ORIGINAL RESEARCH PAPER

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# CROSS INFECTION CONTROL AMONG DENTAL STUDENTS AT QASSIM UNIVERSITY, SAUDI ARABIA

**KEY WORDS:** Cross infection control, Hep B vaccination, barrier techniques, infectious diseases.

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ABSTRACT

**Background:** The aim of this study was to evaluate knowledge and practices regarding infection control procedures among 3rd, 4th and 5th-year undergraduate dental students.

**Materials and Methods:** A questionnaire-based cross-sectional survey was conducted among 3rd, 4th and 5th-year dental students at Dental College, Qassim University, Saudi Arabia. The self-administered questionnaire was comprised of 13 open- and close ended items regarding barrier techniques, vaccination status, infection control practices, and awareness.

**Results:** The response rate was 61% (102 out of 168 potential respondents). Overall, 95.1% of the students had been vaccinated for hepatitis B and only 10.7% were taking post-hepatitis B virus immunization serology. While the vast majority (98%) reported always changing gloves between patients, (62%) of the student reported that they wash their hand between each glove change. Walking around without removing gloves and mask found only in (8.8%) of the student. (85.2%) of the student reported that they change gowns if visibly contaminated. Finally only (28.4%) of the student has the desire to treat patient with infectious diseases.

**Conclusions:** These findings highlight the necessity of continued infection control education in order to improve knowledge and practices regarding infection control among dental students at Qassim University.

## Introduction

Cross-infection is defined as the transmission of infectious agents between patients and staff within a clinical environment.[1] Dental health personnel (DHP) are at high risk of exposure to cross-infection with blood-borne pathogens, such as hepatitis B virus (HBV), hepatitis C virus, and human immunodeficiency virus (HIV), Mycobacterium tuberculosis, streptococci, other viruses.[2,3] This risk is enhanced by accidental injuries caused by dental instruments during patient treatment. Such infections can be prevented using safety precautions and implementing infection control guidelines.[4] Dental schools are responsible for providing appropriate infection control measures, proper training of dental students to protect patients, and for the establishment of safer work conditions.[4] In 2003, the CDC of USA updated its guidelines on infection control in dental settings.[5] These guidelines include standard precautions which aim to ensure a safe working environment and prevent the potential transmission of occupational and nosocomial infections among DHPs and their patients.

Awareness and compliance with these recommendations are crucial for the prevention of infections.[6, 7] Several studies have shown that even dental students have not always properly adhered to these procedures. [8, 9] Dental education can play a significant role in the training of dentists by helping them to adopt adequate knowledge and attitudes related to infection control procedures.

The rationale of this study is to assess the knowledge of cross infection control protocols followed in clinics by dental students of our institution.

## Materials and Methods

This cross-sectional survey was conducted on senior undergraduate dental students, Qassim University, during 2017. As dental education is for 5 years in Qassim and dental students are involved in clinical training starting in their 3th year of education, the questionnaire was distributed among 3rd, 4th and 5th year students. The questionnaire was adapted from a previous study conducted by Rahman et al [3]among dental students in the United Arab Emirates (UAE) and was modified accordingly for this study.

## Results

The response rate was 61% (102 out of 168 potential respondents).

**Table 1 Distribution of the students according to gender and year of study.**

| | | student year | | | Total |
|---|---|---|---|---|---|
| | | 3rd year | 4rth year | 5th year | |
| Gender | male | 21 | 23 | 17 | 61 |
| | female | 16 | 13 | 12 | 41 |
| Total | | 37 | 36 | 29 | 102 |

Mean ± SD Gender: 1.4 ± 0.49
Student Year: 1.9 ± 0.80

In table 2 data related to hepatitis B immunization, the number of doses, and post-HBV immunization serology. Vaccination was completed by 95.1% of the students, Out of the vaccinated students, only 80.4% completed the required three doses. Surprisingly, only 11(10.8%) were tested for post-HBV immunization serology.

**Table 2**

| | | | How many doses | | | | Total |
|---|---|---|---|---|---|---|---|
| | | | No doses | one dose | two doses | three doses | |
| student year | 3rd year | Count | 0 | 0 | 4 | 33 | 37 |
| | | % of Total | 0.0% | 0.0% | 3.9% | 32.4% | 36.3% |
| | 4rth year | Count | 1 | 4 | 2 | 29 | 36 |
| | | % of Total | 1.0% | 3.9% | 2.0% | 28.4% | 35.3% |
| | 5th year | Count | 4 | 0 | 5 | 20 | 29 |
| | | % of Total | 3.9% | 0.0% | 4.9% | 19.6% | 28.4% |
| Total | | Count | 5 | 4 | 11 | 82 | 102 |
| | | % of Total | 4.9% | 3.9% | 10.8% | 80.4% | 100.0 % |

Students self-reported about change of gloves between patients and washing hands between each glove wear. The vast majority (98%) of students reported changing gloves, while only 62.7%

reported washing their hands between each glove change, with no significant difference between 4th- and 5th-year students.

