

# A Survey of Cross-Infection Control: Knowledge, Attitude and Practice among Dental Students

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## ABSTRACT

**Objective:** The objectives of this study were to investigate various infection control methods and amenability with infection control procedures experienced by undergraduate dental students in their clinical years and house officers at Jinnah Medical & Dental College.

**Study Design:** Observational / Descriptive / Cross-sectional study.

**Place and Duration of Study:** This study was conducted in one of the private sector college, Jinnah Medical & Dental College in Karachi from 15<sup>th</sup> January 2016 to 20<sup>th</sup> February 2016

**Materials and Methods:** This study was carried out in one of the private sector college, Jinnah medical & dental college in Karachi. The study set comprised of 3<sup>rd</sup> and 4<sup>th</sup> year dental students and house officers (n=80). A 24 item questionnaire was used to collect data related to knowledge about cross infection, barrier techniques, vaccination status, infection control practices and awareness. The questionnaire used was de novo. It was distributed to all the students and house officers. The self-administered questionnaires were collected immediately after completion on the same day. The responses of the questionnaire were coded for data analysis. Results obtained from different individuals were analyzed using SPSS.

**Results:** In this present study, majority of the students were well aware of cross infection in the first two years of medical/dental college studies whereas the remaining 20% came to know about it in their last two years. Regarding barrier techniques, it was found that (77%) students were well aware of all 4 components of PPE. When enquired whether the students were immunized against hepatitis B, 89% had an affirmative response. In our study there was a low prevalence of needlestick injury (30%). This indicates that our students have substantial knowledge and understanding about handling of sharp objects and are adequately practicing them

**Conclusion:** The knowledge about cross infection in students was found to be adequate but application of prevention protocols need to be emphasized.

**Key Words:** Cross-infection control, knowledge, attitude, practices, needle stick injury

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## INTRODUCTION

Dentistry is a field of high priority regarding the risk of cross infections, therefore, the dental students have to consider every patient potentially infected since many carriers are not aware of their infection.<sup>1</sup> Cross-infection is the clinical transmission of infectious agents from one individual to another. Students, dentists, auxiliary staff and patients have risk of cross infection each time they attend the dental clinic/OPD.<sup>2</sup> In order to prevent infections, it is important to ensure that the dental students are well aware of hygienic protection

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and are educated regarding cross-infection control measures.<sup>1</sup> These practices are important to reduce the risk of hospital acquired infections thereby ensuring a safe and healthy hospital environment for students, patients, dentists, staff and visitors.<sup>3</sup>

Dental teaching institutions have the obligation to protect patients and take protective measures for the students, as they have not yet developed the set of skills essential for practice and are in direct contact with the patients and so may be at a greater risk of exposure to infections. Observing the students infection control practices and reviewing the circumstances involved in their exposures will guide us to introduce safer practices and provide them with better protection.<sup>4</sup>

The guidelines related to cross infection control measures in a dental setting have been updated by the Centers for Disease Control in 2003.

The major aim of these guidelines is to provide an environment with all standard safety precautions in addition to prevention of transmitting infections among dentists, dental students and their patients.<sup>5</sup>

Studies monitoring infection control practices among students are necessary to assess the efficiency of infection control training. In addition it facilitates the development of educational programs to improve adherence to guidelines and reduce injuries.<sup>6</sup>

There is need of further research to evaluate the current knowledge, attitude and practice of dental students regarding infection control and understand the nature of injuries during dental practice. Moreover, appropriate training should be provided regarding infection control to safeguard patients as well as the well-being of undergraduates to ensure a safer work environment.<sup>5</sup>

The objectives of this study were to investigate various infection control methods and amenability with infection control procedures practiced by undergraduate dental students in their clinical years and house officers at Jinnah Medical & Dental College. This initial cross-sectional study will serve as a needs-based assessment for the development of programs and workshops to develop better infection control practices at this institution.

## MATERIALS AND METHODS

This study was conducted in one of the private sector college, Jinnah medical & dental college in Karachi. The study set comprised of 3<sup>rd</sup> and 4<sup>th</sup> year dental students and house officers (n=80). A 24 item questionnaire was used to collect data related to knowledge about cross infection, barrier techniques, vaccination status, infection control practices and awareness. The questionnaire used was de-novo. It was distributed to all the students and house officers. The self-administered questionnaires were collected immediately after completion on the same day. The responses of the questionnaire were coded for data analysis. Results obtained from different individuals were analyzed using SPSS.

## RESULTS

The Questionnaire was distributed among 110 dental students (including 3<sup>rd</sup> year, 4<sup>th</sup> year and house officers), out of which 80 of them responded.

Age	Gender	Study year
Mean Age - 23	Male - 17	3 <sup>RD</sup> Year - 11
Minimum - 21	Female - 63	4 <sup>TH</sup> Year - 41
Maximum - 26		House Officers - 28

In response to our first question in the questionnaire, 52% respondents reported they got well aware of the knowledge about cross-infection control in their first year of dental education (28% in 2<sup>nd</sup> year, 14% in 3<sup>rd</sup> year and 6% in the 4<sup>th</sup> year).

