

Evaluation of Knowledge and Practices of Cross Infection Control among Dental Practitioners of Peshawar Region

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ABSTRACT

Objective: To evaluate the knowledge and practices of dental clinicians regarding cross infection control.

Materials and Methods: In this cross-sectional study, we used a self-administered, standardized questionnaire consisting of mix closed-ended and open-ended questions which were designed to assess the dental practitioners' knowledge of cross infection control. The questionnaire was filled and returned by 219 participants. Data was analysed using Microsoft Excel 2016.

Results: In the current study, 54.3% of participants considered it important to have knowledge of transmissible infections. Handwashing, use of gloves and mask were considered important by 58.8%, 58% and 61.6% of the participants, respectively. Protective eyewear and clothes were used by 54.3% and 56.2% of study participants, respectively. Isolation methods and disposal of sharps in puncture proof container were considered important by 59.8% and 56.2% of study participants. Washing hands before and after seeing a patient was always practiced by 42% and 59% of study participants. Disinfecting clinic surfaces and dental chair consistently before or after seeing a patient were practiced by less than half of the participants. Interestingly, 47.5% of the participants used one mask throughout the clinical session while 61.2% claimed that they always replaced torn gloves. Only 41.1% of clinicians always used eyewear as a part of personal protective equipment. Moreover, less than 50% of study participants always disinfected impressions and other lab work and flushed hand pieces before use. In contrast, majority of the dentists returned instrument trays. Hepatitis B, influenza, measles and tetanus vaccinations were done by 91.3%, 57%, 71.2%, 70% of the study participants, respectively.

Conclusion: We conclude that there are critical deficiencies in the knowledge and practices of dental clinicians of Peshawar region regarding cross infection control. This can expose dentists and their patients to potentially life-threatening infections.

KEY WORDS

knowledge, practice, dental, cross Infection, hepatitis

INTRODUCTION

Cross infection control is of immense importance in dentistry as it plays a huge role in the success and failure of dental procedures and in some cases may avoid potentially life-threatening situations¹⁾. Cross infection is the transfer of harmful microorganisms including bacteria, viruses and fungi from a diseased to a healthy individual. Cross infection is a prevalent problem worldwide particularly in developing countries including Pakistan where it is a significant cause of morbidity and mortality associated with healthcare²⁾.

Dental clinics may provide an ideal environment for microbial transmission if not properly managed. The microbes may include life threatening viruses such as Human Immunodeficiency Virus (HIV), Hepatitis B Virus (HBV) and Hepatitis C Virus (HCV)³⁾. Transmission of these pathogens pose a significant risk to both patient and the dentist. Evidence suggests that a dentist can act as a vector for the spread of various lethal infections⁴⁾. According to a research carried out by Al Faleh et al in Saudi Arabia the prevalence for HBV and HCV was found to be

3-6% and 0.4-1.1% respectively in patients⁵⁾. Similarly, another research by Butt AA et al in Pakistan showed that dental clinics were the leading cause of spread of HCV infection⁶⁾.

The center for disease control and prevention (CDC, 2005) has given some important guidelines related to infection control in health care setup⁷⁾. The CDC recommends "standard precautions" which are designed to protect health care professionals and patients from hospital acquired infections. Despite the steps taken by CDC against cross infection spread, many practitioners are still unaware of these guidelines and the risk of dental clinic acquired infections is still high. Lack of trained staff and inappropriate use of available resources are also responsible for spread of infections. Most dental clinics in Pakistan do not function according to the existing international standards. To the best of our knowledge, there is a lack of research based documented infection control guidelines for dental practice in Pakistan.

Therefore, the aim of this study was to assess the knowledge, attitude and practices of dental practitioners working in representative teaching hospitals in Peshawar.

