



INFECTION CONTROL PRACTICES AMONG GROUP OF DENTAL HEALTH CARE PROVIDERS

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ABSTRACT

Objective: To observe adoption of infection control measures among group of dental students, staff and assistance attended to Sinai University and ministry of health in Egypt.

Methodology: A cross-sectional randomized study based on a convenient sampling technique was conducted. A total of 225 members chosen by random sampling were attended to fill a close ended structured questionnaire (response as 'yes' or 'no'). Study was conducted from the first of February to the first of May 2015. Statistical analysis for knowledge, attitude and practice descriptive statistics were computed using the SPSS software for Windows version 17.

Results: Two hundred and eighteen dental health care providers were asked to participate in the study and response rate of 96.9% was obtained. The included persons as 20 staff members, 150 undergraduate students, 48 were health workers. Significant differences between the study groups were noticed for means of practice scores ($p \leq 0.01$) and significant linear correlation was observed between knowledge and practice scores ($p \leq 0.01$).

Conclusions: Lack of awareness regarding universal precautions proposed by Centers for Disease Control (CDC) is observed among dental practitioners. The knowledge and attitude of dental students about cross infection control is enhancing but there is still some room for developing a firm attitude. This attitude can be improved by refreshing and upgrading their knowledge by obtaining continues education regarding universal infection control measures through arranging sessions or lectures for dentists.

Recommendations: There is a great need for enhancing the awareness of infection control guidelines among dental practitioners

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INTRODUCTION

One of a major problem for health care systems in many countries is infection.¹⁻³ The dental clinic is an environment where disease transmission easily occurs. Prevention of cross infection in the dental clinic is therefore a crucial aspect of dental practice, and dental clinic workers must adopt certain basic routines while practicing.^{2,4,5}

During the various dental procedures, dentists, assistants and their patients are at risk from a wide range of pathogenic microorganisms through their exposure to aerosols and droplets including cytomegalovirus, hepatitis- B/C virus (HBV and HCV), Herpes simplex virus types 1 and 2, human immunodeficiency virus (HIV), Mycobacterium tuberculosis, streptococci, transmissible spongiform-encephalopathies, Methicillin-resistant Staphylococcus aureus (MRSA), and severe acute respiratory syndrome (SARS) virus^{1-3,4,6} Moreover; there is an increase in occurrence of antimicrobial-resistant bacteria within hospital environment, which subsequently a growing in health care problem.⁷

It is well known that most of exposures are accidental and can be avoided by adopting safety work practice and following infection control guidelines. However, in some conditions exposures are not preventable, immunization and appropriate post exposure management become key defense procedures.^{1,4,6}

As healthcare students have increasing patient contact during their education and clinical training, they are at high risk for exposure to pathogens. It is the responsibility of the health institutions to facilitate appropriate preclinical immunization and provide infection control training to protect patients and students, health care providers and to educate the future healthcare professionals in safety work practices.^{2,6} Studies monitoring occupational injuries and infection control practices among students and healthcare workers are necessary to assess the efficacy of infection control training and help to develop educational interventions to improve adherence to guidelines and reduce injuries.^{4,6}

The objectives of this study were to investigate compliance with recommended infection control procedures reported by group of undergraduate dental students in dental faculty and health care providers, interns in ministry of health. Furthermore, the present cross-sectional survey will serve as a preliminary assessment of the local needs for the development of interventions to improve infection control practices at these institutions.

MATERIALS AND METHODS

This cross sectional study was conducted in the faculty of dentistry, Sinai University and Cairo Dental Research Centre during the academic spring semester; 2015. A non-probability convenience sampling technique was used to select sample that included a total of 225. Two hundred and eighteen did complete the study which included undergraduate students, senior dental professionals and health workers. Senior professionals having more than five years of clinical experience and serving on academic posts. undergraduate students and health workers were also included in the study. A self-administered close-ended questionnaire consisting of 15 variables were distributed among the study participants. The first 3 questions were related to socio-demographic details, whereas remaining variables were used to assess sample's knowledge, attitude and practices about infection control measures. Prior to filling the questionnaire, written consent from the study participants as well as an ethical approval from the ethical review board of the institution was taken. In addition, anonymity and confidentiality of the study participants were maintained throughout the study.

