

Research Article

KNOWLEDGE, ATTITUDE AND PRACTICE REGARDING SAFETY PROTOCOLS AND INFECTION CONTROL AMONG DENTAL STUDENTS

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ABSTRACT

Background: Infection transmission can easily occur in routine dental practice. Therefore, protection from crossinfection in a dental setup is a critical aspect of dental practices. A survey questionnaire comprises of questions related to safety protocols and infection control is administered to students through a survey planet link.

Aim: To assess the level of knowledge, attitude and practice regarding safety protocols and infection control among dental students.

Materials and Methods: A self administered questionnaire was designed to create an awareness about safety protocols and infection control in a dental clinic and its major importance of them in prevention of crossinfection. The study population included the dental students to whom the questionnaires were submitted. All students in the study, voluntarily completed a questionnaire consisting of 20 close-ended questions.

Result: 84% of the dental students are aware about the hepatitis b vaccination and has been vaccinated. 75% of the dental students has the habit of changing masks and gloves between each and every procedure, 71% of the dental students have the knowledge about disinfection and sterilisation. 80% of dentists demonstrated their views on appropriate practice regarding infection control.

Conclusion: Dental students in this study have a good level of knowledge and positive attitudes about infection control. However, the knowledge acquired must be transferred into daily practice. With all infection control protocols already implemented in dental schools, improving compliance with infection control recommendations remains a challenge.

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INTRODUCTION

The Dental clinic is an environment where disease transmission occurs easily. Prevention of crossinfection in the dental clinic is therefore a crucial aspect of dental practice, and dental clinic workers must adopt certain basic routines while practicing. Infections may be transmitted in the dental operatory through several routes, including direct contact with blood, oral fluids, or other secretions; indirect contact with contaminated instruments, operatory equipment, or environmental surfaces; or contact with airborne contaminants present in either droplets platter or aerosols of oral and respiratory fluids^[1]. Infection via any of these routes requires that all three of the following conditions be present (commonly referred as the chain of infection): a susceptible host, a pathogen with sufficient infectivity and numbers to cause infection, and a portal through which the pathogen may enter the host. Effective infection control strategies are intended to break one or more of these links in the chain, there by preventing infection. The control of cross-infection and

cross-contamination in dental practice is the focus of continuing discussions and debate and, as a result, recommendations and guidelines are regularly reviewed in the light of available information. Dentists have a duty to take appropriate precautions to protect their patients and their staff from the risk of cross-infection^[2,3]. Failure to provide and use adequate decontamination, disinfection and sterilisation facilities may lead to proceedings for professional misconduct before the Fitness to Practise Committee of the Dental Council. To minimise the risk of transmission of infection between patients and between patients and Health Care Workers (HCW's) a sensible and practical routine for the prevention of cross-contamination and cross-infection should be followed. Clinical dental and auxiliary staff should additionally protect themselves by ensuring up-to-date immunisation against hepatitis B and other infectious diseases including tuberculosis, poliomyelitis, rubella, tetanus, diphtheria and varicellazoster. It is the responsibility of the dentist/employer to make all staff aware of standards of infection control required in the workplace.^[3] Dentist might be occupationally exposed to infectious materials, including body substances and contaminated supplies, equipment, environmental surfaces, water, or air. Cross-infection can be

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defined as the transmission of infectious agents between patients and staff within a clinical environment. Infection control, which is one of the most discussed topics in dentistry, has become such an integral part of the practice to the extent that dental health workers no longer question its necessity. Concerns about control of infection in dentistry increased considerably by a report of transmission of human immunodeficiency virus (HIV) from an American dentist to five of his patients. With the presence of people who are infected with hepatitis B and C and the HIV viruses, crossinfection has become a major concern dentists, dental personnel and patients.^[3] Numerous surveys and studies have shown that the incidence of hepatitis B developing after needle stick injuries from HbsAg patients is approximately 20.0% compared with an estimate of 0.4% following similar exposure to the HIV6. Dental care professionals are at high risk of cross-infection while treating patients. This occupational potential for disease transmission becomes evident when it is considered that most human microbial pathogens have been isolated from oral secretion. In addition, a majority of carriers of infectious diseases cannot be easily identified. Research has shown that infective hazards are present in dental practice because many infections can be transmitted by blood or saliva via direct or indirect contact, droplets, aerosols, or contaminated instruments and equipment. For this reason, since the end of the 1980s, many surveys have been carried out in several countries.^[4] The main aim of this descriptive study was to investigate the knowledge, attitudes and practice regarding safety protocols and infection control among dental students.^[5]

