Original Article

Practice of standard Cross Infection Protocol and disease control management in Private Dental Clinics of Khyber Pakhtunkhwa, Pakistan: A cross-sectional study

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Abstract

Introduction: Infection control, which is considered to be the backbone of dentistry, has become a particularly essential piece of dental training because both the dentists and patients are at an expanded danger of cross-contamination. Dental clinical settings represent a high organic hazard of spreading a wide scope of microorganisms. The objective of this study is to gather information from private dental practitioners regarding their practice of standard cross infection protocols and how can they improve the same in their practices.

Materials and Methods: Materials and Methods: This cross-sectional study was conducted in dental clinics of Khyber Pakhtunkhwa, KPK from January 2020 to July 2020 by distributing a questionnaire among dentists. It was a pre-designed questionnaire that was circulated in Google forms through Whatsapp and emails. The questionnaire was divided into 2 sections. Data was compiled and statistical tests were applied using the Statistical Package for Social Sciences SPSS® ver.23.0

Results: Regarding cross infection control measures, 76.3% dentists seem to have knowledge of cross infection control techniques. A significant difference was found (p= 0.05) between male & female dentists in disposing dental waste from clinical set up properly. A significant difference was also found between male & female dentists about rubber dam isolation (p=0.02).

Conclusion: The result of this study showed that practice of dentists in KPK is not up to standard protocols of cross infection control. In order to improve dental practice in KPK, it is crucial to authorise and put into practice better infection control measures.

Key words: Dental practice, Infection control, Sterilization.

Introduction

Infection control, which is one of the most examined subjects in dentistry, has become a particularly essential part of the training to the degree that dental practitioners presently don't explore its need. [1] Cross-infection is a significant importance to all dental practitioners. It is defined as "the transmission of disease between the staff and the patient inside the hospital climate." [2] Prevention of infection and control of cross-infection are fundamental in giving a safe environment for patients and health care professionals inside medical services settings overall and all the more explicitly in dental practices. Dentists are at an expanded danger of cross-contamination while treating patients. This work potential for disease transmission becomes obvious when one understands that most human microbial microorganisms have been segregated from oral discharge.[3 The known modes of transmission for communicable diseases for dentists is via direct contact with saliva or blood, airborne drops containing infectious agents, or on the other hand aberrant contact through infected objects (e.g., instruments, apparatus, or ecological surfaces).[4] Dental practitioners are known to be at an expanded danger of hepatitis, human immunodeficiency infection (HIV) contaminations and novel Corona virus disease (covid-19). [5]Various overviews and studies have shown that the occurrence of hepatitis B creating after needle stick wounds from HbsAg patients is roughly 20% contrasted with approximate 0.4% after comparable openness to the AIDS infection. [6] With the presence of individuals who are infected with hepatitis B and C and HIV infections, cross contamination control for diseases has turned into a significant concern both to the dental specialist and his patient.[3] Routine utilization of barrier strategies e.g gloves, masks, and spectacles have been accounted for to be significant in forestalling the three courses of transmission i.e (dentist to patient, patient to patient, patient to dentist) in the dental clinic.

Dental professionals' adherence to effective disease prevention techniques may be affected by a number of circumstances, including, information and educational background,[7] expenses and absence of motivations,[8] socio-demographic and professional factors, [9] and accessibility of and admittance to required materials and apparatus.[10] Dental clinical settings represent a high organic hazard of spreading a wide scope of microorganisms. Therefore, it is fundamental that in dental settings measures shall be taken to limit the spread of infection to patients and conditions from every conceivable disease. This study is planned to explain these issues and assess information and perspectives of disease control measures among dental professionals.

Materials and Methods

It was a cross-sectional study that was conducted in different dental clinics in Khyber Pakhtunkhwa (KPK).A total of 150 sample size was calculated using WHO sample size calculator. This study was conducted in 6 months that is from January 2020 to July 2020. Written informed consent was taken from the participants.

All the registered dentists practicing across KPK were included in the study. It was a pre-designed questionnaire based upon Centre for Disease Control (CDC) guidelines that was circulated in Google forms through WhatsApp and emails. The questionnaire was divided into 2 sections. Section 1 contained the demographic details and section 2 consisted of 10 questions to assess the standard cross-infection protocols. 3 point Likert scale (yes, no, maybe) was used.

