

Cross Infection Control Protocol Awareness Amongst Fresh Dental Graduates in Lahore



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OBJECTIVES: This survey aimed to evaluate current knowledge on existence of CIC protocols, procedures and guidelines amongst the fresh graduates working as interns in the dental training institutes of Lahore.

METHODOLOGY: A self-administered questionnaire was used to obtain data regarding awareness on presence of cross infection control protocol. Results: Results observed lapses in the awareness on cross infection control protocols.

CONCLUSION: The current study indicated the low levels of knowledge on infection control protocol.

KEY WORDS: Infection control, dentistry, workplace injuries, dental settings

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INTRODUCTION

Dental clinical settings pose a high biological risk of transmitting a wide range of microorganisms. Therefore, it is essential that in the dental settings measures are taken to minimize spread of infection to patients and the environment from all possible sources. It is mandatory to ensure that the care is provided in a clean and safe environment for both patients and staff. Besides a high standard of decontamination in practices, patients have a right to anticipate minimal risk of person to person infection transmission. Hence, dentists need to follow steps for prevention of infections e.g. using gloves, face masks and protective eye wear among other actions.¹ Prevention is also deemed important because any lapse in the protocol can escalate the cost of care for patients and public at large, leading to un-necessary but avoidable wastage of large volume of funds. One such measure is following cross infection control protocols which help to evade infection transmission from the dental clinical environment to the patients and vice versa.

Over time an improved awareness among dental professionals towards the implementation of effective cross-infection control measures have been reported. This includes sterilization, disinfection, immunization, and the use of barrier techniques when contact with blood and body fluids occurs or is expected.^{2,3} In the past dentists in Lahore, too, have been reported to routinely use gloves and masks for self-protection.⁴ On the other hand, some researchers have painted a dismal picture of cross infection control practices

in public sector hospitals.^{5,6} The authors state that majority of professionals do not follow correct cross infection control policies.^{5,6} The authors have pointed out non-existence of policies on hand hygiene or personal protection even though the supplies in sufficient quantities were available. Also, lapses in the knowledge and routines, lack of training, negligence in following guidelines, especially by frontline staff responsible for infection control in practices has been identified in the past.⁷⁻¹⁶ Improper transportation of impressions and casts to and from the laboratory has also led to transmission of infections in dental settings.¹⁷ Although past research in Pakistan has focused on cross infection control practices by the medical and dental practitioners.^{4,6-18} Reports on awareness on cross infection control protocols and practices are not available in literature. Neither are audits for the same done in Pakistan, hence, non-availability of data for same.

This survey aimed to evaluate current awareness on existence of Cross Infection Control (CIC) protocols, procedures and guidelines at dental hospitals amongst the fresh graduates working as interns in their respective dental training institutes. It also aimed to assess their awareness and knowledge regarding training of staff for the same. The study also investigated existence of protocols for self-protection in work settings. The need to conduct such a study was because the author feels that dental institutes are responsible for the training of their students on infection control. Such training is essential for protection of patients for treatment in a safe working environment. Secondly, past studies have demonstrated varying levels of knowledge and awareness on the policies and practices related to Cross infection control in groups of medical staff. It has also been observed that these practices are greatly influenced by the

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examples set by senior staff members.¹⁹⁻²⁰

METHODOLOGY

The study was a cross-sectional survey using a convenience sample of 250 subjects (freshly inducted interns/ house officers) in five dental hospitals of Lahore, was conducted. Only one of these hospitals was a public sector hospital. The survey was organized between June 2018-July 2018 after approval from the Institutional Review Board of de'Montmorency College of Dentistry, Lahore, and permission from heads of the respective dental hospitals. Australian Dental Board has published Guidelines on infection control (known as the Board's Guidelines) to describe the infection control obligations of registered dental practitioners.²¹ The Dental Board has published a questionnaire for self-assessment of cross infection control. The questionnaire which is a self-audit tool is basically a guidance document which ensures compliance in decontamination in primary care dental practice. The purpose is to self-reflect on how well dentists comply with the requirements in their workplace. The questionnaire has sections assessing infection control with regard to documentation and education, personal and hand hygiene, clinical area, clinical equipment, sharps and waste disposal, and reprocessing areas. It is used as a self-audit tool for self-assessment of compliance with infection control protocols. The tool is easy to understand and can be implemented in any setting to easily identify deficiencies in infection control in dental practices. The instrument has statements regarding awareness on presence of cross infection control protocol manual, familiarity with contents, and continuing professional development training on infection control. Similarly, statements regarding presence of self-protection systems, such as vaccination, awareness on blood borne virus status, hand hygiene, wearing of gloves, eye shields and workplace injuries protocols was part of the questionnaire. The same questionnaire was used to obtain data in all dental hospitals selected for the study. Gender and year since graduation was the only demographic data collected in the study.

