



Adherence of Umm Al-Qura University Dental Students to Infection Control Guidelines: A Four Year – Auditing Report

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Abstract

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BACKGROUND: Infection control auditing is an objective quality improvement process that evaluates current practice against already available standards and guidelines.

AIM: The aim of the study was to assess the adherence of Umm Al-Qura University dental students to infection control guidelines by 4 years' clinical auditing.

MATERIALS AND METHODS: A cross-sectional observational study of audit checklists (n = 40725) at Dental Teaching Hospital, Umm Al-Qura University, throughout 4 academic years (2015–2018) was performed. Checklists item, total category, and overall adherence percentages were calculated based on recorded observations. The difference in adherence and violations was assessed using generalized estimating equations with the identity logit and an autoregressive correlation matrix.

RESULTS: Overall adherence to all checklist categories was high except for 10–45% got out of the cubicle with used gloves and 15–60% not probably wore mask outside the cubicle. Overall violations among females were highly statistically significant lower than males (OR: 0.926, p < 0.01) and 4th grade were statistically significant lower than among 6th grade (OR: 0.932, p < 0.05) while no statistically significant difference in overall violation among 5th grade in comparison to 6th grade. However, along the 4 years of the study, statistically significant difference in overall violations was observed.

CONCLUSION: Adherence of Umm Al-Qura University dental students to infection control guidelines in the past 4 years remained consistently high except for attitude in the clinic station outside the cubicle which improved along study years. Our results highlight the importance of continuous monitoring through clinical audits together with educational programs and counseling with students violating infection control policies to make corrective actions.

Introduction

Dental practitioners are constantly exposed to many infectious materials while treating their patients. Materials such as saliva, blood, operating instruments, and environment as aerosols and water constitute a major risk for acquiring infections including hepatitis B, C, and HIV [1]. To minimize the risk of transmitting such infections among patients and between patients and dentists, practical guidelines for the prevention of cross-contamination and cross-infection in dental clinics should be followed [2]. The increased reporting of infections by hepatitis B virus and HIV transmitted from infected dentists to their patients through the period from 1970 to mid-1980 has urged the detailed study of infections that could be transmitted during dental practice. Consequently, first infection control recommendations have been established by Centers for Disease Control and Prevention (CDC) in 1986, and then updated in 1993 and again in 2003. Finally, in 2016, CDC added tools and checklists to its guidelines to help dental practitioners to follow it [3], [4], [5], [6], [7].

Dental education, providing adequate knowledge and attitudes related to infection control

procedures, can play a significant role in the training of dentists and motivate them to follow standards of infection control practice while treating their patients [8]. In spite of infection control guidelines already established in dental schools, improving compliance with infection control recommendations remains a major challenge [9].

The previous study of Freire *et al.* [10] involved observation of the behavior of eight senior dental students in relation to infection control practices at School of Dentistry, Belo Horizonte, Brazil, and then asked them to answer questionnaire to assess their knowledge, attitude, and practice regarding it. Then, authors concluded that in spite of students' knowledge about the importance of infection control in dental practice as reported by answers of the questionnaire, the compliance in the school environment was less than ideal and the intention was more positive than the observed behavior. Then, Gordon *et al.* [11] in their systematic review concluded that observational element within the study design for researches carried on infection control compliance is highly required to overcome the social desired responses reported by the questionnaires. Later on, Bryce *et al.* [12] recommended auditing as an ideal standardized observational method for monitoring infection control practice that could create

a point of reference for practices across the institution and enhances standards of care.

In Saudi Arabia, the previous published researches on infection control compliance of dental students in College of Dentistry, Jazan [13], King Khalid University, Abha [9], and King Saud University, Riyadh [14], [15] reported that their compliance was satisfactory but more efforts are recommended to improve it. However, all these researches were based on subjective self-reported data through answering questionnaire which according to Ayub *et al.* [16] assumptions could not accurately reflect the actual compliance and might resulted in overestimation of compliance. They finally recommended that clinical audits are required to assess real practice of infection control among dental students.

To the best of our knowledge, no previous published studies in Saudi Arabia investigating compliance of the dental students toward infection control practice through a clinical audit. Hence, the aim of the present study was to assess the adherence to infection control guidelines by collecting data from the past 4 years' checklists checked by infection control team to determine the most common violations to work on it and improve infection control practice in our clinics in the future.

