the real knowledge

and practice of the dental students. Despite these limitations, this study provides some important information about Dental student's knowledge, attitude and practice regarding infection control. This important information should help to diagnose the areas of cross infection control which require further reinforcement and necessary changes in the dental curriculum.

CONCLUSION

In conclusion, dental students of Punjab, Pakistan, in our study showed adequate knowledge and positive attitude but quite less satisfactory practice about infection control.

Our suggestions are that knowledge acquired must be transferred into daily practice. Furthermore, dental colleges should focus on making institutional cross infection control guidelines and regular continuing dental education seminar on update of cross infection control should be organized by the dental colleges.

Conflict of Interests: The authors declare that they have no competing interests.

REFERENCES

1. Yüzbasioğlu E, Saraç D, Canbaz S, Saraç YS, Cengiz S. A survey of cross-infection control procedures: knowledge and attitudes of Turkish dentists. *J Appl Oral Sci.* 2009 Nov-Dec;17(6):565-9.
2. Mutlu S, Porter SR, Scully C. Cross-infection control in dentistry. Erosset, Istanbul, Turkey; 1996.
3. Henderson DK. Managing occupational risks for hepatitis C transmission in the health care setting. *Clin Microbiol Rev* 2003;16(3):546-68.
4. Singh A, Purohit BM, Bhambal A, Saxena S, Singh A, Gupta A. Knowledge, attitude and practice regarding infection control measures among dental students in central India. *J Dent Educ* 2011 March; 75(3): 421-7.
5. Bolyard EA, Tablan OC, William WW, Pearson ML, Shapiro CN, Deitchman SD. Guideline for infection control in health care personnel, 1998. *Hospital Infection Control Practices Advisory Committee.* *Am J Infect Control.* 1998;26:289-354.
6. Shah AH, Wyne AH. Cross infection control in dentistry: A review. *Pak Oral Dent J* 2010;30(1):168-174.
7. Al-Rabeah A, Mohamed AG. Infection control in the private Dental Sector in Riyadh. *Ann Saudi Med,* 2002; 22;13-7.
8. Al Faleh FZ. Hepatitis B infections in Saudi Arabia. *Ann Saudi Med* 1988;8:194-7.
9. Khan OF, Saim M, ZUbairi SJ. Risk factors of Hepatitis B and C transmission in patients coming to a hepatology outpatients clinic. *Pak J Med Res.* 2008;47:44-8.
10. Butt AK, Khan AA, Khan SY, Ijaz S. Dentistry as a possible route of hepatitis C transmission in Pakistan. *Int Dental J* 2003;53:141-4.
11. Morris E, Hassan FS, Al Naisi A, Sugathan TN. Infection control knowledge and practices in Kuwait: a survey on oral health care workers. *Saudi Dent J.* 1996;8: 19-26.
12. Sobayo EL. Nursing aspects of infection control in developing countries. *J Hosp Infect* 1995;18 (suppl A):388-91.
13. Saheeb BDO, Offor E, Okojie OH. Cross infection control methods adopted by medical and dental practitioners in Benin city, Nigeria. *Ann Afric Med* 2003;2 (2):72-6.
14. Ehsani M, Tabarsi B, Abesi F, Mesgarani A, Mohammadi M. Knowledge and attitude of dental students towards infection control in Babol dental school. *J Dentomaxfac Rad PathoSurg* 2013;2(3):21-5.
15. Khan AA, Javed O, Khan M, Mehboob B, Baig S. Cross infection control. *Pak Oral Dent J* 2012; 32 (1); 31-5.
16. Al-Maweri SA, Tarakji B, Shugaa-Addin B, Al-shamiri HM, Alaizari NA, AlMasri O. Infection control: knowledge and compliance among Saudi undergraduate dental students. *GMS Hyg infect Control;* 2015: open access
17. Su J, Deng XH, Sun Z. A 10 year survey of compliance with recommended procedures for infection control by dentists in Beijing. *Int Dent J* 2012 Jun; 62 (3):148-53.
18. Mutters NT, Hagele U, Hagenfeld D, Hellwig E, Frank U. Compliance with infection control practices in an university hospital dental clinic. *GMS Hyg Infect Control.* 2014;9(3):Doc18.
19. George B, Brigi C, Mulamootil VM, Cherian SA. Awareness on infection control procedures among dental students in a dental school in South Kerala. *Health Sciences* 2014;1 (3):Jsoo1E.
20. World Health Organization. WHO guidelines on hand hygiene in health care. World Health Organization: 2009.
21. de Amorim-Finzi MB, Cury MV, Costa CR, Dos Santos AC, de Melo GB. Rate of compliance with hand hygiene by Dental Healthcare Personnel (DHCP) within a Dentistry Healthcare First Aid Facility. *Eur J Dent,* 2010 jul; 4 (3): 233-7.
22. Rahman B, Abraham SB, Alsalami Am. Alkhaja FE, Najem SI. Attitude and practices of infection control among senior dental students at college of dentistry, university of Sharjah in the United Arab Emirates. *Eur J Dent.* 2013 Sep; 7 (suppl 1): S15-9. Open access
23. Kramer A, Meyer G, Ertzinger S, Kietz K, Schrader O, Martiny H. Multicenter study on the realization of selected hygiene measures in 331 dental practices. *Hyg Med.* 2008;33 (3): 64-73.
24. Mohiuddin S, Dawani N. Knowledge, attitude and practice of infection control measures among dental practitioners in public setup of Karachi, Pakistan: cross sectional survey. *Journal of the Dow university of Health Sciences Karachi* 2015;9(1):89-93.
25. Burke FJ, Baggett FJ, Wilson NK. Glove wearing by dental surgery assistant in general practice: result of a survey. *Dent Update.* 1992; 19: 263-5.
26. Miller CH. Sterilization: disciplined microbial control. *Dent Clin North Am.* 1991; 35:339-55.
27. Ali M, Idrees M, Ali L, Hussain A, Rehman I, Saleem S et al. Hepatitis B virus in Pakistan: A systematic review of prevalence, risk factors, awareness status and genotypes. *Virology J* 2011. 102.
28. Rhodes A, Aw TC, Allen C and Ridout M. Immunisation status of dental practice staff in Kent. *Br Dent J* 2008; 205: 20-3.
29. Qudeimat MA, Farrah RY and Owais AI. Infection control knowledge and practices among dentists and dental nurses at a Jordanian University teaching center. *American Journal Of Infection control,* 2006; 34: 218-22.
30. Alavian SM, Mahboobi N, Mahboobi N, Savadrudbari MM, Azar PS, Danesh S. Iranian dental student's knowledge of hepatitis B virus infection and its control practices. *J Dent Educ.* 2011;75 (12); 1627-34.