All subjects on any given day were invited to participate. Verbal consent for participation was taken before implementation of the questionnaire. The purpose of the study was explained to all participants before execution of the tool. No attempt was made to contact the subjects in case of incomplete data. All information was kept anonymous and strict confidentiality was maintained. A total of 180 forms with completed data were analysed on SPSS (version 20). Number and percentage was used for reporting of results.

RESULTS

Out of 250 survey forms distributed 180 were returned with complete data (response rate 72%). The mean age of the subjects was 24.9 ± 1.9 years. The sex distribution was 60% females (108) and 40% males (72). Majority of the subjects had graduated in the last three years of the study period. Table 1 gives information on knowledge on presence of cross infection manual on the premises, familiarity with contents and training for the same amongst the participants.

Cross Infection Control Protocols	Number (%)
Knowledge:	
Cross infection control manual present at workplace	147 (81.7)
Hard copy of the manual present in the workplace	98 (54.4)
Familiarity with contents of manual	100 (55.6)
Attended continuing professional development workshop on infection control	69(38.3)
Evidence of the attendance	69 (38.3)
Staff received training in cross infection control protocol	87 (48.3)
Protocols for Self Protection	
Awareness on blood borne virus status for self	130(72.2)
Record of vaccination kept for staff and clinicians working in the hospital	81(45)
Training in hand hygiene received	88 (48.9)
Protocol for hand drying present	94(52.2)
Presence of waterless hand hygiene	150 (83.3)
Protocol for wearing gloves	139 (77.2)
Protocol for wearing gloves both sterile and non-sterile	132 (73.3)
Protocol for wearing eye wear	127 (70.6)
Presence of workplace injury recording protocol	98 (49)
Existence of protocol for sharps and splash injuries	130 (72.2)

Table : Response in affirmative to queries related to presence of cross infection control protocols (n=180)

The table also delivers information on awareness on blood borne virus status for self, keeping vaccination record for self & staff and also presence of protocols for accidental injuries.

DISCUSSION

First and foremost, it needs to be appreciated that the aim of the study was not to investigate the current knowledge, attitudes or practices on cross infection control but to explore if subjects were aware of existence of cross infection control protocols, procedures and guidelines in their respective dental training institutes. It also aimed to assess their awareness and knowledge regarding training of staff for the same besides investigating existence of protocols for self-protection in their work settings. Although not the aim of conducting this study, the researcher is considering the level of awareness on cross infection control as a proxy measure for infection control practices in training institutes. This proxy measure is used simply for purpose of comparisons with published data.

In 1996, the Centre for Disease Control, USA, adopted the term "standard precautions" to embrace a broader concept of the prevention and transmission of infections. Standard precautions integrate and expand the elements of universal precautions into a standard of care designed to protect health

care professionals and patients from pathogens that can be spread by blood or any other body fluid, excretion, or secretion.¹³ The contents of standard precaution, universal precautions and guidelines are available on-line as well, for easy reference and practice use. These recommendations are meant to be followed irrespective of patient diagnosis and presumed infection status. It is important to follow the guidelines in order to avoid transmission of infection from and to the dental office. The protocols include hand hygiene, personal protection, environmental cleaning and safe waste disposal. Strict adherence to these protocols can break the links of infection chain. Pakistan is facing a rise in hepatitis and HIV cases amongst other transmissible infections. Dentistry has been implied in increasing trend of such diseases²² National guidelines for infection control in Pakistan were established in 2006 with the help of National Aids Control Program. Regarding infection control the guidelines clearly state "It must be made readily available for health care workers, by having at least one copy available at all patient care areas including laboratories. It must be updated in a timely fashion".²³ Availability of the guidelines at premises, familiarity with the contents, and proper training for the same are some of the references given in the manual for minimising infection spread.²³ These guidelines recommend use of protective attire and barrier techniques, hand washing and care of hands, caution when using sharp instruments and needles, instrument sterilization or disinfection, disposal of waste materials and treatment of water and dental unit waterline.

