



RESEARCH ARTICLE

Awareness and Commitment to Infection Control Principles among Students of the College of Dentistry at Tikrit University, Iraq

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ABSTRACT

Many recent studies have shown that many dentists and dental students are at high risk of infection with several serious pathogens during working or training in dental clinics. These significant infections can be prevented by adhering to general safety precautions and applying infection control rules. This study aimed to assess awareness, attitudes, and practices of infection control techniques among senior dental students. At Tikrit University, the questionnaire was contained of 20 questions regarding awareness about infection control practices, barrier techniques. The study revealed that 83.8% of the respondent students were aware of standard precautions within the health care setting. About 79% had adequate knowledge about hand hygiene, but 67% of responded participants were exposed to a hand hygiene training course. Only 66% of students responded that they are committed to hygienic hand washing before and after contact with patients. 40.7% of responders responded that they wear their laboratory coat outside dental clinics, and 51% of female students wear jewelries and/or artificial fingernails during training in dental clinics. Results of this study highpoint the need of persistent education to develop awareness and commitment to infection control principles among students of the College of Dentistry at Tikrit University.

Keywords: Cross-infection, dental clinics, infection control practice, safety precautions

INTRODUCTION

Transmission of infectious pathogens between patients and medical staff is called cross-infection and it is common in dental clinics, and may result in serious infections.^[1] Dental health personnel as well as senior dental students have high risk of infection with blood-borne pathogens, such as hepatitis B virus, hepatitis C virus, hepatitis D virus and human immunodeficiency virus, also they are at high risk of contact with some respiratory pathogenic microorganisms, such as *Mycobacterium tuberculosis*, streptococci, and viruses or bacteria that inhabit the oral cavity and/or the upper respiratory tract.^[2] This risk is heightened by unintended injuries caused by dental instruments during different dental procedures and patient treatment in a dental office. These important infections can be prevented using general safety precautions and applying infection control guidelines in addition to specific prophylaxis by vaccination and appropriate post-exposure management. Most patients in the dental clinic appear to be in good health with no obvious manifestations of any infectious disease. However, some of them may be a source of infection with important pathogenic organisms, as they may be asymptomatic carriers of these pathogens or have an asymptomatic infection with them. Hereafter, hazard controlling

policies or standard precautions should not be applied based solely on the patient's apparent condition.^[3]

Several studies in recent years have shown that many dentists and dental students have been infected with several important pathogens, some of which are blood-borne, such as hepatitis B and C, and some of which are respiratory, such as COVID-19. These infections were often transmitted to them from the patient due to their failure to strictly adhere to prevention instructions and infection control principles while working with patients.^[4] The possibility of dental students

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being exposed to various pathogenic agents, some of which are dangerous, while performing dental procedures during clinical training in the final years of study or after their graduation and work as dentists in their clinics, makes it the duty of dental colleges to spread awareness about infection control and to educate students deeply about the pathogenic agents that can be transmitted to them while working in the clinic and how to prevent them effectively.^[5]

Dental colleges and faculties are accountable for providing appropriate infection control awareness and measures, also they should provide decent training for dental students to protect themselves and their patients, and in the aim of establishing of safer environment in the work. Dental colleges and relevant health authorities usually prepare guidelines specifically about the importance of exposure to infections in dental clinics, standard precautions, and infection control procedures. For these strategies and guidelines to be effective and fulfill their intended purpose, students must be followed up and encouraged to understand, comprehend, and adhere to them.^[5,6]

These strategies typically include standard precautions that target to guarantee a safe working environment and avoid the potential spreading of occupational and nosocomial infections among dental students or dentists and patients. Consciousness and amenability with these references are vital for the prevention of occupational infections for healthcare staff, including dentists and dental students. Inappropriately, despite the significant highlighting positioned on consistent infection control procedures and measures, it looks that only a small number of dental students and dentists adhered actively to necessary procedures in dental practice.^[7-9] Several recent researches have shown that several dental students have not constantly accurately followed these measures.^[10]

Proper and effective education about cross-infection in dental clinics may have an important action in the effective preparation of dental stunts and dentists by aiding them to implement satisfactory knowledge and attitudes linked to infection control measures.^[11-13] Since there are no sufficient studies in Iraq on the dental students' knowledge and awareness about the standard precautions and infection control procedures or the extent of their commitment to these procedures and principles, this study aims to evaluate Knowledge, Attitudes, and Practices of Infection Control among Dental Students at Tikrit University, Iraq.

