Original Article

Knowledge and Awareness of Cross Infection Control Among Dental Practitioners in a Tertiary Care Hospital in Islamabad

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ABSTRACT

Objective: Evaluate the awareness and attitudes of dental practitioners towards infection control measures in the prosthodontic clinic and to assess their knowledge regarding the recent advancements of cross infection control.

Study Design: Cross-sectional study

Place and Duration of Study: This study was conducted at the Tertiary Care Hospital, Islamabad from July-October, 2022.

Methods: A self-administrated questionnaire study was conducted among dental practitioners including House Officers (Hos), Post-Graduate Resident (PGR) Trainees, and Consultants. It consisted of 15 close-ended questions related to the HBV vaccination status, the dentist's daily practices towards infection control in the prosthodontics clinic, previous education about infection control, and subjects' satisfaction about their knowledge and attitude. The questionnaire was sent to all dental practitioners to be filled by hand, and informed consent was obtained before commencing the questionnaire. The responses were recorded in the SPSS version 23 software program and an ANOVA test was employed to compare the credibility of the respondents cross-infection control.

Results: Total of 120 study subjects responded to the questionnaire. Their attitude and awareness toward infection control in prosthodontic clinic was varied. The majority of participants were the House Officers (68.3%) and the Consultants ranked last. 100% were regularly using gloves and face mask but a smaller number of participants opted for the use of protective eyewear. Most of the subjects responded "good" or "fair" to the two questions related to the evaluation of their knowledge implementation of infection control in prosthodontic clinic ($p < 0.05$). 42.5% participants were fairly satisfied with their knowledge and performance.

Conclusion: 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.

Key Words: Attitude, Awareness, Cross Infection Control, Dental Practitioners, Prosthodontics

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INTRODUCTION

Harmful microorganisms invade the body tissues, replicate in them and, by the production of toxins, cause breakdown of the tissues to cause disease; a process called infection.[1]

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METHODS

A cross sectional study was conducted at a tertiary care hospital in Islamabad from July to October 2022.

The study was initiated after taking approval from the Ethical Committee of IIDH for dental research. (ERC number IIDC/IRC/2022/11/032). The basic aim of the study was to evaluate awareness and attitudes of dental practitioners towards cross infection control. Further, comparisons could be made to compare age and gender against the knowledge and practices of the participants. For sampling, a Non-Probability Convenience Sampling Technique was employed.

A structured self-administered questionnaire was designed for this study consisting of 15 close-ended questions. The questionnaire was distributed among various dental practitioners of a tertiary hospital of Islamabad. The participants of the study included house

surgeons, post graduate residents and consultants currently working in the aforementioned hospital. Practicing students, interns and other staff were not considered. A total of 120 responses were collected. Data was kept anonymous and participation was voluntary.

The participants were given the options to express their attitudes and knowledge towards cross infection control. A few satisfaction questions were also filled by the participants to show their satisfaction towards the practices of cross infection control followed by them.

Data was collected and results were analyzed using SPSS version 23. Detailed frequencies of all the data were concocted. A Chi-square test was incorporated to determine the association between the variables and an ANOVA test was used to determine the association of respondents taking workshops and trainings regarding infection control.

RESULTS

A total of 120 responses were tabulated in the SPSS program. Among the sample of respondents, the majority share went to the House Officers (68.3%) and the Consultants ranked last.

The performance-based statistics showed an interesting picture regarding the personal protection sterilization and disinfection protocols of our respondents. All categories of the participants adopted the basic protection items (gloves and face masks), but a smaller number of participants opted for the use of protective eyewear. Both PGs and HOs remained almost equally divided on the use of protective gowns and head covers.

Performing a Chi-Square Test enabled us to vigorously evaluate the response sheet results by comparing statistical significance and whether to accept or reject the null hypothesis. The P value (0.05) for the practice aspect from the data of the questionnaire was obtained and checked. The only statistical significance was observed when participants were asked if they disinfect the impression, dental cast, the bite registration/wax rim, facebow & fork, and the fox occlusal plane. This observation pointed towards the deeper and hidden aspect which many clinicians consider to be unimportant in daily practices.

ANOVA Test on the Efficacy of Lectures and Workshops.

Theoretical knowledge was assessed by the coverage of lectures and workshops attended by the respondents. An ANOVA Test was employed to assess the impact of these factors. For lectures (0.97) and workshops (0.33), the results showed a lack of significance between the groups.

To assess the differences amongst members of the same group, a specialized Tukey Post Hoc Test was analyzed. Again, no significance was yielded from this test.