Data was compiled and statistical tests including simple descriptive analysis, independent sample T-test was applied using SPSS® ver.23.0

Results

A total of 150 dentists participated in the study. The study population comprised 87(55.8%) males and 69(44.2%) females. The level of implementation of cross-infection control measures is shown in table 1. Regarding infection control measures maximum of individuals had detailed knowledge of cross infection management techniques. There was a decent pattern of taking clinical accounts from patients. About 76.3% liked to obtain a detailed clinical history from every patient. For patients with Hepatitis B &C and HIV greatest part of dentists, 63.5% agreed with performing screening.53.8% of dentists used to wash hands with antimicrobial hand wash before starting any dental procedure. A huge share of members had an uplifting disposition towards disease control estimates required during dental practice. Most of the members 88.5% sanitized and sterilized instruments. Concerning sanitization of coming countertops and

working surfaces, 63.5% of dental specialists used disinfect. About 64.1% of dentists used PPE during treatment. Concerning pre-procedural chlorhexidine mouthwash as a necessary protocol, only 16% of dentists used it. Isolation was not considered to play a vital role in cross-infection anticipation as only 14.7% used rubber dam isolation. Regarding flushing of dental unit water lines with a standard 5.25% NaOCl solution 32.1% percent used to perform it. Concerning disposal of dental waste from clinical setup properly the majority of dentists 77.6% responded yes.

Independent sample T test was applied. A significant difference was found (p= 0.05) between male & female dentists in disposing dental waste from clinical set up properly. A significant difference was also found between male & female dentist in rubber dam isolation (p=0.02).

Table 1: Practice of cross infection control measures in KPK Dentists

Statements	*Yes*		*Sometimes*		*No*	
	No.	%age	No.	%age	No.	%age
1-Do you acquire detailed medical history from each patient?	119	76.3	35	22.4	2	1.3
2-Do you wash your hands with antimicrobial handwash before starting any dental procedure?	84	53.8	38	24.4	34	21.8
3-Do you care to perform screening for Hepatitis B, C and HIV prior to any dental procedure?	99	63.5	32	20.5	25	16
4-Do you disinfect and sterilize the instruments according to recommendations of CDC (Centre for disease control)?	138	88.5	9	5.8	9	5.8
5- Do you care to disinfect or cover counter tops and operating surfaces daily in your practice?	99	63.5	44	28.2	13	8.3
6-Do you use PPE (Personal Protective Equipment) during treatment to prevent cross infection?	100	64.1	35	22.4	21	13.5
7-Do you use pre-procedural chlorhexidine mouthwash as a necessary protocol for each patient?	25	16	59	37.8	72	46.2
8-Do you use rubber dam isolation as a standard care to prevent cross infection?	23	14.7	34	21.8	99	63.5
9-Do you often flush your dental unit water lines with a standard 5.25% NaOCL solution?	50	32.1	38	24.4	68	43.6
10-Do you dispose of dental waste from your clinical setup properly?	121	77.6	16	10.3	19	12.2

Discussion

Infection control frames a significant piece of training for all health care workers and stays quite possibly the most cost-beneficial clinical intervention accessible.[11] Following contamination control rules and applying the necessary insurance can forestall a large portion of the unintentional exposures in dental consideration. Standard practices, and utilization of legitimate safety measures, pre-exposure inoculation, and post-exposure prophylaxis are likewise crucial for forestalling transmission of blood-borne contaminations and other cross-infections in dental practice. [12]This study is directed to survey the compliance of general dental specialists working in private facilities in KPK with contamination control methodology that is intended to decrease the danger of transmission of an assortment of microorganisms to dental teams and patients. We concentrated on disease control in private centers since they regularly lack hazard guidelines or occupational health policies that are more normally accessible in colleges and hospitals.

The reaction rate to the poll in this research was higher (100%) than or equivalent to past investigations.[11, 13] The significance of the issue of contamination control in dental practice is what causes this high prevalence. Asking about the medical history of all patients who look for dental treatment ought to be the main strategy before the beginning of the treatment. An intensive medical history can give pieces of information concerning what safety measures, notwithstanding disease control methodology, are vital because a few patients might have medical issues that require pre medications or laboratory examinations. In this review, around 76.3% of dental specialists asked about the medical history of their patients although this is not as much as what has been accounted for in the earlier study. [14]Taking into account that hand

washing is the absolute most significant method for forestalling the spread of contamination, 53.8% of dental practitioners wash their hands before analyzing patients. Our study has uncovered that dentist are nearly lower in rehearsing hand washing method than the past study done in North Wollo that 74.1% of health care workers clean up before looking at patients. [15]The result of our research is also lower than the review led among dental students, which was 95.5%.[16]

