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Original article

Infection Control Practices Among Undergraduate Dental Students at Sebha University, Libya

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Abstract
This study was conducted to find out how well undergraduate dental students at Sebha University followed advised infection control procedures. This cross-sectional study was performed among dental students at Sebha University. A self-administered anonymous questionnaire comprising 18 closed-ended questions has been distributed among 120 dental students in the period of 25 Sept through 30 December 2024. For analysis the data, descriptive statistical analysis and the chi-square test were applied using IBM SPSS Statistics version 17.0. Response rate was (91.6%). All participants reported that they wear gloves during dental procedures (100%), and the majority of them (90%) reported that they replace their hand instruments, burs, saliva ejectors, and handpieces between patients and disinfect prosthesis and impressions. A reduced rate of use was noted for recording patients' medical histories (83.6%), vaccinated against hepatitis B (70.9%), wearing face mask (87.3%), changing face mask (62%), wearing faces Hield (50%), wearing gown (68.2%), using rubber dam (79%) and storing sharp objects in containers (86.4%). Most of the examined infection control strategies were found to be followed by the majority of dental students at Sebha University. However, more education and training are required to enhance some infection control methods, such as recording patients' history, Hepatitis B virus (HBV) vaccination, donning facemasks, gowns, and face shields, and storing sharp objects in special containers.
Keywords. Infection Control Practices, Dental Students, Sebha University, Libya.

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Introduction

A cross-infection was described as the spread of microbes from one individual to another. Several studies have shown that using dental equipment contaminated with blood, saliva, or tissue fragments increases the risk of infectious agent transmission in the dental setting (1,2). Therefore, it's critical to follow the advised infection control guidelines to stop the spread of illness.

The Centers for Disease Control and Prevention (CDC) first released infection control guidelines for dentistry in 1986 (3) and once more in 1993(4), and these guidelines were most recently revised in 2003 (5) and then the American Dental Association advised them for all dental offices (6). These guidelines of infection control addressed a number of topics, such as the hepatitis B virus (HBV) vaccination of dentists, gathering patient medical histories, using personal protective equipment (PPE), using sterilized instruments, and handling sharp objects safely [5]. Healthcare professionals are thought to be highly susceptible to contracting infectious diseases. Thus, obtaining a patient's medical history, administering a hepatitis B vaccination, and the safe use of sharp objects are crucial steps in infection prevention. Additionally, to avoid coming into direct contact with patient bodily fluids like blood or saliva, dentists should wear personal protective equipment (PPE), which includes gloves, a face mask, a face shield, and a gown. Furthermore, the use of PPE and sterilized instruments is necessary to ensure patient safety (6).

Dentistry schools should place a strong emphasis on cross-infection control to ensure that future dentists have the proper understanding of infection control techniques. This is because the dentists who understand the rationale behind an infection control program are more likely to follow it (7). Several cross-sectional studies have been conducted in dental schools worldwide to examine how well dental students adhere to infection control protocols (8-11) and a review of the literature revealed that no comparable study had been done to assess the degree to which Libyan dental students at Sebha University's dental school followed infection control procedures and this paper was initiated to close this gap.

Methods

This study is a cross-sectional study that was conducted on undergraduate dental students in the dental school of Sebha University between September and December 2024. All students in the 3rd,4th, and internship years were included, and their number was 120. In collaboration with four dental intern students working at the Prevention and Community Department, a Self-administered questionnaire was distributed and completed by participants. Informed consent was taken from each participant, and ethical approval was obtained from the ethical committee of Sebha University.

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The questionnaire used in this investigation was designed based on questionnaires used in earlier research. (8,12). The questionnaire consisted of 5 categories that included 18 questions: 1. Demographic data that included gender and dental year. 2. Recording the patient's medical history and students' hepatitis B virus (HBV) vaccination status. 3. Use of personal protective equipment with 6 questions about wearing and changing the gloves, face mask, face shield, and gown [4]. Sterilization and disinfection of patient-care items such as hand instruments, handpiece, burs, saliva ejectors, rubber dam, impression and prosthesis. 5. Disposal of sharp medical objects. The data were arranged in tables and analyzed statistically using Microsoft Excel Worksheet and Statistical Package for Social Sciences (SPSS 17.0) (Table 1&2). The chi-square test was used to assess differences in infection control measures according to the gender and dental year of the students, and P< 0.05 was considered statistically significant.

Results

Out of the 120 undergraduate dental students who were targeted, 91.6% of participants responded and the total number of respondents was 110 dental students distributed by sex (80 Females and 30 Males) and by dental class (third year (48), fourth year (35) and intern (27) dental students).