Knowledge on Infection Control: Participants were assessed regarding their personal knowledge regarding the standards and protocols of infection control with a rating scale of Very Good, Goof, Fair, Poor, and Very Poor. The majority of the practitioners evaluated themselves as adequate in this regard (42.5%), whereas 14.6% rated themselves as 'Poor'.

Self-Evaluating the Implementation of Cross Infection Control Protocols: A good proportion of participants (46.67%) labelled themselves to be 'good' at carrying out necessary regimes for cross infection control.

Satisfaction on Knowledge and Performance: Participants were asked to show a satisfaction level by grading their theoretical and practical applications. In this regard, 47.5% of dentists described themselves as fairly satisfied and 26.7% felt unconvinced with their theoretical and practical knowledge.

Immunization Against HBV Infections: 82.5% participants were vaccine against Hepatitis B infections which showed promising signs. Still 21 respondents remained unimmunized against this disease.

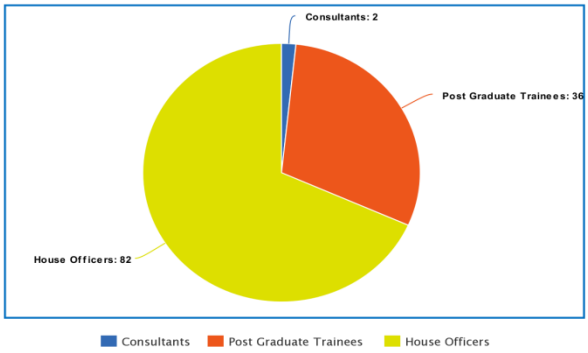

Figure No.1: Pie Chart of the Sample

Table No.1: Practice Assessment

No.	Question		Consultants (Percentage) n = 2	PG Residents (Percentage) n = 36	House Officers (Percentage) n = 82	p value
1	Do you regularly wear the following barriers during dental procedures in clinic?	Gloves	100	100	100	-
		Face Mask	100	100	100	-
		Protective Eyewear	0	13.88	29.27	0.14
		Protective Gowns	0	44.44	54.88	0.20
		Head Cover	0	50	56.01	0.26

2	Do you or your assistant regularly disinfect the following items between patients?	Mixing Bowl	100	50	52.44	0.39
		Alginate Mixing Spatula	100	50	46.34	0.32
		Facebow	100	50	63.41	0.20
		Shade Guide	100	25	50	0.11
3	When taking a primary or final impression do you or your assistant	Rinse Impression	100	66.67	93.90	0.00
		Disinfect Impression	100	75	96.34	0.002
		Disinfect outside of tray	0	38.89	73.17	0.00
3	Do you regularly disinfect the following items before sending to the lab?	Dental Cast	100	33.33	54.88	0.03
		Prosthesis	100	66.66	75.61	0.41
		Metal Framework	100	50	56.10	0.36
		Bite registration or wax rim	100	33.33	62.20	0.01
		Facebow and Fork	0	33.33	65.85	0.001
4	Do you sterilize the following items before being used with patients?	Facebow Fork	100	44.44	48.78	0.34
		Fox Occlusal Plane	100	16.67	17.07	0.03

DISCUSSION

Educating young dental professionals and undergraduates regarding the significance of cross infection control is critical in enhancing patient safety and quality of treatment. In prosthodontics, the importance of reinforcing cross infection control is two-fold.[1] Firstly, because most of the patients reporting to the prosthodontics clinic are from a higher age group and have underlying systemic disorders and particularly decreased immunity. Secondly, every prosthodontic treatment involves lab support and lab work on every step. The fact that inanimate objects are involved and transported from one place to another makes it even more essential to practice and reinforce infection control.[2-5]

The questionnaire evaluated the awareness and attitudes of dental health care professionals in a tertiary care hospital at Islamabad, the federal capital of Pakistan. It was also a possible means of self-evaluation of the dentists regarding infection control practices and policies. This study is with an internal validity; thus, it does not represent the whole population, only one dental teaching hospital but provides a fair picture of the current scenario although it would be interesting to reproduce these results on a vaster population. The questionnaire comprised of limited questions and kept straightforward, since there were concerns that a lengthy questionnaire would decrease the response rate and the accuracy of the responses.[6-8]

The majority of our respondents (68.3%) were house officers and fresh graduates, which represents the young population of dentists as per the aim of our study. Immunization for HBV among the participants was 82.5%. 21 participants were not immunized for Hepatitis B. In the respective tertiary healthcare hospital, it is mandatory to be immunized against Hepatitis B to be eligible for admission in hospital faculty. Alshiddi IF[1] demonstrated 94.2% immunization rate among participants at King Saud University, Riyadh, Saudi Arabia. McCarthy and Britton concluded a 100% immunization rate among undergraduates at University of Western Ontario, Canada.[9]

