

Research Article

**Knowledge, attitudes and practice of dental students
for control of prosthetics infections**

**Hamid Neshandar Asli^{1*}, Mahsa Saadat Mohadese²
and Marzieh Neshandar asli³**

¹Associate Professor, Dental sciences research center, Department of Prosthodontics,
Faculty of dentistry, Guilan University of Medical Sciences, Rasht, Iran.

².DDS, Dentist

³.Dental student, Debrecen University of Medical Sciences, Hungary

*Corresponding Author: Hamid Neshandar Asli, DDS, MS.

Tel: +98(0)911- 1325985. Email: dr.neshandarasli @ yahoo.com

ABSTRACT

Background: Despite extensive development in infection control during recent years there are still many shortages in practice especially in dental schools. Impressions provided for prosthetics are usually contaminated with blood and saliva. They are potential source of infection and can cause cross infection. **Aim:** so, the aim of the current study was to evaluate knowledge, attitude and practice of dental students for infection control in prosthetic. **Methods:** This was a descriptive cross sectional study. A valid questionnaire was prepared to survey knowledge and attitudes of students. A total 87 students participate in the survey. **Results:** according to the results, 41.7 percent of the students had good knowledge about infection control principles in prosthetics department and 75.9 percent of the students brought these principles into practice. Also, a correlation detected between better knowledge and appropriate attitude. **Conclusion:** these results suggested students' had sufficient knowledge about the infection control. So, good supervision of science committee members and adequate facilities of faculty may play a significant role in satisfactory implementation of infection control principles.

Keywords: Infection control, knowledge, attitudes, practice

INTRODUCTION

Dental procedures are associated with the risk of exposure to blood and transmission of blood-borne diseases can occur easily in the dental clinical environment (Mohiuddin et al. 2015). During oro-dental examination or procedures in which there is a chance of coming in contact with the blood of infected patients; without any protective medium, dental health care practitioners are more prone to get infected by pathogens that directly enter the host's body (Santra et al. 2010). As far as dental health care practitioners are concerned, they are potentially at more risk of infections caused by a wide range of causative organisms namely mycobacterium tuberculosis,

hepatitis B and C virus, streptococci, staphylococci, herpes simplex virus type 1 (HSV 1), mumps, rubella, human immunodeficiency virus (HIV), influenza. There is also some evidence to suggest that students of dental schools are also at higher risk of infection through blood borne infectious agents (Ali et al. 2014). Cross infection prevention in dental clinic and schools during a dental procedure is of immense significance, as well as all para-dental auxiliaries must adhere to the standard guidelines of prevention and safety measures particularly at the time of patients handling (Sofola et al. 2007).

In a study on knowledge, attitude and practice of infection control measures among dental practitioners in Pakistan Mohiuddin et al. (2015) reported, the infection control knowledge, attitudes and practices of junior professionals and house officers were better, however, there is need to improve the knowledge and practices among dental health care professionals to minimize cross infection in dental setup and reduces associated morbidity and mortality rates for dental practitioners themselves and patients. Moreover, dental technicians are vulnerable to microbial cross-contamination from the impressions they receive from dental clinics. Casts prepared from the impressions may also harbor infectious microorganisms that can be spread throughout the laboratory when the casts are trimmed (Begum et al. 2013). Therefore, it is essential for all dental laboratory technicians to have a basic understanding of infection transmission. Employers should also have the moral and legal responsibility to train their new and old employees with the standard operating procedures for the infection control of routine and high risk cases in the dental laboratory (Powell et al. 2009). It is reported training of the dentists improve their attitudes toward treatment of the HIV, HBV and HCV infections (Kadeh et al. 2014).

Dental treatment often includes direct contact with patients' blood and saliva; therefore, dentists and dental students can be exposed to some microorganisms such as HIV, HBV and HCV. The HIV and viral hepatitis can be transmitted to dental staff by professional exposure, most often by a needle stick injury. However, the risks of infection with HIV, HBV and HCV by needle stick differ (Ryalat et al. 2011). All dental students should have complete knowledge about the universal precautions which is an administrative control measure that calls for the implementation of practices and equipment to protect the health care workers whenever the potential exists for exposure to blood (Ryalat et al. 2011). So the aim of the current study was to determine knowledge, attitudes and practice of dental students for control of prosthetics infections.

MATERIAL & METHODS

A total 87 dentistry students participate in the survey in prosthetic department of international branch of Guilan dental school, Rasht, Iran. A valid questionnaire was prepared to survey knowledge and attitudes of students. Their Practice was evaluated by observation. The questionnaire included the question about the definition of the infection, sterilization of the equipment and so on. In the first stage questions, students tested for their as general dentistry information where asked to multiple answer by the true, false and NA choice. The second section of the questioners included questions related to the knowledge of the students for sterilization and infection disease. To determine the accuracy of the student's proper function, a check list provided which had 10 steps, if a student observance a positive point was given to it. Also, the correlation between awareness, attitude and performance were determined among the dentistry students. A 87 questioners distributed among the students and after fill, data expressed in the excel and analyzed using SPSS 16.0 for Windows (SPSS, Inc., Chicago, IL, USA) and means compared using a χ^2 test.