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Table 1: Descriptive details on knowledge of cross infection control

Questions	1 (%)	2 (%)	3 (%)	4 (%)	5 (%)
Having Knowledge of transmissible infections	2.3	1.8	11.9	29.7	54.3
Hand Washing	0.9	1.4	14.2	24.7	58.9
Use of Gloves	1.4	2.7	11	26.9	58
Use of Mask	1.4	1.4	11.9	2.3.7	61.6
Use of Protective eye ware	0.9	3.2	11.4	30.1	54.3
Use of Protective Clothes	0.5	1.5	11.9	29.7	56.2
Use of Isolation Method	1.8	0.8	9.6	27.9	59.8
Disposal of sharps in puncture proof containers	1.4	1.4	12.8	28.3	56.2
Cleaning and decontamination methods	1.4	0.5	10.5	23.7	63.9
Sterilization	1.8	1.4	13.2	27.2	56.2
Disinfection of clinical contact surfaces	0.9	1.8	11.4	23.3	62.6

Questions	Always (%)	Often (%)	Sometime (%)	Rarely (%)	Never (%)
Wash hands before seeing a patient	42	34.7	20.1	2.7	0.5
wash hands after seeing a patient	59	31.1	6.8	2.7	0.5
Wash hands at the end of clinical session	60.3	24.7	13.2	0.9	0.9
disinfect (by swabbing) the dental chair before seeing a patient	31.1	39.3	16.9	5.9	6.8
disinfect (by swabbing) the dental chair after seeing a patient	34.2	25.1	22.4	11	7.3
disinfect (by swabbing) the dental chair at the end of clinical session	33.8	35.2	17.4	8.7	5
wear one mask throughout the clinical session	47.5	28.3	13.7	7.3	3.2
change masks in between patients	41.1	32	18.3	5	3.7
wear gloves before examining or treating a patient	58.9	27.4	12.3	0.9	0.5
remove gloves before leaving the chairside	60.3	26	11	2.7	0
Replace torn gloves	61.2	26.5	9.6	2.3	0.5
use protective eyewear	41.1	26	21.5	7.8	3.7

Table 2: disinfection details.

Questions	Always (%)	Often (%)	Sometime (%)	Rarely (%)	Never (%)
Replace torn gloves	61.2	26.5	9.6	2.3	0.5
Use protective eyewear	41.1	26	21.5	7.8	3.7
Use isolation methods (rubber dam)	28.8	31.1	17.8	11.4	11
Dispose sharps in puncture proof containers	50.7	30.6	14.2	2.3	2.3
Flush and swab handpieces after use	44.7	31.1	16.4	4.6	3.2
Disinfect impressions before taking it to the lab	45.7	28.8	15.1	4.6	5.9
Disinfect lab work before taking it into the patient's mouth	37	37.9	16.9	3.2	5
Return instrument trays for sterilization	57.5	24.7	13.2	2.7	1.8

MATERIALS AND METHODS

A cross sectional study was carried out on dental practitioners of private dental colleges of Peshawar including Sardar Begam Dental College (SBDC), Peshawar Dental College (PDC) and Rehman College of Dentistry (RCD).

A self-administered, standardized questionnaire consisting of mix closed-ended and open-ended questions. It also contained multiple choice questions and dichotomous questions which were designed to assess the dental practitioners' knowledge of cross infection control. The aim of study was explained to every participant and verbal informed consents were obtained. 54 closed ended questions regarding knowledge, attitude and practices, immunizations, personal protective equipment, and sterilization were included in the questionnaire.

A total of 219 dentists were evaluated by convenience sampling

method. Pure academicians and those working in private clinics were excluded. Questionnaires were mailed to the practitioners and their responses were recorded. To ensure compliance, the remaining data was collected by meeting the practitioners themselves and presenting them the questionnaire in Google Forms via electronic media (Tablets and iPads). The study was conducted in December 2019. The minimum required education was BDS or DDS. However, final year BDS students were also included. The data was analysed using Microsoft excel 2016.