Regarding the practices of dental care professionals, all of the subjects (100%) made sure to wear gloves before starting treatment of every patient. However, the use of other personal protective equipment was scant; 54.88% of house officers and 44.44% of the postgraduate residents have shown to wear protective gowns while only 13.88% of PG residents and 29.27% of house officers regularly incorporate the use of protective eyewear in their prosthodontic practice. Previous studies[9] have also shown similar results with personal protective equipment, head cap and protective glasses, around 73.3% and 36% respectively.[1]

On the other hand, the practice of disinfecting rubber mixing bowl and impression was seen in 52.44% and 96.34% of the house officers respectively. For the postgraduate residents, this percentage was 50% and 75% respectively. This concludes excellent awareness and execution of impression disinfection. Alshiddi IF[1] demonstrated a range of 53.5% and 79.1% participants disinfecting common prosthodontic items (rubber bowl, shade guide, alginate mixing spatula, facebow).

Regarding infection control between dental office and dental laboratory, several questions in our questionnaire owed to disinfection of items sent or received by the dental laboratory. The Centers for Disease Control and Prevention Guideline for Infection Control in Dental Health-Care Settings in 2003 has provided different

strategies to control infection in the dental clinic and dental laboratory[9]. There has been reported risk of catching infections such as HBV among the patients and dental technician staff[12]. Items such as impressions, dental cast, trial dentures, metal framework for fixed or removable prostheses, bite registration wax rim must be disinfected copiously before they are sent to dental laboratory[13]. In our study, 93.9% of house officers regularly rinse the impression when removed from mouth. Around 62.2%, 56.1% and 75.6% respectively house officers regularly disinfect wax rims, metal framework and completed prosthesis before sending to the laboratory. Alshiddi IF[1] demonstrated this percentage to be around 62.8% - 68.65% of the study samples. The idea was similar to a study in Romania where 76% of the population were aware of the standard precautions[14]. A similar picture was observed in the Saudia Arabia with participants possessing an adequate knowledge set regarding cross infection control[15]. There is a requirement of further education of dental healthcare professionals regarding disinfection of inanimate objects that contact the oral mucosa of the patient. Such knowledge must be reinforced among young dentists.

In order to have a better understanding and awareness of infection control practices, it is imperative for them to have educational workshops and lectures of the topic. Assessing that in the research, it was observed that majority of respondents have not attended workshops and seminars on infection control. This means their knowledge regarding infection control practices are not up to date. The findings of the study reported inadequate knowledge of attending lectures of the said topic. Alshiddi IF[1] reported that 93% of subjects had not attended or attended only one clinical demonstration of infection control. This was constant in another study in Rawalpindi and Islamabad where respondents reported that cross-infection protocols were transferred from teachers and there appeared to be a lack of any formal and structured training[8].

The knowledge of dental health care professionals appeared decent but not of absolute standards. There was a very less significance or difference between the groups of respondents. All dental practitioners were apt in covering their basic but cross infection policies require rigorous implementation. It must be noted that the study was conducted according to the written response of the participants, and it can vary in actual clinical practice of dentists. Establishing standardized recommendations for dental professionals holds significance in enhancing their understanding[16]. This also involves crafting a usable manual for enhancing the process of cross-infection control and adherence to guidelines. Moreover, there is a need to provide education within the dental community to enhance adherence, elevate the effectiveness of superior practices, and ensure the protection of health[17].

CONCLUSION

Meticulous history taking procedures and disease screening must be done for every patient before the commencement of treatment. All the dentists, dental technicians and assistants must be vaccinated against Hepatitis B (HBV). It is important for every dentist to review the CDC guidelines of cross infection control and incorporate those in their practice. This study concluded insufficient knowledge regarding cross infection control due to lack of regular lectures and workshops. Subjects showed insufficient confidence when it came to satisfaction of their own knowledge of cross infection control.

Recommendations:

- A larger sample size should be used to give more accurate results.
- More than one hospital could be included in the study and the results could be compared for two different hospitals.
- The questionnaire should have been piloted before circulation, or feedback of the questionnaire could be taken by the first few participants of the study.
- An equal or near to equal number of house officers and residents/consultants should be reinforced.
- This issue should be promoted for further findings and analysis.