Data Analysis

The data were entered into the Social Package of Statistical Sciences version 16. Descriptive statistics were computed. Categorical variables (i.e. gender and professional levels) were presented as frequency/percentage. Affirmative responses on knowledge, attitude and practices items on

infection control were also presented as frequency/percentage.

Data collected was analyzed using Statistical Package for Social Sciences (SPSS 15.0). Frequencies for each question were analyzed and chi square test for comparison was used to assess the differences in infection control practices according to the participants experience year .A significance level of 0.05 was adopted for all tests.

RESULTS

Among the 225 study participants, 218 complete questionnaires were collected, thus the response rate was 96.9. Majority (n=150) of the participants 68.8% were younger with the mean age of 22.53(SD \pm 4.93) years. 65.6% (n=143) were females, and 34.4% (n=75) were males. Majority of the study participants were undergraduate students 68.8% (n=150) followed by health workers 22 %(n=48) and senior professionals 9.2%(n=20). (Table 1)

100 %of senior professionals sterilize hand-piece as compared to only 50% of undergrads and 70.8 % of health workers. Also 100% senior professionals usually used gloves while examining patients as compared to only 84% of the undergrads and 62.5% of health workers used gloves.

70% senior professionals, 88% of the undergrads and 45.8% of health workers use face masks while working. 100% of senior professionals and 100% health workers never answer phone with a contaminated gloves while the percentage in undergrads was 91.3%.

In addition all senior professionals scrub the instruments compared to 70% of undergrads 66.3% of health workers.40% of staff usually disinfects the prosthesis before its insertion compared to 23.3% of undergrads while 70.8% of health workers usually do.

As regards the disinfection of tray before its use 90% of senior compared to 38.6% of undergrads while 66.6% of health workers do. 60 % of seniors

disinfect the impressions before sending it to the lab compared to 24.7% of the undergrads while 66.7% of health workers usually do.

All seniors sterilize the cotton compared to 62% of undergrads and 91.7% of health workers. Furthermore; 100% of senior dentists sterilize the endodontic file before use it compared to 61.3 of undergrads and 41.7% of health workers.

Senior dentists never open instruments package using contaminated gloves while 76.7% of undergrads and 41.7% of health workers.100% of senior dentists re-sterilize the instrument if it falls into the ground compared to 59.3% of undergrads and 70.8% of health workers (Table 2).

Infection control attitude and practice

Eighty percent 80.7% (n=176) of participants replied that they wear and change gloves after each patient. On asking about wearing mask for each patient 77 % (n=168) stated positively that they change face- mask between patients.

On inquiring about disinfection of impression 37.2% (n=81) reported affirmatively, 59.2% (n=129) stated that they change hand pieces in between patients.

Regarding disinfection of the tray and prosthesis before insertion to the patient and disinfection of the impression before sending it to the lab 49.5% (n= 108), 35.3% (n=77) and 37.2% (n=81) respectively.59.2% (n=129) had stated that they do sterilize hand piece after every patient. Furthermore, 71.1% (n=155) had stated that they never use contaminated gloves to open wrapped instruments.

Regarding dental practices of the study participants, majority of them 94% (n=205) never answer phone when they are working. Questions related to scrub instrument before putting in autoclaves 72% (n=157) do it. 72% (n=157) use sterilize cotton and 60.6% (n=132) endodontic files before its use. Moreover; 65.6% (n=143) responded positively, re-sterilize the instruments if it falls. (Table 3)

TABLE (1) Characteristics of the Study Population:

Variable	Frequency
1-Age	
>25	68 (31.2%)
<25	150(68.8%)
2-Gender	
Male	75 (34.4%)
Female	143(65.6%)
3- Job Category	
Senior professionals	20 (9.2%)
Undergraduate Students	150 (68.8%)
Dental health care workers	48 (22%)

TABLE (2) Reported adherence to various infection control procedures among different participant groups:

Variable	Response		
	Senior	Undergrads	Health workers
Knowledge &attitude			
Q4- Wear gloves?	100%	84%	62.5%
Q5- Sterilize the handpiece after each and every use?	100%	50%	70.8%
Q6- Disinfect tray?	90%	38.6%	66.6%
Q7-Change facemask between patients?	70%	88%	45.8%
Q8 -Disinfect the prosthesis before the insertion?	40%	23.3%	70.8%
Q9-Disinfect the impressions?	60%	24.7%	66.7%
Q10- Never use contaminated gloves to open wrapped instruments?	100%	76.7%	41.7%
Practice			
Q11- Never answer phone when they are working?	100%	91.3%	100%
Q12- Scrub instrument before putting in autoclaves?	100%	70%	66.3%
Q13- Sterilize the endodontic file before use	100%	61.3%	41.7%
Q14- Sterilize the cotton before use?	100%	62%	91.7%
Q15- Re-sterilize the instruments if it falls?	100%	59.3%	70.8%

TABLE (3) Infection Control Attitude and practice of the Study Participants:

Knowledge & Attitude (Variable)	Frequency (%)
Q4- Wear gloves?	176 (80.7%)
Q5- Sterilize the handpiece after each and every use?	129 (59.1%)
Q6- Disinfect tray?	108 (49.5%)
Q7-Change facemask between patients?	168 (77%)
Q8-Disinfect the prosthesis before the insertion?	77 (35.3%)
Q9-Disinfect the impressions?	81 (37.1%)
Q10- Never use contaminated gloves to open wrapped instruments?	155 (71.1%)
Practice	
Q11- Never answer phone when they are working?	205 (94%)
Q12- Scrub instrument before putting in autoclaves?	157 (72%)
Q13- Sterilize the endodontic file before use	132 (60.6%)
Q14- Sterilize the cotton before use?	157 (72%)
Q15- Re-sterilize the instruments if it falls?	143 (65.6%)

DISCUSSION

The most susceptible people to infectious diseases in the work environment are healthcare professionals. The dental professional is repeatedly exposed to many microorganisms present in blood and saliva. As a consequence, the incidence of certain infectious diseases is higher among dental professionals than observed for the general population. Infection in the dental practice may result from direct contact with blood, oral fluids, and other secretions or from indirect contact with contaminated instruments, operatory equipment, and environmental surfaces. It may even occur due to contact with airborne contaminants, droplets, splatter, and aerosols. Thus, dental professionals are at a greater risk of acquiring and spreading infections, which requires the implementation of infection control guidelines.⁽⁴⁾

The purpose of infection control measures is to break the chain by consistently practicing standard protocols which would prevent the infectious agent from moving from one person to another. Nearly all dental practitioners believe that isolation prevents the transmission of hazardous infections. Majority of study population considered disinfection of dental chair, surfaces and dental clinic is mandatory along with sterilization of instruments.^(8,9)

Cross- infection can be defined as the spread of pathogenic organisms between patients and staff in a clinical setting. Nowadays, understanding concerning cross-infection control among dental practitioners and para-dental auxiliaries has been increased in dental setups because of the increase in transmission of blood borne diseases like HIV, Hepatitis to dental patients and practitioners^(10,11).

The knowledge and attitude of cross infection control is increasing among dental health care workers but there is a room for further improvement^(7,12). The results of the study demonstrate that practices of standard protocols are better among seniors.

Dental students are the future dental professionals, who will provide oral healthcare for the population. They tend to practice the infection control procedures they acquired during training at the dental school. Thus, the present study investigated the compliance with recommended infection control procedures by dental students pursuing their career at faculty of dentistry at Sinai University as well as health workers at Cairo Dental Research Center. This survey also aimed to help the development of educational interventions to improve infection control practices at this institution.

The result suggests that thorough infection control measures exercises, at all the stages of dental education is of paramount importance. This study shows that knowledge of infection control measure is sound among dental students but need some

improvement towards developing a firm attitude. This attitude can be improved by refreshing and upgrading their knowledge by obtaining continuous education regarding universal infection control measures through arranging sessions or lectures for students of each professional year and keeping all the vaccination especially Hepatitis B mandatory for students prior to take admission in any dental institution.

The findings were of great significance as junior professionals and house officers might follow the practices of their senior professionals, thus strict adherence to the infection control practices are required by the senior dental faculty members. Moreover, as in recent times there has been much stress over the infection control practices and more literature has been cited, including the continuing medical education session planned in relevance to infection control practices, thus the dental health care practitioners (DHCPs) should be encouraged to attend, update and revised their knowledge, attitude and practices in relation to infection control.

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