RESULTS

The results of the knowledge, attitudes and practice of dental students for control of prosthetics infections are presented in tables 1-6. The results of the section 1 questioner as general dentistry information among the dentistry students is presented in table 1. According to the results, 59.38 % of the students had true answer to the question "The correct infection control in dentistry is a sole method for all patients". Also, almost all students (92%) had wrong believe for the "There is no dentistry treatment for patients with AIDS and hepatitis". Students had true answer to the questions "Alcohol can use a germicide" and "The fabricated cast must send to the laboratory after sterilization", 66.7 and 90.8%, respectively. As seen in table 2, dentistry students false answered to the "The guide of the sterilization method to the student is OK" and "In case of the inadequacy of the angle and turbine, the used

equipment can use for the next patient after sterilization” and “Based on the obtained information, I have enough ability to determine AIDS and hepatitis”, 66.7, 87.2% and 59.8%, respectively. In this study, 87.4 % of the students true answered to the “It is necessary to inform the instruction of the sterilization to the students”. Also, 85.1 % of the students true answered to the “it is necessary to inform the instruction of the correct sterilization of the casts” (table 2). Based on the results of the check list on the proper performance of the dentistry students, almost all of them had acceptable performance for items listed in table 3. The distribution of the awareness, attitude and performance among the dentistry students is shown in table 4. As seen, 41 of them (47.1%) had good awareness. Also, 65 (74.7%) of them had good attitude. In total, 66 (75.9%) of the students had good performance.

As seen in the table 5 and 6, a significant correlation detected between awareness and attitude as well as awareness and performance (P<0.0001).

DISCUSSION

As seen in this study, 41.7 percent of the students had good knowledge about infection control principles in prosthetics department and 75.9 percent of the students brought these principles into practice. Also, a correlation detected between better knowledge and appropriate attitude. These results suggested students’ had sufficient knowledge about the infection control. In a study, de Abreu et al. (2009) reported there was no improvement in the use of rubber gloves, face masks or gowns on dental students concerning infection control. Also, no student used the individual protection equipment correctly (de Abreu et al. 2009) which our findings were not in

agreement with their report. Most students do not have knowledge regarding the test to determine HBV, despite the educational programs and specific material published for the dental community (de Abreu et al. 2009) and our findings was in agreement with.

According to Al-Rabeah and Mohamed (2002), 100% of dentists use gloves and 90% of them use masks while treating their patients. Al Ruhaimi1 stated that between 2%-4% of dental professionals in Saudi Arabia never wore gloves when treating patients. In another study, authors showed that about 90% of dentists in Kuwait wore gloves, 75% wore masks and 52% wore protective spectacles. Also, Pornasrollah et al. (2016) reported the mean knowledge grade was 9.4 (23.4% poor knowledge level, 74.5% moderate and 2.2% good). At all attitude questions 80% of GDPs agreed. The mean practice grade was 5.1 (1 to 9) (13% of GDPs poor practice level, 71.2% moderate, and 14.7% good) among dental general practitioners about infection control of taken impressions (Pornasrollah et al. 2016). According to the various studies, dentists used gloves 100% (Al-Rabeah and Mohamed 2002) , 90 % (Morris et al., 1996), 42% (Treasure and Treasure, 1994), 91.8 % (McCarthy and MacDonald, 1997) , masks 90% (Al-Rabeah and Mohamed, 2002), 75% (Morris et al., 1996), 64.8 % (Treasure and Treasure, 1994), 74.8% (McCarthy and MacDonald, 1997) and protective spectacles 66.4% (Treasure and Treasure, 1994), 83.6% (McCarthy and MacDonald, 1997) during the dental treatment. In another study of 66 dental clinics, it is found that most of the dentists conformed to use of gloves and mouth mask during working with patients. Moreover, nearly 50% of the dentists had no information about vaccination against hepatitis B (Taha et al. 2015).