Dental institutes are responsible for the training of their students on infection control. Such training is essential for protection of patients by providing them treatment in a safe working environment. Past studies have demonstrated varying levels of knowledge and awareness on the policies and practices related to Cross infection control in groups of medical staff. It has also been observed that these practices are greatly influenced by the examples set by senior staff members.^{19,20} In the past researchers have painted a dismal picture of cross infection control practices in public sector hospitals. The authors state that majority do not follow correct cross infection control policies.⁵ The researchers also reported non-existence of policies on hand hygiene or personal protection even though the supplies were present in sufficient quantities. Similarly, cross-sectional studies assessing knowledge, attitude and practices of infection control, reported a high percentage of dental personnel being aware on universal precautions and prevention of cross infection, but a large majority stated these were not being practiced.²⁵⁻²⁶ In the current study more than half of the subjects reported familiarity with the contents of universal precautions. This reported familiarity with contents need not be taken as a true

reflection of actual practices, since this aspect was not aim of the present study. In opinion of Banglani and co-workers, a lack of training in cross infection control is the reason for not practicing these protocols.¹⁶ Other reasons given for not following infection control protocols included cost, resource deficiency and large number of patients.²⁶ Lapses in the knowledge and routines, especially of frontline staff responsible for infection control in practices has been identified in the past researches as well.⁷⁻¹⁵ These lapses indicate a need for improvement in compliance of protocols when protocols have been implemented.²⁷ Data on awareness on cross infection control protocols and practices are not available and neither are audits for the same done in Pakistan. Therefore, comparisons with the findings of current study are not possible. A Brazilian study comparing practices of dental students over a 10 year interval states no improvement in the attitudes and practices related to cross infection control or even worsening of practices in some aspects.²⁴

Even though, subjects in the present study claimed that a manual on cross infection control was available on the premises, very few knew for certain that a hard copy was present. Only a little over half affirmed that they were familiar with the contents of the manual. This response is quite low and a point of concern since it may be suggestive of lack of awareness on infection prevention protocols and procedures necessary in a dental setting. Similarly, approximately a third of the sample reportedly received a training in cross infection control or claimed evidence of attendance. Such low number of practitioners having obtained this important aspect of training indicates the lapse in our undergraduate training program. It also indicates lack of stress placed on this important aspect; a gap that necessitates ensuring stricter adherence to protocols in the dental set up. Past research has also indicated very few dentists exercising these in clinical practice despite emphasis on standard precautions.²⁸⁻⁴¹ The reason for such a low number having received training may be absence of an infection control infrastructure in the teaching institutes and hospitals. The current study supports the findings of Banglani and his team who have pointed out lack of training as the reason for not practicing infection control protocols at institutes.¹⁶ Considering the importance of limiting infection spread, training in standard precautions need to be encouraged and ensured by all staff alike. It is suggested that students should be introduced to intense training program for cross infection control for the entire period of their stay in dental institutes. A way to overcome the inadequacy can be a mandatory training during the undergraduate years for students before they enter the clinical years. Any lack of emphasis on prevention and cross-infection control can pose a major risk of infection transmission in Pakistan. The country already faces high risk of transmissible

diseases.

Another observation in the current study was a gap in the reported training received by female dental graduates. A significantly low number of female graduates reported having received a training in standard precautions when compared to male counterparts. In recent years, females comprise around 80% of admissions every year to dental institutions across Pakistan and will, therefore, consist of major dental workforce practicing in future. Hence, this finding is alarming for dental practices in Pakistan in times to come. The reasons behind females not receiving training also needs to be investigated.

