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Student Self-Analysis of Infection Control in Preclinical and Clinical Spaces at the Dental Medicine Study of the School of Medicine, University of Mostar

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ABSTRACT

Background: This study aimed to demonstrate that the knowledge of infection control standard measures among students in the preclinical and clinical settings of the dental medicine study program at the Faculty of Medicine, University of Mostar, is higher in sixth-year students compared to fifth-year ones.
Methods: The participants completed a self-assessment survey on infection control during student exercises, which had been previously explained in detail. The survey consisted of two parts: general participant data (age, gender, professional status) and a targeted questionnaire about infection control in dental institutions.
Main findings: The sixth-year students and staff showed greater knowledge of infection control compared to the fifth-year students.
Principal conclusion: Based on the survey results, staff possess greater knowledge compared to students, and sixth-year students have more knowledge about infection control than fifth-year ones, indicating a gradual increase in knowledge over the course of the study program.

Key words: infection control, students, clinical research, dental medicine

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INTRODUCTION

Infection is a biological process that occurs when pathogenic microorganisms enter the host organism, causing disease due to tissue damage from the microorganism itself, either through its invasiveness (the ability to reproduce and penetrate tissues) or toxicity (the ability to produce toxins). Infectious disease pathogens are microorganisms from all groups of microbiological classification: bacteria, viruses, fungi, protozoa, and parasites.

Several additional terms are associated with infection and infectious diseases: colonization, carriage, and contamination. Colonization signifies the settlement of microorganisms on body surfaces. During colonization, the host does not produce an immune response to the microorganism, and it is generally passive. Carriage denotes the presence and persistence of pathogenic microorganisms after an individual has recovered from an infection. An example is the lifelong carriage of viral hepatitis B and C. The carrier has no symptoms or signs of disease but can be a source of infection. Contamination involves the pollution of inanimate objects and surfaces with infectious agents. In clinical practice, contamination refers to the pollution of primarily sterile materials (such as sterile gauze, surgical instruments, and needles) (1).

To prevent the unwanted transmission of microorganisms, dental team members should wear protective clothing and equipment when working clinically with patients (2). Wearing protective clothing and equipment prevents contamination and the transmission of infections both from and to the patient, as well as the possibility of injuries.

The aim of this study was to assess the knowledge of fifth- and sixth-year students and staff about standard infection control measures in the preclinical and clinical spaces of the dental medicine program at the Faculty of Medicine, University of Mostar.

The hypothesis was that knowledge would be greater in sixth-year students compared to fifth-year ones. The study was conducted on the premises of the Faculty of Medicine at the University of Mostar.

PARTICIPANTS AND METHODS

Participants

The total sample of participants in the study consisted of fifth- and sixth-year students of the dental medicine program at the Faculty of Medicine, University of Mostar, dental assistants, dental technicians, and dentists working in the dental preclinical and clinical areas of the same institution in Mostar, ensuring the criteria of accessibility and cooperation throughout the entire research process.

Based on their professional status, the participants were categorized into three groups:

1. Fifth-year students of the dental medicine program,
2. Sixth-year students of the dental medicine program,
3. Dental assistants, dental technicians, and dentists employed at the Faculty of Dental Medicine, University of Mostar.

This research was approved by the Ethics Committee of the Faculty of Medicine, University of Mostar.

The inclusion criteria for the participants in the statistical analysis and final report were:

1. Students listed in the Office of Teaching at the Faculty of Medicine, Mostar,
2. Dental assistants, dental technicians, and dentists employed at the Faculty of Dental Medicine, University of Mostar,
3. Participants who fully completed the questionnaire.

The exclusion criterion for the participants was: partial completion of the questionnaire.