MATERIALS AND METHODS

The study was conducted as a descriptive survey based on knowledge attitude and practice regarding safety protocols and infection control among undergraduate dental students. A cross-sectional study was conducted during the academic year in December 2016 among the dental students of various private dental college in Chennai. 100 students were randomly enrolled in the study and voluntarily completed a questionnaire consisting of 20 close-ended questions. A self administered questionnaire was designed to create an awareness about safety protocols and infection control in a dental clinic and its major importance of them in prevention of cross infection and also to determine the attitudes and perceptions of respondent dental students towards infection control in dentistry.

The questionnaire was pre-tested, revised, and retested before use. A list of private dental units was obtained. Two researchers gathered questionnaire data by face-to-face interviews. No tracking system was used to determine who responded and who did not, in order to ensure anonymity. The questionnaire required data on sociodemographic characteristics, knowledge and practice of infection control procedures, sterilization, wearing of gloves, mask, use of rubberdam, method of storing instruments and disposal methods of contaminated material, etc. Questionnaire data was entered into a computer and analyzed by statistical software (SPSS for Windows, SPSS Inc). The accuracy of input data was verified by entering it twice with subsequent comparison of two datasets. No discrepancies were found in the data (Table 1).

RESULT

Among 100 dental students and interns, 54 males (36%) and 96 females (64%) filled the questionnaire. The questionnaire required data on sociodemographic characteristics, knowledge and practice of infection control procedures, sterilization, wearing of gloves, mask, use of rubberdam, method of storing instruments and disposal methods of contaminated material, etc. From the survey conducted, it has been observed that 84% of the dental students are aware about the hepatitis b vaccination and has been vaccinated. 75% of the dental students has the habit of changing masks and gloves between each and every procedure, 71% of the dental students have the knowledge about disinfection and sterilisation. Only 43% of the practitioners were aware about the operative instruments which should be changed in between each and every patients .55% of the dental practitioners have the knowledge about the risk of transmission of diseases in a dental setup. Failure of this basic knowledge may yield various consequences. 42% of the dentists are aware about the biomedical way of disposal of waste. 49% of the dental students agree that hepatitis b vaccine is mandatory for everyone. 67% of the dental students are willing to treat infectious patients. Approximately 80% of dentists demonstrated appropriate practice regarding infection control. The results showed dispersion and deviation, as the rate varied from 40 % to 50%. The knowledge of dentists on infection control and safety protocols was overall about 80%. Therefore A positive attitude towards infection control was seen among dentists. (>80%) (Figure 1-5).