The best rates of adherence to infection control recommendations were found while wearing gloves (100), changing bur & saliva ejectors, disinfecting impressions (98.2%), replacing the handpiece (96.4%), wearing face mask (87.3%), storing sharp objects in containers (86.4%) and recording patients' medical histories (83.6), as Table 1 illustrates. However, about 70.9% said they had received a hepatitis B vaccination, and about two-thirds changed their masks regularly (62%), and the remaining third changed them sometimes (35.2%). While 20.9% of the study sample did not use a rubber dam during the treatment, 79.1% of the sample did. Among those who responded to the question about whether or not to wear face shields, half (50%) did so, and 30% never did. Additionally, the results revealed that 68.2% of the respondents had regularly worn gowns on routine clinical work.

The analysis of differences between dental classes and between sex groups in adherence to infection control protocols is shown in Table 2. The table demonstrated that more females than males had received vaccinations and disinfectant impressions, while more male students wore face shields than females (P value<0.05). Additionally, the table showed that third-year dental students had a lower percentage of face mask changing behavior than their fourth-year peers and interns (P value<0.05).

Table 1. Reported compliance of dentistry students with different infection control protocols

Procedure	Response
Recording the medical history of the patient	Yes 92 (83.6%) No 18 (16.9%)
Vaccination for hepatitis B	Yes 78 (70.9%) No 32 (29.1%)
Glove wearing	Always110 (100%) Sometimes 0 Never 0
Facemask wearing	Always 96 (87.3%) Sometimes 12 (10.9%) Never 2 (1.8%)
Facemask changing	Always 67 (62%) Sometimes 38 (35.2%) Never 3(2.8%)
Face shield wearing	Always 55 (50%) Sometimes 21(19%) Never 34 (30%)
Gown wearing	Always 75 (68.2%) Sometimes 20 (18.2%) Never 15 (13.6%)
Change hand instruments	Yes 103 (93.6%) No 7 (6.4%)
Change handpiece	Yes 106 (96.4%) No 4 (3.6%)
Change bur	Yes 108 (98.2%) No 2 (1.8%)
Change the saliva ejector	Yes 108 (98.2%) No 2 (1.8%)
Use a rubber dam	Yes 87 (79.1%) No 23 (20.9%)
Disinfect impression	Yes 108 (98.2%)

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	No 2 (1.8%)
Disinfect prosthesis	Yesv105 (95.5%) No 5 (4.5%)
Store sharps in a special container	Yes 95 (86.4%) No 15 (13.6%)

Table 2. Compliance with diverse infection control protocols among dental stude..ts based on their dental class and sex

Procedure	By dental year				By Sex		
	3th year (%)	4th year (%)	Intern (%)	P value	Female (%)	Male (%)	P value
Recording the medical history of the patient							
Yes	87.5%	77.1%	85.2%	0.438	82.6%	86.7%	0.599
No	12.5%	22.9%	14.8%		17.5%	13.3%	
Total	(48)	(35)	(27)		(80)	(30)	
Vaccination for hepatitis B							
Yes	68.8%	65.7%	81.5%	0.363	76.3%	56.7%	0.04*
No	31.3%	34.3%	18.5%		23.8	43.3%	
Total	(48)	(35)	(27)		(80)	(30)	
Glove wearing							
Always	93.8%	91.4%	92.6%	0.714	91.3%	96.7%	0.56
Sometimes	4.2%	8.6%	3.7%		6.3%	3.3%	
Never	2.1%	0	3.7%		2.5%	0	
Total	(48)	(35)	(27)		(80)	(30)	
Facemask wearing							
Always	85.4%	91.4%	85.2%	0.517	86.3%	90.0%	0.539
Sometimes	10.4%	8.6%	14.8%		12.5%	6.7%	
Never	4.2%	0	0		1.3%	3.3%	
Total	(48)	(35)	(27)		(80)	(30)	
Facemask changing							
Always	45.8%	79.4%	69.2%	0.017*	58.2%	72.4%	0.065
Sometimes	47.7%	20.6%	30.8%		40.5%	20.7%	
Never	6.3%	0	0		1.3%	6.9%	
Total	(48)	(35)	(27)		(80)	(30)	
Face shield wearing							
Always	45.8%	51.4%	55.6%	0.937	42.5%	70%	0.025*
Sometimes	20.8%	17.1%	18.5%		23.8%	6.7%	
Never	33.3%	31.4%	25.9%		33.8%	23.3%	
Total	(48)	(35)	(27)		(80)	(30)	
Gown wearing							
Always	56.3%	74.3%	81.5%	0.144	66.3%	73.3%	0.738
Sometimes	22.9%	14.3%	14.8%		18.8%	16.7%	
Never	20.8%	11.4%	3.7%		15	10.0	
Total	(48)	(35)	(27)		(80)	(30)	
Change hand instruments							
Yes	97.9%	88.6%	92.6%	0.220	93.8%	93.3%	0.936
No	2.1%	11.4%	7.4%		6.3%	6.3%	
Total	(48)	(35)	(27)		(80)	(30)	
Change handpiece							
Yes	93.8%	97.1%	100%	0.365	95.0%	100%	0.212
No	6.3%	2.9%	0		5.0%	0	
Total	(48)	(35)	(27)		(80)	(30)	
Change bur							
Yes	100%	97.1%	96.3%	0.441	97.5%	100%	0.382
No	0	2.9%	3.7%		2.5%	0	
Total	(48)	(35)	(27)		(80)	(30)	
Change the saliva ejector							
Yes	100%	94.3%	100%	0.113	98.8%	96.7%	0.461
No	0	5.7%	0		1.3%	3.3%	
Total	(48)	(35)	(27)		(80)	(30)	
Use rubber dam							
Yes	79.2%	74.3%	85.2%	0.578	80.0%	76.7%	0.702
No	20.8%	25.7%	14.8%		20.0%	23.3%	