Among these respondents, 97% of them answered taking medical history of patients regarding infectious diseases is important. When inquired about infectious diseases that have highest rate of transmission via blood, 46.3% answered Hepatitis B, 41.3% Hepatitis C and only 10% answered AIDs.

In order to prevent infectious diseases, it is important to educate the dental students. 25% reported there are programs taking place in their surroundings related to cross-infection control, but 75% of the respondents answered that there aren't much of the educational programs taking place.

All the participants of this questionnaire think that not just the students, dentists or the auxiliary staff but the whole population should be immunized against Hepatitis B. Further, the questionnaire contained questions about vaccination status, in which we figured 89% of them were vaccinated against Hepatitis B and unfortunately 11% were not.

When inquired about familiarity with the barrier techniques 77% of the respondents showed knowledge about all four techniques (Figure 1) whereas, 15% did not know about protective eyewear.

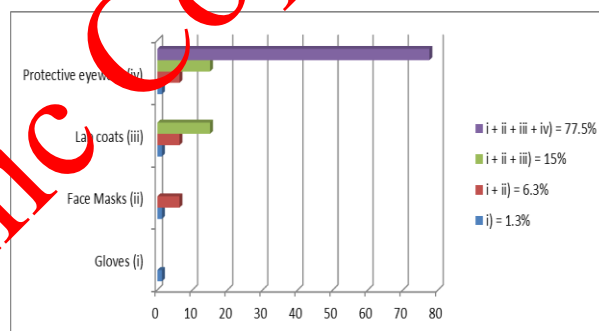


Figure No.1: Barrier Techniques

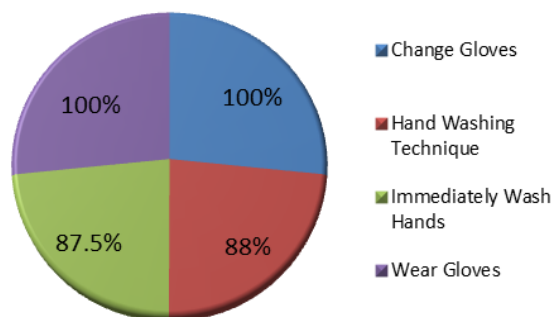


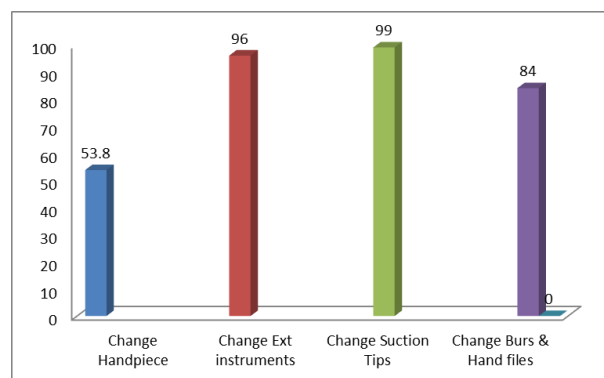
Figure No.2: Protective Measures

All the students (100%) wear gloves and change them after each patient, but 87.5% of them wash hands immediately after the procedure while the remaining 25% did not. When asked about the disposal of gloves, 80% reported they throw them in dustbin. (Figure 2).

Regarding the hand washing technique 88% of the students were familiar with it and 47.5 % of them preferred the use of oral mouthwash prior the procedure (Figure 2).

About instrument usage following results were reported (Figure 3). 82.5% respondents reported that, disinfection of dental chair, dental clinic is as necessary as of instruments. 83.8% responded positively for the use of plastic wrappings or otherwise the instruments are kept in a closed container.

Prior to any procedure, 58.8% reported they use plastic gloves for handling of instruments and if an instrument gets accidentally dropped 62.5% of the students will ask the assistant to pick it up and take it away. Regarding disposal of sharp objects 62.5% responded negatively about the presence of separate containers.



**Figure No.3: Instrument usage**

When asked about experiencing Needle stick injury, 30% responded yes, whereas the remaining 70% did not have such exposure.

When inquired regarding the management in case of an exposure 41.3% reported they will apply disinfectant, 25% wash it with water and 22.5% immediately report it. When asked about whether the students were willing to treat patients with cross infection, 63.8% reported an affirmative response. On the other hand, 63.8% of the respondents said that cross-infection does affect their career choice.

## DISCUSSION

In today's era infection control is a major issue of concern among health care providers. Dental practitioners in general and students in particular are very much prone to such hazards due to lack of experience and knowledge. In this present study, majority of the students were well aware of cross infection in the first two years of medical/dental college studies whereas the remaining 20% came to know about it in their last two years.