Materials and Methods

Study design

This is a cross-sectional observational study in which adherence to infection control guidelines among dental students for a period of 4 years was evaluated.

Setting

This study was conducted in the Dental Teaching Hospital, college of dentistry, Makkah city, Saudi Arabia. The study was conducted between September 2019 and December 2019.

Participants

The subjects included in the study were clinical students in the 4th, 5th, and 6th grades with a total number of 730 students (369 males and 361 females). All available auditing checklists checked by infection control team members throughout 4 academic years from 2015 to 2018 constituting 40,725 observations of 730 students.

Variables

Checklists used were designed by college's Infection Control Committee and its items were considered to reflect behaviors that could be observed and represent

best practices according to the CDC guidelines. It includes three domains; adherence to the dress code, infection control measures in the cubicle environment, and in the clinic station outside the cubicle (in X-ray rooms, getting out of the cubicle with used gloves, and mask below the chin). At each domain level, we determined item adherence proportion based on recorded observations. That is, for each item in the checklists, the number of times the item was recorded as "yes" divided by the total number of recorded observations ("yes" + "no"). For wrong attitudes, proportion was calculated by the number of times the attitude was recorded as wrong divided by the total number of recorded observations. For total domain and overall adherence, proportions were determined by summation of items within each domain and then applying the calculation described for item-level adherence.

Data sources and measurement

Fourth grade students have three clinical sessions weekly; while 5th and 6th grade students have 6 clinical sessions weekly. During the 4 years of the study, all students were audited by infection control supervisors and according to the items listed on Yes or No checklist just after they entered the clinic, during the treatment session, and until they left clinics. Fourth grade students were audited regularly once weekly and randomly every other week while 5th and 6th grade students were audited regularly 2 times weekly and randomly every other week or sometimes weekly. To avoid the possible inter-observer variation that could happen between the reports of different observers, switching between the observers for each clinic was done every other week.

Statistical methods

For categorical variables, frequency and proportion were reported. To explore potential differences in compliance practice, we used generalized estimating equations with the identity logit and an autoregressive correlation matrix to evaluate the odds of having an infection control violation, over audits, in relation to student grade in our sample. We used robust standard errors and had five exploratory models with different outcomes (overall violation, dress code violation, cubic environment violation, X-ray room violation, and attitude violation). All models were adjusted for gender, audit time, and academic year. Checklists with incomplete checked items were excluded from the study. All statistics were computed using STATA software (version 14.1; Stata, College Station, TX). All statistical tests were two-tailed and interpreted at the 0.05 significance level.

Ethical considerations

Before commencement of the study, approval of College's Ethical Committee was obtained from the Institutional Review Board.

Table 1: Students gender and grade distribution throughout the 4 years of study

Student grade	2015–2016		2016–2017		2017–2018		2018–2019		Total n (%)
	Males	Females	Males	Females	Males	Females	Males	Females	
4 th	29	26	36	37	45	42	27	28	270 (37)
5 th	16	20	29	26	36	37	45	42	251 (34.4)
6 th	25	20	16	20	29	26	36	37	209 (28.6)
Total	70	66	81	83	110	105	108	107	
	136		164		215		215		730

Results

Clinical practice of 730 dental students in the 4th, 5th, and 6th clinical grades was reviewed during the study period; 369 males and 361 females working in 64 cubicles. Among them, 270 (37%) were audited while they were in the 4th grade, 251 (34.4%) while in the 5th grade, and 209 (28.6%) while in the 6th grade (Table 1).

Total number of checklists completely checked and available for the study was 40,725 with the lowest number in 2015–2016 (7559 checklists; 18.6% of total) and the highest number in 2018–2019 (13,865 checklists; and 34% of total).

Overall adherence to dress code among study participants along the study period expressed as percentage showed that 100% of participants wearing gloves throughout the clinical session and nearly almost all of them wear adhere to dress code (92%–100%) (Table 2).

As regard to adherence to infection control guidelines inside the cubicle, 100% of participants are aware about the recommended guidelines of sharps box level of fullness before disposal while few of them (1%) left sharps on the bench top after the session and nearly almost all of them adhere to infection control guidelines during clinical practice (90%–100%). On the other hand, during the 1st year of study (2015–2016) 14% of the 4th grade male and 12% of six grade female students did not apply wrapping to dental chair monitor. During the 2nd (2016–2017) and 3rd years (2017–2018) of the study, some of the 4th grade male students (14% and 11%, respectively) did not apply wrapping to computer screen on the working table (Table 3).