RESULTS

In this study, about 54.3% considered it important to have knowledge about transmissible infections [Table 1. Hand washing was considered important by 58.0% of the study participants. Masks, gloves and

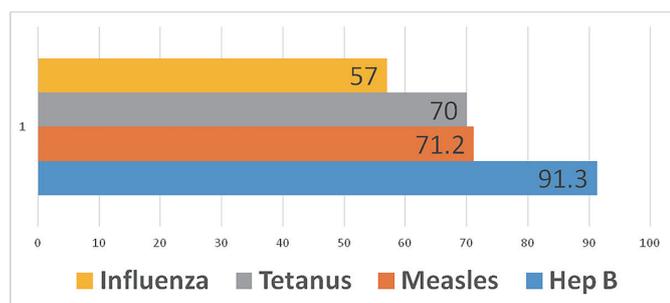


Figure 1. Vaccination Details

eye wear was considered an important part of the practice by 61.6%, 58% and 54.3% of the dentists respectively. 42% of the participants always wash hands before seeing a patient while 0.5% never wash hands. 47.5% of the dentists wear the same mask throughout out the clinical session. Eyewear is used invariably by 41.1% of the participants while 2.7% never use eyewear. Disinfection of dental unit after seeing each patient is done by 34.2%. Less than 50% i.e. 44.7% always flush handpieces and only 28.8% use isolation methods i.e. rubber dams. 45.7% always disinfect impressions before taking it to the lab [Table 2]. When questioned about the vaccination, 57% were vaccinated against Influenza virus. 70% and 71.2% were vaccinated against tetanus and measles respectively. The percentage of Hepatitis B vaccination was found to be 91.3% [Figure 1].

DISCUSSION

Spread of infectious diseases is a major problem in the developing world. Health professionals play an important role in the prevention of cross infection. Health professionals should be equipped with sound knowledge of cross infection control and receive rigorous training to follow strict cross infection control guidelines during clinical practice. However if health professionals develop the wrong reflexes about cross infection control during their training, they can expose themselves and their patients to serious and life threatening infections. Due to the nature of procedures they carry out, dentists in particular can play a major role in prevention of cross infection. Awareness about cross infection has significantly grown during the past decade although health professionals and health facilities continue to be sources of spread of infectious diseases⁹.

Pakistan, particularly KPK has been a high-risk region when it comes to chronic Hepatitis B & C infections. Khan *et al* in his study stated that about 2.71% of the population in KPK was infected with Hepatitis B infection⁹. Similarly, in 2019, WHO claimed that about 5-10 million people in Pakistan are positive for Hepatitis B. Another study carried out in 2017 showed that the total prevalence of Hepatitis C in Pakistan was found to be 8.64%¹⁰. According to UNAIDS about 160,000 people in Pakistan were living with HIV in 2018¹¹. This makes it highly essential for dentists who are always involved in high risk activities to be specifically vigilant regarding control of cross infection.

In our study majority of the dentists were vaccinated against Hepatitis B. Approximately half of the participants acknowledged the importance of having knowledge regarding blood borne viruses while, surprisingly, a minority also thought it was not important at all. Majority of them claimed they used Personal Protective Equipment while 98.6% participants used gloves and had the essential knowledge about sterilization. Most of the participants were unaware of CDC (Center for Disease Control) guidelines regarding dental practice which means that there is an urgent need for making infection control guidelines an essential part of the curriculum and continuing dental educational programs. Around 87.7% said that separate sets of instruments should be reserved for Hepatitis B and C patients. Surprisingly, 'not trusting their sterilization' was given as a justification for using separate set of instruments for people infected with blood born viruses. A significant number of the workers stated that it is totally unacceptable to expose a patient with HCV to the HCV infection of another positive patient. Upon questioning some of the reasons to above mentioned questions were; the practice being ethically wrong, some expressed that the results could be false negative. However, some added that different genotypes of HCV exist and if patient has cured from one strain, the patient can still get infected with