Table 1

Descriptive Statistics					
	N	Mini- mum	Maxi- mum	Mean	Std. Deviation
Gender	100	1	3	1.24	.432
HAVE YOU BEEN VACCINATED AGAINST HEPATITIS B VACCINE?	100	1	2	1.18	.386
HOW MANY DOSES OF HBV YOU HAD?	100	1	2	1.16	.368
DO YOU THINK WEARING EYE PROTECTION/FACE MASK COULD HELP IN INFECTION CONTROL DURING DENTAL PRACTICES?	88	1	2	1.20	.406
DO YOU AGREE DISINFECTION OF DENTAL CLINIC IS IMPORTANT TO PREVENT CROSS INFECTION AMONG PATIENTS AND DENTAL PERSONNEL?	89	1	2	1.10	.303
DO YOU AGREE THAT ALL PATIENTS TO BE TREATED AS POTENTIALLY INFECTIOUS?	88	1	4	1.17	.460
ARE YOU WILLING TO TREAT PATIENTS WITH INFECTIONS?	88	1	2	1.17	.378
DO YOU PREFER WASHING HANDS BEFORE AND AFTER EXAMINING PATIENTS?	88	1	2	1.11	.319
IS IT IMPORTANT TO FOLLOW PROPER BIOMEDICAL WASTE DISPOSAL METHODS?	88	1	2	1.07	.254
DO YOU PREFER CHANGING GLOVES BETWEEN PATIENTS AFTER EVERY PROCEDURE?	88	1	2	1.22	.414
DO YOU THINK PROPER ISOLATION DURING TREATMENT IS IMPORTANT FOR INFECTION CONTROL IN DENTISTRY?	87	1	2	1.11	.321
DO YOU AGREE DISINFECTION OF DENTAL CLINIC IS IMPORTANT TO PREVENT CROSS INFECTION AMONG PATIENTS AND DENTAL PERSONNEL?	88	1	2	1.15	.357
DO YOU THINK HBV IS MANDATORY FOR ALL DENTAL PRACTITIONERS ?	88	1	2	1.14	.345
WHICH OF THE FOLLOWING DISEASES YOU THINK ARE THE HIGHEST RISK OF TRANSMISSION IN DENTAL SETTING?	87	1.00	4.00	1.8736	.86002
USE OF DENTAL HANDPIECES AND OTHER DEVICES ATTACHED TO AIR AND WATER LINES SHOULD BE ?	88	1.00	4.00	1.9091	.68877
OPERATIVE INSTRUMENTS THAT SHOULD BE CHANGED BETWEEN THE PATIENTS	88	1.00	4.00	2.8182	1.39412
WHICH ONE OF THE FOLLOWING IS EFFECTIVE WAY OF STERILISATION ?	88	1.00	4.00	3.3864	1.18837
BLOOD/BODY SPILL SHOULD CLEANED WITH	88	1.00	4.00	1.3977	.76624
PREFERRED TIME OF USE OF STERILISED, WRAPPED OR PACKED INSTRUMENTS	88	1.00	4.00	2.0568	.97507
ARE YOU WILLING TO IMPLEMENT AND FOLLOW THE SAME INFECTION CONTROL PROCEDURES WHICH ARE TAUGHT IN YOUR PRIVATE PRACTICE ?	88	1.00	4.00	1.0909	.47067
Valid N (listwise)	85				

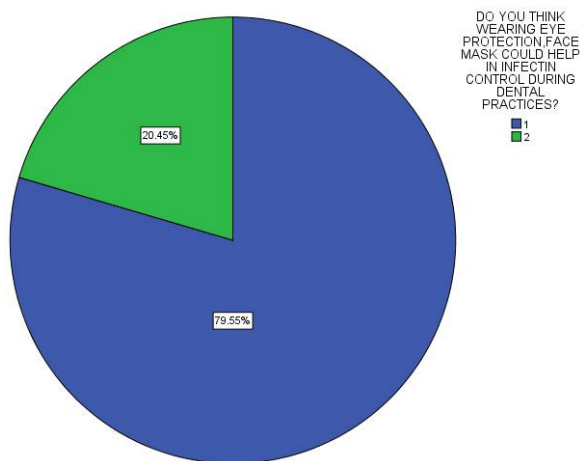


Figure 1 Importance of wearing face masks, eye protection during dental practices Options 1-yes 2-no