As regard to overall adherence to infection control guidelines in clinic station outside the cubicle among study participants along the study period, it is observed that 100% of participants wore gloves while taking X-ray to the patient and 94%–100% of them applied wrapping to radiograph tube, control panel, and keyboard. On the other hand, from 10% to 45% of participants get out of the cubicle with used contaminated gloves and 15% to 60 % of study participants not probably wear mask leaving it below the chin with lower percentages among 6th grade female students in the past year of the study (2018–2019) (Table 4).

For multivariable analyses, nine students were excluded from analyses due to missing data; leading to a total number of observations of 40,499 for 721 students. For all analysis, the odds were calculated

Table 2: Overall adherence to dress code among study participants along the study period expressed as percentage

Year	Gender and grade	Adherence to dress code					
		Mask	Gloves	Gown	Closed toe shoes	Short nails	No rings/accessories
2015/2016							
Males							
	4 th grade	98	100	95	94	96	98
	5 th grade	99	100	96	95	97	100
	6 th grade	100	100	97	98	99	100
Females							
	4 th grade	99	100	94	96	93	95
	5 th grade	100	100	93	96	96	97
	6 th grade	100	100	95	94	94	96
2016/2017							
Males							
	4 th grade	98	100	96	96	99	100
	5 th grade	100	100	96	95	99	100
	6 th grade	100	100	96	99	99	100
Females							
	4 th grade	100	100	97	100	97	97
	5 th grade	100	100	96	99	96	98
	6 th grade	100	100	98	100	95	99
2017/2018							
Males							
	4 th grade	99	100	95	96	100	100
	5 th grade	100	100	92	100	100	100
	6 th grade	100	100	96	99	100	100
Females							
	4 th grade	100	100	99	97	100	99
	5 th grade	100	100	99	96	100	99
	6 th grade	100	100	99	95	100	99
2018/2019							
Males							
	4 th grade	100	100	97	98	99	100
	5 th grade	100	100	98	97	98	100
	6 th grade	100	100	96	99	99	100
Females							
	4 th grade	100	100	99	97	100	98
	5 th grade	100	100	99	98	99	99
	6 th grade	100	100	100	97	98	99

on average, while adjusting for gender, audit time, and academic year. The odds of having an overall violation among 4th grade students were statistically significant lower than the odds of having that violation among 6th grade students by 7% (OR: 0.932, $p < 0.05$). On the other hand, there was no statistically significant difference in the odds of having an overall violation among 5th grade students when compared to 6th grade students. As regard to the odds of having a dress code violation, it was statistically significantly higher among 4th grade students than the odds among 6th grade students by 21% (OR: 1.206, $p < 0.01$). However, the odds of having that violation among 5th grade students were statistically significant higher than among 6th grade students by 38% (OR: 1.379, $p < 0.01$) (Table 5).

The odds of having a cubic environment violation among 4th grade students were statistically significant higher than among 6th grade students by 31% (OR: 1.308, $p < 0.01$). While, the odds of having a cubic environment violation among 5th grade students were statistically significant higher than among 6th grade students by 12% (OR: 1.121, $p < 0.01$). On the other hand, there was no statistically significant difference in

the odds of having an X-ray violation among 4th grade students when compared to 6th grade students whereas the odds of having an X-ray violation among 5th grade

students were statistically significant lower than the odds of having such violation among 6th grade students by 49% (OR: 0.507, P < 0.01). In respect to the odds of

Table 3: Overall adherence to infection control guidelines inside the cubicle among study participants along the study period expressed as percentage