Limitations:

- The research is carried out in one hospital of Islamabad, and does not represent the whole dentist population of the city.
- Very few consultants (n=2) were included in the study. Most of the participants in our sample comprised of house officers/fresh graduates.
- The answers given were self-reported which could have been biased.
- The results of the study do not guarantee the practices in actual clinical practice of the subjects.
- A significant error in the printed questionnaire was identified later, in which a section of "Years of Practice" of the dentist was added at one corner of the paper. It was not easily discernible by the participants which lead to skipping of the question by majority of the participants.
- The questionnaire was distributed to every dentist in the premises, which inadvertently gave a snowballing effect to our sampling technique.

Author's Contribution:

Concept & Design of Study:	Omaima Arshad
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Final Approval of version: Omaima Arshad

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REFERENCES

1. Alshiddi FI. Attitude and awareness of dental students and interns toward infection control measures in prosthodontic clinics. Dental, Oral Craniofacial Res 2015;1(4):116-120.
2. Ch NA, Usman N, Kiran S, Zahra T, Khalid H, Akhtar UM. Cross Infection Control in Dental Institutions. Pak Oral Dental J 2018;38(4):419-422.
3. Yüzbasioglu E, Saraç D, Canbaz S, Saraç YS, Cengiz S. A Survey Of Cross-Infection Control Procedures: Knowledge And Attitudes Of Turkish Dentists. J Applied Oral Sci 2009 Dec 1 [cited 2020 Nov 16];17(6):565–9.
4. Singh BP, Khan SA, Agrawal N, Siddharth R, Kumar L. Current biomedical waste management practices and cross-infection control procedures of dentists in India. Int Dental J 2012;62(3):111–6.
5. Milward RM, Cooper RP. Competency Assessment For Infection Control in the Undergraduate Dental Curriculum. Eur J Dent Educ 2007;11(4):148-54.
6. Qazi N, Shah NS. Knowledge, Attitude and Practice of Dentists Regarding Cross Infection in Dental Teaching Hospitals of Peshawar. J Gandhara Med Dent Sci 2016;2(2):3-8.
7. 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 Univ Health Sciences Karachi 2015;9(1):1-2.
8. Ahtasham H, Sohail K, Kiyani A, Akhtar SN, Asif RF, Asif N, et al. Knowledge, Attitude and Practice of Dental Students and Graduated Dentists Regarding Patients with Hepatitis B and C Infections in Islamabad and Rawalpindi, Pakistan. Foundation Univ J Dentistry 2022;2(1):49–57.
9. McCarthy MG, Britton EJ. A Survey of Final-Year Dental, Medical and Nursing Students: Occupational Injuries and Infection Control. J Canadian Dental Association 2000;66(10):561.
10. Rahman B, Abraham BS, Alsalami MA, Alkhaja EF, Najem IS. Attitudes and practices of infection control among senior dental students at college of dentistry, university of Sharjah in the United Arab Emirates. Eur J Dentistry 2013;7(1):15-19.
11. Prevention aCDfC. 2003 CDC infection control recommendations for dental health-care settings. Compendium Continuing Education Dentistry 2004;25(1):45-48, 50-53.
12. Salvia DRCA, Matilde SDF, Rosa SCF, Kimpara TE, Jorge COA, Balducci I, et al. Disinfection protocols to prevent cross-contamination between dental offices and prosthetic laboratories. J Infection Public Health 2013;6(5):377-382.
13. Kohn GW, Harte AJ, Malvitz MD, Collins SA, Cleveland LJ, Eklund JK. Guidelines for infection control in dental health care settings--2003. J Am Dental Assoc 2004;135(1):33-47.
14. Saveanu CI, Meslec MD, Saveanu AE, Anistoroaei D, Bobu L, Balcos C, et al. Knowledge Level on Infection Control among Romanian Undergraduate and Postgraduate Dental Students. Medicina 2022;58(5):661.
15. Mustafa RM, Alshali RZ, Bukhary DM. Dentists' Knowledge, Attitudes, and Awareness of Infection Control Measures during COVID-19 Outbreak: A Cross-Sectional Study in Saudi Arabia. Int J Environmental Research Public Health 2020;17(23):9016.
16. Larson E. Status of practice guidelines in the United States: CDC guidelines as an example. Preventive Med 2003;36(5):519–24.
17. Khanagar S, Kumar A, Naik S, Neelakantappa H, Ramachandra S, Vadavadagi S. Knowledge, attitude, and practice of hand hygiene among dentists practicing in Bangalore city - A cross-sectional survey. J Int Society Preventive Comm Dentist 2014;4(3):159.