MATERIALS AND METHODS

This study is a questionnaire-based cross-sectional study, and was accompanied on 250 last dental students, Faculty of Dentistry, Tikrit University, Iraq, during the academic year 2024–2025. Where dental students start their clinical training in their 4th year of education.

A special questionnaire was designed and distributed among 5th-year students (last year of undergraduate education). The anonymous self-administered questionnaire was designed by researchers to cover key points of IPC practices guidelines and was comprised of 20 open- and close-ended questions related to awareness, infection control training and practice, the adequate use of personal protective tools, percutaneous, awareness about importance of contact with blood or bloody

fluids during treatment of dental patients, and approaches of necessary measures to different types of infections.

The questionnaire was distributed to students via email in the form of a Google Form, and students' knowledge and awareness about infection control and prevention practices were assessed depending on their answers to the used questionnaire.

Statistical analysis of the obtained data was accompanied using SPSS version 20.

RESULTS

The percentage of students, who responded to the questionnaire, completed it, and returned it to the researchers was 84% (211/250) regarding the gender of responded students, they were 84 females and 127 males.

The mean age of the responded participant students was 23.16 ± 1.76 , extending from 20 to 32 years; 127/211 (60%) were males, and 84/211 (40%) were females [Table 1].

Regarding general knowledge and awareness about infection control strategies among dental students, results of the study showed that a total of 177/211 (83.8%) respondent students were aware of standard precautions within the health care setting (dental clinics). About 79% (167/211) had adequate knowledge about hand hygiene, but 67% of responded participants were exposed to a hand hygiene training course (141/211). However, only 66% of students (139/211) responded that they are committed to hygienic hand washing before and after each contact with patients or with suspected materials.

Regarding the minimum time needed for hand washing, 70% of respondents (148/211) responded that the minimum time needed for hand washing is 20 s [Table 2].

About using the protective techniques and tools during clinical training in dental clinics, the study reveals that (76.7%) of participant students (162/211) stated wearing gloves all the time during training in dental clinics, while 53.5% reported wearing masks at all times (113/211) [Table 3].

Regarding to Commitment to healthy behavior and attitude during training in dental clinics, 86/211 (40.8%) of responders responded that they usually wear their laboratory coat outside dental offices during training in dental clinics, and 43/84 of female students (51%) responded that they usually wear jewelries and/or artificial fingernails during training in dental clinics. Furthermore, 18% of the responders (38/211) sometimes are eating or drinking during training in dental clinics [Table 4].

Concerning the knowledge and awareness about the transmission modes of some common and important infectious diseases, the study showed that 81.5% (172/211) of responders believe that invasive procedures rise the risk

Table 1: Distribution of the participant students according to gender

Gender	No.	%
Male	127	60
Female	84	40
Total	211	100

Table 2: General knowledge and awareness regarding infection control strategies among responded students

Type of knowledge or awareness	No.	%
Awareness of standard precautions within the health care setting (dental clinics)	177	83.8
Having adequate knowledge about hand hygiene	167	79
Exposed to a hand hygiene training course	141	67
Committed to hygienic hand washing before and after each contact with patients or with suspected materials.	139	66
Awareness about the minimum time needed for hand washing	148	70

Table 3: Using the protective techniques and tools during clinical training in dental clinics

Type of practice	No.	%
Always wearing gloves during training in dental clinics	162	76.7
Wearing masks at all times during training in dental clinics	113	53
Wearing gloves and masks	147	69

Table 4: Commitment to Healthy attitude during training in dental clinics

Type of practice	No.	%
Wearing a laboratory coat outside the dental clinic	86	40.7
wearing jewelries and/or artificial fingernails during training in dental clinics	43/84	51
eating or drinking during training in dental clinics	38	18

of nosocomial infections, and 76.3% (161/211) responded that transmission of blood borne infection is possible after a single contaminated needle stick injury, while 22% (47/211) of responders think that hepatitis B and C can be transmitted through bloody saliva [Table 5].