Year Gender and grade	Adherence to infection control guidelines inside the cubicle						
	No personal items on bench top	No sharps on bench top	Wrapping for clinical contact surfaces	Wrapping for computer screen	Wrapping for dental chair monitor	Sharps box is not ¾ filled	Blood soaked cotton and gauze disposed in clinical waste
2015/2016							
Males							
4 th grade	92	100	98	90	86	100	94
5 th grade	94	99	99	90	97	100	96
6 th grade	95	100	100	92	99	100	96
Females							
4 th grade	96	100	100	93	90	100	98
5 th grade	99	99	100	95	92	100	98
6 th grade	99	100	100	92	88	100	99
2016/2017							
Males							
4 th grade	92	100	99	86	92	100	96
5 th grade	94	100	100	90	98	100	97
6 th grade	95	100	100	92	98	100	97
Females							
4 th grade	96	100	100	93	93	100	99
5 th grade	99	100	100	95	95	100	98
6 th grade	99	100	100	92	92	100	99
2017/2018							
Males							
4 th grade	94	100	100	89	92	100	99
5 th grade	90	100	100	93	94	100	99
6 th grade	96	100	100	96	99	100	99
Females							
4 th grade	98	100	100	94	99	100	99
5 th grade	100	100	100	96	98	100	98
6 th grade	100	100	100	96	96	100	99
2018/2019							
Males							
4 th grade	95	99	98	96	96	100	98
5 th grade	96	100	99	94	94	100	99
6 th grade	94	100	100	95	95	100	100
Females							
4 th grade	99	100	100	96	98	100	99
5 th grade	100	99	100	95	99	100	99
6 th grade	100	100	100	97	99	100	99

Table 4: Overall adherence to infection control guidelines in clinic station outside the cubicle among study participants along the study period expressed as percentage

Year Gender and grade	Adherence to infection control guidelines in clinic station outside the cubicle			
	X-ray rooms		Wrong attitude	
	Wearing gloves	Wrapping of radiograph tube, control panel	Getting out of the cubicle with used gloves	Mask not covering the nose and/or mouth
2015/2016				
Males				
4 th grade	100	96	40	60
5 th grade	100	94	25	33
6 th grade	100	96	43	26
Females				
4 th grade	100	99	45	30
5 th grade	100	100	35	36
6 th grade	100	100	25	20
2016/2017				
Males				
4 th grade	100	98	23	51
5 th grade	100	97	21	23
6 th grade	100	99	33	32
Females				
4 th grade	100	100	32	29
5 th grade	100	100	27	27
6 th grade	100	100	23	20
2017/2018				
Males				
4 th grade	100	97	29	46
5 th grade	100	97	25	37
6 th grade	100	98	24	28
Females				
4 th grade	100	100	25	36
5 th grade	100	100	15	17
6 th grade	100	100	17	26
2018/2019				
Males				
4 th grade	100	99	25	40
5 th grade	100	98	20	33
6 th grade	100	96	20	25
Females				
4 th grade	100	100	15	30
5 th grade	100	100	15	15
6 th grade	100	100	10	20

having an attitude violation in the clinic station outside the cubicle, it was statistically significant lower among 4th grade students than the among 6th grade students by 46%, (OR: 0.535, $p < 0.01$). Similarly, the odds of such violation among 5th grade students were statistically significantly lower than the odds among 6th grade students by 13% (OR: 0.874, $p < 0.01$) (Table 5).

Discussion

Audit is a benchmarking organized investigation of practices and procedures against already available standards and guidelines, identifying areas of weakness and subsequent interventions needed to improve practice. However, audit has received little attention in infection control field being mostly focused on environmental cleanliness rather than involving procedures required to protect patient and healthcare worker safety [12].

Auditing done in the present study as regard to dress code (donning gloves, masks, and gown) revealed high overall adherence where 100% of participants wore gloves, 98–100% wore masks, and 92–99% wore gown throughout the clinical session. These results were nearly similar to the previous studies performed by many audits; 60 audits in Germany [17], 48 audits in New York [18], 99 audits over 2 separate years (2010, 2014) in London [19], 2 months' audits in Pakistan [20], and three studies of one clinical audits; one in Iran [21], and two in Malaysia [16], [22].

High percentages of adherence to personal protective equipment in different areas of the world reflect the widespread awareness of dental students about CDC [7] guidelines of personal protective equipment as a core element in preventing spread

of infections in dental clinics by blocking infectious materials from the patient's oral cavity, for example, saliva, blood, and aerosols. However, in our college in addition to awareness, wall mounted posters in each treatment station as a reminder for students to improve their practice in this regard might have additional role.

Other items of dress code included in the present study's audit form were; closed footwear, hand free accessories, and short fingernails. CDC [7] recommended these items to avoid the risk blood spillage or sharp items onto feet, infection risk by possible damaging the integrity of the glove, harboring dirt, and bacteria under long fingernails. High adherence to these items was observed in the present study (94%–100%) which is similar to that reported by Westall and Dickinson [19] in their 1st year of study as regard to closed toe shoes and in both study years for hand free accessories. Controversially, lower adherence percentages for closed toe shoes (88%) were reported in the 2nd year of study done by Westall and Dickinson [19], and for hand free accessories (47%) in study of Mutters *et al.*, [17]. In one clinical audit done by Sukumaran *et al.*, [22], much lower adherence percentages regarding to closed toe shoes (69%) and hand free accessories (83%) among study participants while similar percentage of adherence for short fingernails. These findings could be explained by the fact that their study was only a record of one clinical audit.