Among the respondents 97% of them took medical history regarding infectious diseases whereas a similar survey carried out at DIKIOHS reveals the oral history taking scheme is adopted by 76.5% of the practitioners.<sup>2</sup> Detailed history taking has a pivotal role when it comes to cross infection control. Assuring that the patient is in good health relieves the nervousness and unwillingness of the students and allows them to treat patients adequately and confidently.

Regarding barrier techniques, it was found that (77%) students were well aware of all 4 components of PPE (masks, gloves, eye wear and scrubs). Emir et al in their study reported that 96.3% of the dentists demonstrated the habit of using masks, gloves and eye wear.<sup>7</sup> In a different study, authors in Kuwait reported 90% of practitioners used gloves; masks were used by 75% and 52% used protective goggles.<sup>8</sup> Treasure and Treasure indicated 42% of dentists used gloves, 64.8% used masks and 66.4% used protective spectacles in New Zealand.<sup>9</sup> McCarthy and MacDonald revealed that 91.8% of practitioners in Ontario, Canada, always used gloves, 74.8% always used masks and 83.6% used protective spectacles.<sup>10</sup> This reflects inclinations throughout the world where gloves and masks are favored as part of personal protective equipment while scrubs and protective eye wear are not in common use.<sup>11</sup> It is imperative to increase their use as in variety of procedures like scaling, endodontic procedures etc. as the dentist is exposed to a high number of pathogens.<sup>12</sup> Also students in particular incorrectly consider contamination from splashes not a major source of cross infection. Failure to change gloves in between patients is another major cause of cross infection. When asked about usage of gloves, 100% of students stated that they wear single patient with a pair of gloves as in contrast to an Iranian study which reports that 25% of its respondents do not always wear gloves during procedures.<sup>13</sup> When enquired whether the students were immunized against hepatitis B, 89% had an affirmative response. Other studies showed higher responses of 95.8%<sup>14</sup> and 90.8%.<sup>15</sup> McCarthy and Britton's study showed 100% immunization among all the final year undergraduate students at the University of Western Ontario, Canada.<sup>16</sup> On the other hand, Singh et al<sup>17</sup> stated that 61.2% of students in a Dental School in Central India were not vaccinated for HBV despite it was mandatory. He concluded a positive attitude but poor compliance of cross infection control practices amongst students. Immunization of dental students prior to their start of interaction with patients remains the most effective in dental health care. Immunizations not only considerably decrease the incidence but also reduce the transmission of the diseases. Vaccinations must be made mandatory for all students before they are exposed to clinical practice. The dentist should not bank on single protective strategy and masks, gloves, and eyewear should be considered as only the first line of protection in reduction of infectious agents such as aerosols. The second layer of protection is formed by the use of chlorhexidine mouthwash prior to procedure. 47.5% of our study participants said they did prefer the use oral mouthwash prior to commencing procedures which was slightly lower when compared to another study revealing an oral mouth rinse was preferred 55.5% of the students.<sup>18</sup>

All sharp items must be collected in properly marked containers. In the present study, 62.5% of the respondents said that there were no separate containers available for disposal of sharp objects which is alarming as these sharp objects are a major source of cross infection. In another study, 37.80% of participants reported the use of marked containers to dispose of sharp objects. In previous studies, 72% and 56.20% of practitioners used separately marked containers.<sup>19</sup>

In our study there was a low prevalence of needle stick injury (30%). This indicates that our students have substantial knowledge and understanding about handling of sharp objects and are adequately practicing them. One of the studies suggested of recapping needles has 70% incidence of needle stick injury.<sup>20</sup> Other studies also report a higher fraction of needle stick injuries to students in the early phases of clinical training.<sup>21</sup> When asked whether the students would be willing to treat patients with cross infection, 63.8% of them responded affirmatively, whereas, the same percentage of students (63.8%) said this might affect their choice of career which seems a bit surprising. The concern is mainly against hepatitis B and C and tuberculosis, the reason being the transmissible nature of these diseases and high prevalence in our part of the world. In a similar study carried out in Columbia, USA, only 8.2% showed unwillingness to perform procedures on such patients.<sup>22</sup> The same study reported that a majority of students expressed concerns while treating patients with infection but it made them to modify the treatment plan. Students expressed concerns about treating patients with HIV which is highly prevalent in the western world. In this period of widespread implementation and standard precautions, this unwillingness likely produces the continuing bias towards patients with infectious diseases and underlines the need for additional attempts to educate the students to practice cross infection protocols rather than depriving this population of treatment. This study has some limitations as firstly it is limited to just one hospital and the other is that our study is of cross sectional design so we could not oversee the individual practices and had to rely on their responses. Therefore, the answers might not have correctly reflected the true knowledge and attitude in practice. But when provided with the information and opportunities to work, it promotes healthy changes in attitude and increases the sense of responsibility, thereby preparing them for professional life.

## CONCLUSION

The knowledge about cross infection in students was found to be adequate but application of prevention protocols need to be emphasized.

**Conflict of Interest:** The study has no conflict of interest to declare by any author.

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