another HCV strain. Only about half of the dentists believed that it is very important to use gloves and masks respectively. To know about practices of the dentists they were asked questions regarding their everyday routines. Less than half of the participants always washed hands before seeing a patient. Disinfection of the dental units after seeing patient was relatively uncommon with only 13.8% of the participants practicing it which is alarming because a dental unit itself can be one of the causes of infection spread and it usually over-looked. Less than half of the participants changed masks between patients while a total of 59% always wore gloves before examining a patient. This means, that around 40% of the participants did not always wear gloves before touching a patient which can expose both the dentist and patient to various infections. More than half of the participants did not always use protective eye wear, which is an essential component of PPE. It is widely known that disinfection alone is not adequate to kill all bacteria and their spores, making sterilization an important component of the infection control protocol. In this study, 67.9% preferred autoclave as decontamination method which is in line with another report from Pakistan in which 78.8% preferred autoclaving for sterilization¹². These numbers are still very low compared to the rest of the world where nearly all dentists prefer autoclaving for sterilization¹³. Interestingly, only 62% were able to correctly answer the time required for sterilization. This depicts lack of knowledge regarding autoclave and sterilization which should be addressed in dental curriculum at undergraduate level and continuing dental education programs. 68% of dentist in Rawalpindi, 80% in Karachi and 73% in Peru stated the time for sterilization correctly¹⁴⁻¹⁶. As sterilization is a time-sensitive procedure, the duration plays a crucial role in decontamination process. According to this study more than half of the dentists considered rubber dam as important isolation method however only 29% practiced use of isolation methods. In a study from Lebanon, only 20.8% of dentists considered the use of rubber dam important¹⁷. This value is quite different from a study by Arif *et al* in which rubber dam is preferred by 98.8% dentists¹⁸. In our study, 81% dentists practiced washing hands before and after seeing the patient. A study from Karachi, Pakistan, reported that 93.3% dentists wash hands before and after touching the patient¹⁵. In another study 100% of dentists washed hands before and after seeing patients¹². More than half (61%) of the participants in this study considered masks as a highly important component of the infection control which is in agreement with another study where they reported 74.2% dentists having similar views¹⁵. Dentists are always prone to needle injuries and this may predispose to dentists contracting blood borne viruses like Hepatitis B & C. It is highly recommended for a dentist to be immunized against Hepatitis B. In the current study 91.3% of dentists were vaccinated against Hepatitis B as compared to 91.3% and 71.7% reported elsewhere^{16,17}. Another study showed that only 36.6% of the dental surgeons were vaccinated against Hepatitis B in Peru¹⁰. Vaccination status of dentists against Hepatitis B in Pakistan can thus be considered satisfactory. Eyes can be a portal of entry for a number of viruses through aerosol generating procedures. Eye wear is an indispensable component of Personal Protective Equipment. Our results are consistent with a study from Lebanon where 43% of the dentists reported use protective eye wear¹⁷. Other studies have found different proportions of dentists using protective eye wear ranging from 14% to 80.8%^{11,16,17}. Moradi states that the use of eyewear is by only 7% of the Iranian dentists which is a significantly low value when compared to our study²⁰. Sufia S. *et al* expressed that 77.2% and 70% of dentists used gloves, eye ware respectively while 72.2% were aware of the spread of BBVs²¹.

The knowledge scores in the current study were somewhat lower compared to studies carried out in other countries which can be attributed to the lack of infection control guidelines at national level and deficiencies in the curriculum^{11,16,17,21}. The results of our study, when juxtaposed with previous studies conducted in Pakistan, are encouraging which can be due to the improved knowledge and awareness levels of clinicians over time. The observed dissimilarity can also be ascribed to the difference in conduction times of various studies. Differences in study methodologies can also account for the differences seen among various studies. In this study only the private sector hospitals were involved excluding the public sector institutes which limits the extrapolation of our study. Moreover, male to female ratio was unequal with 83.5% males and 16.5% females. Further research is required regarding cross infection control in the region to address these issues. Also, the attitude and perception of patients as well as dental assistants play a vital role in this aspect which needs to be studied further.

CONCLUSION

We conclude that there are critical deficiencies in the knowledge and practices of dental clinicians of Peshawar region regarding cross infection control. This can expose dentists and their patients to potentially life-threatening infections. Therefore, there is an urgent need to develop and implement strict infection control guidelines on national level. In addition, knowledge and practice of infections control guidelines should be made an essential part of undergraduate dental curriculum and training and further reinforced by regular continuing dental education programs.

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