Health care professionals are presented to the danger of gaining HBV and HCV disease through mucosal-cutaneous openness (eyes or mouth mucosa or skin) to possibly irresistible blood or blood items or through percutaneous exposure to tainted sharp articles (needles, cutting edges, and so forth). [17]Screening before doing patients in dental setup is very important. According to our study, 63.5% of the dentist's care about performing screening of hepatitis B, C, and HIV before the dental procedure. [18]A survey was done in which it is stated that 142 patients screened before surgery. [18]Many researchers have stressed the risk of cross-contamination by the utilization of dental instruments. [19, 20] In another study it is shown that 94% of dental specialists in Kuwait utilized autoclaves to sanitize handpieces. [21]The current review showed that just 88% of the studied dental specialist's utilized autoclaves for cleaning handpieces. The most widely recognized justification for not sanitizing handpieces is the dread of harm to the instruments.[20]

Personal protective equipment is intended to ensure the skin and the mucous films of the eyes, nose, and mouth of dental medical services staff from exposure to blood or other possibly irresistible material. Occupational safety and wellbeing organization orders that dental HCWs wear gloves, surgical masks, defensive eyewear, and defensive attire in indicated conditions to diminish the danger of exposure to blood-borne microorganisms. [22]Our study result showed that 64.1% of dentists use personal protective equipment during treatment. The result of our study was a lot higher than the research directed in Central India among dental science students which demonstrated that among the participants just two members (students) utilized face masks, gloves, eye wears, and defensive clothing during procedures as an infection control measure.[16] The utilization of the rubber dam, as well as further developing safety and salivation control, altogether diminishes bacterial pollution of the atmosphere during restoration, especially nearby the operator and dental associate. [23]The result of this study showed that only 14% of dental practitioners used rubber dams for isolation as standard care to prevent cross infection control which is very lower than the study conducted in Durban were 40% of dentists used rubber dams, this might be due to lack of clinical practice for rubber dam application in private dental setups ,or due to lack of specialization of general dentists. [24]

Pre-procedural rinses with chlorhexidine mouth wash are very significant in reducing the microbial content of dental aerosols. [25]But according to our study, only 16% of dentists use pre-procedural chlorhexidine mouth wash. All sharp instruments utilized in dental centers ought to be securely discarded. It is a clear-cut clinic strategy that such instruments ought to be discarded in safe compartments, what's more, that these compartments ought to be punctured proof. [26, 27] The research by Kurdy and Fontaine showed that 72% of dental facilities in PHC focuses had holders for expendable needles and sharp instruments. [28]However, in the present study 77.6% of dentists disposed of dental waste from the clinic properly.

Limitations

Due to the cross-sectional nature of the study design, one of this study's limitations was the inability to establish temporal correlations between the explanatory and outcome variables. The other limitations of this study are that the sample size could have been larger to receive larger data. The duration of study could have been extended so that many other dentists could respond well in time. The study should have been conducted in other cities as well in a view to cover more ground for study.

Conclusion

As dentistry is overwhelmingly a surgical discipline, it is vital to practice strict measures of disease control. The result of this study showed that the practice of dentists in KPK is not satisfactory and up to the standard cross infection protocols. To ensure the dental practitioners, it is important to utilize great quality PPE intended to match the prerequisites of health care workers. In this way, the need of great importance is to authorize and execute better proportions of infection control to improve dental practice in KPK.