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Total	(48)	(35)	(27)		(80)	(30)	
Disinfect impression							
Yes	95.8%	100%	100%		100%	93.3%	
No	4.2%		0	.2680	0	6.7%	0.020*
Total	(48)	(35)	(27)		(80)	(30)	
Disinfect prosthesis							
Yes	93.8%	94.3%	100%		96.3%	93.3%	
No	6.3%	5.7%	0	0.424	3.8%	6.7%	0.513
Total	(48)	(35)	(27)		(80)	(30)	
Store sharps in a special container							
Yes	91.7%	82.9%	81.5%		87.5%	83.3%	
No	8.3%	17.1%	18.5%	0.357	12.5%	16.7%	0.571
Total	(48)	(35)	(27)		(80)	(30)	

Discussion

Investigations of compliance with infection control criteria have been conducted in numerous dental settings worldwide. To the best of our knowledge, this is the first study looking into how closely dental students at Sebha University's dental school adhere to infection control guidelines.

Examining the health of patients and reporting any infectious diseases is a crucial step in order to take the appropriate safety measures. In this current study, (83.6%) of dental students recorded medical history before starting the dental treatment. While still high, this rate is lower than what was found in similar studies from Saudi (99%), India (97.9%) (8, 9).

According to the results of this current study, (70.9%) of the dental students had received a Hepatitis B vaccination. Similar results were obtained from Pakistan (72%), India (75%,) and Yemen (71.7%) (9-11). This finding demonstrated that dental students had a greater awareness of the potential for HBV transmission.

One of the recommended infection control guidelines is that a separate pair of gloves must be used for each patient to avoid contamination (13). all dental students (100%) reported that they wear gloves during workon the patients to prevent the transmission of infection and contact with blood and saliva.

According to infection control guidelines reported by the CDC in 1993 (4), Infectious droplets can be introduced onto the mask's outer surface by oral fluid sprays or by contacting the mask with contaminated fingers. Additionally, more airflow travels around the edges of a wet mask because exhaled moist air presents greater resistance to airflow through the mask. For this reason, if it is practical, the mask should be changed between patients or, if it becomes wet, even during patient treatment (4). Participants who wore face masks (87%) but who changed face masks (60%) which is significantly higher than that reported by Kumar (2009) when very few subjects reported changing face masks between patients (11.3%) (9).

One of the best ways to minimize occupational cross-infection while working in the dental sector is to use barrier methods such as wearing a face shield ana d gown. In this present study, the rate of individual responses to the use of face shields as (50%) and to the use of gowns was (68%). When these rates are contrasted with the findings of similar research from Saudi Arabia, India, Pakistan, Yemen, they can be considered acceptable even though they are relatively low (8-11). Dental students may not be aware of the possibility of cross-contamination from blood splashes and infected aerosols, which could account for this low compliance. In order to reduce the possibility of disease transmission through airborne infections, it is crucial to encourage dental students to use face shield and gown.

In the present study, the highest level of compliance was found for changing handpieces (96.4%), burs (98.2%), saliva ejectors (98.2%) between cases; however, in order to avoid cross-contamination, it was expected of all dental students to replace them. Despite being categorized as semi-critical equipment, dental handpieces should be heat-sterilized in between patients (14). In the present study, the rate of students who change handpieces between patients was (96.4%). Even while the results are good when compared to an Indian study's findings, which showed that 16.3% of dental students followed this method (9), it is anticipated that all dental students will exchange handpieces between patients.