Table 1. The section 1 questioner as general dentistry information among the dentistry students

Question	True (N, %)	False (N, %)
The correct infection control in dentistry is a sole method for all patients	52 (59.38)	35 (40.2)
There is no dentistry treatment for patients with AIDS and hepatitis	7 (8)	80 (92)
Alcohol can use a germicide	58 (66.7)	29 (32.3)
The fabricated cast must send to the laboratory after sterilization	79 (90.8)	8 (9.2)
It is better to done AIDS and hepatitis test in all patients	18 (20.7)	69 (79.3)

Table 2. The section 2 questioner as knowledge of the students for sterilization and infection disease among the dentistry students

Question	True (N, %)	False (N, %)	NA
The guide of the sterilization method to the student is OK	16 (18.4)	58 (66.7)	13 (14.9)
In case of the inadequacy of the angle and turbine, the used equipment can use for the next patient after sterilization	14 (16.1)	68 (87.2)	5 (5.7)
Based on the obtained information, I have enough ability to determine AIDS and hepatitis	25 (27.8)	52 (59.8)	10 (11.5)
It is necessary to inform the instruction of the sterilization to the students	76 (87.4)	5 (5.7)	6 (6.9)
It is necessary to inform the instruction of the correct sterilization of the casts	74 (85.1)	6 (6.9)	7 (8)

Table 3. The check list of students proper performance of the dentistry students

Performance	True (N, %)	False (N, %)
Use clean overalls	81 (93.1)	6 (6.9)
Use of gloves and masks	81 (93.1)	6 (6.9)
Use protective glasses	79 (90.8)	8 (9.2)
Use gloves in laboratory	70 (80.5)	17 (19.5)
Use disposable impression trays	54 (62.1)	33 (37.9)
No-touch materials forming tube with infected gloves	49 (56.3)	38 (43.7)
Disinfect the impression before sending it to the lab	74 (85.1)	13 (14.9)
Disinfection of dental prostheses messages before delivery to the patient	77 (88.5)	10 (11.5)
Disposal of waste and consumption and disinfect after completion of treatment	73 (83.9)	14 (16.1)
Protective coating unit and chairs	80 (92)	7 (8)

Table 4. The distribution of the awareness, attitude and performance among the dentistry students.

Experimental factors	Weak (N, %)	Moderate (N, %)	Good (N, %)	Total (N, %)
Awareness	8 (9.2)	38 (43.7)	41 (47.1)	87 (100)
Attitude	22 (25.3)	-	65 (74.7)	87 (100)
Performance	21 (24.1)	-	66 (75.9)	87 (100)

Table 5. The correlation between awareness and attitude among the dentistry students

Awareness	Attitude		Total (N, %)	P value
	Inappropriate (N, %)	Appropriate (N, %)		
Good (N, %)	3 (7.3)	38 (92.7)	41	0.0001
Moderate (N, %)	12 (31.6)	26 (68.4)	38	
Weak (N, %)	7 (87.5)	1 (12.5)	8	

Table 6. The correlation between awareness and performance among the dentistry students

Awareness	Performance		Total (N, %)	P value
	Good (N, %)	Weak (N, %)		
Good (N, %)	39 (95.1)	2 (4.9)	41	0.0001
Moderate (N, %)	27 (71.1)	11 (28.9)	38	
Weak (N, %)	0 (0)	8 (100)	8	

Todorova et al (2015) in a study on knowledge and attitude towards hepatitis b and hepatitis c among dental medicine students reported, most of the participants (82.3 %) considered hepatitis B and C as serious diseases and had positive attitude towards HBV vaccination (75 %). Almost 90% considered that dental practice could enhance the risk of infection with HBV and HCV. Unfortunately, only 57.4% of students knew their

vaccination status and 13.9 % had checked HBV antibodies level. The relationship between experience and knowledge was found to be significant in the study by Lavvaf et al. (2011) where knowledge decreased with increasing experience, indicating a need for academic workshops. Mortadi et al. (2010) reported that 37.2% of dentists washed and 2.7% cleaned the impressions with a brush before dispatch. Zaker

Jafari et al. (2008) reported that dental students transferred impressions to the laboratory without proper cleaning, disinfection, or packaging, owing to a lack of information as per the students' own admission. They also stated that this practice had never been questioned before. Further, a study by Ajami et al. (2009) demonstrated that students' theoretical knowledge alone was insufficient and that practical experience of infection control procedures was necessary. Additionally, Alshiddi et al. (2015) on attitude and awareness of dental students and interns toward infection control measures in prosthodontic clinics reported the attitude and awareness toward infection control in prosthodontic clinic was varied between 100% were regularly using gloves with patient to 17.8% were regularly disinfect dental cast before sending it to dental laboratory. Most of the subjects responded "good" or "fair" to the two questions related to the evaluation of their knowledge and policy implementation of infection control in prosthodontic clinic. Around 43% were almost satisfied and 36% were fairly satisfied with their knowledge and performance. Findings indicate insufficient attitude and awareness of subjects toward infection control in prosthodontic practice. Their self-assessment and satisfaction reflect their performance toward infection control policy. In conclusion, good supervision of science committee members and adequate facilities of faculty may play a significant role in satisfactory implementation of infection control principles.