Importance of knowledge on cross infection control protocols is vital because a survey conducted by Pakistan Medical Research Council (PMRC) during 2007-2008, reported 2.5% of Pakistani population affected by Hepatitis B (HBV) and 5% with Hepatitis C (HCV) infection (42). The risk of developing hepatitis B ranges from 22% to 31% following a percutaneous exposure involving blood known to be infected by HBV and the presence of HBeAg. The numbers given in the report are the known cases of Hepatitis. Carrier of infection might not be known thus posing a very high risk of infecting others. If timely measures to control spread of infection are not taken the number is likely to increase many folds. The dental community from all health care personnel has the highest risk of infection to hepatitis B.⁴³ The incidence of HBV infection increases with the length of clinical practice of dentists, dentists age, irregular use of protective glasses and clothing and presumed contact with infected blood and the non-immune status. In the current study over 2/3rd of the sample stated they were aware of their blood borne virus status. We assume that the subjects had been vaccinated against hepatitis B. Previously, less than two third of healthcare workers (HCWs) surveyed by Baqi and coworkers were immunized against Hepatitis B.⁵ Singh et al. have reported a similar number of dental students having been vaccinated for Hep B while approximately 50% of the study subjects had not been vaccinated against most common infections encountered in dental offices.⁴⁴

Hand hygiene is of utmost importance when it comes to prevention of infections to the patients and dental healthcare personnel. Risk of exposure to infection is through blood which can be passed on through hands. During dental procedures, if no protective barriers such as gloves are used, potentially infected blood may be retained beneath the fingernails for up to five days.^{45,46} Hence, the chances of transmission of infection in dental settings would increase, especially so when graduates are not appropriately trained for the purpose. The likelihood of infection can be decreased significantly by using infection control strategies. More than 80% of subjects in present study also claimed existence of

protocols for hand hygiene including waterless hand hygiene. This response might have been prompted because of routine practices observed at the institute with waterless hand hygiene procedures. In comparison, an Indian study has reported less than two thirds of dental students practicing hand hygiene before and after patient examination.⁴⁴ Due to lack of knowledge on indications and the steps involved in hand hygiene, inadequate hand washing practices and poor monitoring of hand hygiene by the health professionals in the health institution have been reported for developing countries like Nigeria.⁴⁷ It may be pointed out that the present study did not inquire knowledge or the steps involved in hand hygiene. Soap and water, antiseptic soap and water less hand hygiene techniques have their indication and need to be followed accordingly. The current research did not investigate actual practices in waterless hand hygiene in conjunction with other methods used for the purpose. The study also did not investigate the frequency of changing gloves and masks in between patients by these young dentists which is a major limitation of current study and thus, need to be addressed in future research. Presence of protocols on use of gloves, protective eye wear and masks, claimed by a high percentage of current respondents, however, is an encouraging finding. Furthermore, response bias is a shortcoming of questionnaire based studies. Hence the results presented need to be interpreted with caution since these do not reflect actual practices.

A very high percentage of the respondents in the present study affirmed presence of splash injuries protocol but very few reported recording of workplace injuries or following such protocols. Considering that roughly 50% were aware of the protocols described in the manual, the response is not representative of practices in case of sharp injuries. Approximately three fourths of the sample claimed to be aware of their blood borne virus status but few (less than 50%) reported that a record for the vaccination status for the staff was kept. These loopholes in training and institutional practices need to be addressed and proper record keeping should be stressed and maintained. Past studies have also indicated that few dentists have adhered to standardized infection control procedures in their clinical practice.²⁸⁻³² The current study too, indicated the low levels of knowledge on infection control protocols which is suggestive of lack of practices for the same.

RECOMMENDATIONS

It is recommended that all dental settings should have policies and protocols for early detection and management of potentially infectious persons at initial points of patient encounter. Ongoing education and training on the basic

principles and practices to Dental Health Care Professionals (DHCP) should be introduced during orientation to the setting, when new tasks or procedures are introduced. Records of such training should also be kept at a minimum, annually. These are critical for ensuring that infection prevention policies and procedures are in place, understood and followed. Additionally, regular supplies of products such as for hand hygiene, safer devices to reduce percutaneous injuries, and personal protective equipment are rendered available as these are critical for health of all at the health facilities. It is also necessary to conduct clinical research to observe and monitor infection control knowledge and practices among dental health care personnel and on dental occupational injuries. This would also assist in the development of educational interventions to improve adherence to guidelines and reduce injuries in future dental workforce in Pakistan and hence, help reducing burden of disease spread through dental settings.

CONCLUSIONS

The study concludes that the fresh dental graduates working in various teaching hospitals of Lahore lack awareness on guidelines and protocols on Universal/ Standard precautions defined for dental practice use. Ongoing education and training for ensuring that infection prevention policies and procedures are in place, understood and followed are not only essential but critical for safe dental practices in Pakistan in future.

CONFLICT OF INTEREST

None declared

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