In the current study, rubber dams are utilized by more than three-quarters (79%) of dental students, with dental interns using them the most (85%). Regular usage of a rubber dam has been demonstrated to significantly limit bacterial contamination of the atmosphere during restorative treatments, so this could provide further protection in this context. When air aerosols are expected to build up during restorative operations, it is important to try to encourage students to utilize rubber dams on a frequent basis.

Prosthetics and other items like impressions need to be disinfected before being placed in a patient's mouth. This study showed good percentage of dental students (95.5%) who disinfected dental prostheses before inserting them into their patients' mouths and it also showed that (98.2%) of the respondents disinfected impressions. In comparison, this percentage is higher than those in Saudi Arabia (87%) (8). However, more instruction is needed to encourage regular disinfection of prosthesis and impressions.

To reduce human interaction, sharp objects like needles and blades should be stored in containers that can withstand punctures. In the present study, (86.4%) of dental students store sharps in special containers. This percentage was lower than findings from Saudi study (91%) (8). It is, nevertheless, comparatively better than the rate seen in the study conducted in India (68.8%) (9).
A limitation of this research is the utilization of a self-administered questionnaire, which could have led to an overestimation of compliance. In order to address this, future research should employ a clinical audit checklist to gather data and observe dental students during their clinical rotations in order to evaluate their adherence to infection control protocols.

Conclusion

According to the findings of this study, undergraduate dentistry students at Sebha University's dental school follow infection control protocols quite well for the majority of the procedures that were looked at. Additional education is necessary to encourage dental students to record patients' history, get vaccinated against Hepatitis B, use rubber dams, change their face masks between treatments, and wear face masks and face shields, and gowns.

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Conflict of interest

No conflicts of interest need to be disclosed.

References

1. Porter K, Scully C, Theyer Y, Porter S. Occupational injuries to dental personnel. J Dent. 1990;18(5):258-62.
2. Cleveland JL, Lockwood SA, Gooch BF, Mendelson MH, Chamberland ME, Valauri DV, et al. Percutaneous injuries in dentistry: an observational study. J Am Dent Assoc. 1995;126(6):745-51.
3. Centers for Disease Control (CDC). Recommended infection-control practices for dentistry. MMWR Morb Mortal Wkly Rep. 1986;35(15):237-42.
4. Centers for Disease Control (CDC). Recommended infection-control practices for dentistry, 1993. MMWR Recomm Rep. 1993;42(RR-8):1-12.
5. Azzain A. Assessment of Infection Prevention and Control Program in Misurata Medical Center Using the WHO Infection Prevention and Control Assessment Framework (IPCAF), 2023. Khalij-Libya Journal of Dental and Medical Research. 2024 Nov 24:260-9.
6. Jerbi R, Elhamadi M. Assessment of Infection Prevention and Control Minimum Requirements for Primary Health Care Facilities, Ain Zara, Libya. AlQalam Journal of Medical and Applied Sciences. 2023 Nov 15:701-6.
7. McCarthy GM, MacDonald JK. The infection control practices of general dental practitioners. Infect Control Hosp Epidemiol. 1997;18(10):699-703.
8. Ahmad IA, Rehan EA, Pani SC. Compliance of Saudi dental students with infection control guidelines. Int Dent J. 2013;63(4):196-201.
9. Kumar S, Sharma J, Duraiswamy P, Kulkarni S, Tadakamadla SK. Infection control practices among undergraduate students from a private dental school in India. Rev Odonto Cienc. 2009;24(2):204-8.
10. Halboub E, Al-Maweri SA, Ahmed A. Practice of infection control among dental students at Sana'a University, Yemen. J Int Oral Health. 2015;7(7):15-9.
11. Sami A, Bashir R, Rizvi KF. Assessing the knowledge and adherence of dental students to cross-infection control measures. Pak J Med Dent. 2023;12(4):11-8.
12. Al-Rabeah A, Gad Mohamed A. Infection control in the private dental sector in Riyadh. Ann Saudi Med. 2002;22(2):100-4.
13. Harte JA. Standard and transmission-based precautions: An update for dentistry. J Am Dent Assoc. 2010;141(5):572-81.
14. ADA Council on Scientific Affairs and ADA Council on Dental Practice. Infection control recommendations for the dental office and the dental laboratory. J Am Dent Assoc. 1996;127(5):672-80.