DISCUSSION

Adequate awareness and a healthy attitude are the main necessities for the prevention of most infectious diseases, especially among healthcare workers and dental medical students.^[14-16] In this study, a high rate of questioned students, 84% (211 out of 250), responded to the questionnaire about knowledge and attitudes about infection control measures in dental clinics. The rate of responding male students was higher than the rate among females, but without a significant difference (85% and 78.2% prospectively).

Regarding general knowledge and awareness about infection control among dental students, results of the study showed a high percentage of knowledge and awareness among responded students, as (83.8%) respondent students were aware of standard precautions within the dental clinics, and about 79% had adequate knowledge about hand hygiene, but 67% of responded participants were exposed to hand hygiene training course. However, only 66% of students (139/211) responded that they are committed to hygienic hand washing

Table 5: Knowledge and awareness about the transmission modes of some infectious diseases

Knowledge and awareness about the transmission modes	No.	%
Invasive procedures rise the risk of nosocomial infections	172	81.5
Transmission of blood-borne infection is possible after a single contaminated needle stick injury	161	76.3
Hepatitis B and C can be transmitted through bloody saliva.	47	22

before and after each contact with patients or with suspected materials.

Despite the high percentage of theoretical awareness, only 65% of students responded that they are committed to hygienic hand washing before and after each contact with patients or with suspected materials.

Also, the study reveals that (76.7%) of participant students (162/211) are always wearing gloves during training in the dental clinic, while only 53.5% reported wearing masks in the training at all times.

This moderate adherence to hand hygiene practice may indicate an important gap between knowledge and practice. This may be due to the lack of good role models for these students among their teachers and supervisors. This perhaps may also be due to the lack of effective monitoring of them while they are training in the dental clinics. Similar results were shown in other studies.^[17-19]

This study showed important unhealthy students' attitudes and practices during training in dental clinics, as 40.7% of responders responded that they usually wear their laboratory coats outside the dental clinics. About 51% of female students usually wear jewelries and/or artificial fingernails during laboratory sessions. Furthermore, 18% of the responders (38/211) sometimes are eating or drinking during training in dental clinics.

This may indicate a general lack of adherence to the instructions among many students. It may also indicate a lack of appreciation for the importance of these instructions in preventing infections.^[19-22]

The study showed moderate percentage regarding the knowledge and awareness about the transmission modes of some important infectious diseases, as 81.5% of responders believe that invasive procedures rise the risk of nosocomial infections, and 76.3% responded that transmission of blood borne infection is possible after a single contaminated needle stick injury, while 22% of responders think that hepatitis B and C can be transmitted through bloody saliva.

Similar studies showed that a short course of infection control that is provided in most medical schools may not be enough to make all students awarded of infection control measures and safety techniques.^[23-26]

CONCLUSION

This study revealed different levels of knowledge, awareness, and attitude regarding infection control precautions and

measurements among students of the dental college at Tikrit University, Iraq. Furthermore, showed insufficient practical adherence to some important precautions among significant proportion of participated students. To improve the safety of dental students during clinical training in dental clinics, we believe that it is essential to begin teaching the necessary basic knowledge about transmission of common and important infections and the principles of infection control and prevention protections during the 1st year of study in the dental college. These educational and awareness programs should be supported by practical commitment to preventive measures by senior colleagues and clinical trainers. Understanding and accepting the assurance to preventive and infection control procedures should be a significant aim of education in medical colleges.

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