Methods

Participants were given the infection control self-assessment survey during their student exercises, and it was then thoroughly explained to them. The survey consists of two parts: general data about the participants (age, gender, professional status) and a targeted

questionnaire about infection control in dental institutions. Each participant filled out the infection control self-assessment survey for student exercises. The estimated time for completing this survey was 10 to 15 minutes. All responses (1. Yes, 2. No, 3. I don't know) could be evaluated and statistically analyzed. After statistical processing, the results show the level of infection control in the preclinical and clinical areas of the dental medicine program.

Statistical analysis

The number of participants and percentages were presented for the responses: "Yes," "No," and "I don't know." To assess the statistical significance of the differences among the responses, the Chi-square test and Student t-test were used. The statistical significance threshold for the analysis was set at <0.05. Statistical analysis was conducted using SPSS for Windows (Version 17.0; SPSS Inc., Chicago, IL, United States) and Microsoft Excel (Office 2016, Microsoft Corporation, Redmond, WA, USA).

RESULTS

Male participants scored higher on the survey, but the observed difference was not statistically significant (Figure 1).

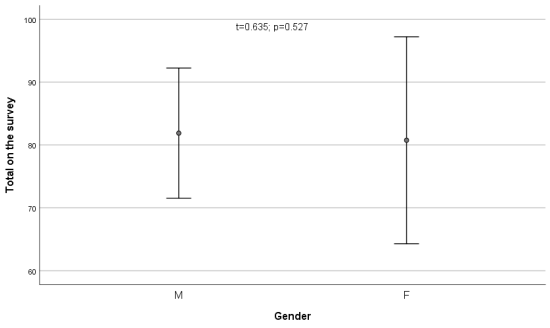

Figure 1. Total survey score by gender.

Staff members achieved higher scores on the survey compared to students, and the observed difference was statistically significant (Figure 2).

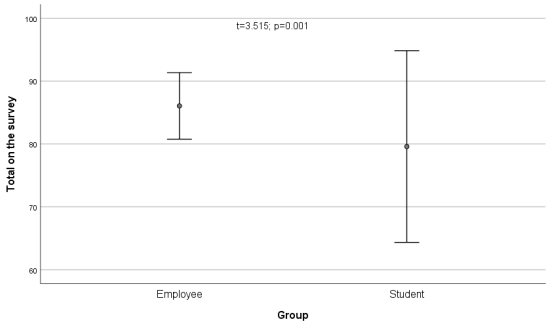

Figure 2. Staff members scored significantly higher on the survey than students.

The third chart shows the differences in the total survey scores between fifth- and sixth-year students. Sixth-year students achieved higher scores on the survey compared to fifth-year students, and the observed difference was statistically significant (Figure 3).

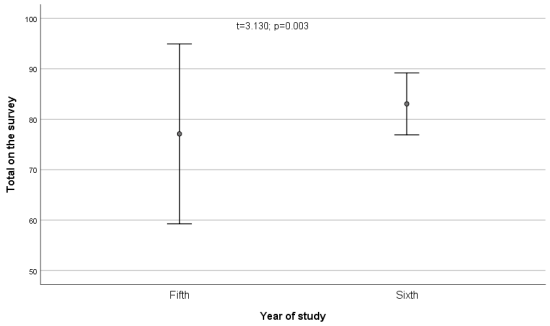

Figure 3. Total survey score by year of study.

DISCUSSION

The research showed that the knowledge of employees and sixth-year students regarding standard infection control measures is greater than that of fifth-year students.

The majority (88%) of radiology students in the study by Weerakoon and Chandrasiri had never participated in any infection control programs. Their knowledge and practice of infection control were also assessed using a survey tool (12). This statement aligns with the methodology and research conducted at our clinic and contributes to the experience and knowledge of the students who participated in the survey.