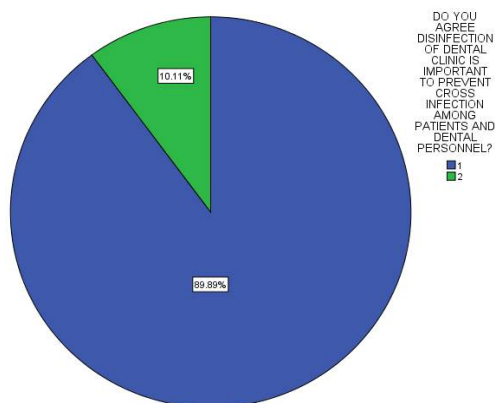


Figure 2 importance of disinfection in a dental setup
Options: 1-YES 2-NO

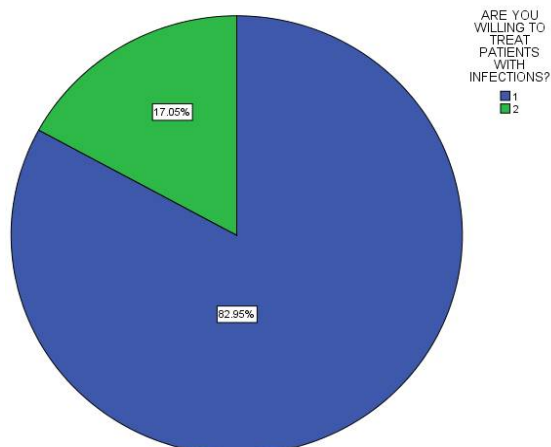


Figure 3 willingness to treat infectious patients Options: 1-Yes 2-no

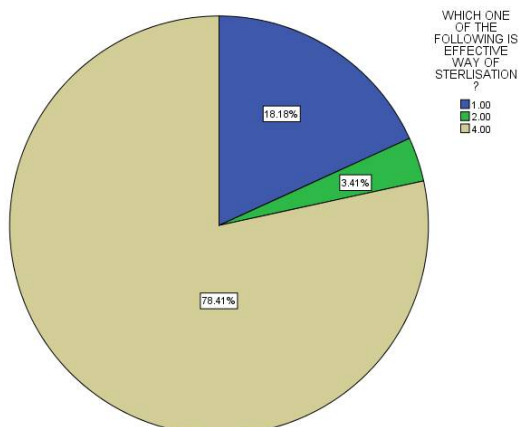
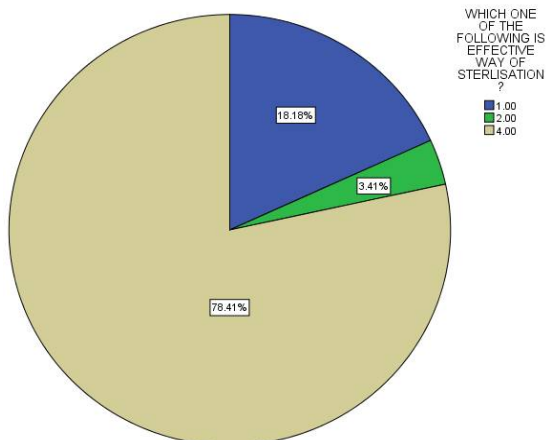


Figure 4 Effective Way of Sterilisation: Options: 1-use of autoclave 2-disinfecting solutions 3-dont know

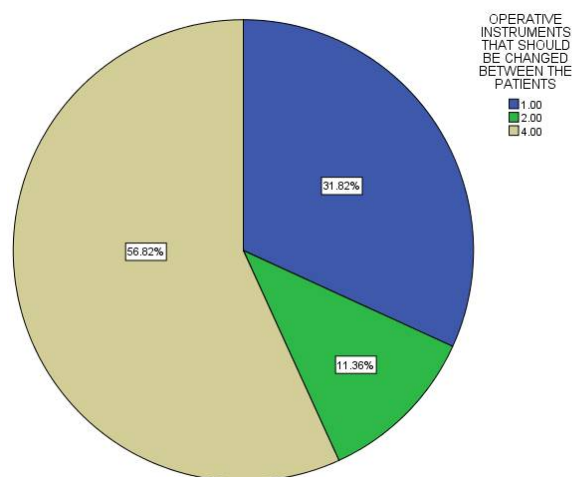


Figure 5 Changing operative instruments in between each and every patients 1-burs 2-extraction instruments 3-dont know