Table 3 (75.5%) of the student think that dental clinics is more prone to infection than other medical field clinics.

**Table 3**

| dental clinics are more prone to infection | | | | |
|---|---|---|---|---|
| Count | | | | |
| | | dental clinics are more prone to infection | | Total |
| | | yes | no | |
| Gender | male | 43 | 18 | 61 |
| | female | 34 | 7 | 41 |
| Total | 77 | 25 | 102 | |

***p = .028**
****p = .019**

Finally, we asked the student about their knowledge about Prion disease and 86.3% reported that they don't know anything about it.

## Discussion

Cross Infection control forms a key part of practice for all health care professionals and remains one of the most cost-beneficial medical interventions available. It is important for any hospital or dental clinic to set up its own measures to prevent the spread of infectious diseases. This survey was conducted to assess the level of knowledge and practices of dental students. The school of Dentistry, Qassim University is a large public dental school in Saudi Arabia and, therefore, we believe that our results can be generalized to other dental schools within the country.

The findings of the present study show that 95.1% of the students were vaccinated against Hepatitis B. The rate is almost similar to that reported by other studies in Brazil (90.8%), Canada (100%), and UAE (95.8%). [3,4,10] However, this rate is much higher than that reported in India, where only 38%, Yemen (70%) of students were found to be vaccinated.[9] Notably, 80.2% of the vaccinated students had received the recommended 3 doses of vaccination.

In our survey, only 10.8% of students who were immunized have reported post-HBV immunization serology, a percentage lower than that reported by other studies. de Souza *et al*. found that 90.8% have been vaccinated. [4] However, only 27.5% reported post-HBV immunization serology. Rahman *et al*. found that 50.4% were tested for post-immunization serology. 3 Several studies have reported that not all vaccinated individuals exhibit an immune response. [14,15] since dental students play a critical role

| | Vaccination status for Hep B * | | Post Hbv serology | | Injury with used instruments ** | | Sterilize instrument after each procedure | | Desire to treat infectious disease patients | | Knowledge about prion disease | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year of students | yes | No | yes | No | yes | No | yes | No | yes | No | yes | No |
| 3rd year | 37 | 00 | 06 | 31 | 05 | 32 | 36 | 01 | 10 | 27 | 06 | 31 |
| 4rth year | 35 | 01 | 04 | 32 | 11 | 25 | 34 | 02 | 13 | 23 | 04 | 32 |
| 5th year | 25 | 04 | 01 | 28 | 13 | 16 | 28 | 01 | 06 | 23 | 04 | 25 |
| | | | | | **Total** | 102 | | | | | | |

in Saudi's health care system, periodic mandatory assessment of their vaccination and immunization status is highly recommended. Despite the fact that there is evidence of improvement in compliance with barrier use in many countries, dentists' adherence to all infection control guidelines still needs further improvement. In the present study, change gloves between patients was high (98%), similar to previous studies conducted in Canada, Iran, the UK, the UAE, and Brazil. [10, 16, 17] It has been recommended that dental uniforms be worn only in dental clinics. [19]

Hand hygiene is considered the single most effective method for the prevention and control of infections. [20,21] 62.7% of our sample reported washing their hands between each gloves change. This finding is higher than earlier studies conducted by Rahman et al. [3] (47.9%) and de Amorim-Finzi [22] (45%).

This survey reports that 62% of the students had non-sterile occupational injuries. This finding is lower than that uncovered by a similar study conducted in Canada (82%) Brazil (31.1%), Iran (48.5%), and the UAE.[4,17]

When the students were asked about their willingness to treat patients with infectious diseases only 28.4% have desire to treat them. Finally, we asked the student about their knowledge about Prion disease and 86.3% reported that they don't know anything about it.

One of the limitations of this study is that the responses were based on students' self-assessment rather than being provided under the supervision of the investigators in a clinical environment.

## CONCLUSION

In general, our study showed acceptable compliance with the recommended infection control practices among dental students of Qassim University. However educational programs, as well as training workshops on infection control isolation precaution/vaccination for dental students, and the required facilities to allow compliance with infection control policies are needed.

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