REFERENCES

1. Ajami B, Ebrahimi M, Sediqi S. Evaluation of students' knowledge of Mashhad Dental Infection Control in 2007. *Journal of Mashhad Dental* 2009; 33(1):53-62.
2. Ali M F, Hussain A, Maqsood A. Knowledge, attitude and practices concerning infection control measures among dental health care providers of Dow University of Health Sciences. *PODJ*. 2014;34(3):452-56.
3. Almortadi N, Chadwick RG. Disinfection of dental impressions compliance to accepted standards. *Br Dent J* 2010; 209(12):607-11.
4. Al-Rabeah A, Mohamed AG. Infection control in the private dental sector in Riyadh. *Ann Saudi Med*. 2002;22(1-2):13-7.
5. Alshiddi IF. Attitude and awareness of dental students and interns toward infection control measures in prosthodontic clinics. *Dent Oral Craniofac Res*, 2015; 1(4): 116-120.
6. Begum A, Ahmed R, Dithi AB, Islam S, Shaikh MH. Infection control protocol in prosthetic laboratory. *City Dent. Coll J*. 2013 10(2): 47-49.
7. de Abreu MHNG, Lopes-Terra MC, Braz LF, Rímulo AL, Paiva SM, Pordeus IA. Attitudes and behavior of dental students concerning infection control rules: a study with a10-year interval. *Braz Dent J* (2009) 20(3): 221-225.
8. Kadeh H, Saravani S, Golzari P. Knowledge, attitude and practice of dentists towards patients with HIV, hepatitis B and hepatitis C infections. *Avicenna J Dent Res*. 2014 June; 6(1): e21348.
9. Lavvaf SH, AziziA, Shantia M. knowledge and attitudes of dentists in Ahvaz on disinfecting dental impressions. *Journal of Isfahan dental school Isfahan Journal* 2011; 8(7):676-83. Persian.
10. McCarthy GM, JK MacDonald (1997). "The infection control practices of general dental practitioners." *Infection control and hospital epidemiology*: 699-703.
11. Mohiuddin S, Dawani N. Knowledge, attitude and practice of infection control measures among dental practitioners in public setup of Karachi, Pakistan: cross-sectional survey. *J Dow Uni Health Sci* 2015; 9(1):89-92.
12. Morris E, FS Hassan, A Al-Nafisi (1996). "Infection control knowledge and practices in Kuwait: a survey on oral health care workers." *Saudi dental journal* 8(1): 19-26.
13. Pornasrollah A, Neghahradi R, Zabihi Z, Zarandi A. 2016. Evaluation of knowledge, attitude and practice of Tabriz dental general practitioners about infection control of taken impressions. *Merit Research Journal of Medicine and Medical Sciences*. 4(6): 290-293
14. Powell GL, Runnells RD, Saxon BA, et al. The presence and identification of organisms

- transmitted to dental laboratories. *J Prosthet Dent* 2009;64:235-37.
15. Ryalat ST, Sawair FA, Shayyab MH, Amin WM. The knowledge and attitude about HIV/AIDS among Jordanian dental students: (Clinical versus pre-clinical students) at the University of Jordan. *Research Notes* 2011, 4:191
 16. Ryalat ST, Sawair FA, Shayyab MH, Amin WM. The knowledge and attitude about HIV/AIDS among Jordanian dental students: (Clinical versus pre-clinical students) at the University of Jordan. *BMC Res Notes*. 2011;4:191.
 17. Santra D.K, Tripathi S, Ganger A. Study to access the level of knowledge, attitude and practices of infection control among dental professionals. *JDSOR*. 2010;57-60.
 18. Singh A, Purohit BM, Bhambal A, Saxena S, Singh A, Gupta A. Knowledge, attitudes, and practice regarding infection control measures among dental students in central India. *J Dent Educ*. 2011;75(3):421-7.
 19. Sofola OO, Folayan MO, Denloye OO, Okeigbemen SA. Occupational exposure to bloodborne pathogens and management of exposure incidents in Nigerian dental schools. *Journal of dental education*. 2007;71(6):832-37.
 20. Taha F, J Joseph, C Janakiram, R Puttaiah (2015). "Dental Infection Control Practices and Public Perception: A Cross-sectional Study." *Health* 7(12): 20-26.
 21. Todorova TT, Tsankova G, Tsankova D, Kostadinova T, Lodozova N. Knowledge and attitude towards hepatitis B and hepatitis C among dental medicine students. *J of IMAB*. 2015, 21(3):810-813.
 22. Treasure P, E Treasure (1994). "Survey of infection control procedures in New Zealand dental practices." *International dental journal* 44(4): 342-348.
 23. Zaker Jafari H, Mohammadi Salimi H. Knowledge, attitudes and practices of dental students in the Department of Prosthodontics, Faculty of Dentistry Rasht. *Journal of Infectious and Tropical Diseases* 2008;41:71-74.