Table 1. Respondents' answers to hygiene and safety practices during clinical exercises

	n	%	χ^2	p
5. Do you remove jewelry from your hands before clinical exercises?			38.480	<0.001
Yes	49	65.3		
No	20	26.7		
I don't know	6	8.0		
8. Do you wear a mask when examining patients during clinical exercises?			121.520	<0.001
Yes	70	93.3		
No	3	4.0		
I don't know	2	2.7		
12. Do you make sure your lab coat is clean during practice?			121.680	<0.001
Yes	70	93.3		
No	4	5.3		
I don't know	1	1.3		
14. Do you know where the contaminated area is in your workspace?			66.320	<0.001
Yes	58	77.3		
No	12	16.0		
I don't know	5	6.7		

In a study conducted by Mutters et al. at a German university dental clinic, a survey was used to assess individual knowledge about infection control procedures among employees. While all employees wore gloves during clinical work, in some cases (dentists: 14.3% and dental assistants: 28.6%), they did not change gloves or disinfect their hands between patient contacts. Male dentists wore protective eyewear significantly more often. The majority of dentists (62.9%) and dental assistants (80.7%) wore jewelry during dental procedures. The results indicated that despite knowledge of various hygiene procedures, only a small percentage of dental staff at this German university clinic followed the hygiene procedures according to recommended guidelines (13).

The results of our research do not show similarities to the aforementioned study. It is possible to conclude that infection control at the dental clinic of the Faculty of Medicine at the University of Mostar is good compared to the results of the research conducted at the mentioned German university dental clinic.

In our survey, which included employees from the Faculty of Dentistry Clinic, as well as fifth- and sixth-year students, 92% of respondents stated that they disinfect and wash their hands between patients. During patient examinations, 93.3% of participants wear masks. The percentage of participants in the study who remove jewelry before clinical work is higher than in the previous one. Older respondents showed greater awareness of the importance of infection control measures in dental institutions. When asked, "Do you ensure your coat is clean during exercises?," the vast majority of participants (93.3%) answered affirmatively, regardless of age. The results reveal that awareness of hygiene importance is not age-dependent but is rather a result of training and education.

Our results are entirely supported by research where medical students were surveyed after training and again after six months, indicating an improvement in their knowledge of infection control measures (14). Younger participants demonstrated less consistency in adhering to certain preventive measures, suggesting underdeveloped habits. Our results are again contrary to the research by El-Saaidi et al., who reported a low level of knowledge about infection control and found better knowledge among fourth-year students than fifth-year students (15). Employees at the dental medicine clinic showed more knowledge about infection control than students, which is naturally associated with training and repeated practice.

Employees were better informed about contamination locations in the workplace compared to students. The group of older participants and those with higher levels of

education demonstrated greater consistency in adhering to preventive measures, while younger participants and students showed gaps in consistency. There is a need for proper infection control practices among dental assistants and other staff, as noted by Qudeimat et al. (16).

Such studies provide more knowledge and experience for students in educational institutions. The results also serve as a reminder to staff, dental assistants, dental technicians, and dentists about their responsibility for infection control in the community.

This research offers educational benefits, improves infection control practice, and raises awareness about the need for knowledge about safety measures implemented for mandatory practical education cycles for students interacting with employees in the clinical space. The obtained results will serve as a basis for future research to monitor and develop infection control strategies, contributing to better protection of the health of patients, students, and employed staff.

CONCLUSION

The conducted research confirmed that sixth-year dental students have better knowledge of infection control standard measures compared to fifth-year students, indicating progress in the understanding and application of infection prevention principles through clinical education.

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CONFLICT OF INTEREST

None to declare.

AUTHORS' CONTRIBUTIONS

MM conceived and designed the study; ZŠ collected the data; MM analyzed the data, interpreted the results, and prepared the figures; ZŠ edited and revised the manuscript; MM and ZŠ approved the final version of the manuscript.

ETHICAL BACKGROUND

Institutional review board statement: The study was conducted according to the guidelines of the Declaration of Helsinki and approved by the Ethics Committee.

Informed consent statement: Informed consent was obtained from all subjects involved in the study.

Data availability statement: We deny any restrictions on the availability of data, materials and associated protocols. Derived data supporting the findings of this study are available from the corresponding author on request.

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