Student clinics at Umm al-Qura Dental Teaching Hospital has two main closed stations; one assigned for male students and the other for female students, each station has 32 cubicles and 3 digital X-ray rooms; each cubicle has dental chair attached to a monitor and side bench on which desktop computer is placed and clinical sessions are scheduled to allow every student work in a separate cubicle under supervision of faculty member. In respect to adherence to infection control

Table 5: Comparison of overall and category violations to infection control among study participants along the study period

Predictors Outcome	Model (1)	Model (2)	Model (3)	Model (4)	
	Overall violation	Dress code violation	Cubic environment violation	Violations in clinic station outside the cubicle X-ray violation	Attitude violation
Gender (male reference)					
Males	5.8%	1.5%	3.3%	1.5%	30.3%
Females	4.3%	2.6%	2.3%	0.1%	29.4%
OR	0.926	1.387	0.728	0.545	1.028
p value	*** <0.01	*** <0.01	*** <0.01	*** <0.01	>0.05
Grade (6 th reference)					
6 th grade	10.9%	1.7%	2.2%	1.1%	34.1%
4 th grade	10.1%	2.8%	3.2%	0.9%	29.25%
OR ¹	0.932	1.206	1.308	0.901	0.535
p value	** <0.05	*** <0.01	*** <0.01	>0.05	*** <0.01
5 th grade	10.6%	2.2%	2.9%	0.7%	25.3%
OR ²	1.021	1.379	1.121	0.507	0.874
p value	>0.05	*** <0.01	*** <0.01	*** <0.01	*** <0.01
Year					
2015–2016	10.2%	2.8%	3.5%	1.3%	34.8%
2016–2017	10.3%	1.5%	3.0%	0.5%	28.4%
2017–2018	10.1%	1.1%	2.1%	0.7%	25.7%
2018–2019	10.0%	1.0%	1.8%	0.6%	22.3%
OR	1.021	1.021	1.009	0.960	0.984
p value	* <0.1	* <0.1	>0.05	>0.05	>0.05
Total number of audits	40,499	40,499	40,499	40,499	40,499
Total number of students	721	721	721	721	721

OR¹ is the odd's ratio of 4th grade in comparison with 6th grade, OR² is the odd's ratio of 5th grade in comparison with 6th grade, *** $p < 0.01$ extremely significant, ** $p < 0.05$ highly significant, * $p < 0.1$ significant, $p > 0.05$ non-significant.

guidelines inside the cubicle among study participants along the study period, adherence was high to the items observed. In comparison to other studies, much lower adherence was reported in applying protective barrier on all surfaces of dental workstation [16], [19], [22] and level of filling of sharps bin [19], while adherence to other items had nearly of similar percentages. Variation in adherence rates could be attributed to different levels of educational infection control training in dental schools, lack of constant reinforcement sessions, or regularly updated recommendations.

As regard to adherence to infection control guidelines in the clinic station outside the cubicle, high adherence was observed regarding to infection control guidelines in X-ray rooms, but 10–45% getting out of the cubicle (to call the supervisor or dental assistant) with used gloves and 15–60% not probably wear mask (not fitted to the nose and/or mouth) outside the cubicle. Closely similar percentages of adherence to guidelines in X-ray rooms as regard to gloves wear were reported by students responded to a questionnaire in Japan but 55.7% only used wrapping to X-ray unit [23]. The authors recommended that it is necessary to deepen the awareness of dental practitioners to the potential for contamination when taking dental X-rays as radiographic procedures are as risky as other more invasive procedures because saliva is usually difficult to see. They added that dental professionals should wear gloves when taking dental X-rays as hands contacting the patient's mouth and saliva and touching the X-ray tube and control panel may become contaminated.