References

1. Upendran A, Gupta R, Geiger Z. Dental infection control. StatPearls [Internet]: StatPearls Publishing; 2021.
2. Al-Omari MA, Al-Dwairi ZN. Compliance with infection control programs in private dental clinics in Jordan. Journal of Dental education. 2005;69(6):693-8.
3. Volgenant C, De Soet J. Cross-transmission in the dental office: does this make you ill? Current oral health reports. 2018;5(4):221-8. . doi: 10.1007/s40496-018-0201-3
4. Dagher J, Sfeir C, Abdallah A, Majzoub Z. Infection control measures in private dental clinics in Lebanon. International journal of dentistry. 2017;2017. doi: 10.1155/2017/5057248
5. Jayaweera M, Perera H, Gunawardana B, Manatunge J. Transmission of COVID-19 virus by droplets and aerosols: A critical review on the unresolved dichotomy. Environmental research. 2020;188:109819.
6. Moore DL, Society CP, Diseases I, Committee I. Needle stick injuries in the community. Paediatrics & Child Health. 2008;13(3):205-10. doi: 10.1093/pch/pxy129
7. Tada A, Watanabe M, Senpuku H. Factors influencing compliance with infection control practice in Japanese dentists. The international journal of occupational and environmental medicine. 2014;5(1):24.
8. Al Shatrat SM, Shuman D, Darby ML, Jeng HA. Jordanian dentists' knowledge and implementation of eco-friendly dental office strategies. International dental journal. 2013;63(3):161-8. doi: 10.1111/idj.12031
9. Cheng HC, Su CY, Huang CF, Chuang CY. Changes in compliance with recommended infection control practices and affecting factors among dentists in Taiwan. Journal of dental education. 2012;76(12):1684-90.
10. Puttaiah R, Miller K, Bedi DR, Shetty S, Almas K, Tse E, et al. Comparison of knowledge, attitudes and practice of dental safety from eight countries at the turn of the century. J Contemp Dent Pract. 2011;12(1):1-7. doi: 10.5005/jp-journals-10024-1001.
11. Alhumaid S, Al Mutair A, Al Alawi Z, Alsuliman M, Ahmed GY, Rabaan AA, et al. Knowledge of infection prevention and control among healthcare workers and factors influencing compliance: A systematic review. Antimicrobial Resistance & Infection Control. 2021;10(1):1-32. doi: 10.1186/s13756-021-00957-0.
12. Setia S, Gambhir R, Kapoor V, Jindal G, Garg S. attitudes and awareness regarding Hepatitis B and Hepatitis C Amongst Health. care Workers of a Tertiary Hospital in India. Annals of medical and health sciences research. 2013;3(3):551-8. DOI: 10.4103/2141-9248.122105
13. Al-Rabeah A, Mohamed AG. Infection control in the private dental sector in Riyadh. Annals of Saudi medicine. 2002;22(1-2):13-7. DOI: 10.5144/0256-4947.2002.13.
14. Gordon B, Burke F, Bagg J, Marlborough H, McHugh E. Systematic review of adherence to infection control guidelines in dentistry. Journal of dentistry. 2001;29(8):509-16. DOI: 10.1016/s0300-5712(01)00043-4.
15. Yakob E, Lamaro T, Henok A. Knowledge, attitude and practice towards infection control measures among Mizan-Aman general hospital workers, South West Ethiopia. J Community Med Health Educ. 2015;5(5):1-8. DOI: 10.4172/2161-0711.1000370
16. 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. Journal of dental education. 2011;75(3):421-7.
17. Elseviers MM, Arias-Guillén M, Gorke A, Arens HJ. Sharps injuries amongst healthcare workers: review of incidence, transmissions and costs. Journal of renal care. 2014;40(3):150-6. DOI: 10.1111/jorc.12050
18. Chaudhary IA, Khan SS, Majrooh MA, Alvi AA. Seroprevalence of hepatitis-B and C among the patients reporting in surgical OPD at Fauji Foundation Hospital, Rawalpindi: Review of 5 year literature. Pakistan Journal of Medical Sciences. 2007;23(4):514.
19. Umar D, Basheer B, Husain A, Baroudi K, Ahamed F, Kumar A. Evaluation of bacterial contamination in a clinical environment. Journal of international oral health: JIOH. 2015;7(1):53.
20. Zemouri C, Volgenant C, Buijs M, Crielaard W, Rosema N, Brandt B, et al. Dental aerosols: microbial composition and spatial distribution. Journal of Oral Microbiology. 2020;12(1):1762040. doi: 10.1080/20002297.2020.1762040
21. Varsha L, Geetha R. Awareness about cross infection among dentists. Research Journal of Pharmacy and Technology. 2016;9(10):1611-4. DOI: 10.5958/0974-360X.2016.00319.X
22. National Institute of Health P. National Guidelines Infection Prevention & Control. 2020.
23. Miao C, Yang X, Wong MC, Zou J, Zhou X, Li C, et al. Rubber dam isolation for restorative treatment in dental patients. Cochrane Database of Systematic Reviews. 2021(5).
24. Yengopal V, Naidoo S, Chikte U. Infection control among dentists in private practice in Durban. SADJ: journal of the South African Dental Association= tydskrif van die Suid-Afrikaanse Tandheelkundige Vereniging. 2001;56(12):580-4.
25. Reddy S, Prasad MS, Kaul S, Satish K, Kakarala S, Bhowmik N. Efficacy of 0.2% tempered chlorhexidine as a pre-procedural mouth rinse: A clinical study. Journal of Indian Society of Periodontology. 2012;16(2):213. DOI: 10.4103/0972-124X.99264
26. Alanazi DKH. Manual of Infection Prevention & Control in Dental Settings. 2018.
27. Tripathi S, Singh RD, Singhal R, Khanna R, Arya D, Parlani S. Sharps Safety and Management among Dental Practitioners. Journal of Dental Problems and Solutions. 2017;4(2):015-8. DOI: 10.17352/2394-8418.000041
28. Gore SM, Felix DH, Bird AG, Wray D. Occupational risk and precautions related to HIV infection among dentists in the Lothian region of Scotland. Journal of Infection. 1994;28(2):209-22. DOI: 10.1016/s0163-4453(94)95740-1