DISCUSSION

Dentists are at high risk of infection by blood-borne pathogens, as they are continually exposed to blood and saliva mixed with blood, and may even suffer needle punctures [5]. The key to reducing or preventing the transmission of a variety of micro-organisms to dentists lies in strict adherence to infection control practices. This study evaluated the attitudes and awareness of dental students and interns toward infection control measures in Saveetha Dental College and Hospital. It also assessed their education and provided self-assessment to their basic knowledge and implementation of infection control policy. Proper hepatitis B vaccination is the best way of providing protection to dentists against contagious transmission of pathogens during dental treatments [5]. The prevalence of hepatitis B vaccination among dental health workers varies from 38% to 100% [5]. In our study, only 68% reported having been vaccinated against HBV. Among them, 77.2% of students had completed the three recommended doses, which is similar to that reported in other studies by de Souza *et al.* [5], Alavian *et al.* and Kramer *et al.* in which more than 80% of students received the required three doses of HBV vaccination. 32% of dental students were not vaccinated against HBV which makes them susceptible to the infection from patients while practicing. The efficacy of HBV vaccination can be assessed by post-immunization HB titer level. Unfortunately, only 52% of students who were immunized reported post-HBV immunization serology, a finding similar to the results obtained in studies by de Souza *et al.* [6], McCarthy and Britton [6]. Periodic monitoring and serological testing among health care workers (HCWs) should be encouraged to reduce the risk of acquiring hepatitis B following an occupational exposure. Another important issue to be considered is the awareness about PEP. Hepatitis B immunization and post exposure management are integral components of a complete program to prevent infection following blood borne pathogen exposure [6]. In our study, only 8% were unaware about PEP. In a study conducted at Armed Forces Hospital, Sarourah, 93% HCW were unaware about PEP. Only 10% of HCW were aware of PEP, according to the study by Siddique *et al.* This reflects that our students have a good knowledge and awareness about management protocols of HBV and HIV infections. The risk of transmission after exposure to HIV-infected blood in one of the studies has been highlighted to be about 0.3%, whereas it

is estimated to be up to 100 times greater for HBV (30%) and could be as high as 10% for hepatitis C virus. Many students were aware that hepatitis B and C and HIV can spread in the dental setting. Awareness related to infection control policies, i.e., universal/standard precaution guidelines, in this study was found to be 59.3% which is in accordance to the survey at Armed Forces Hospital, Sarourah, in which 61% HCWs were aware about the Universal precaution guidelines^[8]. In a study by Shah *et al.* 81% HCWs knew about universal precaution guidelines. In contrast, only 21.6% were aware of universal precaution guidelines in the survey conducted by Siddique *et al.* These CDC guidelines pay firm emphasis on wearing face masks and gloves on each and every patient, changing face mask and gloves after completing the individual patient, wearing protective clothes and protective eyewear which should be properly disinfected or sterilized before reuse. After each and every patient hands must be thoroughly washed with an antimicrobial solution followed by drying of the hands. The practice of standard precautions including the use of barrier techniques has been shown to be the best prevention strategy against occupational transmission of infectious diseases in health care settings. In this study, there was high compliance with glove and mask use, similar to previous studies conducted in Canada, Germany, the UK, Iran, and UAE^[10,11,12]. Nonetheless, compliance with protective eyewear was very low; only 43% reported using protective eyewear at all times. The same results are reflected in many other studies in the UK, UAE, Germany and Nigeria, which have also shown that a majority of dental students did not use eye protection most of the time^[13,15]. The poor utilization of eyewear may indicate a low level of awareness among students and dentists about the probability of disease transmission via aerosols and blood splashes. In our study, 82% of dental students had blood/saliva splashes to their eyes. Hence, dental students should be encouraged to wear masks and protective eyewear to minimize the chance of transmitting air borne infections. This study shows that knowledge of infection control measure is adequate among dental students but needs some improvement towards developing a firm attitude. This attitude can be improved by refreshing and upgrading their knowledge by providing continuous education of universal infection control measures through arranging sessions or lectures for students of each professional year^[17]. It may be recommended to focus on strategies to motivate dental students to implement infection control measures with their routine use. Moreover, dental schools could offer opportunities for students to analyse their own experiences in the dental clinic from the perspective of infection control^[18].

CONCLUSION

Dental students in this study have a good level of knowledge and positive attitudes about infection control. However, the knowledge acquired must be transferred into daily practice. With all infection control protocols already implemented in dental schools, improving compliance with infection control recommendations remains a challenge. Continuing education programs and refreshing courses regarding cross infection control procedures are necessary to update the knowledge of dental practitioners.

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