As regard to getting out of the cubicle with used gloves, closely similar percentages to our study were reported in study of Sukumaran *et al.* [22] and Ayub *et al.*, [16]. These results reflect lack of awareness to international infection control guidelines which were confirmed by study of Adams *et al.* [24], who reported that bacteria, originating from the patient mouth or from surfaces around the dental unit, were removed from glove surfaces more than from the skin of the hand and constitute an obvious path of cross-infection. In respect to improper wearing of mask, higher percentage of 69% among study participants of Ebrahimpour *et al.*, [21] pull the mask under their chin which is against the infection control principles as reported by CDC [7]. These guidelines reported that contaminated mask could contaminate the rest of the scrub attire and according to assumption of Zhiqing *et al.*, [25] surgical masks could be the source of bacterial shedding with extended wearing time.

On trial to explore the high percentage of getting out of the cubicle wearing gloves and improbably worn mask outside the cubicle in the present study, it is somehow justifiable since students were adherent to gloves and probably worn mask inside the cubicle. This is possibly due to the fact that dental students are well aware of the risk of infection during dental treatment and so they paid more attention while treating patients inside

the cubicle compared to outside it. The percentage of these attitude violations outside the cubicle although decreasing by time, confirms the postulation of Westall and Dickinson [19] that despite the presence of well-established infection control policies and frequent educational sessions to promote adherence, we cannot guarantee a 100% compliance rate with protective measures for infection and occupational risk hazards.

Statistical analysis comparing overall violations and categories violations as regards gender showed that violations among females were highly significant lower than among males except for attitude violation where female violations were non statistically lower than male. On the other hand, when adjusting for gender, audit time, and academic year, categories violations among 4th and 5th grade students were highly significant higher than that of 6th grade students in dress code and cubic violations and lower in attitude violations outside the cubicle in both grades. These findings could be accounted for the fact that senior students who had clinical experience become more aware of cross infection risk inside the clinics while having much heavier load to finish their clinical requirements to be eligible for graduation might lead them to miss some infection control regulations outside the treatment cubicle [15].

Statistical analysis of X-ray violations showed that it was statistically significantly lower among 5th grade students and non-significant among 4th grade students when compared to 6th grade students. On the other hand, with respect to overall violation among 4th grade students, it was statistically significant lower than that overall violation among 6th grade students. The findings among 4th grade students of could be explained by the fact that they have only clinical sessions for operative, periodontics, and pain and anesthesia with no comprehensive care treatment or prosthetic clinics that might need full mouth X-ray and many practices that could violate infection control guidelines.

In general, infection control violations were classified into four types which are erroneous violations, due to a lack of knowledge about infection risk; exceptional violations such as in emergency situations where time is the main factor; institutional violations related to environment constraints such as lack of equipment and staff; and routine violations that occur on a regular basis, caused by a culture that agrees low standard practice, poor role-modeling by seniors, and a lack of administrative management policies [26]. Violations reported in the present study could belong to one of the first two types which will be worked on our hospital coming infection control action plan.

However, along the 4 years of the present study, statistically significant difference in overall violations was observed that reflects improvement in adherence rate over time. This finding is similar to that reported by Westall and Dickinson [19] whose study compare compliance to infection control guidelines among their students by auditing them 4 years apart

(49 separate clinical audits at 2010 then 50 audits at 2014). Consistently high adherence in our study could be explained higher institutional commitment provided by annual infection control training sessions, well-established infection control policies, and maintained auditing by the college's infection control committee as well as applying suspension penalties to students violating IC guidelines. Moreover, non-significant difference noted over the period of 4-year suggests that the present study was not subject to observational bias.

Conclusion

The adherence of infection control guidelines at College of Dentistry, Umm Al-Qura University remained consistently high to great extent along study years except for attitude violations in clinic station outside the cubicle which decrease by time. Hence, we recommend that monitoring through clinical audits should be continued together with educational programs, as well as training workshops on infection control for dental students and counseling with students violating infection control policies to make corrective actions.

However, the present study has both strengths and limitations; the most important strengths are being the first published auditing report about adherence to infection control guidelines among dental students in Saudi Arabia. The second is the duration of 4 years auditing which could reflect the actual adherence level among the small number of students in our college being a newly established dental college at Umm-Al-Qura University. The only limitation in the present study is that auditing did not involve all components of infection control standard precautions in dental practice.

Clinical Significance

Adherence to infection control guidelines constitutes the main component in preventing the spread of microorganisms in dental clinics; and the concept of consistent review of its implementation, by auditing, complies with quality improvement process targeting safe dental practice for protection of patients, dental practitioners, and community.

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